

# Governments as Shadow Banks: The Looming Threat to Financial Stability

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*Governments often have short-term horizons and are focused excessively on the level of current economic activity, disregarding whether financial-sector regulation designed to achieve it leads to long-term instability. Their short-term objective can be well served through policies governing competition and risk taking in the financial sector. By allowing excessive competition, providing downside guarantees, and encouraging risky lending for populist schemes, governments can create periods of intense economic activity fueled by credit booms. This way, governments effectively operate as “shadow banks” in the financial sector, a moral hazard that can have even more adverse consequences than risk-taking incentives of the financial sector. This government role appears to have been at the center of recent boom and bust cycles, especially in the housing sector in the United States through the presence of government-sponsored enterprises (Fannie Mae and Freddie Mac), and continues to pose a threat to financial stability.*

## I. Introduction

Most discussion of macroprudential regulation of the financial sector focuses on banks and intermediaries in the private sector.<sup>1</sup> However, governments are themselves heavily involved in intermediation, either explicitly in the form of government-sponsored enterprises (GSEs) or implicitly in the form of government guarantees to private-sector

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1. See, e.g., Bengt Holmström, *Managerial Incentive Problems: A Dynamic Perspective*, 66 REV. ECON. STUD. 169, 170 (1999) (suggesting that the free market will remove moral hazard problems for managers, inducing efficient managerial behavior); Jeremy C. Stein, *Takeover Threats and Managerial Myopia*, 96 J. POL. ECON. 61, 61–62 (1988) (exploring how takeover pressure leads private-sector managers to sacrifice long-term interests).

intermediaries.<sup>2</sup> The government involvement also extends to determining the nature of regulation in the financial sector in the form of policies governing competition among financial firms, rules for prudential risk controls, and leverage limits or equivalent capital requirements.<sup>3</sup> This way, governments exercise a significant control over the extent and quality of intermediation activity in the economy and the attendant risks, not just in emerging market economies where the issue has been recognized due to the explicit state ownership of banks,<sup>4</sup> but also in developed economies where there is an implicit guarantee of the financial sector and government influence on the lawmaking process of competition and prudential rules for the financial sector.<sup>5</sup>

Governments, unfortunately, often have a short-term horizon and may adopt policies that create excessive current intermediation—a “large financial center”—at the expense of future costs of financial instability. For example, in pursuit of short-run popularity, governments can encourage competition in the financial sector,<sup>6</sup> provide downside guarantees,<sup>7</sup> weaken risk controls,<sup>8</sup> subsidize leverage through tax deductions,<sup>9</sup> and direct lending to specific sectors for populist goals.<sup>10</sup> This way, governments can effectively operate as “shadow banks” in the financial sector, exploiting intermediation activity for private objectives, the end result of which is often the fueling of credit booms and periods of intense economic activity but with a looming threat to financial stability.

There are several reasons why governments have short-term horizons. First and foremost, politicians are primarily focused on getting reelected.<sup>11</sup> Hence, they may cater to their specific constituencies or the preferences of the current generation, and therefore support boosting current economic activity, even if that risks financial hazards for other constituencies or future generations. Second, government balance sheets are hard to comprehend since they inherently involve some smoothing of expenditures and taxation

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2. See *infra* Part III.

3. See *infra* Part III.

4. See I. Serdar Dinç, *Politicians and Banks: Political Influences on Government-Owned Banks in Emerging Markets*, 77 J. FIN. ECON. 453, 454–55 (2005) (exploring political influence on government-owned banks in emerging economies during election years).

5. See *infra* Part III.

6. See *infra* Part III.

7. See *infra* Part III.

8. See *infra* Part III.

9. See *infra* Part III.

10. See *infra* Part III.

11. A significant body of political science literature takes such a model of representatives' interests as a starting point for analysis of political behavior. See, e.g., DAVID R. MAYHEW, CONGRESS: THE ELECTORAL CONNECTION 16–17 (1974) (analyzing the universality of the electoral goal and treating Congressmen as “single-minded election seekers”).

over time.<sup>12</sup> Given such difficulty of comprehension, recent growth and economic activity numbers often drive a population's evaluation of their government's success.<sup>13</sup> In turn, even governments and politicians with long-term horizons can find themselves caught up in the game of meeting short-term expectations.<sup>14</sup> That is, opportunistic governments can attempt to exploit the moral hazard opportunity given the opaqueness of their activities and balance sheets, and obfuscate current spending and activity by relegating to future governments the tail risks undertaken by such spending. Prime examples of such risks include the long-run risk of housing subsidies,<sup>15</sup> funding risks from excessive health care and labor protection for the current generation of voters,<sup>16</sup> and the risk of sovereign default when fiscal deficits grow large and unsustainable,<sup>17</sup> among others, many of which have been realized or surfaced following the housing, financial, and sovereign crises in Western economies since 2007.<sup>18</sup>

For the purposes of this paper, I take this distortion of government objectives as given for the positive analysis of the paper and assume that the government chooses financial-sector policies to maximize the level of *current* economic activity, disregarding whether such activity will lead to stable growth and ignoring the future costs of encouraging intermediation through its policies. In contrast, prudential regulation of the financial sector—a normative benchmark for the analysis—maximizes the expected

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12. See Chao-Hsi Huang & Kenneth S. Lin, *Deficits, Government Expenditures, and Tax Smoothing in the United States: 1929–1988*, 31 J. MONETARY ECON. 317, 336–37 (1993) (concluding that Barro's tax-smoothing hypothesis was successfully tested using U.S. historical fiscal data).

13. See, e.g., Larry M. Bartels, *The Irrational Electorate*, WILSON Q., Autumn 2008, at 44, 49 (stating that U.S. voters focus on recent economic conditions and ignore long-term performance).

14. This point is akin to the modeling of corporate myopia. See Holmström, *supra* note 1 (analyzing the tension between investments in human capital and financial returns); Stein, *supra* note 1 (examining how takeover pressure can lead companies and managers to sacrifice long-term growth for short-term profits); Viral V. Acharya & Bart M. Lambrecht, *A Theory of Income Smoothing When Insiders Know More Than Outsiders* 1–2 (Nat'l Bureau of Econ. Research, Working Paper No. 17,696, 2011), available at <http://www.nber.org/papers/w17696.pdf> (discussing how insiders smooth reported cash flow and income to meet outsiders' expectations). This point is also similar to the model of government myopia. See Viral V. Acharya & Raghuram A. Rajan, *Sovereign Debt, Government Myopia, and the Financial Sector* 37–38 (Nat'l Bureau of Econ., Research Working Paper No. 17,542, 2011), available at <http://www.nber.org/papers/w17542.pdf> (providing an explanation for why governments seeking short-term electoral popularity still service external debt even if it may not be in their best interest).

15. See VIRAL V. ACHARYA ET AL., *GUARANTEED TO FAIL: FANNIE MAE, FREDDIE MAC, AND THE DEBACLE OF MORTGAGE FINANCE* 171–72 (2011) (discussing how current administrations have maintained housing subsidies and shifted the burdens to future administrations).

16. Henning Bohn, *Who Bears What Risk? An Intergenerational Perspective* 1–2 (Apr. 2005) (prepared for presentation at the 2005 Pension Research Council Symposium), available at <http://www.econ.ucsb.edu/~bohn/papers/PRC05.pdf>.

17. Acharya & Rajan, *supra* note 14, at 3–4.

18. See, e.g., ACHARYA ET AL., *supra* note 15, at 1–3 (outlining Fannie Mae's and Freddie Mac's role in the 2008 financial crisis).

output from intermediation net the costs of financial failures.<sup>19</sup> I examine policies under the two objectives in a setting where financial firms have incentives to take on excessive risks after borrowing funds, but the strength of these incentives depends upon the “franchise values” they give up from risk taking, which in turn, depends upon the nature of competition in the financial sector and the extent of risk and leverage controls imposed on the financial sector.<sup>20</sup>

Prudential regulation adopts limited competition policy to preserve franchise values in the financial sector,<sup>21</sup> limited downside guarantees (if any) to limit taxpayer costs from failures,<sup>22</sup> and adequate risk and leverage controls.<sup>23</sup> In striking contrast, governments in the model do exactly the reverse: they deregulate the financial sector fully, encouraging a competitive “race to the bottom” among financial firms;<sup>24</sup> offer blanket downside guarantees to boost franchise values so that full deregulation implies greater entry and competition; and weaken risk controls and capital requirements. Government moral hazard, in the guise of short-term policies for the financial sector, emerge as a bigger risk to financial stability than the risk-taking incentives of the private financial sector.

I then present a leading example for this thesis. Based on *Guaranteed to Fail: Fannie Mae, Freddie Mac, and the Debacle of Mortgage Finance*, I argue that the housing boom and bust in the United States that caused the financial crisis of 2007–2009 was deeply rooted in government interventions and policies in housing finance. I focus on the role played by two GSEs, Fannie Mae and Freddie Mac. “Born of a well-intentioned and economically efficient goal of creating liquidity in the secondary mortgage market, these institutions morphed into typical profit-taking firms” that had the majority of their risks backstopped by the government.<sup>25</sup>

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19. See Thomas F. Hellman et al., *Liberalization, Moral Hazard in Banking, and Prudential Regulation: Are Capital Requirements Enough?*, 90 AM. ECON. REV. 147, 147–48 (2000) (accepting that the role of prudential regulation is to protect the banking system from financial crisis).

20. “Franchise values” for banks generally refer to continuation values for bank owners in case the bank survives another period. The model in this paper is one-period only, but its assumptions on the probability structure of a bank’s outcomes at the end of the period facilitate interpreting bank owners’ payoff when the bank survives as a franchise value.

21. THE INT’L BANK FOR RECON. & DEV., THE WORLD BANK & THE INT’L MONETARY FUND, FINANCIAL SECTOR ASSESSMENT: A HANDBOOK 92–93 (2005), available at [http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2005/10/12/000012009\\_20051012134613/Rendered/PDF/337970rev0Final10Assessment01PUBLIC1.pdf](http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2005/10/12/000012009_20051012134613/Rendered/PDF/337970rev0Final10Assessment01PUBLIC1.pdf).

