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Corrective Taxation, Leverage and Compensation in a Bloated Financial Sector

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CORRECTIVE TAXATION, LEVERAGE AND COMPENSATION IN A BLOATED FINANCIAL SECTOR

*Tim Edgar**

The financial crisis of 2007-2009 reinvigorated academic and policymaking interest in the design of prudential regulatory regimes governing the financial sector as a policy instrument intended to moderate financial instability. The crisis also motivated interest in the role of taxation as a complement to these regimes. In practice, however, the use of tax instruments has been modest. This paper considers three tax instruments that could serve this complementary role. Political economy considerations aside, it is suggested that the use of bank leverage taxes by policymakers as the tax instrument of choice is unsurprising. But as recognized in the literature, a corrective taxation case can be made for an increase in the rate of such taxes as an instrument to eliminate the availability of cheap debt for systemically important institutions. Although returns to risk taking is a potentially robust tax base, the weak behavioral properties of this tax instrument have apparently diminished its appeal for policymakers, while a revenue-raising imperative that might otherwise motivate its adoption is muted considerably by the adoption of a bank leverage tax. Perhaps somewhat surprisingly, the tax literature does not consider the case for an excise tax on bonus and performance-based compensation as an instrument to alter the structure of compensation. This may be attributable, in part at least, to redundancy where regulatory regimes can be used to impose constraints with similar intended effects.

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We have a social purpose.... [I’m] just a banker doing ‘God’s work’.
Lloyd Blankfein¹

It’s almost like these guys should have gotten a Nobel Prize for evil.
Austen Goolsbee²

¹ Quoted in John Arlidge, *I’m doing ‘God’s Work’. Meet Mr. Goldman Sachs*, SUNDAY TIMES, Nov. 8, 2009.

² Quoted in Arthur Delaney, *White House Adviser: AIG Deserves ‘Nobel Prize for Evil’*, HUFFINGTON POST, Apr. 16, 2009.

I. INTRODUCTION

In terms of likely causes, the financial crisis of 2007-2009 was not a tax story.³ Cleaning up the fiscal mess that is the result of the need to prop up the financial sector in the wake of the crisis is a tax story, one part of which is the use by some countries (most notably, France and the United Kingdom) of temporary taxes on bonus compensation as a means to address the perverse distributional result of the consequent income transfer.⁴ Another part of this post-crisis tax story emphasizes the potential for corrective or Pigovian taxes to support prudential regulatory regimes as the policy instrument of choice to realize a measure of financial stability.⁵ In practice, however, the use of special taxes on the financial sector has been very limited post crisis, with bank leverage taxes applied at relatively modest rates being the instrument of choice.⁶

³ See TAXATION AND THE FINANCIAL CRISIS (Julian S. Alworth & Giampaolo Arachi eds., 2012). *But see* Martin A. Sullivan, *Deleveraging the Tax Code* 120 TAX NOTES (2008) 1241 (emphasizing a close link between interest deductibility for income tax purposes and levels of leverage). *See also* Ruud de Mooij, Michael Keen, & Masanori Orihara, Taxation, *Bank Leverage, and Financial Crises* (IMF Working Paper WP/13/48, Feb. 2013), available at <http://www.imf.org/external/pubs/ft/wp/2013/wp1348.pdf> (finding from bank panel data for the period 2001-2009 that there is a link between an increase in the probability of crisis and an increase in bank leverage associated with a tax-debt bias).

⁴ The UK bonus tax appears to have raised revenue five times greater than expected, which may have been attributable to the grossing up of bonus pools in the presence of the temporary tax. *See* Brooke Masters, George Parker & Sharlene Goff, *Supertax Pulls in £2.5bn for UK Treasury*, FINANCIAL TIMES, Mar. 4, 2010.

⁵ *See e.g.*, Int'l Monetary Fund [IMF] Staff, *A Fair and Substantial Contribution by the Financial Sector* [hereinafter IMF Staff, *A Fair and Substantial Contribution*], in FINANCIAL SECTOR TAXATION: THE IMF'S REPORT TO THE G-20 AND BACKGROUND MATERIAL 2, 9-11, 47-53 (Stijn Claessens, Michael Keen & Ceyla Pazarbasioglu eds., Sept. 2010).

⁶ The Financial Crisis Responsibility (FCR) fee, proposed by the Obama administration, is an example of a bank leverage tax applicable to the principal amount of uninsured or wholesale liabilities of financial institutions with assets in excess of \$50 billion. The FCR fee was initially proposed in January 2010 and was included as a proposed measure in the Administration's Fiscal Year 2014 budget. *See* DEPARTMENT OF THE TREASURY, GENERAL EXPLANATIONS OF THE ADMINISTRATION'S FISCAL YEAR 2014 REVENUE PROPOSALS 149-150 (April 2013). Several European Union (EU) member states have adopted comparable taxes. *See* EUROPEAN COMM. (EC), CONCLUSIONS OF THE 17 JUNE EUROPEAN COUNCIL (2010); Julian S. Alworth & Giampaolo Arachi, *Introduction in TAXATION AND THE FINANCIAL CRISIS*, *supra* note 3, 1, 13-14; Thornton Matheson, *Financial Sector Taxation and the Ongoing Financial Crisis* [hereinafter Matheson, *Financial Sector Taxation*], in TAXING THE FINANCIAL SECTOR: FINANCIAL TAXES, BANK LEVIES AND MORE (Otto Mares & Dennis Weber eds., 2012) 203, 205-209.

Abstracting from the possible effect of political economy considerations,⁷ it is suggested here that this modest tax-policy action is unsurprising given the dominance of prudential regulation.

More particularly, the paper makes the following four points. First, much of the post-crisis tax literature fails to clarify how the notion of a corrective tax - in its conventionally understood sense in the public finance literature as a tax that is designed to impose a cost equal to the social marginal harm of an activity - can realize a result that is not already realized by prudential regulatory regimes.⁸ Second, the redundancy of corrective taxation in its conventionally understood sense leaves a bank leverage tax on uninsured or wholesale liabilities as an attractive instrument to perform a clearly specified revenue-raising function with behavioral properties that can be seen to support prudential regulatory regimes. Third, taxation of returns to risk taking in the financial sector has not had any policy traction,⁹ primarily because of its weak behavioral properties and an incomplete revenue-raising role in the presence of a bank leverage tax. Fourth, an excise tax on bonus and performance-based compensation in the financial sector can be justified as a policy instrument intended to induce a narrowly defined behavioral response.

Parts two and three review, respectively, the related roles of leverage and compensation in the financial sector as sources of risk taking and financial instability. Part two begins with a

⁷ See e.g., SIMON JOHNSON & JAMES KWAK, 13 BANKERS: THE WALL STREET TAKEOVER AND THE NEXT FINANCIAL MELTDOWN (2010).

⁸ A notable exception is Michael Keen, *Rethinking the Taxation of the Financial Sector*, 57 CESIFO ECON. STUD 1, 10-20 (2011). See also Michael P. Devereux, *New Bank Taxes: Why and What Will Be the Effect?* 17-20 (European Tax Policy Forum/Centre for European Policy Studies Conference on Taxes and Behaviour, Apr. 11, 2011), available at <http://www.etpf.org/papers/64bank.pdf> (describing choice of taxation or regulation of the financial sector “starting with a blank sheet of paper”); Douglas A. Shackelford, Daniel Shaviro, & Joel B. Slemrod, *Taxation and the Financial Sector*, 63 NAT’L TAX J. 781(2010) (discussing the theory and design of corrective taxes as applied to the financial sector); Joel B. Slemrod, *Lessons for Tax Policy in the Great Recession*, 62 NAT’L TAX J. 387, 389 (2009) (suggesting that some insight may be gained from applying the economics of Pigovian taxes to address systemic risk).

⁹ See e.g., IMF Staff, *A Fair and Substantial Contribution*, supra note 5, at 19-23, 65-69; Michael Keen, Russell Krelove, & John Norregaard, *The Financial Activities Tax*, in IMF, FINANCIAL SECTOR TAXATION, supra note 5, 118.

brief account of Hyman Minsky's "financial instability hypothesis,"¹⁰ which describes the build-up of excessive leverage and risk taking through the business cycle as the sources of financial instability that are endemic to a sophisticated market economy with financial intermediation. This is followed by a description in part two of Paul Woolley's agency explanation of the asset mispricing identified by Minsky as the source of the kind of system-wide risk that can precipitate a crisis.¹¹ The role of compensation structures in the financial sector is highlighted as an important factor that amplifies the effects of Woolley's agency story.

Part four examines the role of special taxes on the financial sector as a complement to prudential regulation in suppressing the sources of financial instability reviewed in parts two and three. It is suggested that the use of bank leverage taxes, as the apparent tax instrument of choice to suppress the use of debt, could be designed more expansively to both generate revenue sufficient to cover the expected direct costs of future bailouts and to eliminate the borrowing subsidy attributable to implicit government support for systemically important institutions that are considered "too-big-too-fail" (TBTF). Given the case for a bank leverage tax to serve these two roles, the case for taxation of returns to risk taking in the financial sector appears weaker. But its design features highlight the fact that an excise tax intended to alter the structure of bonus and performance-based compensation can fill a gap in prudential regulatory regimes. It is not clear, however, that this tax instrument should be preferred over a regulatory response.¹²

¹⁰ Minsky's financial instability hypothesis is articulated most completely in HYMAN P. MINSKY, *STABILIZING AN UNSTABLE ECONOMY* (1986) [hereinafter MINSKY, *STABILIZING* (1986)]. With the first edition out of print, recent interest in Minsky's ideas led to publication of a second edition, posthumously, under the guidance of Dimitri B. Papadimitriou and L. Randall Wray, two former colleagues of Minsky's at the Levy Economics Institute. See HYMAN P. MINSKY, *STABILIZING AN UNSTABLE ECONOMY* (McGraw Hill Prof'l, 2d ed. 2008) [hereinafter MINSKY, *STABILIZING* (2008)].

¹¹ See Paul Woolley, *Why Are Financial Markets So Inefficient and Exploitative – And a Suggested Remedy*, in *THE FUTURE OF FINANCE: THE LSE REPORT* 105 (2010). See also Dimitri Vayanos & Paul Woolley, *An Institutional Theory of Momentum and Reversal* (AFA 1020 Atlanta Meetings Paper, Aug. 2010), available at <http://ssrn.com/abstract=1305671>.