22. *Id.* at 155 (recounting the importance of regulation covering all firms in an industry so that gaps in regulation do not impose unnecessary burdens on regulated firms and taxpayers).

23. *Id.* at 87.

24. See Eric C. Chaffee, *A Panoramic View of the Financial Crisis that Began in 2008: The Need for Domestic and International Regulatory Reform*, 35 U. DAYTON L. REV. 1, 7 (2009) (identifying the push for deregulation as a contributor to the international race to the bottom for securities regulations).

25. ACHARYA ET AL., *supra* note 15, at 12.

As of 1970, when Fannie Mae had been recently privatized and Freddie Mac was newly created, they represented [only] 4.4% of the mortgage market; by 1991, they captured 28.4%; by the time of the financial crisis, they held 41.3%, with a combined \$1.43 trillion mortgage portfolio and \$3.50 trillion in mortgage-backed security (MBS) guarantees; and, as of August 2010, they had left the U.S. taxpayers with a [debt] of close to \$150 billion . . . .<sup>26</sup>

In a nutshell, the policies that led to the extraordinary growth of the GSEs and their eventual collapse are as follows: the privatization of Fannie Mae in 1968 even as its debt was implicitly guaranteed;<sup>27</sup> the creation of Freddie Mac to further support housing markets;<sup>28</sup> the deregulation of MBS markets to allow private market securitization starting in the 1980s;<sup>29</sup> and the relaxation of GSE capital requirements and the required expansion of their business by the government to riskier mortgages in the 1990s.<sup>30</sup> All of these policies lead to the conclusion that these were part of initiatives to boost lending against housing as a government-favored asset class, disregarding the substantial downside risks to taxpayers in the future.<sup>31</sup> Importantly, a case can be made that the deregulation of housing finance in the United States in the 1980s and the “push” to extend GSE activity in high-risk mortgages in the 1990s created a fierce competition in risk taking and market-share grabbing between the GSEs and the financial sector.

Overall, the facts presented are suggestive of a distorted government objective behind these outcomes, an objective focused on short-run populist schemes for housing, provided through the government’s own imprint in the financial sector in the form of GSEs as well as through policies affecting the quality of lending against houses by the private sector. While this threat from government policies was raised prior to the crisis,<sup>32</sup> it went largely unnoticed but did materialize and continues to loom.

Before proceeding to the rest of the paper, it is useful to highlight ways in which government short-termism induces regulatory and economic outcomes that differ from the traditional models of political economy and its effects on financial-sector regulation.

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26. *Id.*

27. *See infra* Part III.

28. *See infra* Part III.

29. *See infra* Part III.

30. *See infra* Part III.

31. *See* ACHARYA ET AL., *supra* note 15, at 97 (arguing that “[t]he specific quasi-public/quasi-private structure of the GSEs created incentives for excessive risk-taking, at the ultimate expense of the tax-paying public”).

32. *See, e.g.*, Josh Rosner, *Housing in the New Millennium: A Home Without Equity is Just a Rental with Debt* 29 (June 29, 2001) (unpublished manuscript), *available at* <http://ssrn.com/abstract=1162456> (arguing in 2001 that the cycle of increasing homeownership spurred in part by policy changes relaxing underwriting standards “has the potential to become a vicious cycle of lower home prices due to an accelerating rate of foreclosures caused by lower savings”).

In one view, governments provide guarantees to the financial sector not because they are myopic, but primarily because, due to a time-inconsistency problem—*ex post* (once the financial sector is in a crisis)—the government must provide guarantees to it.<sup>33</sup> In contrast, when governments have a short-term decision making horizon, government-guarantee provisions occur even *ex ante*, with the objective of generating greater entry in the financial sector and expanding current levels of economic activity. While there is certainly merit to the huge government presence in private financial-sector bailouts during a crisis, it is harder to justify, based on time-inconsistency alone, that presence in financial sectors worldwide in good times (in the form of state-owned or government-sponsored enterprises) and long after the incidence of financial crises.

In the second important alternative view, interest groups, notably the financial sector in good times, capture the regulatory objective function through direct or indirect side payments to government officials, thereby ensuring that the private interests of the financial sector are protected at the expense of the average taxpayer.<sup>34</sup> The government short-termism view is different in important ways. While the interest-group view results in transfers across interest groups, short-termist government policies are more likely to induce transfers across generations.<sup>35</sup> More importantly, as my model shows, a short-termist government may in fact erode the financial sector rents to zero by encouraging excessive competition.<sup>36</sup> Such a government interest in generating excess risk taking can thus even exceed the private risk-taking interests of the financial sector.

In the end, I view these different political economy channels as complementary. I find it appealing, though, that government short-termism—even if just as a convenient modeling device—ignores *ex ante* (or underweights, more generally) long-run risks from financial-sector risk taking in rules and laws that govern such risk taking.<sup>37</sup> It therefore has the natural implication that “tail risks” in the financial sector are structurally

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33. See Viral V. Acharya & Tanju Yorulmazer, *Too Many to Fail—An Analysis of Time-Inconsistency in Bank Closure Policies*, 16 J. FIN. INTERMEDIATION 1, 2 (2007) (positing that, when the number of bank failures is large, the government must provide guarantees because it is *ex post* optimal to do so).

34. Edward J. Kane, *Redefining and Containing Systemic Risk*, 38 ATLANTIC ECON. J. 251, 252 (2010).

35. See Matthew W. Wolfe, Note, *The Shadows of Future Generations*, 57 DUKE L.J. 1897, 1910 (2008) (noting that policymakers who place a higher importance on present interests, as opposed to future interests, give present generations preferential treatment over future generations).

36. See *infra* section II(A)(1).

37. See Acharya & Yorulmazer, *supra* note 33, at 21 (showing that “bank closure policy is often marred by considerations of regulatory reputation . . . and political economy” causing decision making to have a “short horizon”).

induced or encouraged and, thereby, the regular incidence of financial crises may be ultimately rooted in government-level moral hazard problems.<sup>38</sup>

Part II presents the model of government's role in the financial sector as a shadow bank. Part III describes in detail the case of GSEs in the United States as a quintessential example of government operating as a shadow bank in the financial sector. Part IV provides some other examples of governments operating as shadow banks and concludes with implications for financial stability and prudential regulation of the financial sector.

## II. The Model of Governments as Shadow Banks

### A. *Benchmark Model*

Consider a representative financial firm (bank, shadow bank, government-sponsored enterprise, etc.) operating in a one-period economy. The financial firm borrows deposits from investors who can otherwise earn a reservation rate of  $r$  (e.g., by investing in government bonds). For simplicity, deposits of each firm are normalized to one unit. The financial firm can invest the funding raised in projects in the economy (e.g., loans and loan guarantees to households and corporations). The firm can choose the "scale" of its portfolio of investments (denoted as  $y$ ). This scale can be interpreted as a measure of *current* economic activity related to total financial investments (in turn physical investments, extent of job creation, and so on). To capture that  $y$  is a measure of current economic activity but not necessarily of the stable or robust (long-run) economic activity, we assume that the portfolio  $y$  has a likelihood of "success" of  $p(y)$ , in which case it yields a return of  $y$  at the end of the period, i.e.,  $y$  indeed becomes the stable level of economic activity; otherwise, the portfolio "fails," producing no return, i.e.,  $y$  generates current economic activity but no stable economic gain. This modeling of bank portfolios can be thought of as showing return on an aggregate portfolio of the economy with the states corresponding to an economic (or financial) boom and bust, respectively. In case of a boom, a high current level of economic activity is associated with stable economic value creation; whereas in case of a bust, high current activity is followed by a crash or a crisis wiping out any value creation in the process.

We also assume that the economy's capacity to produce high levels of output has limits, which are captured by assuming that  $p'(y) < 0$ . To ensure bounded outcomes in the model, it is also assumed that  $p''(y) < 0$ . That is, as the financial firm grows its portfolio size, it must do so on the margin by

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38. See *id.* at 25 (highlighting study findings which conclude that government bailouts of troubled banks create a greater likelihood of a banking system crisis).

making poorer quality loans, meaning the overall likelihood of success of the portfolio falls.<sup>39</sup>

The first-best portfolio size (or equivalently the level of risk)  $y^{FB}$  maximizes the expected output of the economy,  $(p(y).y)$ , so that the first-order condition and second-order conditions for the optimal investment size are given respectively by

$$p(y) + yp'(y) = 0, \quad (1)$$

$$2p'(y) + yp''(y) < 0. \quad (2)$$

In contrast, the financial firm's choice of portfolio size, denoted as  $y^*$ , maximizes the firm's expected equity value  $(p(y)).(y - r_D)$ , where  $r_D$  is the equilibrium (gross) cost of borrowing to the firm. Assume that the financial firm chooses its portfolio size *after* it has borrowed at the rate of interest  $r_D$ . Then, the first-order and second-order conditions are given respectively by

$$p(y) + (y - r_D)p'(y) = 0, \quad (3)$$

$$2p'(y) + (y - r_D)p''(y) < 0. \quad (4)$$

Comparing conditions (1) and (3), it follows that for any rate of borrowing  $r_D > 0$ , there is asset substitution or risk shifting<sup>40</sup> in that the portfolio size is greater than is efficient ( $y^* > y^{FB}$ ), and in turn, risk is greater ( $p(y^*) < p(y^{FB})$ ) and expected firm output is smaller ( $p(y^*).y^* < p(y^{FB}).y^{FB}$ ).<sup>41</sup>

As a comparative static, it is interesting to note that differentiating the first-order condition (*foc*) in (3) with respect to  $r_D$  (and denoting the second-order condition (4) as *soc*) yields  $(soc)\frac{dy^*}{dr_D} + \frac{\partial(foc)}{\partial r_D} = 0$ , so that

$$\text{sign}\left(\frac{dy^*}{dr_D}\right) = \text{sign}\left(\frac{\partial(foc)}{\partial r_D}\right) = \text{sign}(-p'(y)), \text{ which is positive. That is, an}$$

increase in the borrowing cost leads to greater risk taking and lower expected value. The intuition is the same as Michael Keeley's: since financial firms are leveraged, an increase in the cost of borrowing ( $r_D$  in the model) results in a fall in the "franchise value" ( $y - r_D$  in the model) that they lose if they do not survive, so that an increase in the cost of borrowing induces greater risk taking or gambling for resurrection. Conversely, a reduction in the cost

39. This benchmark model and extensions considered below are based on FRANKLIN ALLEN & DOUGLAS GALE, *COMPARING FINANCIAL SYSTEMS* (2000) and Jürg Blum, *Do Capital Adequacy Requirements Reduce Risks in Banking?*, 23 J. BANKING & FIN. 755 (1999).