¹² See e.g., Martin Wolf, *Why and How Should We Regulate Pay in the Financial Sector?* in *THE FUTURE OF FINANCE*, *supra* note 11, 227.

II. THE SOCIAL PURPOSE OF THE FINANCIAL SECTOR AND LEVERAGE AS AN INSTRUMENT OF EVIL: MINSKY'S FINANCIAL INSTABILITY HYPOTHESIS

The social purpose of the financial sector, which Lloyd Blankfein infamously referred to as “God’s work,” is conventionally categorized in terms of the following general functions:¹³

- the provision of payment services;
- the provision of insurance in the form of risk pooling;
- the making of markets in assets, both spot and forward; and
- the intermediation of funds between providers (that is, savers and investors) and users (that is, all borrowers and businesses raising equity capital).

Financial instability tends to arise from a combination of asset mispricing and the use of leverage by the financial sector in performing the functions within the third and fourth categories, with the latter extending to the provision of maturity and risk/return transformation. Used in moderation, leverage is an instrument of good in performing these necessary functions. Used excessively, leverage is an instrument of evil as it fuels asset price increases through a price bubble. The inevitable price correction can “blow a hole” in the balance sheet of financial institutions and, in the extreme, can result in a financial crisis.

The instability-breeding dynamics associated with the combination of asset mispricing and leverage is described by Hyman Minsky’s “financial instability hypothesis.”¹⁴ At the macro level, Minsky illustrates how aggregate profits for each period equal aggregate investment and depend on aggregate spending on investment.¹⁵ At a micro level, he argues that firms must be

¹³ See Adair Turner, *What Do Banks Do? Why Do Credit Booms and Busts Occur? What Can Public Policy Do About It?* in THE FUTURE OF FINANCE, *supra* note 11, 3, 8.

¹⁴ Hyman P. Minsky, *The Financial Instability Hypothesis* 1, 6 (Jerome Levy Econ. Inst., Working Paper No. 74, 1992) [hereinafter Minsky, *Instability*] (financial instability hypothesis is a theory of “... the impact of debt on system behavior and also incorporates the manner in which debt is validated.”).

¹⁵ MINSKY, STABILIZING (2008), *supra* note 10, at 157-90. The aggregate amount of profits equals the sum of investment plus consumption out of profits plus the government’s deficit and any trade surplus, less savings out of wages. In a simplified model without government deficits, balanced trade, and no savings out of wages, profits equal investment (plus consumption by capitalists, which is negligible). See e.g., Elisabetta De Antoni, *The (too?) Optimistic ‘Financial Keynesianism’ of Hyman Minsky* 5-13 (2005), available at

able to realize a markup over labor costs and will pursue market power to do so. Prices, therefore, have five discrete functions:¹⁶

- to ensure that a surplus is generated;
- to ensure that some of the surplus accrues to business owners;
- to ensure that the demand price of capital assets is consistent with the supply price;
- to ensure that debt finance commitments can be satisfied; and
- to ensure that resources are allocated to the investment sector.

In a capitalist economy, these functions are discharged in the form of two sets of prices: one for current output and one for capital assets.¹⁷ The price of current output depends on short-run expectations of demand and wage rates. Spending on investment depends on the demand price and the supply price of capital assets. The latter is a function of the costs of production, which consist primarily of purchase price (costs of labor plus a markup) and financing costs. The former is a function of expectations about future profits.

Investment thereby links the price of capital assets with the price of current production. But the uncertainty associated with expectations of future profits and the financing of capital assets with debt makes the economy unstable. Expectations of profits depend on future investment, with realized profits determined by investment. Financial institutions are the critical actors in this process; they receive savings from households which are provided to businesses for production, with a reverse flow of funds moving from businesses to households. The flow of money to businesses occurs as a response to expectations of future profits, while the flow of money from businesses is financed by realized profits. Expectations of profits determine the flow of financing contracts to businesses and the value of those contracts, with the past, present, and future linked by these financial relations. Minsky's description of financial relations is not

<http://www.ius.unicas.it/mc2005/papers/deantoni.pdf> ; see also Dimitri B. Papadimitriou & L. Randall Wray, *Minsky's Analysis of Financial Capitalism* 6-9 (Jerome Levy Econ. Inst., Working Paper No. 275, 1999); Janelia Tse, *Minsky's Financial Instability Hypothesis*, 4 OECOMOMICUS 77, 79-80 (2001).

¹⁶ MINSKY, STABILIZING (2008), *supra* note 10, at 157-90. See also Tse, *supra* note 15, at 79.

¹⁷ Tse, *supra* note 15, at 80.

limited, however, to businesses; it extends to households and governments by way of their ability to borrow on the basis of expectations of future cash flows.¹⁸

These essential features of Minsky's financial instability hypothesis are captured in his two theorems. The first theorem holds that the character of the financial relations predominating at any time in an economy determines its financial stability.¹⁹ In this respect, Minsky describes three states of financial relations characteristic of economic units: hedge finance, speculative finance, and Ponzi finance. A hedge finance unit is characterized by an ability to fulfill payment commitments with realized cash flows. Because equity finance provides a margin of safety in the event that realized profits are less than payment commitments under debt contracts, economic units with greater weighted levels of such finance will tend to be hedge finance units. A speculative finance unit is one that can meet its interest and similar income account commitments as they fall due, but cannot repay the amount of its principal repayment obligations and must roll over or refinance its liabilities on maturity. A Ponzi finance unit is one that cannot fulfill its obligations to pay interest or principal as they become due and must borrow against rising asset prices or sell assets to meet these commitments.

Minsky's second theorem holds that capitalist economies tend to move from a financial structure dominated by hedge finance to a structure dominated by speculative and Ponzi finance during periods of prolonged prosperity.²⁰ The transition occurs as realized profits continue to validate debt, which increases expectations of future profit levels and investment financed by

¹⁸ Minsky's leverage story extends to an open-economy setting when businesses, households, and governments borrow internationally. Minsky, *Instability*, *supra* note 14, at 4-5. See also Philip Arestis & Murray Glickman, *Financial Crisis in Southeast Asia: Dispelling Illusion the Minskyan Way*, 26 CAMBRIDGE. J. ECON. 237 (2002) (arguing that the sources of instability identified by Minsky are intensified in an open-economy setting); Jan Kregel, *Managing the Impact of Volatility in International Capital Markets in an Uncertain World 4* (Jerome Levy Econ. Inst., Working Paper No. 558, 2009) (describing the transmission of financial instability through international capital flows and risk-management techniques of multinational banks).

¹⁹ Minsky, *Instability*, *supra* note 14, at 7-8.

²⁰ *Ibid.* Much the same process is described by John Geanakoplos as the "leverage cycle." See e.g., John Geanakoplos, *The Leverage Cycle 2* (Cowles Found. for Research in Econ., Discussion Paper No. 1715, July 2009), available at <http://www.cowles.econ.yale.edu/>.

greater levels of debt.²¹ Financial institutions are supposed to function as skeptics and dampen the excessive enthusiasm, so that realized profits are more likely to be sufficient to fulfill commitments. But as Minsky emphasizes, financial institutions are profit-seeking enterprises that innovate in their acquisition of assets and marketing of liabilities as “merchants of debt”²² and, in the process, tend to fuel the transition to speculative and Ponzi finance during periods of prolonged prosperity. An ostensibly stable economy is essentially destabilized by its tranquility, as past success leads to expanding credit and the assumption of riskier positions.²³ The inevitable asset price correction can precipitate a “Minsky moment”²⁴ characterized by the ensuing debt deflation as financial institutions call in debts and tighten the provision of new credit, while borrowers, which include financial institutions, must sell assets to fulfill payment commitments.²⁵ In the extreme, hedge finance units become speculative units; speculative units become Ponzi units; and Ponzi units see their net wealth disappear.

²¹ This process is famously captured by the label “irrational exuberance,” which was used by Alan Greenspan, when he was chairman of the Federal Reserve Bank in testimony before Congress, to describe the stock market bubble in the mid-1990s. The label was arguably made that much more famous when Robert Shiller subsequently used it as the title of his book describing the same asset price bubble. See ROBERT J. SHILLER, *IRRATIONAL EXHUBERANCE* 3 (1st ed., 2000).

²² Minsky, *Instability*, *supra* note 14, at 6 (“... thus, bankers ... are merchants of debt who strive to innovate in the assets they acquire and the liabilities they market.”).

²³ See CARMEN M. REINHART & KENNETH S. ROGOFF, *THIS TIME IS DIFFERENT: EIGHT CENTURIES OF FINANCIAL FOLLY* (2009); See also Jaime Caruana, Gen. Manager, Bank for Int’l Settlements (BIS), *The International Policy Responses to Financial Crises: Making the Macprudential Approach Operational - Panel Remarks at Jackson Hole* (Aug. 21-22, 2009), available at <http://www.bis.org/speeches/sp090911.htm> (emphasizing the feedback effects of credit extension, leverage, risk perceptions and risk appetite, asset prices, and economic activity which together can make the financial system more complex and characterized by nonlinear dynamics); Geanakoplos, *supra* note 20, at 16 (emphasizing the significance of reductions in collateral requirements during periods of prosperity which are then increased in a debt deflationary environment).

²⁴ Minsky never used the term “Minsky moment” to describe the downward shift in a business cycle with the ensuing necessity to sell assets to meet payment commitments. The term was apparently coined by a bond fund director, Paul McCulley, during the Russian debt crisis. See Justin Lahart, *In Time of Tumult, Obscure Economist Gains Currency*, WALL ST. J., Aug. 18, 2007.

²⁵ See e.g., E. Philip Davis & Mark R. Stone, *Corporate Financial Structure and Financial Stability*, 1 J. FIN. STABILITY 65 (2004) (finding that the debt-equity ratios of firms are correlated with investment and inventory declines following crises). The process of debt deflation was first described by Irving Fisher, *The Debt Deflation Theory of Great Depressions*, 1 *ECONOMETRICA* 337 (1933).