40. See, e.g., Michael C. Jensen & William H. Meckling, *Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure*, 3 J. FIN. ECON. 305, 355 (1976) (explaining the ease with which firms may adversely shift outcome distributions for bondholders).

41. The last inequality follows from the observations that  $y^{FB}$  maximizes  $p(y).y$ ;  $p(y).y$  is a concave function of  $y$ ; and,  $y^* > y^{FB}$ .



of borrowing or an increase in the spreads earned on investments can enhance franchise values and in turn reduce risk-taking incentives.<sup>42</sup>

Going back to the private equilibrium, assuming investor rationality, the rate of interest charged satisfies:  $p(y^*) r_D = r$ . The equilibrium borrowing rate reflects the financial firm's risk taking, but because risk is chosen *after* the rate is contracted, it does not get the firm to fully internalize the inefficiency of its risk taking.

Finally, to ensure that financial intermediaries make non-zero profits in equilibrium (implicitly their reservation utility is zero), it must be the case that  $y^* > r_D$ , which holds as long as  $y^* p(y^*) > r$ . In other words, even though financial firms are taking excessive risks ( $y^* > y^{FB}$ ), the expected output they generate is greater than the output earned by simply investing in the reservation investment opportunity of depositors. I will assume this condition holds for now, but consider its possible violation in a later part.

### 1. Model with Competition

Consider an extension of this benchmark model of a representative bank to the model financial sector with  $n$  identical firms. These firms engage in Cournot competition<sup>43</sup> for investments. For simplicity, I model directly the (gross) return each financial firm earns on investments after competition as  $f(n)y$ , where  $y$  is the size of intermediation, or investments made or originated (also the total output realized in the economy on these investments).<sup>44</sup> For simplicity, I ignore any competition on the liabilities side in raising deposits because it would qualitatively lead to similar results. I make the natural assumptions that  $f(n) > 0$ ,  $f(1) = 1$ ,  $f(\infty) = \bar{f} > 0$ ,  $f'(n) < 0$ ,  $f''(n) < 0$ .

In a symmetric equilibrium, the financial firm's choice of portfolio size (denoted as  $y^*(n)$ ) maximizes expected equity value  $p(y) \cdot [f(n)y - r_D]$ , where  $r_D$  is the firm's (gross) cost of borrowing. Thus, the first-order condition for optimal  $y^*(n)$  is given by

$$f(n)p(y) + [f(n)y - r_D]p'(y) = 0. \quad (5)$$

42. See generally Michael C. Keeley, *Deposit Insurance, Risk, and Market Power in Banking*, 80 AM. ECON. REV. 1183 (1990) (explaining the effects of borrowing costs and deposit insurance on risk-taking behavior by banks).

43. See Andrew F. Daugherty, *Cournot Competition*, in THE NEW PALGRAVE DICTIONARY OF ECONOMICS (Steven N. Durlauf & Lawrence E. Blume eds., 2d ed. 2008), available at [http://www.dictionaryofeconomics.com/article?id=pde2008\\_C000591](http://www.dictionaryofeconomics.com/article?id=pde2008_C000591) (explaining the premises of Cournot competition).

44. In effect, firms are not internalizing the effect of competition on each other or on themselves. A standard Cournot model, in which each firm has control over its own level of economic activity, determining the aggregate activity in equilibrium and the equilibrium level of competition affecting each firm, yields similar results.

I continue with the premise that  $\frac{dy^*(n)}{dr_D} > 0$ . Differentiating the first-order condition in (5) with respect to  $n$  (which is legitimate as a comparative static even though  $n$  takes on integer values) and denoting the corresponding second-order condition as  $(soc^*)$  yields

$$\frac{dy^*(n)}{dn} = -\frac{1}{(soc^*)} [p(y) + yp'(y)] f'(n) > 0 \quad (6)$$

because  $(soc) < 0$ ,  $[p(y) + yp'(y)] < 0$ ,  $f'(n) < 0$ , where the second inequality follows from the fact that private risk taking exceeds social risk taking (along the lines shown for the benchmark model). Intuitively, competition reduces financial firms' margins on investments and therefore their franchise values. With less to lose when they gamble, competition by financial firms enhances risk taking beyond that in the benchmark case.

A corollary of this effect of competition on risk taking is that full competition is, in general, not desirable from a social standpoint. Note that the expected social output is given by  $n p(y^*(n)) \cdot y^*(n)$ , or  $nV_n^*$ , where  $V_n^*$  is the expected total output from each financial firm's investments. The optimal size of the financial sector is given by the  $n$  that satisfies the condition (or the value of  $n$  beyond which the condition turns negative)

$$V_n^* + n \frac{dV_n^*}{dn} = 0. \quad (7)$$

Due to excessive risk taking by financial firms,  $\frac{dV_n^*}{dn} < 0$ , such that some competition is desirable from a social standpoint, but excessive competition is not desirable because of the deleterious effects of competition on franchise values and risk taking. The intuition is that increasing competition has two opposing effects: on the one hand, it increases the number of participants (and total potential output), but on the other hand, it leads to increased excessive risk taking by each firm, reducing the expected economic output from the intermediation of each firm.

In practice, however, governments often adopt policies that largely deregulate competition in the financial sector.<sup>45</sup> The model shows that such

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45. See, e.g., Tamin Bayoumi, *Financial Deregulation and Consumption in the United Kingdom*, 75 REV. ECON. & STAT. 536, 536 (1993) (noting the widespread financial deregulation in the United Kingdom in the 1980s); Abhiman Das & Saibal Ghosh, *Financial Deregulation and Efficiency: An Empirical Analysis of Indian Banks During the Post Reform Period*, 15 REV. FIN. ECON. 193, 194 (2006) (commenting on the initiation of deregulation policy in India's financial sector in 1992 and its effect on competition); Sebastian Edwards, *Financial Deregulation and Segmented Capital Markets: The Case of Korea*, 16 WORLD DEV. 185, 185 (1988) (introducing Korea's goal to liberalize its financial sector, including introducing "measures geared at increasing competition among banks"); Peter Englund, *Financial Deregulation in Sweden*, 34 EUR. ECON. REV. 385, 385-86 (1990) (listing the deregulatory policies enacted by Sweden in the 1980s).

deregulation erodes franchise values and induces excessive risk taking. To show that such deregulation is desirable for a government operating as a shadow bank, suppose that instead of maximizing expected output, the government maximizes the potential *size* of the output. Instead of maximizing the social objective  $np(y^*(n)) \cdot y^*(n)$ , the government maximizes the size of economic activity  $n \cdot y^*(n)$ . There are several reasons to believe this is an accurate characterization of government behavior.

The size-maximizing government's optimal level of competition in the financial sector is full competition ( $n \rightarrow \infty$ ) because

$$\frac{d(ny^*(n))}{dn} = y_n^* + n \frac{dy^*(n)}{dn} > 0. \quad (8)$$

An alternative interpretation is that a government focused on current activity ignores the risk of financial fragility altogether and deregulates the financial sector excessively so as to stimulate competition and risk taking. Such deregulation boosts current lending and investments, some of which may be populist in nature (housing loans, for example), and some of which allows creation of large financial centers and jobs, but which also comes at the cost of poor quality of investments in terms of future risks.<sup>46</sup> These costs may not always be internalized by governments because they have short-term objectives. Governments may also cater to specific constituencies for political gain.<sup>47</sup> The model implies that when such deregulation is undertaken, there will be a “race to the bottom” in risk taking between incumbent and new financial firms as a result of the erosion in the incumbents' franchise values.<sup>48</sup>

### B. Government Guarantees

To facilitate “large” financial sectors, governments provide substantial guarantees to the financial sector.<sup>49</sup> To understand this preference for guarantees, suppose in the benchmark model that the representative financial firm were a government-sponsored enterprise (GSE) or effectively had a full

46. See *supra* note 31.

47. See generally Randall S. Kroszner & Philip E. Strahan, *What Drives Deregulation? Economics and Politics of the Relaxation of Bank Branching Restrictions*, 114 Q.J. ECON. 1437 (1999) (finding that interest-group factors explain the timing of banking deregulation and congressional voting on interstate deregulation).

48. This is consistent with the evidence of Hellman, Murdock, and Stiglitz, who also built a model showing this effect. See Hellman et al., *supra* note 19, at 147 (using a dynamic model of moral hazard to show how competition can undermine prudent bank behavior). This model explains why deregulation with such perverse effects is undertaken, namely due to governments wishing to operate banks to reach their own objectives.

49. See ACHARYA ET AL., *supra* note 15, at 134 (describing, generally, how a government guarantee becomes more implicit as a financial firm becomes larger and, thus, more “systemically important”); *id.* at 27–30 (detailing the U.S. government's substantial guarantees in the housing sector via the subsidizing of Fannie Mae and Freddie Mac); *infra* notes 80–82 and accompanying text (providing examples of government guarantees of large financial sectors in Spain and Germany).

explicit or implicit government guarantee (such as the market's perception of a too-big-to-fail or too-systemic-to-fail firm). Then, the borrowing rate for the GSE is  $r$ , assuming that creditors are fully bailed out *ex post* (but not the GSE's equity holders who are wiped out). The risk choice of the GSE is given by  $y^*(r)$ . Then, the government or the resolution authority, such as the Federal Deposit Insurance Corporation (FDIC), bears a cost of bailout of  $[1 - p(y^*(r))]r$  because, in the failure state of the GSE, creditors are bailed out fully at the gross rate of return  $r$ . The (perceived) cost may be even higher if injection of these funds crowds out alternative fiscal expenditures in states where government borrowing constraints are binding.