Minsky's principal point of departure with neo-classical economic theory is the fact that he takes seriously the financial intermediation function, which he refers to generically as "banking."²⁶ The dynamics of the financing function, which are described by Minsky as the source of financial instability, do not depend on a premise of irrationality on the part of investors along any behavioral margin.²⁷ Minsky's challenge to neoclassical orthodoxy can be characterized, therefore, as a fundamental one distinguishing the market for consumer goods and services from the market for financial assets. The pricing mechanism of the former operates to allocate resources. Increased demand for an item triggers an increase in supply and vice versa, with changes in price equating demand and supply such that markets clear. Because of this process, the market for consumer goods and services is equilibrium seeking and vulnerable only to external shocks. The market for financial assets is much different in that it is characterized by the search for scarcity value in an environment in which supply does not respond completely to changes in price.²⁸ An increase in price can stimulate increased demand without a corresponding increase in supply, while a decrease in price can cause a decrease in demand without a contraction of supply. In this type of market, it is the rate of price change that affects demand rather than price change itself.²⁹ Such a market is not equilibrium seeking, but is inherently unstable and, in the presence of excessive leverage, it is fragile.

²⁶ MINSKY, *STABILIZING* (2008), *supra* note 10, at 173 ("In today's standard economic theory, an abstract non-financial economy is analyzed. Theorems about this abstract economy are assumed to be essentially valid for economies with complex financial and monetary institutions and usages. This logical jump is an act of faith ..."). *See also* Papadimitriou & Wray, *supra* note 15, at 4-6 (describing the assumptions underlying the orthodox microeconomic and macroeconomic models criticized by Minsky).

²⁷ *See* Geanakoplos, *supra* note 20, at 3 ("But a crucial part of my leverage cycle story is that every agent is acting perfectly rationally from his own individual point of view.").

²⁸ GEORGE COOPER, *THE ORIGIN OF FINANCIAL CRISES: CENTRAL BANKS, CREDIT BUBBLES AND THE EFFICIENT MARKET FALLACY* 7-8 (2008). *But see* RICHARD BOOKSTABER, *A DEMON OF OUR OWN DESIGN: MARKETS, HEDGE FUNDS, AND THE PERILS OF FINANCIAL INNOVATION* 213-220 (2007) (emphasizing demand and supply of liquidity as the principal driver of price movements rather than the revelation of information).

²⁹ Cooper, *supra* note 28, at 8. *See also* Jack Treynor, *Bulls, Bears, and Market Bubbles*, 54 *FIN. ANALYSTS J.* 69 (1998) (arguing that investors' different views mean that there are winners and losers as prices change in response to new information, with the resulting wealth effect creating a new equilibrium and wealth shift that can cause greater subsequent price changes).

Descriptively at least, Minsky's financial instability hypothesis captures the instability-breeding dynamics evident in financial crises; however, an observed shortcoming of Minsky's story is a failure to posit a micro foundation that can explain the source of asset mispricing that, when combined with leverage, lies at the heart of financial instability. As described in the next part, an agency explanation of asset mispricing, focused on the financial intermediation function, can be seen to fill this gap

III. AN AGENCY THEORY OF ASSET MISPRICING, RENT EXTRACTION AND WINNER-TAKE-ALL FEATURES OF THE LABOR MARKET IN THE FINANCIAL SECTOR

The build up to the financial crisis of 2007-2009 was marked by two prominent features. One is the increasingly disproportionate size of the financial sector relative to the rest of the economy, particularly in the United Kingdom and the United States.³⁰ The other is the increasingly disproportionate levels of compensation in the financial sector labor market as compared to the labor market generally.³¹ This outsized growth was not necessarily accompanied by a proportionate increase in the value added delivered by the financial sector.³² Indeed, much

³⁰ See Turner, *supra* note 13, at 13-30 (describing various dimensions indicative of the increased scale of operations of the financial sector relative to the rest of the economy occurring over the thirty to forty years preceding the financial crisis).

³¹ See e.g., Thomas Philippon & Ariell Reshef, *Wages and Human Capital in the U.S. Financial Industry 1909-2006* (NBER Working Paper No. 14644, January 2009), available at <http://ssrn.com/abstract=1329262> (finding that compensation in the financial sector was excessively high around 1930 and from the mid-1990s until 2006).

³² See Andrew Haldane, Simon Brennan & Vasileios Madouros, *What Is the Contribution of the Financial Sector: Miracle or Mirage?* in THE FUTURE OF FINANCE, *supra* note 11, 64 (finding that a detailed decomposition of returns to banking suggest that much of the increase in measured GDP contribution of the financial sector reflected returns to higher risk taking). See also Thomas Philippon, *Has the U.S. Finance Industry Become Less Efficient?* (NYU Working Paper No. FIN-11-037, November 2011), available at <http://ssrn.com/abstract=1972808> (finding that: (i) improvements in information technologies of the past 30 years have not resulted in a decrease in the annual unit cost of financial intermediation which has remained stable over time at around 2 percent of outstanding assets, and (ii) financial services are produced under constant returns to scale); Jennie Bai, Thomas Philippon & Alex Savov, *Have Financial Markets Become More Informative?* available at <http://ssrn.com/abstract=2023889> (finding that the information content of market prices for equities and bonds in the United States has not increased despite increased trading activity); Turner, *supra* note 13, at 30-40 (suggesting that the value added by credit intermediation depends on the social function of different categories of credit intermediation while the provision of liquidity to asset markets through position taking is valuable up to a point but not beyond).

of the growth may be attributable to increasingly destructive rent-seeking behavior³³ which Paul Woolley argues is the source of the inherent instability described by Minsky.³⁴

Woolley's critical premise is that asset prices are set, not by end investors or the representative household, but rather by their agents in the financial sector (banks, fund managers, and broker-dealers). This premise sets up a standard agency problem of information asymmetry in which the agents have more and better information than their principals while having divergent interests. Because of the information asymmetry, principals cannot distinguish competent and diligent agents from incompetent and shirking agents as determined against performance benchmarks. In particular, principals cannot determine whether underperformance is attributable to incompetence or the prudent avoidance of overpriced assets. When underperformance persists, principals shift their funds to outperforming agents which generates and reinforces price momentum. In this respect, Woolley's agency story is the mechanism by which asset pricing is the outcome of the well-recognized battle between "fair value and momentum."³⁵

Woolley also argues that his agency story explains the extraction of progressively higher rents by the financial sector. What is important here is the recognition that information

³³ See e.g., FIN. SERVS. AUTH., THE TURNER REVIEW: A REGULATORY RESPONSE TO THE GLOBAL BANKING CRISIS, 49 (Mar. 2009), *available at* <http://www.fsa.gov.uk/Pages/Library/Corporate/turner/index.shtml> (suggesting that much of the structuring and trading activities involved in securitized credit was not required to deliver credit intermediation efficiently, but instead achieved rent extraction made possible by (i) the opacity of margins, (ii) the asymmetry of information and knowledge between end users of financial services and producers, and (iii) the structure of principal-agent relationships between investors and companies and between companies and individual employees); *see also* Philippon & Reshef, *supra* note 31 (estimating that rent extraction accounted for 30-50 percent of the wage differential between the financial sector and the rest of the economy observed over the ten years preceding the financial crisis).

³⁴ Woolley, *supra* note 11; Vayanos & Woolley, *supra* note 11.

³⁵ Woolley, *supra* note 11, at 111. *See also* Franklin Allen & Douglas Gale, *Bubbles and Crises*, 110 ECON. J. 236 (2000) (constructing a simple model in which agency problems associated with leveraged investment in risky assets cause those assets to be priced above their fundamental value in the context of a credit expansion); RAGHURAM G. RAJAN, FAULT LINES: HOW HIDDEN FRACTURES STILL THREATEN THE WORLD ECONOMY 122 (2010) [hereinafter RAJAN, FAULT LINES] (observing that banker behavior tends to be self-reinforcing and can exaggerate investment trends, moving prices far away from fundamentals).

asymmetries explain the increasing, yet ultimately unsustainable, size of rents. Such rents are contrasted with the usual form of sustainable rents commonly attributed to exploitation of market power. This proposition is presented in a formal dynamic rational expectations model showing the evolution of a financial innovation.³⁶ The key features of the model are uncertainty, learning, and information asymmetry which together generate initial growth, followed by the extraction of progressively higher rents and fat tails in the distribution of aggregate defaults and endogenous crisis. Agents must distinguish between robust and fragile financial innovations. Default risk with the former is low while default risk with the latter is high. In the presence of uncertainty, agents learn progressively about an innovation by observing profits derived from its adoption. High profits result in increased adoption and confidence that an innovation is, in fact, robust. Provided that information is symmetric for principals and agents, an increase in the scale of adoption of an innovation leads to increased compensation for agents; however, gains are competitively determined at normal levels (that is, an absence of rents), and a robust innovation flourishes. On the other hand, fragility leads to deteriorating profits, and an innovation is abandoned. Crises do not occur.

In the presence of information asymmetries, agents have an incentive to shirk in their assessment of an innovation as fragile or robust which is exacerbated by payoff profiles that allow agents to share in gains but avoid losses. Principals must reward agents to address shirking but at the cost of the greater moral hazard associated with the resultant payoff profiles that result in progressively higher rent extraction. Woolley's model shows that the probability of shirking is higher when an innovation is robust. After a period of consistently high profits, agents become increasingly confident that an innovation is robust, and the incentive to shirk increases such that principals must pay more to induce effort while agents increasingly capture most of the gains. An otherwise robust innovation ultimately collapses as principals become frustrated with increasingly poor returns. Alternatively, the fragility of an innovation is revealed in the presence of asset mispricing, and an otherwise fragile innovation similarly collapses. Principal-agent information asymmetry is thus posited as "responsible for creating the twin social bads of

³⁶ See Bruno Blais, Jean-Charles Rochet & Paul Woolley, *Innovations, Rents and Risk* (DNB Working

mispricing and rent capture.”³⁷ Mispricing causes price swings that are at the heart of financial instability. Rent capture causes the misallocation of labor and capital, with significant wealth transfers to the financial sector that can also induce systemic failure on the collapse of an innovation.³⁸

Increasing levels of rent capture and increasing susceptibility to crisis are the two principal predictions of Woolley’s agency story that he claims are consistent with the empirical evidence.³⁹ He fails to incorporate, however, the possible sources for the innovation that is posited as the driver of his agency theory of asset mispricing and rent capture that, because of standard problems of opacity and moral hazard, destabilize the economy through the financial sector. In this respect, explanatory power may be found in the observation that the labor market in the financial sector has, in the past several decades, come to exhibit features characteristic of what Robert Frank and Philip Cook characterize as “winner-take-all markets.” As Frank and Cook describe in their popular book, *The Winner-Take-All Society*,⁴⁰ these kinds of labor markets are characterized by the determination of payoffs by relative rather than (or in addition to) absolute performance;⁴¹ another feature is that rewards tend to be captured by a small proportion of individuals. Small differences in abilities end up being associated with disproportionate differences in compensation levels.⁴²

Frank and Cook divide winner-take-all labor markets into two types: one type they label “mass markets” in which disproportionate rewards are available because a multitude of buyers each have a small interest in the winner’s performance.⁴³ The other type of winner-take-all

Paper No. 356, Oct. 2012), available at <http://ssrn.com/abstract=2171740>.

³⁷ Woolley, *supra* note 11, at 117.

³⁸ *Ibid.* (arguing that mispricing and rent capture create “a perfect storm of wealth destruction”).

³⁹ *Ibid.*, 115-116 citing Philippon & Resheff, *supra* note 31.

⁴⁰ ROBERT H. FRANK & PHILIP J. COOK, *THE WINNER-TAKE-ALL SOCIETY: WHY THE FEW AT THE TOP GET SO MUCH MORE THAN THE REST OF US* (1995).

⁴¹ *Ibid.*, at 24.

⁴² *Ibid.*

⁴³ *Ibid.*, at 26. (citing as examples the markets for athletes and entertainers).

market is labelled “deep pocket markets” in which disproportionate rewards are available because a small number of buyers are intensely interested in the winner’s performance.⁴⁴ The pattern of rewards characteristic of a winner-take-all labor market arguably tends to appear in the financial sector as a deep-pocket market associated most strongly with investment banking, asset management and securitization.⁴⁵ Although Frank and Cook identify various sources of winner-take all markets and factors driving the growth of such markets,⁴⁶ four stand out as features of the labor market in the financial sector:

- technological innovation;
- deregulation;
- decision leverage; and
- wealth concentration.

The adoption by the financial sector of sophisticated risk-management strategies is a familiar story⁴⁷ that coincided with a movement to lighter regulation of the regulated part of the financial sector and a movement into unregulated shadow banks, securitization structures, hedge funds and private equity. These two trends fueled competition for talent that included an exodus of engineers, physicists, mathematicians, and business school graduates to the financial sector.⁴⁸

⁴⁴ *Ibid.* (citing as examples the markets for painters, sculptors, and lawyers).

⁴⁵ See RAJAN, *FAULT LINES*, *supra* note 35, at 123-129 (emphasizing use of money to measure performance in the financial sector and the lack of any other factor as a measure of worth).

⁴⁶ FRANK & COOK, *supra* note 40, at 32-44, 45-60.

⁴⁷ For accessible and entertaining accounts of the development of financial theory, see PETER L. BERNSTEIN, *CAPITAL IDEAS: THE IMPROBABLE ORIGINS OF MODERN WALL STREET* (1992); PETER L. BERNSTEIN, *AGAINST THE GODS: THE REMARKABLE STORY OF RISK* (1996); PETER L. BERNSTEIN, *CAPITAL IDEAS EVOLVING* (2007).

⁴⁸ See Philippon & Reshef, *supra* note 31 (finding that financial deregulation and corporate activities linked to initial public offerings (IPOs) and credit risk increased the demand for skills in financial jobs that were relatively skill intensive, complex and highly paid until the 1930s and after the 1980s, but not in the interim period). See also Joshua N. Ruah & Steven N. Kaplan, *Wall Street and Main Street: What Contributes to the Rise in Highest Incomes?* (NBER Working Paper No. 13270, July 2007), available at <http://ssrn.com/abstract=931280> (suggesting that theories of skill-biased technological change, superstars and greater scale explain the increased percentage representation of financial sector employees (from

The competition for talent to create and refine innovations provided labor below the executive level with decision leverage: that is, the ability to significantly affect the outcomes of an organization with decisions made by a particular employee. All of these factors can be seen in increasingly higher levels of compensation to successful traders in financial firms. Increasing levels of wealth concentration have also provided concentrated purchasing power seeking the best asset management talent often found in hedge funds and private equity firms that seamlessly compete for talent developed in investment banks.⁴⁹

These kinds of factors can be seen to have driven the genesis and growth of winner-take-all labor markets in the financial sector which then adopted the standard payoff profiles seen in other winner-take-all labor markets. More particularly, performance as the basis of different levels of compensation can be readily measured; moreover, the gains from successful performance can be scaled: that is, non-linear returns can be generated from a given level of investment of human capital. The financial sector especially lends itself to scalable returns because of the limitless supply of financial products in response to demand. The financial sector thus became characterized by the chase for returns in excess of those provided by holding a benchmark market index that reflects systemic or “beta risk.” The value added provided by the asset manager (the agent in Woolley’s agency story) is seen to generate the excess return referred to as “alpha” for which investors will pay a premium. Woolley’s robust versus fragile innovations can be seen as strategies employed by asset managers to generate alpha.⁵⁰ As noted by Rajan,⁵¹ there are, however limited sources of alpha. One source is genuine abilities to

investment banks, hedge funds, private equity firms, and mutual funds) in the adjusted gross income categories at or above top 0.1 percent).

⁴⁹ See e.g., RAJAN, *FAULT LINES*, *supra* note 35, at 132 (“..... there are enormous risks in bringing together deep-pocketed investors who are not adequately conscious of prices and risks, and the highly motivated private financial sector.”).

⁵⁰ See e.g., PHILIP AUGAR, *CHASING ALPHA: HOW RECKLESS GROWTH AND UNCHECKED AMBITION RUINED THE CITY’S GOLDEN DECADE* (2009).

⁵¹ RAGHURAM RAJAN, *Bankers’ Pay Is Deeply Flawed*, FINANCIAL TIMES, Jan. 9, 2008 [hereinafter Rajan, *Bankers’ Pay*]. See also RAJAN, *FAULT LINES*, *supra* note 35, at 134-53; Gian Luca Clementi, Thomas F. Cooley, Matthew Richardson & Ingo Walter, *Rethinking Compensation in Financial Firms*, in *RESTORING FINANCIAL STABILITY: HOW TO REPAIR A FAILED SYSTEM* 187, 203-206 (Viral V. Acharya & Matthew Richardson eds., 2009).

consistently identify underpriced assets as a “value-investing” strategy, but agents/asset managers with these abilities are rare. Another source is from activist investment commonly associated with venture capital and private equity funds that acquire a controlling interest and manage assets in a more effective manner. A third source is the financial innovation identified by Woolley in creating cash flows and associated securities that are new and thereby complete markets by providing investors with novel payoff profiles.

Rajan emphasizes that generating sustainable alpha is difficult because of the requirement of special abilities and constant innovation.⁵² “False alpha” arises in the form of what appear to be excess returns associated with a steady stream of payoffs that can be reversed on the occurrence of a “tail risk” event resulting in a rare but disproportionate negative return. Given limited liability in the event of loss, the financial sector can engage in the chase for false alpha by adopting asymmetric bets using leverage that has manifested itself in a series of financial crises from the 1980s, culminating in the crisis of 2007-2009 centered in the US mortgage market. As the latest crisis revealed, sustainable and genuine alpha can be measured only in the long term, with false alpha arising in the short to medium term. This fact is significant for the structuring of compensation in the financial sector⁵³ and, as emphasized in the next part, a line of argumentation that borrows loosely from the conceptual foundations of corrective taxation can support an excise tax on bonus and performance-based compensation, as well as a bank leverage tax, as instruments intended to suppress the instability-breeding dynamics of financial markets.

⁵² Rajan, *Bankers' Pay*, *supra* note 51.

⁵³ *Ibid.*

IV. CORRECTIVE TAXATION AND THE POLICY CASE FOR SPECIAL TAXES ON THE FINANCIAL SECTOR

The post-crisis tax literature tends to emphasize the following justifications for special taxes on the financial sector:⁵⁴

- as a corrective tax intended to impose a marginal cost on the financial sector equal to the marginal social harm attributable to excessive risk taking;
- as a risk-based charge intended to function as an insurance levy; or
- as a revenue source intended to require the financial sector to pay for some portion of the costs of bailouts.

It is argued in this part that the first and second justifications are problematic: the first because of redundancy with prudential regulatory regimes; and the second because of costing issues. Nonetheless, a bank leverage tax, which has been adopted by a number of countries post crisis, can be justified as an instrument to both require the financial sector to pay the direct fiscal costs of bailouts and eliminate the TBTF borrowing subsidy. A decidedly secondary, but desirable, effect of this tax base is a possible reduction of risk taking associated with a reduction of leverage attributable to a tax-price increase. As proposed in some of the tax literature,⁵⁵ the case for adoption of standard measures of returns to risk-taking in the context of income and consumption tax bases as the base for a special tax on the financial sector must be grounded primarily on the third justification noted above. Any behavioral response to this tax base is likely weak, particularly as compared to a bank leverage tax. An excise tax on bonus and performance-based compensation in the financial sector can be justified as a policy instrument intended to alter the structure of such compensation and associated risk taking, but is redundant where regulatory regimes impose requirements with similar intended effects. In that case, this tax base must also be justified on the third basis noted above.

⁵⁴ See e.g., IMF Staff, *A Fair and Substantial Contribution*, *supra* note 5; Keen, *supra* note 8. See also Devereux, *supra* note 8, at 13-23 (distinguishing between taxes on the financial sector that are intended to raise revenue and those same taxes that are intended to influence behavior).

⁵⁵ See IMF Staff, *A Fair and Substantial Contribution*, *supra* note 5, at 19 (noting that a “financial activities tax” (FAT) could raise significant revenue and be designed to serve a range of purposes).

A. Prudential Regulation as the Policy Instrument of Choice Intended to Moderate Financial Instability

Parts two and three described the destabilizing effect of the use of leverage combined with asset mispricing in the financial sector, as well as the winner-take-all features of the labor market in this sector that can amplify both in the context of a standard principal-agent problem. Such instability, which is endogenous to the financial sector and thus sophisticated capitalist economies reliant on a robust financial function, requires a regulatory response in the presence of social costs imposed by the insolvency of financial institutions. The case for regulation is thus a standard one that requires government intervention in the market whenever particular activities in production or consumption impose costs on third parties (referred to as “negative spillovers” or negative externalities”). Even in the presence of asset mispricing, no such externalities would arise if all financial institutions were entirely equity-financed in performing their necessary functions, or if equity holders had unlimited liability and sufficient assets to satisfy the liabilities of their leveraged firms. Under those conditions, all costs of insolvency would be internalized as private marginal costs of the equity holders.⁵⁶ But as capitalist economies have grown and become more sophisticated, these conditions have been seen to be excessively constraining on performance of the financial sector’s functions.