Note that subsidizing the borrowing cost of the GSE enhances its franchise value and reduces its risk-taking incentives because equity holders want to preserve the enhanced franchise value. As a result, it might be attractive from a welfare standpoint for the government or the FDIC to provide such an unconditional guarantee (without charging an *ex ante* premium for it). The potential social gain from the guarantee is expressed as

$$V^*(r) - V^*(r_D) - [1 - p(y^*(r))]r, \quad (9)$$

where  $V^*(r) = p(y^*(r)) \cdot y^*(r)$ ,  $V^*(r_D) = p(y^*(r_D)) \cdot y^*(r_D)$ , and as discussed before  $r_D = \frac{r}{p(y^*(r_D))}$ . Since  $V^*(r)$  is declining at  $r = r_D$ , the gain can be positive for  $r < r_D$ . More generally, the government guarantee can have a probability of creditor bailout of less than 1, making the equilibrium rate of borrowing between  $r$  and  $r_D$ .

However, even when the gain from insuring the creditors of a monopolistic financial sector is positive, it may no longer be positive from a social standpoint in a financial sector with high competition. This is because risk taking becomes more severe with competition,  $\frac{dp(y^*(n))}{dn} < 0$ , and the bailout costs become progressively larger. The social gain per financial firm is now given by

$$V_n^*(r) - V_n^*(r_D) - [1 - p(y^*(n, r))]r \quad (10)$$

where  $V_n^*(r) = p(y^*(n, r)) \cdot y^*(n, r)$ ,  $V_n^*(r_D) = p(y^*(n, r_D)) \cdot y^*(n, r_D)$ , and where  $r_D = \frac{r}{p(y^*(n, r_D))}$ . It follows that government guarantees may not be

desirable from a societal standpoint when competition in the financial sector is sufficiently high, because the provision of guarantees is too expensive relative to the risk reduction they produce. That is, guarantees simply become costly transfers to creditors of financial firms. More generally, the optimal government guarantee when competition in the financial sector is high would consist of a lower probability of creditor bailout than without competition, and potentially consist of no bailout possibility.

In the case of a government operating as a shadow bank, the benefit provided by government guarantees is given by

$$y^*(n, r) - y^*(n, r_D). \tag{11}$$

Since guarantees reduce risk taking,  $(y^*(n, r) < y^*(n, r_D))$ , the government would not find it optimal to offer guarantees. This, however, assumes that the government does not deregulate the financial sector further when it subsidizes its cost of borrowing. To entertain this possibility, note that the government wishes to deregulate to the fullest extent possible  $(n \rightarrow \infty)$ , but must meet the participation constraint of the intermediaries,

$$f(n)y^*(n, r_D) \geq r_D = \frac{r}{p(y^*(n, r))}, \quad \text{or in other words,}$$

$f(n)p(y^*(n, r_D))y^*(n, r_D) \geq r$ . Let  $n^*$  be such that this constraint is barely met (or in integer-based analysis, the smallest  $n$  such that constraint is violated at  $n^* + 1$ ).

The government maximizing  $ny^*$  would like to increase  $n$  further but is constrained by the participation constraint. The government can relax the constraint by subsidizing the cost of borrowing through implicit or explicit forbearance towards creditors. That is, bring down  $r_D$  to  $r$ , expanding franchise values to  $p(y^*(n^*, r)) \cdot [f(n^*)y^*(n^*, r) - r]$ . But, since the government prefers to deregulate fully, this only implies that equilibrium competition rises to a higher level of  $\bar{n} > n^*$  such that  $[f(\bar{n})y^*(\bar{n}, r) - r] = 0$ . The increased competition leads to current activity  $\bar{n} \cdot y^*(\bar{n}, r)$ , which must exceed  $n^* \cdot y^*(n^*, r_D)$ , the activity in the absence of guarantees, for the government to find it attractive to guarantee the financial sector and deregulate further. This holds true whenever the level of competition  $n^*$  is sufficiently high.<sup>50</sup>

To summarize, a government operating as a shadow bank to maximize economic activity subsidizes the financial sector’s cost of borrowing to the fullest extent possible and then deregulates it sufficiently so that competition erodes all profits of financial firms. In the process, it ensures that financial firms will compete fiercely to maintain market share and preserve franchise

50. Note that  $\bar{n} \cdot y^*(\bar{n}, r) = \frac{\bar{n} \cdot r}{f(\bar{n})}$  and  $n^* \cdot y^*(n^*, r_D) = \frac{n^* \cdot r}{f(n^*)p(y^*(n^*, r_D))}$ . Therefore, a sufficient condition to have  $\bar{n} \cdot y^*(\bar{n}, r) > n^* \cdot y^*(n^*, r_D)$  is that the function  $g(\bar{n}) < g(n^*)$ , where  $g(n) = \frac{n}{f(n)}$ . This holds whenever  $n > \left(\frac{f'(n)}{f(n)}\right)^2$ . Since  $f(n) \geq \bar{f}$  and  $f''(n) < 0$ , this condition is met for sufficiently high  $n$ .

values (even though they do not succeed in equilibrium). This way, the government achieves its desired objective of maximizing lending or financial investments, creating substantial future risk of investment failures.

### C. Prudential Risk Controls

Next, consider prudential regulation in the form of risk controls. Given the risk-shifting problem induced by leverage and competition, a simple prudential rule that would increase expected social output is that  $y$  not exceed some upper limit  $\bar{y}$  (greater than or equal to  $y^{FB}$  and lower than the private optimum  $y^*$  absent risk control), if such a rule could be feasibly enforced. For example, a practical counterpart of this rule in the context of mortgage lending would be not allowing loan-to-value ratios to exceed 80%.<sup>51</sup> Another counterpart would be restricting the size of loans that some financial firms such as GSEs can invest in, for example, the so-called conforming loan limit, so that the total size of the market they participate in is limited.<sup>52</sup>

While it is clear that perfect risk enforcement could eliminate the risk-taking problem altogether without enhancing franchise values, what is striking is that, in practice, governments often encourage risk taking in specific asset classes such as housing.<sup>53</sup> This may be achieved through explicit guidelines (“mandates” or “norms”) to GSEs to lend to lower-income households (“affordable housing” or “priority-sector lending”) in the form of high loan-to-value mortgages.<sup>54</sup> Indeed, this would be a direct way for the government to get the financial firms to “lend down the quality curve” and expand current economic activity.<sup>55</sup> In the model, if there are limits to encouraging competitive entry, the government could require financial firms to maintain portfolios that contain lending beyond the “quality”  $y^*$ . Since this would make the franchise values smaller, monopolistic or oligopolistic financial firms would resist such mandates and, to the extent possible, not meet them. A highly competitive financial sector, by contrast, would accede to such pressures willingly because firms in such an environment see risk taking as a way to preserve their franchises.

### D. Leverage Choice and Capital Requirements

Finally, competition and government guarantees may exacerbate not only the level of risk in financial firms’ portfolios, but also the level of their leverage. Increased leverage enhances the size of their gamble even further at little private cost because leverage costs do not rise substantially with risk due to the guarantees. Again, prudential regulation would want to impose

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51. See *infra* Part III.

52. See *infra* Part III.

53. See *infra* Part III.

54. See *infra* Part III.

55. See *infra* Part III.

capital requirements in order to increase the financial intermediaries' stake in their franchise and thereby discourage risk taking. However, in practice, capital requirement harmonization is often politicized, with introduction of favorable treatment for certain asset classes.<sup>56</sup> For instance, Basel capital requirements accorded before the crisis of 2007–2009, and continue to accord, greater leverage (lower capital requirements) on housing-related assets (for example, the 20% Basel risk-weight on AAA-rated residential mortgage-backed securities, with no equivalent favorable treatment for other asset classes such as corporate loans).<sup>57</sup> Government interventions to meet populist or short-term goals can substantially threaten financial stability, even as prudential regulators ensure that capital requirements are met, because the design of requirements has been compromised and lending has been directed excessively in favor of certain asset classes and sectors.<sup>58</sup>

Combining these observations, a socially efficient financial sector should feature a combination of some, but not excessive, competition; some enforceable risk controls; and, finally, limited government guarantees, given their costs to the taxpayer. What is observed in practice is often the opposite of these outcomes—specifically, a credit boom coincident with heightened economic activity fueled by a highly competitive financial sector, combined with lax capital standards and encouragement of lending to risky asset classes, all covered by a blanket of explicit and implicit government

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56. See *infra* Part III.

57. See Viral V. Acharya, *The Dodd-Frank Act and Basel III: Intentions, Unintended Consequences, Transition Risks, and Lessons for India* 19 (NYU Stern Sch. of Bus., Working Paper, 2011) (“For commercial banks, the Basel [II] accord weighted the risk of AAA-rated securities at less than half of the risk of ordinary commercial or mortgage loans, and thus required an even lower capital [requirement] for them (a 20% risk weight compared to 50% for mortgages and 100% for corporate bonds).”); *id.* at 19, 21–22 (arguing that Basel III, like Basel II, allows greater leverage as to these highly rated securities—a practice that can be characterized as a way to “get around the Basel rules”—because the approach for setting capital requirements in all Basel frameworks is “eerily similar”). Indeed, the current Basel III debates in a world of low economic growth in the Western economies have once again raised the prospect of adopting more relaxed standards to boost current output levels. See, e.g., Somruedi Banichongduang, *Banks Baulk at Basel III Capital Demands*, BANGKOK POST, Mar. 28, 2012, at B1, available at <http://www.bangkokpost.com/business/economics/286307/banks-baulk-at-basel-iii-capital-demands> (stating concerns by Asian banks that Basel III’s heightened liquidity and leverage requirements will increase industry costs without reducing risk in the banking sector); Rachel Armstrong et al., *Bank Regulators Agree More Leeway on Liquidity Rule: Sources*, REUTERS (Mar. 23, 2012, 11:07 AM), <http://www.reuters.com/article/2012/03/23/us-basel-liquidity-idUSBRE82M0KV20120323> (describing the Basel Committee’s actions to introduce more flexibility into the bank-safety buffers required by Basel III); Annemarie Hvidberg, *Banking Regulators to Soften Basel III Standards*, DAILY PRESS DOT COM, Sept. 7, 2011, <http://www.dailypressdot.com/banking-regulators-to-soften-basel-iii-standards/753611/> (explaining predictions that banking regulators would relax Basel III’s liquidity standards in response to concerns that the standards would cause restrictions in lending). While some of this forbearance may be justified, it is clear that the primary focus of political debates surrounding the Basel III rules is focused on current levels of lending rather than the high risk from lending in times of heightened growth uncertainty.

58. See *infra* Part III.

guarantees.<sup>59</sup> These can all be rationalized when the government acts as a shadow bank to maximize current economic output without appropriately accounting for associated risks and bailout costs.

### III. Governments as Shadow Banks: The Case of GSEs<sup>60</sup>

As a leading example of governments operating as shadow banks, the following section focuses on GSEs, primarily Fannie Mae and Freddie Mac, which securitize residential mortgages in the United States by providing a guarantee against the credit risk of mortgages to investors that buy the mortgage-backed securities. In their second line of business, GSEs also purchase mortgages to hold on their balance sheets. These activities are by and large funded with debt, rather than equity. Financial markets have always believed the debt issued by GSEs to be implicitly guaranteed by the U.S. government, so that GSE debt has always traded at a small spread above U.S. Treasuries, even when most of their equity was wiped out in September 2008. Thus, from the GSE shareholders' standpoint, there has been a strong incentive to take substantive risks in their two lines of business as well as to lever up the risks (use more debt financing than equity), to the extent permitted by regulators, and effectively by the government.

There have been five somewhat distinct, even if partly overlapping, phases in the evolution of GSEs.

The first phase was the beginning "in the Depression era, [which] helps us to understand how and why the federal government established a foothold in mortgage finance"<sup>61</sup> in the form of the Federal National Mortgage Association (FNMA) in 1938. Until the 1960s, however, the presence of Fannie Mae in mortgage finance remained relatively small.

The second phase consisted of the privatization of Fannie Mae in 1968. "The Johnson administration wanted Fannie Mae privatized [primarily for accounting purposes], so as to remove its debt from the federal government's books, thereby reducing the size of the national debt."<sup>62</sup> Then, the Federal Home Loan Mortgage Corporation (Freddie Mac) was set up in 1970 to perform similar functions as Fannie Mae, primarily, but not exclusively, for mortgages made by the savings and loans (S&L) industry. Since the debt issued by Fannie Mae and Freddie Mac still received special status in fixed income markets, including in the Federal Reserve's open market operations, these steps paved the way for the expansion of GSEs on the back of (now implicit) government guarantees. The expansion, however, remained checked in the 1970s and 1980s due to the relatively tight "ring-fencing" of the nature of risks GSEs could take on through the restriction that GSEs

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59. For an example, see *infra* Part III.

60. The discussion in this section borrows heavily from Chapters 1–3 of ACHARYA ET AL., *supra* note 15.

61. *Id.* at 14.

62. *Id.* at 17.



could securitize only those mortgages with so-called conforming loan limits (which restricted size and quality of mortgages securitized). These limits were important to contain the risks taken by GSEs. To the extent that GSE debt remained outside of the government's debt ceiling, the only substantial constraint on GSE expansion remained in the form of ring-fencing their asset base to conforming loan limits.

The third phase started with the Federal Housing Enterprises Financial Safety and Soundness Act of 1992 (FHEFSSA), which enshrined the capital requirement for GSEs (to a relatively modest level) and the rest of the financial sector for holding the GSE-issued mortgage-backed securities. Given their cheaper debt, their own low capital requirement, and the low system-wide capital requirement for their securities, there was no substantial competition for GSEs in the mortgages they financed. Given the lack of substantial competition, the GSE franchise remained one that could be called a duopoly, or at best an oligopoly, that started growing its market share substantially (see Figure 1). Along with their market share, the debt financing of the GSEs rose substantially too.

In a May 2001 updated study, the [Congressional Budget Office (CBO)] estimated that the annual implicit subsidy had risen to \$13.6 billion by the year 2000. A few years later, Federal Reserve Board economist Wayne Passmore, using . . . a standard discounted earnings model over a forward-looking 25-year horizon, estimated that the aggregate value of the [GSE] subsidy ranged somewhere between \$119 billion and \$164 billion, of which shareholders received respectively between \$50 and \$97 billion. Astonishingly, the subsidy was almost equal to the market value of these two GSEs . . . .<sup>63</sup>

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63. *Id.* at 29. Gradually,

a large number of economists and policy makers questioned the distortions that were being created by this “big fat” subsidy. In what is perhaps one of the more eloquent summaries of subsidy-related distortions, a speech on May 19, 2005, by [the then] Federal Reserve Chairman Alan Greenspan explains the growth of GSE balance sheets and their guarantee-driven shareholder value:

Although prospectuses for GSE debt are required by law to stipulate that such instruments are not backed by the full faith and credit of the U.S. government, investors worldwide have concluded that our government will not allow GSEs to default. . . . Investors have provided Fannie and Freddie with a powerful vehicle for achieving profits that are virtually guaranteed through the rapid growth of their balance sheets, and the resultant scale has given them an advantage that their potential private-sector competitors cannot meet. As a result, their annual return on equity, which has often exceeded 30 percent, is far in excess of the average annual return of approximately 15 percent that has been earned by other large financial competitors holding substantially similar assets. Virtually none of the GSE excess return reflects higher yields on assets; it is almost wholly attributable to subsidized borrowing costs. . . . The Federal Reserve Board has been unable to find any credible purpose for the huge balance sheets built by Fannie and Freddie other than the creation of profit through the exploitation of the market-granted subsidy.

*Id.* at 29–30 (footnote omitted).

That the GSE debt and implicit taxpayer guarantee were never being registered on the government's balance sheet meant that until the debt finally faced risk in 2007–2008, the issue was never taken seriously by either political party in the United States.

The political compromise of the FHEFSSA also started the fourth phase for GSEs, in which they were subject to the “Mission” goals for promotion of affordable housing in the United States.

The new mission laid out in FHEFSSA was quite specific and encompassed three related goals . . . to reach a target percentage of their mortgage purchases in terms of home ownership for lower- and middle-income households. The first goal was directed toward low-income housing, defined as household incomes that were below the area median. The second goal chose underserved areas as defined by census tracts with median household incomes that were less than 90% of the area median, or else in census tracts with a minority population of at least 30% and with a tract median income of less than 120% of the area median income. The final goal, named “special affordable housing,” targeted census tracts with family incomes less than 60% of the area median (or else in tracts with incomes less than 80% of the area median and also located in specified low-income areas).

[Table 1] provides the detailed goals for 1993 and after.<sup>64</sup>

These goals for the GSEs, combined with the implicit guarantees and favorable regulatory capital treatment, implied a virtually unbounded capacity for the GSEs to lend “down the quality curve.”

As an illustration of [the declining underwriting standards of GSEs], consider data on Fannie Mae's year-by-year mortgage purchases over the next decade from 1992 onward. . . . [Figure 2] graphs the share of risky mortgage loans each year, as defined by either [(loan to value ratio)]  $LTV > 90\%$  or  $80\% < LTV < 90\%$ . . . . For example, from just 6% (\$11.6 billion) of loans having LTVs  $> 90\%$  in 1992, by 1995, the number of loans with LTVs  $> 90\%$  had doubled to \$20.9 billion and 19% of Fannie Mae's purchases. Though the percentage of loans with LTVs  $> 90\%$  dropped to 13% by 2001, the dollar amounts increased substantially to \$68.3 billion.<sup>65</sup>

Freddie Mac's data tell a similar story: “This entry of Fannie and Freddie into high-risk mortgages”<sup>66</sup> and “lower[ing of] underwriting standards [meant that] there was no turning back[;] as soon as housing prices started falling [in 2007], their fate was sealed.”<sup>67</sup>

Several of these aspects fit with the model of Part II in that the facts presented are highly suggestive of distorted government objectives functioning behind these outcomes, at least since 1968—when Fannie Mae

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64. *Id.* at 33 (footnote omitted).

65. *Id.* at 36 (footnote omitted).

66. *Id.* at 38.

67. *Id.* at 40.

was privatized and its debt taken off the government's balance sheet—and particularly since 1992, when both Fannie Mae's and Freddie Mac's ability to take on unbounded housing bets was effectively endorsed by the government. The government initiatives taken since 1968 all appear focused on short-run populist schemes for housing, disregarding the substantial risk of financial instability that was created through GSE quality of assets and leverage.

The eventual fate of the GSEs was, however, also hastened by their competition with the private sector during 2003–2007, in what constitutes the fifth phase before they were put in conservatorship by the U.S. government in September 2008, and which I describe in some detail below as it highlights how competition led to greater leverage and worse risk standards across the board for mortgage underwriting in the financial sector. In this competitive race to the bottom starting in 2002, first the private-label MBS market overtook GSEs in growth of leverage and securitization, and next, the GSEs attempted to get back their competitive share by going “all in,” which ultimately culminated in the housing crisis starting in 2007.

[Figure 3] graphs the tremendous growth in the mortgage market (solid line, plotted against the right axis), and the fraction of residential mortgage originations each year that were securitized by the GSEs or private-label firms, as well as the amount not securitized (dashed lines plotted against the left axis). [The Figure shows that] the mortgage market increased dramatically in size, especially in the latter period with the emergence of the riskier mortgage lending. It also shows that mortgage securitization generally increased every year from 1995 onwards, albeit for different reasons. In the period up to 2003, the GSEs dominated the market, but, post 2003, non-GSE MBS more than tripled from 12% to 38% of the origination market. By 2006 and 2007, . . . the GSEs recovered some of their market share (and currently dominate the market).<sup>68</sup>

These trends illustrate the competitive race to the bottom between the GSEs and private securitizers.