Limited liability of equity holders means that the combination of leverage and asset mispricing are destabilizing with consequent social costs of insolvency.⁵⁷ As described by Goodhart,⁵⁸ there are five separate sets of such costs:

- direct costs of the use of resources to wind up a firm;
- potential dislocation of financial markets and settlement/payment systems;

⁵⁶ See Charles Goodhart, *How Should We Regulate the Financial Sector?* in THE FUTURE OF FINANCE, *supra* note 11, 153, 159.

⁵⁷ See IMF, *Debt Bias and other Distortions: Crisis-Related Issues in Tax Policy*, 12 (June 12, 2009), available at <http://www.imf.org/external/np/pp/eng/2009/061209.pdf>, [hereinafter IMF, *Crisis-Related Issues*] (characterizing excessive leverage as a negative externality that is not captured by micro-economic models focused on the level of firm-specific borrowing as a function of the internalization of bankruptcy costs).

⁵⁸ Goodhart, *supra* note 56, at 158.

- loss of specialized skills/information of employees of the firm;
- uncertainty and potential loss for all counterparties of the firm; and
- loss of unused credit facilities with loss of potential access to money.

In the event of a crisis precipitated by the contemporaneous failure of multiple institutions,⁵⁹ social costs extend to include:⁶⁰ (i) deadweight losses from fiscal transfers; and (ii) output losses, including increases in unemployment.

The most significant location of instability with the largest potential social costs is the performance of the credit intermediation function, primarily in the form of:⁶¹ (i) maturity transformation in which financial institutions lend funds at longer average maturities than they borrow funds; and (ii) risk-return transformation using the liabilities of borrowers to create a different mix of debt and equity investment options for savers. Although instability can also be associated with the market-making function,⁶² it tends to be more prominent and threatening in the case of maturity and risk-return transformation because the dominant portion of the assets and liabilities of large and systemically important financial institutions are devoted to these functions. As a result, “the hole in the balance sheet” that can occur because of an asset price correction can be especially severe. The standard pattern of prudential regulation intended to maintain firm and sector-wide stability focuses on the performance of these functions. Indeed, a prominent feature of the latest financial crisis was the fact that it was precipitated by problems in traditional investment banks that were essentially performing the maturity and risk-return

⁵⁹ See GARY B. GORTON, MISUNDERSTANDING FINANCIAL CRISES: WHY WE DON'T SEE THEM COMING 171 (2012) (citing Gerard Caprio & Daniela Klingebiel, *Bank Insolvencies: Cross Country Experience* 1-2 (World Bank Policy Research Working Paper No. 1620, 1996), available at http://www-wds.worldbank.org/servlet.../WDSP/IB/1996/.../multi_page.pdf for a definition of a financial crisis as the exhaustion of the entire capital of the banking system or evidence of significant problems in the banking system).

⁶⁰ GORTON, *supra* note 59, at 171.

⁶¹ Turner, *supra* note 13, at 9-11.

⁶² *Ibid*, at 59 (observing that losses incurred in trading activities can generate confidence collapses which can constrain credit supply and necessitate public rescue in extreme cases).

transformation function through securitization of subprime mortgages, but were not formally within the regulatory regime applicable to this function.⁶³

At a general level, prudential regulatory regimes attempt to moderate instability by requiring minimum liquidity and equity capital requirements as constraints on leverage in the event the value of assets is impaired. Constraints on activities can also be used to ensure some stability of asset value. In the wake of the financial crisis, there has been a concerted focus by policymakers, as well as in the academic literature, on reform of prudential regulatory regimes. Not surprisingly, the more radical reform proposals, in the sense that they are focused on structural reform of regulatory regimes, are found in the policy literature.⁶⁴ As Turner argues,⁶⁵ however, a significant problem shared by these proposals is their inability to adequately address the underlying causes of financial instability centred on asset mispricing and leverage while also sufficiently allowing for the provision of valuable maturity and risk-transformation functions demanded by households and businesses. He emphasizes that the challenge for policymakers remains striking a suitable balance between constraining the sources of financial instability while allowing the provision of valuable credit intermediation providing maturity and risk transformation.⁶⁶ In this respect, the focus of policymakers has been, not radical structural reform,⁶⁷ but incremental reforms of existing regulatory structures, including increased levels of

⁶³ *Ibid*, (highlighting the combination of credit intermediation and the trading function performed by investment banks securitizing subprime mortgages as the source of the financial crisis).

⁶⁴ See e.g., LAURENCE J. KOTLIKOFF, JIMMY STEWART IS DEAD: ENDING THE WORLD'S ONGOING FINANCIAL PLAGUE WITH LIMITED PURPOSE BANKING (2010) (proposing a system of mutual lending in which the credit intermediation function would be performed by mutual loan funds with investors sharing in returns as fund holders); JOHN KAY, NARROW BANKING: THE REFORM OF BANKING REGULATION (2009) (proposing a system of "narrow banking" which would involve removal of retail deposit taking from the credit intermediation function and provision of this function by financial firms competing in an unregulated market for uninsured wholesale funds). Another structural reform proposal for separation of commercial lending and proprietary trading is commonly associated with the former Federal Reserve Bank chairman, Paul Volcker.

⁶⁵ Turner, *supra* note 13, at 58-61.

⁶⁶ *Ibid*, at 61-62.

⁶⁷ Of the structural reform proposals on offer, only "the Volcker rule" has been adopted. *Dodd-Frank Wall Street Reform and Consumer Protection Act*, PUB. L. 111-203, TITLE VI, H.R. 4173 §601[hereinafter Dodd-Frank Act].

liquidity and capital,⁶⁸ adoption or refinement of resolution regimes,⁶⁹ and the development of macro-prudential tools.⁷⁰

As an initial proposition, it is unclear what role corrective taxation can, or is supposed to, serve in supporting prudential regulation - either in its existing form or a radically reformed structure - as a policy instrument intended to provide a desirable level of resiliency in the financial sector. In the standard public finance analytical framework, prudential regulation is clearly the preferred policy instrument over corrective taxation understood in the sense of the attempt to force market participants to internalize the full costs of their activities in either production or consumption. The case for the use of a corrective tax is simply the observation that, under certain conditions, a corrective tax can induce a desired reduction in social costs attributable to an activity at the lowest private marginal cost for market participants.⁷¹ Some of the relevant conditions include the following:⁷²

- the ability to quantify social marginal costs on a present-value basis in order to calibrate the amount of the corrective tax necessary to realize the desired reduction in the activity generating the costs;
- the presence of different cost structures for market participants such that some market participants can avoid paying the tax by adopting lower cost methods of avoidance, while

⁶⁸ See e.g., Basel Committee on Banking Supervision, *Basel III: A Global Regulatory Framework for More Resilient Banks and Banking Systems* (June 2011); Basel Committee on Banking Supervision, *An Assessment of the Long-Term Economic Impact of Stronger Capital and Liquidity Requirements* (Aug. 2010). But see Anat R. Admati, Peter M. DeMarzo, Martin F. Hellwig & Paul C. Pfleiderer, *Fallacies, Facts, and Myths in the Discussion of Capital Regulation: Why Bank Equity is not Expensive* (Rock Centre for Corporate Governance at Stanford University Working Paper No. 86, Mar. 23, 2011), available at <http://ssrn.com/abstract=1669704> (arguing that bank equity is not socially expensive and significantly higher equity requirements should be imposed).

⁶⁹ See e.g., IMF, *A Fair and Substantial Contribution*, *supra* note 5, at 7-8.

⁷⁰ See e.g., Paul Jenkins & Gordon Thiessen, *Reducing the Potential for Future Financial Crises: A Framework for Macro-Prudential Policy in Canada* (Toronto: CD Howe Institute, May 2012); Caruana, *supra* note 23; Tobias Adrian & Markus Brunnermeier, *CoVAR* (Federal Reserve Bank of New York Staff Reports, No. 348, Aug. 27, 2009), available at <http://ssrn.com/abstract=1269446>.

⁷¹ The seminal paper modelling the choice between regulation and corrective taxation is Martin L. Weitzman, *Prices Versus Quantities*, 41 REV. ECON. STUD. 477 (1974).

⁷² See e.g., JONATHAN GRUBER, PUBLIC FINANCE AND PUBLIC POLICY 134-146 (4th ed., 2012).

other market participants must pay the tax to the point that private marginal costs are equated with social marginal costs;

- a linear relationship between an increase in the relevant activity and the imposition of additional social costs; and
- the presence of social marginal costs that increase in modest incremental amounts with increases in the relevant activity.

In performing its necessary functions, the financial sector arguably operates under none of these conditions. The social costs attributable to the insolvency of a financial firm are exceedingly difficult to quantify and virtually impossible to quantify in the event of a financial crisis involving multiple firm failures; at least in terms of the various subsectors of the financial sector performing different functions, the cost structures tend to be homogenous, with this pattern appearing in firms operating across different functions; the relationship between an increase in social marginal costs and risk-taking behavior by financial institutions is decidedly non-linear; at some point that is difficult to define with any precision, the level of risk-taking goes from the imposition of only potential social costs to the imposition of actual costs as an institution becomes insolvent,⁷³ with this “cliff-effect” relationship resulting in the imposition of decidedly traumatic social costs in the event of a financial crisis with multiple failures.⁷⁴

Given that the financial sector operates under these conditions, the case for corrective taxation as the policy instrument of choice to moderate financial instability is problematic.⁷⁵ Moreover, the dominant position of prudential regulatory regimes means that, for all practical

⁷³ See e.g., Andrew Haldane, *Regulation or Prohibition: The \$100 Billion Question*, 2 J. REG. & RISK - NORTH ASIA 101, 106-16 (2010) (reviewing major changes to regulatory regime in the United States and suggesting that regulation of the financial sector is preferable to corrective taxation because the social marginal cost curve is likely steeper than the private marginal cost curve). See also IMF, *A Fair and Substantial Contribution*, *supra* note 5, at 53 (observing that the nonlinear nature of financial stress suggests that hard limits on leverage and/or the prohibition of certain activities be used to moderate financial instability).