While Freddie Mac had been securitizing mortgages since 1971 (and Fannie Mae since 1981), . . . private-label securitization did not start in earnest until the mid-1990s. As seen in [Figure 3], in 1996, nonagency mortgage-backed securities (MBS) represented only 12% of all MBS originations. Their share grew dramatically from 17% in 2003 to 50% by 2006. In 2007, it fell back to 40%. Subprime mortgages were being securitized at a much higher rate than the average. In 2001, 50% of all subprime mortgages were securitized, whereas in 2006 this fraction had grown to 80%.<sup>69</sup>

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68. *Id.* at 41–42.

69. *Id.* at 48.

[This] rise of “private-label mortgage-backed securities” (PLS) shown in [Figure 3] posed a challenge to the GSEs. This is because the PLS involved nonconforming mortgages (securitized, for instance, by investment banks) that were of lower quality than the mortgages that met the GSEs’ usual underwriting standards or were for amounts that exceeded the GSE conforming loan limit. Borrowers who might otherwise have qualified for a conforming loan were being encouraged by lenders to borrow greater amounts (pushing them into “jumbo” territory) and/or to structure their loans in ways that would not meet the GSEs’ underwriting standards (pushing them into the nonconforming territory). The latter was done, for example, by the borrower’s making less than the requisite 20% down payment but not arranging for private mortgage insurance, or by getting a second mortgage loan to cover some or even all of the down payment, or by getting an initial low “teaser” interest rate but with a scheduled upward adjustment after two or three years.<sup>70</sup>

As such, no private firm could compete with Fannie and Freddie because of Fannie and Freddie’s access to government-guaranteed capital:

One way that the private sector started competing was through moving down the credit curve of increasingly shaky mortgage loans—loans that were difficult for Fannie and Freddie to compete with, given their “conforming loan” underwriting standards. . . .

. . . [And, a] Lehman Brothers study from 2008 show[s] that more than 50% of AAA-rated non-GSE MBS [(which since 2002 enjoyed similar capital requirements as the AAA-rated GSE MBS)] were held within the financial sector, which was highly concentrated in just a few [large and complex financial institutions (LCFIs)]. For example, in June 2007, just before the start of the financial crisis, a dozen firms held almost two-thirds of all of the assets of the top 100 firms (\$21 trillion) and constituted a “who’s who” of the crisis that subsequently emerged: in order, Citigroup, Bank of America, JP Morgan Chase, Morgan Stanley, Merrill Lynch, AIG, Goldman Sachs, Fannie Mae, Freddie Mac, Wachovia, Lehman Brothers, and Wells Fargo. (Bear Stearns and Washington Mutual come in at No. 15 and 17, respectively.) . . .

. . . [T]he GSE firms and these LCFIs were not identical in form. The LCFIs had a more diversified product line, were afforded greater flexibility, and increasingly were perceived to have a too-big-to-fail government guarantee, whereas the GSEs had a public mission [and] received a more explicit government guarantee . . . . But when one digs beneath the surface, the failure of the LCFIs and the GSEs is quite similar—a highly leveraged bet on the mortgage market by firms

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70. *Id.* at 42–43.

that were implicitly backed by the government with artificially low funding rates only to differing degrees.<sup>71</sup>

Theoretically, gambling for resurrection or risk shifting involves taking large bets through an increase in risk or an increase in leverage. As long as the risk realization turns out to be good, the bets pay off. But if the bets go bad, then losses are substantial. In the context of the model of Part II, risk-shifting incentives arise due to lower economic rents from increased competition.<sup>72</sup> In equilibrium, however, competition ensures that there is entry until all rents are eliminated.<sup>73</sup> Similarly, government guarantees arise in the model purely as a view to ensuring there is greater entry and economic activity, even though equilibrium rents are all eroded as a result of such entry.<sup>74</sup>

Thus, the competitive race to the bottom should *not* enhance economic value creation by firms (which should simply match their effective cost of capital), and might even deteriorate economic value creation due to choice of poor investments as greater competition forces are lending down the quality curve. However, as long as the risks pay off, for example, in the form of a series of positive surprises to the housing market, financial firm owners (or equity owners) should make substantial rents, both from greater size of the bets taken ( $y$  in the model) as well as due to the lower cost of capital in taking these risks since they are (at least partly) government guaranteed.<sup>75</sup>

[To summarize,] [i]n a competitive race to the bottom involving financial risk taking, [one] would expect that firms expand their balance sheets (and off-balance-sheet positions if faced with on-balance-sheet constraints), do so increasingly with leverage, and finance assets with an increasingly risky profile. Their economic performance as a whole—debt and equity combined—does not rise, and, because of the undertaking of excessive risks, may even decline. However, the performance of their equity rises [as long as bets continue to pay off]—both because of higher risk that pays off in good times and because of greater leverage. As the bets go bad, equity loses value [and potentially gets wiped out].<sup>76</sup>

Tables 2 and 3 highlight this race to the bottom. In terms of actual measurement, I proxy for fundamental economic value creation in terms of accounting return on assets (ROA) which is not affected by the share of value creation between the firm's owners and creditors. To capture the boom and bust pattern of firm owners' value from gambling or risk shifting, I examine

71. *Id.* at 48–49.

72. *See supra* section II(A)(1).

73. *See supra* section II(A)(1).

74. *See supra* subpart II(B).

75. *See supra* subpart II(B).

76. ACHARYA ET AL., *supra* note 15, at 53. Formally, the competitive race to the bottom in the model implies (up to the competitive factor  $f(n)$ ): (i) greater  $y$ , or the upside bet for the equity, (ii) greater downside risk or lower  $p(y)$ , and, (iii) smaller expected output  $p(y)y$ .

accounting return on equity (ROE) which even for a given ROA could rise if financial firms undertook risks with greater leverage. And, I first capture risk-taking incentives by looking at leverage undertaken by financial firms, and later (in Table 4) also examine the extent of “high-risk” mortgage underwriting as a share of total activity undertaken by the financial firms.

[Table 2] shows the total asset growth (relative to 2003) and equally weighted leverage (assets divided by shareholder’s equity) for the five largest commercial banks (Citigroup, JPMorgan, Wells Fargo, Bank of America, and Wachovia), five largest investment banks (Goldman Sachs, Morgan Stanley, Merrill Lynch, Lehman Brothers, and Bear Stearns), and the two largest GSEs (Fannie Mae and Freddie Mac) in the United States during the period 2003 to 2007. [Table 3] shows the return on assets (ROA)—an accounting measure of overall profitability of the firm, and return on equity (ROE)—an accounting measure of the performance of just the equity of the firm, again for these three sets of financial firms.

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These economic forces play out in [Tables 2 and 3], when viewed in combination with [Figure 3]:

. . . Investment banks and commercial banks grew their balance sheets by a factor of two between 2003 and 2007 . . . . Interestingly, Fannie and Freddie did not grow much in terms of their on-balance-sheet assets over this period and in fact shrunk somewhat. They were constrained in their asset growth (and leverage) by [the HUD and the] prudential regulator (OFHEO) after the accounting scandals of 2003–4. This, however, is misleading because their off-balance-sheet growth was not reined in. As [Figure 1] (and [Figure 3]) show, their extension of MBS guarantees grew by a factor of two as well. All in all, the largest financial firms were willing to hold and guarantee mortgages and MBS at a pace hitherto unseen.

. . . Investment banks started with a leverage of around 23:1, slightly lower than that of Fannie and Freddie but rocketed steadily toward a leverage exceeding 30 (Bear Stearns and Lehman Brothers being the most levered investment banks). In contrast, commercial bank leverage stood steady in the range of 10:1 to 15:1, which was consistent with a capital requirement of 8–10% for being well capitalized. Citigroup, however, was levered close to 20:1 by 2007. Again, the leverage of commercial banks was significantly understated by their reported balance sheet figures, as they had engaged in a significant amount of off-balance-sheet vehicle guarantees. And, while Fannie’s and Freddie’s book leverage in fact came down over this period because of pressures from the regulator, these leverage numbers did not capture the credit risk on their outstanding MBS, as well as the risk that mortgages were increasingly of worse quality over time. And all of these numbers also do not do justice to the fact that the risk in the financial sector was becoming all too concentrated on

one asset class [favored by the government and capital requirements through a variety of means]: housing.

. . . What is telling, however, about this asset growth (and in the case of investment banks, leverage too) is that there was little improvement in the underlying economic profitability. During 2003–6 the ROA was steady for commercial banks, around 1.3%, and for investment banks, 0.7%–0.8%; and, in fact, for Fannie and Freddie it was declining steadily, from 0.7% to 0.4%. However, the ROE painted a different picture to the shareholders. Because commercial banks did not ramp up leverage that much, their ROE was steady in the range of 13% to 17%, that of investment banks kept rising with their leverage from 15% to 22%, and that of Fannie and Freddie in fact fell from 20% to 9%.

. . . .

The strong growth in private-label subprime mortgage originations and securitizations had important consequences for the GSEs. First, as shown in [Figure 3], their market share of originations fell dramatically between 2003 and 2006. Second, the loss in market share made it harder for them to meet their ever-increasing congressionally mandated quotas. To preserve the profit growth rates of the pre-2003 period and to simultaneously meet their quotas, the GSEs embarked on an all-in policy, which saw them dramatically ramp up the risks of their portfolio. This policy started as far back as 2000–2001 with the motivation that a stronger GSE presence in the subprime market would create lower priced mortgages for some subprime borrowers.<sup>77</sup>

The data tell the story. . . . [Table 4] presents data for “risky” mortgage loans for both Fannie Mae/Freddie Mac and private-label

77. *Id.* at 50–56. For example:

Former FHFA director James Lockhart testified that both Fannie and Freddie “had serious deficiencies in systems, risk management, and internal controls.” Furthermore, “there was no mission-related reason why the Enterprises needed portfolios that totaled \$1.5 trillion.” He chalked it up to “the Enterprises’ drive for market share and short-term profitability.” In fact, in testimony to the Financial Crisis Inquiry Commission on April 9, 2010, former Fannie Mae CEO Daniel Mudd admitted as much:

In 2003, Fannie Mae’s estimated market share of new single-family mortgage-related securities was 45%. By 2006, it had fallen to 23.7%. It became clear that the movement towards nontraditional products was not a fad, but a growing and permanent change in the mortgage marketplace, which the GSEs (as companies specialized in and limited to, the mortgage market) could not ignore.

Similar language can be found in Fannie Mae’s own strategic plan document, “Fannie Mae Strategic Plan, 2007–2011, Deepen Segments—Develop Breadth,” in which the company outlined its 2007 onwards strategy:

Our business model—investing in and guaranteeing home mortgages—is a good one, so good that others want to ‘take us out’ . . . Under our new strategy, we will take and manage more credit risk, moving deeper into the credit pool to serve a large and growing part of the mortgage market.

*Id.* at 56–57.

securitization for this period. For comparison purposes, [let us] restrict [the data] to the size of mortgages at or below the conforming-limit level. For example, from 2001 to 2003, for mortgage loans with LTVs greater than 80% and/or FICO scores less than 660, Fannie Mae and Freddie Mac represented respectively 86%, 80%, and 74% of this high-risk activity. From 2004–5, this changed as both the dollar volume and share of high-risk lending of conforming-size loans moved toward the private sector, with \$168 billion (and a 26% share) in 2003 to \$283 billion (and a 52% share) in 2004 and \$330 billion (and 58% share) in 2005.

Consistent with the race to the bottom [thesis], Fannie and Freddie responded by increasing their high-risk mortgage participation by recovering a majority share of 51% in 2006 and an almost complete share of the market in 2007 at 87%. Equally important, as a percentage of their own business, [Table 4] shows that Fannie’s and Freddie’s risky mortgage share increased from 25% in 2003 to 36% in 2007. Even more telling, if the preceding analysis is restricted to the very highest-risk mortgage loans, that is, those with LTVs > 90% and FICO < 620, [Table 4] shows an almost identical “race-to-the-bottom” pattern in Fannie’s and Freddie’s share during the 2003–7 period, culminating in a doubling of these particularly risky mortgages from \$10.4 billion in 2006 to \$20.3 billion in 2007.

On top of this high-risk lending activity, [Table 4] also provides evidence that Fannie and Freddie grew their mortgage portfolio as the race to the bottom unfolded. For example, compared to \$103 billion of risky private-label MBS purchased in 2003, over the next three years, Fannie and Freddie averaged \$204 billion per year even though their overall MBS purchases essentially halved. In other words, their percentage share in risky MBS for their own portfolio quadrupled over this period.

....

Clearly, the quality of GSE loans deteriorated substantially from 2003 to 2007. It seems that the GSEs were able to stretch the concept of a prime, conforming loan much beyond what its regulator had intended[, especially when they felt threatened in their market share and franchise by private competitors in the securitization market].<sup>78</sup>

All of these results are consistent with implications of the model presented in Part I, wherein a government interested in boosting the size of the current housing market for populist reasons is happy about—and even encourages—competition between the housing GSEs and the private sector to escalate originations, even though it entails substantial future risks.<sup>79</sup>

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78. *Id.* at 57–60 (footnotes omitted).

79. *See supra* Part I.



#### IV. Other Examples and Implications for Financial Stability

Of course, the notion that governments can heavily influence the financial sector risk taking to meet their own objectives is not specific to the United States, even though its imprint in housing finance may be of an unmatched scale. The *Cajas* in Spain, the equivalent of savings and thrift institutions, are effectively owned by local governments and played a central role in the Spanish housing boom (and painful bust).<sup>80</sup> They competed aggressively with commercial banks while generating substantial local tax revenues through property transactions and creating jobs through unprecedented construction activity.<sup>81</sup> The *Landesbanken* in Germany, which operate as regionally organized state-owned savings banks, undertook aggressive risks offshore, exploited grandfathered government guarantees, and were among the first banks to fail when the U.S. housing markets crashed.<sup>82</sup>

State-owned banks in many Asian countries also serve government objectives of central planning and investments (China) and priority-sector lending to farming and housing (India), objectives that also shape the financial regulation of their limited private sectors.<sup>83</sup> However, the state-owned banks often crowd out the private-sector banks, inducing the latter to adopt greater leverage and riskier policies.<sup>84</sup> Finally, deregulation of the financial sector need not just take the form of greater competition between regulated financial institutions, but can also consist of silent endorsement in the growth of an unregulated financial sector, which by virtue of its greater

80. ACHARYA ET AL., *supra* note 15, at 6, 130.

81. *Id.*

82. *Id.* at 6, 129; *see also The Sick Banking System of Europe: The Financial Crisis Provides a Chance to Fix Germany's State Banks*, ECONOMIST, May 7, 2009, available at <http://www.economist.com/node/13611897> (attributing the collapse of the *Landesbanken* to government guarantees that encouraged the *Landesbanken* to take on large amounts of debt to fund investments in subprime securities, including subprime mortgages in the United States).

83. *See, e.g.*, YUKO ARAYAMA & PANO MOURDOUKOUTAS, THE RISE AND FALL OF ABACUS BANKING IN JAPAN AND CHINA 123–24 (2000) (characterizing Chinese banks as “government departments[] operating within a central planning environment” and bank managers as “lack[ing] the will and the freedom to assume risks and to adjust their inputs and outputs to changing market conditions”); GREGORY C. CHOW, CHINA’S ECONOMIC TRANSFORMATION 239 (2d ed. 2007) (“In China today, economic planning still plays an important role in the market economy . . . [A]ssuming that the planning activities assigned to the central bank cannot be left to market forces alone, one has to rely on the ability and competence of the central planners and the incentive structure for these planners.”); ANNE O. KRUEGER & SAJJID Z. CHINYOY, REFORMING INDIA’S EXTERNAL, FINANCIAL, AND FISCAL POLICIES 111–15 (2003) (describing the effects of priority-sector lending on both private- and public-sector banks in India); ARVIND PANAGARIYA, INDIA: THE EMERGING GIANT 222–23 (2008) (describing India’s “entitlement formula” and explaining priority-sector lending as being “motivated by redistributive concerns” and identifying several costs of such a model, including a decrease in available credit to “nonpriority sectors” and a buildup of nonperforming assets in Indian banks).

84. Viral V. Acharya et al., *Market Failures and Regulatory Failures: Lessons From Past and Present Financial Crises*, in FINANCIAL MARKET REGULATION AND REFORMS IN EMERGING MARKETS 27, 68–69 (Masahiro Kawai & Eswar S. Prasad eds., 2011).

leverage and weaker risk controls immediately creates greater credit and economic activity, while also inducing a race to the bottom with regulated institutions.

The following key normative question arises: How can prudential regulation of the financial sector deal with the threat from interventions of short-termist governments?

First and foremost, it may be important to recognize that government objectives, while shaping laws for the financial sector, may be rather short-term, and that this myopia may arise due to the government's own preference for high levels of current economic activity rather than from influence and lobbying activities of the financial sector. While the model of this paper is silent about when government short-termism and populism will take a strong foothold, it is plausible that this happens when fundamental economic growth of an economy weakens (for example, due to a productivity shock or shift in global competition) and the government feels pressure to confront the resulting weakness of growth and jobs with its own policies.<sup>85</sup>

Second, wherever possible, independent prudential regulators should strive to ensure that financial institutions—government owned or otherwise—are all under the perimeter of unified regulation, so that substantial portions of the market, such as housing, are not beyond their reach and scrutiny.

Third, independent financial-sector regulators of large financial centers, notably central banks but also bank supervisors and resolution authorities, may want to acknowledge and recognize that international harmonization of leverage and capital rules, as well as the threat from global banking to national government objectives, can induce regulation that ends up chasing the lowest common denominator. These regulators would need to exercise their independence in staying the course of enforcing prudential reforms, political support for which can be restored in midst of financial crises.

While ensuring government objectives are sufficiently long-term may not be entirely feasible due to attendant entrenchment issues caused by long tenures, it would improve the quality of government accounting, provide a fair and honest dissemination to investors and voters, and bring about sufficient adjustments to risk and leverage in our assessment of the financial sector's operating performance. These changes by themselves can help contain government moral hazard as long-run risks become apparent more immediately when short-run goals are pursued. Current financial-sector regulation reforms have similar objectives for transparency of financial firm

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85. RAGHURAM G. RAJAN, *FAULT LINES: HOW HIDDEN FRACTURES STILL THREATEN THE WORLD ECONOMY* 14–16 (2010) (arguing that the “jobless recoveries” following the recessions of the early 1990s and 2000–2001 might have paved the way of expansionary housing policies by the U.S. government, especially through the GSEs, and attributing the fundamental underlying shock to the increasing global competition for jobs from emerging market reforms in the 1980s and 1990s, especially in China and the rest of Asia, a shock that also affected other Western economies).

balance sheets, but the principle should be carried over to government balance sheets.

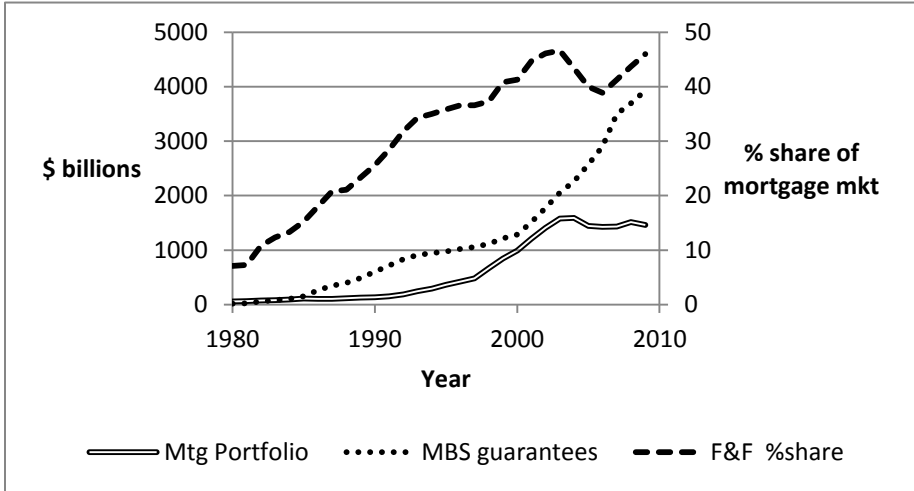


Figure 1. Growth of GSEs from 1980 until 2009

SOURCE.—Federal Housing Finance Agency and Federal Reserve, in ACHARYA ET AL., *supra* note 15, at 21.