⁷⁴ See Keen, *supra* note 8, at 12-13 (observing that the expected social costs are a function of the probability of financial institution failure and the wider economic costs associated with such failure if unmitigated).

purposes, any debate over the choice of policy instrument is closed. Indeed, until the latest financial crisis, there really was no discussion in the public finance literature of the use of corrective taxes to moderate financial instability.⁷⁶ But special taxes on the financial sector can have normative significance independent of prudential regulatory regimes, as well as the notion of a corrective tax as an attempt to quantify the social marginal harm attributable to excessive risk taking and impose a tax equal to that harm in an effort to equate private and social marginal costs. One possibility is the use of a tax instrument to fill a gap in prudential regulatory regimes or otherwise perform a supporting role by inducing a behavioral response that moderates financial instability. Another possibility is the raising of revenue from the financial sector to avoid the distributional consequences of the income transfer that occurs when government bails the sector out to avoid its liquidation. As suggested in the following section, it is somewhat unsurprising that bank leverage taxes have emerged as the dominant tax instrument framed in terms of these possible justifications.

B. Bank Leverage Taxes and Taxation of Returns to Risk Taking

There are arguably two different strands in the post-crisis tax literature using the concept of corrective taxation in a much looser sense of a tax intended to induce a desired behavioral response. One strand of this post-crisis literature emphasizes the possible amplifying effects on the build up to the crisis of certain structural features of the income tax system, such as the inconsistent treatment of corporate debt and equity, the deduction of home mortgage interest, and a capital gains preference, as well as exempt treatment of financial services under value-added tax (VAT) systems.⁷⁷ However, the lack of any empirical evidence of the relationship between

⁷⁵ *But see* Devereux, *supra* note 8, at 20 (emphasizing that a corrective tax can be imposed using a nonlinear schedule but it is necessary to divide the aggregate marginal benefit among banks to derive the appropriate schedule and it is difficult to implement a tax in which each bank faces a different tax rate).

⁷⁶ *See* Shackelford, Shaviro, & Slemrod, *supra* note 8 (emphasizing the difficulties in the design of Pigovian taxes as a means to address systemic risk in the financial sector). *See also* Keen, *supra* note 8, at 2-5 (noting the lack of public finance literature on the taxation of the financial sector).

⁷⁷ *See e.g.*, IMF, *Crisis-Related Issues*, *supra* note 57; Michael Keen, Alexander Klemm, & Victoria Perry, *Tax and the Crisis*, 31 *FISCAL STUD.* 43 (2010); *see also* Daniel Shaviro, *Income Tax Reform Implications*, in *TAXATION AND THE FINANCIAL CRISIS*, *supra* note 3, 174 (emphasizing the need for tax rules to avoid behavioral responses that exacerbate the causes of financial crises).

these structural features and the sources of financial instability⁷⁸ means that the standard inefficiencies commonly associated with these features remain the principal policy imperative for reform; the crisis can be seen to have provided an opportunity to view them from a new perspective that, at best, can add to the case for reform.

Another strand of the same literature emphasizes the revenue-raising capacity of special taxes on the financial sector as a means to fund the public costs of bailouts in the event of failure; as a secondary feature, these taxes are seen as instruments to induce a desired behavioral response in the form of a reduction in leverage attributable to an increase in its tax price. In effect, taxing debt of financial institutions can be seen to have the desirable secondary feature of offsetting a generalized income tax bias in favor of debt and, by reducing leverage levels, reducing associated risk taking.⁷⁹ As noted already, a bank leverage tax applied to wholesale liabilities⁸⁰ of financial institutions is the apparent instrument of choice for policymakers post crisis to realize both the revenue-raising and leverage-reduction goals.⁸¹ In extending the application of such a tax beyond retail deposit insurance, which is intended to limit the social

⁷⁸ *But see* Michael Keen & Ruud de Mooij, *Debt, Taxes, and Banks* (IMF Working Paper WP/12/48, Feb. 2012), available at www.imf.org/external/pubs/ft/wp/2012/wp1248.pdf (finding from bank panel data for the period 2001-2009 that bank capital structure is about as responsive to taxes as those of non-financial firms).

⁷⁹ *See e.g.*, de Mooij et al., *supra* note 3, at 19-20 (estimating that a bank leverage tax applied at a rate of 10 basis points would yield modest welfare gains associated with a reduction in bank leverage and probability of crisis, although such gains would be considerable at high levels of tax responsiveness at high initial leverage levels of 96 percent of assets). *But see also* Michael Devereux, Nils Johannesen & John Vella, *Can Taxes Tame the Banks? Capital Structure Responses to the Post-Crisis Bank Levies* (Munich, CESifo Area Conference on Public Sector Economics, April 11-13, 2013), available at http://www.cesifo-group.de/link/psc_Johannesen.pdf (finding, for a data set of 5,000 banks in the European Union in the period 2008-2011, that bank leverage taxes increased equity-asset ratios by 1-1.5 percentage points but that the riskiness of bank assets also increased).

⁸⁰ A financial transactions tax (FTT) focused on financial transactions such as commodity and securities trades can also serve a comparable function, although a bank leverage tax on wholesale liabilities may be seen as more effectively targeted on leverage as a source of instability. Moreover, an FTT tends to be justified in terms of the behavioral response it is intended to induce: that is, excessive trading and the consequent destabilizing effects of excessive volatility in a targeted market. A prominent post-crisis example of an FTT is the FTT proposed by the EU. *See* EC, *Proposal for a Council Directive on a common system of financial transaction tax and amending Directive 2008/7/EC*, Sept. 28, 2011.

⁸¹ *See e.g.*, IMF, *A Fair and Substantial Contribution*, *supra* note 5, at 6-16 and the sources cited *supra* note 6.

costs of liquidity crises in the form of bank runs,⁸² policymakers presumably recognize that prudential regulatory regimes are imperfect and cannot be expected to eliminate the occurrence of either individual institution or sector-wide insolvencies.⁸³ In particular, a balance must be struck between ensuring complete stability of the financial sector and managing instability in order to allow the financial sector to deliver an adequate range of services that enhance welfare and facilitate economic growth. That balance may be defensibly shifted toward tighter regulation in the context of developed economies where the link to economic growth is not as clear as in developing economies, and there is therefore an element of financial activity that is wasteful.⁸⁴ Even then, however, an element of instability must be tolerated in order to avoid unduly constraining the financial sector in its performance of necessary functions. The simple notion is to accumulate a fund that can be used to absorb the public costs of rescue in the same manner as general insurance. In this sense, an insurance levy can be seen as an attempt to contain the public costs of rescue by forcing the financial sector to self-fund while supporting the prudential regulatory regime in the event of its failure.

A bank leverage tax imposed on wholesale liabilities can be justified, therefore, as performing an insurance function, with leverage as the proxy for risk taking; it may also serve as a corrective tax in the sense used in the public finance literature if average and marginal social damage attributable to risk taking by financial institutions are equivalent.⁸⁵ Any behavioral

⁸² *But see* Keen, *supra* note 8, at 11 (suggesting that retail deposit insurance can also be justified as a way to correct for excessive risk taking and, in doing so, requires a charge that raises the expected value of the amount needed to restore depositors in the event of bank failure).

⁸³ *See* GORTON, *supra* note 59, at 151-164 (emphasizing the inadequacy of bank capital requirements in mitigating or preventing financial crises). *See also* Piergiorgio Alessandri & Andrew Haldane, *Banking on the State 2* (Bank of England, November 2009), available at <http://www.bankofengland.co.uk> (observing that the social contract between banks and the state is incomplete which results in a time-inconsistency problem for authorities).

⁸⁴ *See e.g.*, Turner, *supra* note 13, at 30-32 (citing studies finding a correlation between the growth of basic financial services and economic growth but questioning whether the same relationship holds where continued financial deepening occurs beyond a level of financial maturity characteristic of developed economies).

⁸⁵ Keen, *supra* note 8, at 10-11 (observing that a user charge and a corrective tax have a similar effect where the technical structure of an externality is such that average and marginal damage are the same, with revenue raised by the tax exactly covering the damage).

response in the form of a reduction in the level of leverage of financial firms and associated instability is entirely incidental, however; the goal is to ensure that premiums and any investment income earned on the accumulated fund equal the expected benefit of payment on the occurrence of the insured event.⁸⁶ Indeed, it is unclear what the extent of any behavioral response would be and to what extent it would be efficiency enhancing by moderating instability without unduly constraining financial activities that deliver value added.⁸⁷ More importantly perhaps, a significant problem with the design of a bank leverage tax as an insurance levy is the determination of an actuarially appropriate levy at both the individual institution level and sector wide. With respect to the former, the amount of the levy can be determined most simply as a fixed percentage of wholesale liabilities as the specified base. But under this simplified approach, a segment of insureds with a lower risk profile subsidize those with a higher risk profile. The alternative is to calibrate the levy at the institution level to realize a separating equilibrium among insureds. This approach is exceedingly complex and requires, in particular, an assessment of the systemic importance of individual institutions.⁸⁸

⁸⁶ *Ibid*, at 11 (suggesting that a mismatch in premium payments and expected benefits will induce a behavioral response and it should be “intrinsically desirable”).

⁸⁷ *But see* Carmen Matutes & Xavier Vives, *Imperfect Competition, Risk Taking, and Regulation in Banking*, 44 EURO. ECON. STUD. 1 (2000) (illustrating how actuarially appropriate deposit insurance can reduce risk taking when bank regulators can observe the positions of regulated banks). There is a deep literature on the design of FTTs as a policy instrument to dampen excessive volatility in commodities and securities markets. This literature is surveyed in Thornton Matheson, *Taxing Financial Transactions: Issues and Evidence*, in IMF, FINANCIAL SECTOR TAXATION, *supra* note 6, 144 [hereinafter Matheson, *Taxing Financial Transactions*]. *See also* Thomas Hemmelgarn & Gaetan Nicodeme, *The 2008 Financial Crisis and Taxation Policy* 27-35 (CESifo Working Paper No 2932, 2010), available at <http://ssrn.com/abstract=1546973> [hereinafter Hemmelgarn & Nicodeme, *The 2008 Financial Crisis*] (concluding that the effects of a FTT on asset price bubbles are ambiguous and preferring elimination of the preferential treatment of debt as a more promising means to avoid excessive leverage and risk taking); Daniel Shaviro, *The Financial Transactions Tax vs the Financial Activities Tax*, in TAXING THE FINANCIAL SECTOR, *supra* note 6, 165, 195-197 [Shaviro, *Financial Transactions Tax*] (suggesting that an FTT can be effective in addressing wasteful over-investment in trading activity, but emphasizing that there is considerable uncertainty whether a FTT realizes social benefits that exceed the social costs).

⁸⁸ *See e.g.*, Viral V. Acharya, Lasse H. Pedersen, Thomas Philippon, & Matthew Richardson, *Regulating Systemic Risk*, in RESTORING FINANCIAL STABILITY, *supra* note 51, 283 (proposing the use of a capital charge as a corrective tax capturing the marginal contribution of individual financial institutions to system-wide risk). A bank leverage tax might also be calibrated to account for systemic risk attributable to maturity mismatch. *See* Enrico Perotti & Javier Suarez, *Liquidity Risk Charges as a Macro-Prudential Tool* (CEPR Policy Insight No. 40, Nov. 2009).

Moreover, it is not clear that determination of an actuarially appropriate levy at the level of individual institutions matters all that much when risk of failure is correlated among institutions, and the event requiring funding is multiple failures and the potential liquidation of the financial sector.⁸⁹ In fact, the extension of retail deposit insurance through a bank leverage tax on wholesale liabilities is probably most clearly conceived as an insurance levy protecting against failure at the level of an individual financial institution in an environment in which risk of failure is uncorrelated among institutions, and policymakers can abstract from a necessary accounting for systemic risk. If the goal is instead the raising of sufficient revenue to avoid liquidation of the financial system, the revenue target must necessarily be limited to the direct fiscal costs of bailout: that is, the wealth transfer that would otherwise be made from taxpayers to the financial sector to avoid its liquidation.⁹⁰ The magnitude of output losses attributable to a financial crisis would arguably require imposition of an insurance levy in an amount that would eliminate profits and would itself liquidate the financial sector.⁹¹ An alternative is to conceive of the insurance levy as intended to prevent bank runs by wholesale lenders similar to retail deposit insurance, but the magnitude of the exposure in the event of a sector-wide solvency crisis also makes the necessary premia for such coverage unrealistic.⁹² The general revenue-raising function of government is thus required to provide sufficient funding to address the full social costs of a financial crisis.

⁸⁹ Keen, *supra* note 8, at 17 (suggesting that “public buffers” can have a useful risk-pooling role when shocks are not strongly (or are negatively) correlated, in which case taxation can economize on the reserves needed to deal with institutional failure, but “private buffers” provided by regulation leave institutions better placed to deal with shocks that are strongly positively correlated across institutions).

⁹⁰ Revenue raised could include an amount necessary for the funding of a resolution mechanism. See IMF, *A Fair and Substantial Contribution*, *supra* note 5, at 7, 14-15 (adoption of improved and effective resolution regimes requires funding which should come from financial sector through some form of charge and considering whether the proceeds of such a charge should be used to finance a resolution fund or feed into general revenues).

⁹¹ See e.g., Haldane, *supra* note 73, at 102-103.

⁹² Keen, *supra* note 8, at 15, footnote 33 (noting the difficulty of setting appropriate risk premia in the face of the sheer magnitude of the exposure of an insurance scheme for wholesale bank liabilities intended to prevent runs in the same way as retail deposit insurance).

The modest rates at which bank leverage taxes have been enacted by many countries post crisis⁹³ suggests that these taxes are seen as a means to require the financial sector to pay for the direct fiscal costs of bailouts either in advance or after-the-fact⁹⁴ while, in the former case at least, suppressing, to some indeterminate extent, the use of leverage and associated risk taking. As emphasized in some of the post-crisis literature,⁹⁵ however, bank leverage taxes can also serve a much different role as a corrective tax. More particularly, the application of a bank leverage tax can be limited to TBTF institutions and applied at a rate that equals the borrowing subsidy attributable to implicit government support. This alternative framing is defensible as an attempt to eliminate the subsidy with an emphasis on the associated behavioral response that, in the loose sense used in some of the post-crisis literature, is a form of corrective taxation. In fact, this policy justification may be the closest form of corrective tax in the tighter sense of the term used in the public finance literature even though the amount of the subsidy,⁹⁶ and the offsetting amount of the tax, does not equal the social damage attributable to additional financial activity because of the availability of cheap debt. The connection between the amount of the tax and the social damage is, instead, an indirect one with the elimination of the subsidy by the tax resulting in a reduction in social damage attributable to it. By setting the tax rate at an amount equal to the subsidy, government effectively collects a fee for provision of its implicit guarantee as established by the bond market and thereby increases private costs to an appropriate risk-adjusted market rate. The resulting reduction in financial services provided by TBTF institutions may have an impact on what might otherwise be considered excessive risk taking and complement prudential regulatory regimes in moderating financial instability; it should also help to address

⁹³ See e.g., Matheson, *Financial Sector Taxation*, *supra* note 6, at 206 (observing that the top rates of bank leverage taxes in practice are low relative to estimates of the TBTF subsidy).

⁹⁴ The FCR fee is designed as an ex post levy intended to recover direct fiscal costs. See IMF Staff, *A Fair and Substantial Contribution*, *supra* note 5, at 15-16 (stating a preference for ex ante levies designed to cover the expected costs of future bailouts because ex post levies impose a burden only on surviving institutions and are pro-cyclical, requiring the financial sector to meet costs when it is least able to do so).

⁹⁵ See e.g., IMF Staff, *A Fair and Substantial Contribution*, *supra* note 5, at 12 and 54-59; Keen, *supra* note 8, at 12-15 (distinguishing the “failure externality” from the “bailout externality”).

⁹⁶ Keen, *supra* note 8, at 11-15.

distortions to competition and the possible over-supply of financial services by a bloated financial sector.

Irrespective of the particular justification, bank leverage taxes present a number of second-order design issues, none of which would appear to be insurmountable.⁹⁷ Determination of both the rate and the scope of a bank leverage tax intended to eliminate the TBTF subsidy is, admittedly, more problematic than it is when the tax is intended to recover expected direct fiscal costs of bailouts. Estimates of the amount of the subsidy and the rate required to eliminate it vary empirically.⁹⁸ In terms of the scope of the tax, some form of asset-based test must be used as a proxy for TBTF status rather than applying it broadly to the financial sector on the premise that all institutions benefit from government intervention in the event of a crisis.⁹⁹ Perhaps because of the different rate and scope features, there is a tendency to frame a bank leverage tax as either intended to cover the direct fiscal costs of bailouts or to eliminate the TBTF borrowing subsidy. However, it is relatively obvious that a bank leverage tax could be designed to realize both purposes. On the plausible empirical assumption that the rate required to eliminate the TBTF subsidy would be greater than the general rate payable by all financial institutions, TBTF institutions could be permitted to credit the amount of the tax payable at the higher rate against their general liability at the lower rate.

⁹⁷ See e.g., Matheson, *Taxing the Financial Sector*, *supra* note 6, at 205-209 (discussing, for example: (i) the need to extend bank leverage taxes to account for the implicit leverage in the derivatives portfolios of financial institutions; (ii) the deductibility status of bank leverage taxes for corporate income tax purposes; and (iii) coordination of tax jurisdiction to avoid double taxation of cross-border financial institutions).

⁹⁸ See IMF Staff, *A Fair and Substantial Contribution*, *supra* note 5, at 54-55; Kenichi Ueda & Beatrice Weder di Mauro, *The Value of the Too-Big-to-Fail Subsidy to Financial Institutions*, in IMF, FINANCIAL SECTOR TAXATION, *supra* note 5, 106 (concluding that the funding advantage from the TBTF subsidy is 10-50 basis points and averaging around 20 basis points). *But see also* Haldane, *supra* note 73, at 104-105 (citing various estimates of the annual value of the TBTF subsidy, including: (i) \$60 billion at the height of the crisis for the five largest global banks; (ii) \$34 billion for the 18 largest US banks; and (iii) £30 billion for the 5 largest UK banks); Keen, *supra* note 8, at 14 (noting that a corrective tax case for elimination of the TBTF subsidy requires elimination of the subsidy at the margin which is higher than the average cost of the externality because of the increase in the benchmark “no intervention” borrowing rate at the margin and suggesting that “it is not difficult to arrive at a corrective tax on wholesale borrowing in the order of 50 basis points”).

⁹⁹ IMF Staff, *A Fair and Substantial Contribution*, *supra* note 5, at 11-12.

With adoption of a comprehensive bank leverage tax designed to recover the direct fiscal costs of bailouts as well as eliminate the TBTF borrowing subsidy, other tax bases would seem to be required, at least in terms of revenue generation, only if policymakers were inclined to require the financial sector to pay for the full social costs of bailouts and, in particular, consequent output losses.¹⁰⁰ In that case, a bank leverage tax provides too narrow a base to generate the required revenue at a rate that would not otherwise force the financial sector into an all-equity mutual-lending structure advocated by Kotlikoff¹⁰¹ and thereby generate no revenue because of the prohibitive cost of debt. The revenue target is, however, ill-defined since, as already noted,¹⁰² full compensation by the financial sector for output losses would require a tax or insurance levy of a magnitude that would itself liquidate the financial sector. As an instrument intended to compensate for expected output losses associated with financial crises, the justification for other possible bases thus moves away from the determination of an actuarially appropriate insurance levy or a tax intended to induce a behavioral response that moderates financial instability. The attempt is to require a contribution by the financial sector that goes beyond reimbursement of the inevitable income transfers in the event of a financial crisis, but can similarly be seen to have desirable distributional properties in the sense that the tax compensates, but only in part, for the social harm in the form of output losses. It is in this respect that taxation of returns to risk taking in the financial sector has emerged in the literature as a possible base in addition to a bank leverage tax.¹⁰³

It is a well-known insight of the tax-policy literature that normal returns to capital can be exempted by imputing interest expense on equity and providing a deduction at the corporate level consistent with the treatment of debt while not taxing such returns to investors; moreover, risk

¹⁰⁰ *Ibid.* at 16-23. Matheson, *Financial Sector Taxation*, *supra* note 6, at 208-209 (arguing that a bank leverage tax may be a better instrument for behavior modification than for significant revenue-raising, with preliminary calculations indicating that such a tax imposed at a 20 basis point rate on non-deposit debt of banks would raise approximately €28.5 billion in the Eurozone, £4.3 billion in the United Kingdom, and \$5.1 billion in the United States).