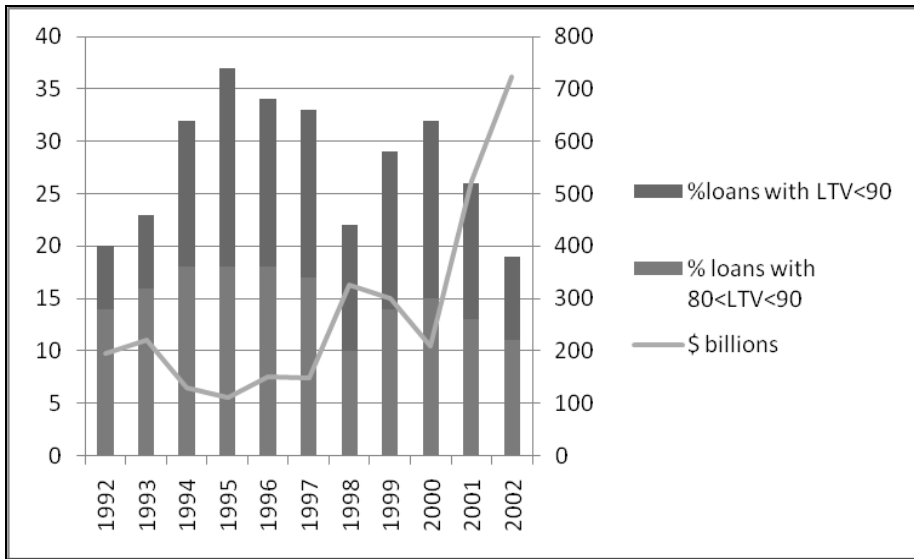


Figure 2. Fannie Mae Mortgage Purchases with High LTVs (1992–2002)

SOURCE.—Annual Reports of Fannie Mae, *Inside Mortgage Finance*, in ACHARYA ET AL., *supra* note 15, at 37.

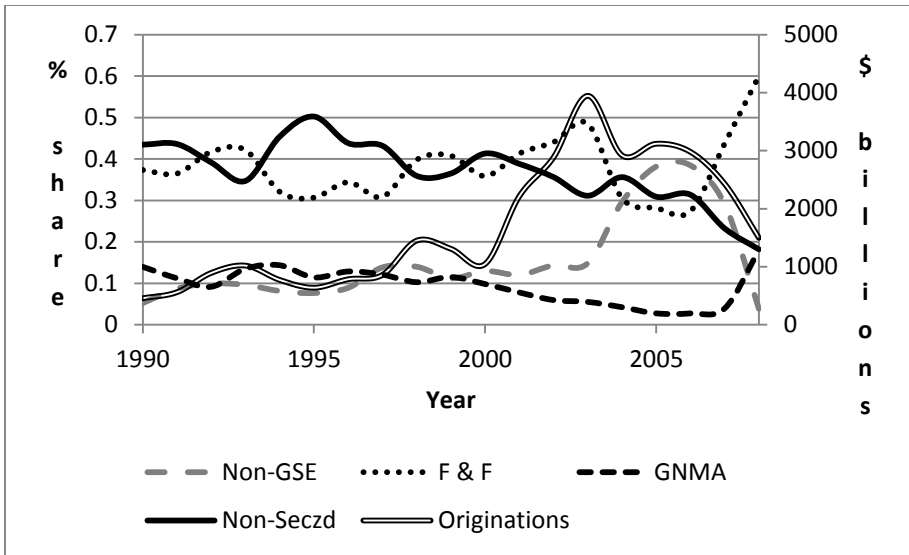


Figure 3. Growth in Mortgage Market, Securitization, and % Share of Market

SOURCE.—*Inside Mortgage Finance*, in ACHARYA ET AL., *supra* note 15, at 42.

|                               | 1993 to 1995 | 1996 | 1997 to 2000 | 2001 to 2004 | 2005 | 2006 | 2007 | 2008 |
|-------------------------------|--------------|------|--------------|--------------|------|------|------|------|
| Low- and Moderate-Income Goal | 30%          | 40%  | 42%          | 50%          | 52%  | 53%  | 55%  | 56%  |
| Underserved Areas Goal        | 30%          | 21%  | 24%          | 31%          | 37%  | 38%  | 38%  | 39%  |
| Special Affordable Goal       | NA*          | 12%  | 14%          | 20%          | 22%  | 23%  | 25%  | 27%  |

Table 1. GSE Affordable Housing Goals Since 1993 (Share of mortgage purchases)

NA\*—Not Applicable: goals set in dollar amounts for each GSE rather than percentages.

SOURCE.—Federal Housing Finance Agency, in ACHARYA ET AL., *supra* note 15, at 34.

| Year | Asset Growth Relative to 2003 |                  |                | Leverage         |                  |                |
|------|-------------------------------|------------------|----------------|------------------|------------------|----------------|
|      | Commercial banks              | Investment banks | Fannie-Freddie | Commercial banks | Investment banks | Fannie-Freddie |
| 2003 | 1.0                           | 1.0              | 1.0            | 13.4             | 23.0             | 28.2           |
| 2004 | 1.3                           | 1.3              | 1.0            | 11.8             | 24.0             | 25.8           |
| 2005 | 1.4                           | 1.5              | 0.9            | 11.9             | 24.5             | 25.3           |
| 2006 | 1.7                           | 1.8              | 0.9            | 11.8             | 27.3             | 24.2           |
| 2007 | 1.9                           | 2.1              | 0.9            | 12.6             | 30.9             | 23.8           |

*Table 2.* Total Asset Growth and Equally Weighted Leverage of the Top Five U.S. Commercial Banks, Top Five U.S. Investment Banks, and GSEs

Note: 2003 assets are normalized to 1.0 in all sectors. Leverage is defined as book assets to shareholder equity.

SOURCE.—*Fortune* and Authors' calculations, in ACHARYA ET AL., *supra* note 15, at 51.

| Year | Return on Assets (ROA) |                  |                | Return on Equity (ROE) |                  |                |
|------|------------------------|------------------|----------------|------------------------|------------------|----------------|
|      | Commercial banks       | Investment banks | Fannie-Freddie | Commercial banks       | Investment banks | Fannie-Freddie |
| 2003 | 1.3%                   | 0.7%             | 0.7%           | 17.5%                  | 14.7%            | 20.3%          |
| 2004 | 1.1%                   | 0.7%             | 0.5%           | 12.7%                  | 15.8%            | 11.1%          |
| 2005 | 1.3%                   | 0.7%             | 0.6%           | 15.7%                  | 16.8%            | 12.2%          |
| 2006 | 1.3%                   | 0.8%             | 0.4%           | 15.1%                  | 22.1%            | 9.2%           |
| 2007 | 0.8%                   | 0.2%             | -0.3%          | 10.2%                  | 6.6%             | -8.2%          |

*Table 3.* Equally Weighted Return on Assets and Return on Equity of the Top Five U.S. Commercial Banks, Top Five U.S. Investment Banks, and GSEs

SOURCE.—*Fortune* and Authors' calculations, in ACHARYA ET AL., *supra* note 15, at 52.

| \$ Billions | GSE New business                       |                                      |           | GSE Mortgage Portfolio Purchases |                         | Private Market New business (Non Agency)                |   | GSE High Risk % | GSE Share in High risk activity |
|-------------|--|--------------------------------------|-----------|----------------------------------|-------------------------|---|---|-----------------|---------------------------------|
|             | High risk (1) LTVs>80% and/or FICO<660 | Very high risk LTVs>90% and FICO<620 | Total (2) | Private-Label Securities (PLS)   | Percentage of PLS/Total | High risk (4) LTVs>80% and/or FICO<660 Conforming Limit | Very high risk LTVs>90% and FICO<620 Conforming Limit |                 |                                 |
| 2003        | 466                                    | 12.1                                 | 1839      | 103.2                            | 13%                     | 168   | 8.9   | 25%             | (1)/(1)+(4)]                    |
| 2004        | 262                                    | 8.8                                  | 898       | 211.8                            | 53%                     | 283   | 14.1  | 29%             |                                 |
| 2005        | 236                                    | 7.1                                  | 899       | 221.3                            | 57%                     | 330   | 13.9  | 26%             |                                 |
| 2006        | 245                                    | 10.4                                 | 877       | 180                              | 52%                     | 240   | 12.4  | 28%             |                                 |
| 2007        | 363                                    | 20.3                                 | 1012      | 113.5                            | 37%                     | 54  | 2.4   | 36%             |                                 |
|             |  |                                      |           |                                  |                         |   |   |                 | 74%                             |
|             |  |                                      |           |                                  |                         |   |   |                 | 48%                             |
|             |  |                                      |           |                                  |                         |   |   |                 | 42%                             |
|             |  |                                      |           |                                  |                         |   |   |                 | 51%                             |
|             |  |                                      |           |                                  |                         |   |   |                 | 87%                             |

Table 4. The Increasingly Risky GSE Lending Activity (2003–2007)

Note: GSE new business represents originated guaranteed MBS plus non-private label MBS portfolio purchases; the private market new business represents all MBS financed through private label securitization.

SOURCE.—Federal Housing Financing Agency, Office of Federal Housing Enterprise Oversight Annual Report, *Inside Mortgage Finance*, in ACHARYA ET AL., *supra* note 15, at 59.