¹⁰¹ *Supra* note 64.

¹⁰² *Supra* note 90 and accompanying text.

¹⁰³ See e.g., IMF Staff, *A Fair and Substantial Contribution*, *supra* note 5, at 19-23.

premia for the bearing of undiversifiable market risk (beta) can also be exempted by imputing interest expense on equity at an appropriate risk-adjusted rate. The tax base thus becomes supernormal or excess returns (alpha) to risk taking as well as economic rents attributable to market power. The standard rationale for the articulation of such a tax base is to equate the tax treatment of debt and equity while treating normal and risk-adjusted returns consistent with a consumption tax in order to avoid the deadweight loss attributable to the behavioral response in the presence of the taxation of these returns.¹⁰⁴ Supernormal returns to risk taking remain taxable on the empirical assumption that there is no behavioral response in the presence of taxable treatment. The notion in the post-crisis literature, however, is to apply taxation of supernormal returns to risk taking exclusively in the financial sector as a tax base in addition to the income tax and the VAT;¹⁰⁵ although in the case of the latter, the additional tax base would provide a measure of taxation of value added by the financial sector in the aggregate at the firm level and can be seen as a substitute for exempt treatment of margin-based financial charges in the presence of a perceived inability to tax such charges under a transactional invoice/credit VAT.

In terms of revenue-raising capacity, returns to risk taking and economic rents clearly provide a larger revenue base than a bank leverage tax,¹⁰⁶ but at the cost of a weaker behavioral response that the tax-policy literature emphasizes as the principal attraction of a tax base limited

¹⁰⁴ This is the standard rationale for a corporate cash-flow tax and, in particular, the allowance for corporate equity (ACE) system. The ACE system was popularized in a study sponsored by the UK Institute for Fiscal Studies. See INSTITUTE FOR FISCAL STUDIES, *EQUITY FOR COMPANIES: A CORPORATION TAX FOR THE 1990s* (1991).

¹⁰⁵ See e.g., IMF Staff, *A Fair and Substantial Contribution*, *supra* note 5, at 65-69; Keen et al., *supra* note 9, at 122-126, 130-137 (describing three forms of FATs differing in the definition of the tax base as either (i) value added computed at the firm level by application of a subtraction method VAT (“FAT 1”); (ii) economic rents equal to supernormal returns earned by labor and shareholders (FAT 2”), (ii) returns to excessive risk taking equal to supernormal returns earned by labor and shareholders above a specified threshold (“FAT 3”).

¹⁰⁶ See e.g., IMF Staff, *A Fair and Substantial Contribution*, *supra* note 6, at 67-69 (providing estimates of revenue potential for OECD countries of all three types of proposed FATs). See also Shaviro, *Financial Transactions Tax*, *supra* note 87, at 176-178 (suggesting that an FAT is preferable to an FTT because it is a broader net measure of financial activity).

to supernormal or excess returns.¹⁰⁷ Indeed, to the extent that this base is focused on supernormal or excess returns with a tax rate at something less than 100 percent, there will be no, or very little, behavioral response.¹⁰⁸ The presence of sustainable alpha associated with unique abilities, or false alpha associated with asymmetric bets, will cause financial firms to pursue the relevant investment and business strategies providing these forms of returns to the extent there is a positive after-tax amount; moreover, the lack of any behavioral response at something less than a 100 percent tax rate would likely persist even if loss recognition is denied.¹⁰⁹ To induce a reduction in risk taking, returns to undiversifiable risk, as well as supernormal returns, could be taxed by imputing and exempting interest on equity at a riskless rate; yet the reduction in risk taking would be efficiency enhancing only to the extent that it suppresses superfluous financial activity, and there is no obvious way to distinguish such activity from the delivery of financial services that provide value added in support of economic growth.¹¹⁰ Taxation of risk premia associated with undiversifiable market risk would raise the cost of equity financing for financial firms and operate at cross-purposes with prudential regulatory regimes requiring maintenance of specified capital ratios. Given these probable behavioral properties and an imprecisely specified revenue target in the presence of a bank leverage tax, it is perhaps not surprising that taxation of returns to risk taking in the financial sector has not had any policy traction in practice.

¹⁰⁷ See e.g., Devereux, *supra* note 8, at 24-25 (characterizing taxation of returns to risk-taking through an FAT as motivated by revenue generation concerns but with little or no behavioral response in contrast with a bank leverage tax which is similarly motivated by revenue generation concerns but also has a sharp behavioral response). *But see* Thomas Hemmelgarn & Gaetan Nicodeme, *Can Tax Policy Help to Prevent Financial Crisis?* in TAXATION AND THE FINANCIAL CRISIS, *supra* note 3, 116, 125[hereinafter Hemmelgarn & Nicodeme, *Can Tax Policy?*] (concluding that an FAT would reduce the size of the financial sector by making financial services more expensive).

¹⁰⁸ See e.g., Matheson, *Financial Sector Taxation*, *supra* note 6, at 211 (“Since these taxes [i.e., FATs] fall on financial sector rents, their base should prove fairly inelastic except insofar as the tax is successful in curbing excessive risk-taking.”).

¹⁰⁹ *But see* Shaviro, *Financial Transactions Tax*, *supra* note 87, at 186 (observing that limited loss recognition provides asymmetric gain/loss tax rates and suggesting that it can suppress risk taking).

¹¹⁰ See e.g., Hemmelgarn & Nicodeme, *Can Tax Policy?* *supra* note 107, at 126 (noting that an FAT cannot distinguish between high returns attributable to unduly risky behavior as opposed to skills and effort).

C. An Excise Tax on Bonus and Performance-Based Compensation

Taxation of returns to risk taking has tended to focus on these returns realized by equity investors, with the choice of interest imputation rate on equity determining the extent to which risk premia are taxed. The assumption underlying this focus is that rents are not earned by labor and all wages and salary are therefore deductible in computing the tax base. This assumption does not hold in the financial sector where, as described in part three, a substantial portion of rents are captured by labor. In this respect, it is again descriptively correct to observe that rents captured by labor in the financial sector, as well as rents captured by equity investors, can be taxed. This result can be realized relatively easily by denying a deduction for compensation in excess of a specified level.¹¹¹ But as with taxation of rents captured by equity investors, there should be no behavioral response to the extent that rents captured by labor are taxed at something less than 100 percent. Nonetheless, taxation of these returns, in particular, can be designed to realize a sharp behavioral response provided the tax is focused on the structure of compensation in the financial sector and not the level of compensation. In effect, the tax can be designed to induce compensation structures that mimic the payoff profile of equity investors by ensuring that labor is exposed to loss of performance-based compensation in the same manner as equity investors are exposed to the loss of invested capital.

One of the reform themes in the post-crisis legal and economic literature is the need to address the structure of bonus or performance-based compensation in the financial sector, which can be seen to have encouraged excessive risk taking in the form of placing asymmetric bets generating option-like payoffs that for some time appeared to be rents but that were revealed by the crisis to be false alpha. Two structural reform ideas can be identified in this literature. One idea, advocated by Bebchuk and Spamann, would require an element of bonus or performance-based compensation to be linked with the value of the interests of debt holders and fixed

¹¹¹ See e.g., IMF Staff, *A Fair and Substantial Contribution*, *supra* note 5, at 68 (suggesting an exemption level for compensation based on the empirical estimate of rents provided by Philippon and Resheff, *supra* note 31).

participating equity holders (for example, preferred shareholders).¹¹² This type of link would broadly align the incentives of labor with other stakeholders who do not benefit from option-like payoff profiles and thereby would suppress, to some extent at least, the incentive to otherwise place asymmetric bets with firm assets to the benefit of labor and fully-participating equity investors (common shareholders). The other reform idea, proposed most prominently in a report by a group of leading financial economists,¹¹³ would attempt to realize the same goal, but instead by requiring that an element of bonus or performance-based compensation earned in a year be set aside and be subject to claw back in the event of loss occurring during a specified period.

Both reforms would obviously require considerable thought as to second-order design details focused on, for example, the requisite weighting of the interests of stakeholders other than common shareholders,¹¹⁴ or in the case of claw back of compensation, the period over which exposure to claw back would be considered adequate.¹¹⁵ Abstracting from those second-order details, an important difference between the two proposals is the expected dimension of any desirable behavioral response.¹¹⁶ Exposure to claw back of bonus or performance-based compensation would provide payoff profiles comparable to that of common shareholders. There would thus remain an incentive for labor to place asymmetric bets, although that incentive would

¹¹² Lucian A. Bebchuck & Holger Spamann, *Regulating Banker's Pay*, 98 GEO. L.J. 247 (2010); Lucian A. Bebchuck, Alma Cohen & Holger Spamann, *The Wages of Failure: Executive Compensation at Bear Stearns and Lehman 2000-2008*, 27 YALE J. REG. 257 (2010). See also Patrick Bolton, Hamed Mehran & Joel D. Shapiro, *Executive Compensation and Risk Taking* (Federal Reserve Board of New York Staff Report No. 46, Nov. 2011), available at <http://ssrn.com/abstract=1635349> (finding that debt-like compensation for bank executives is believed by the market to reduce risk).

¹¹³ KENNETH R. FRENCH ET AL., THE SQUAM LAKE REPORT: FIXING THE FINANCIAL SYSTEM 75, 81-82 (2010) (recommending that “systemically important financial institutions should withhold a significant share of each senior manager’s total annual compensation for several years and employees would forfeit their holdback if their firm goes bankrupt or receives extraordinary assistance.”). See also Neil Record, *How to Make Bankers Share the Losses*, FINANCIAL TIMES, Jan. 7, 2010 (recommending unlimited liability of bank executives in respect of bonus compensation).

¹¹⁴ Bebchuck & Spamann, *supra* note 112, at 282-286.

¹¹⁵ See e.g., Wolf, *supra* note 12, at 234-35 (describing regulatory requirements for system of claw back of compensation).

¹¹⁶ See Clementi et al., *supra* note 51, at 213 (noting that use of compensation claw backs has been criticized for its potential unintended negative consequences, such as the incentive it provides for traders to hide losses or to avoid any type of risky trading strategy and become unduly conservative).

not be as severe as it is when labor is not exposed to loss. In fact, an element of such exposure is already realized to the extent executives, in particular, receive share compensation, and this compensation structure did not deter excessive risk taking in the build up to the crisis.¹¹⁷ Bebchuck and Spamann's reform proposal would avoid this effect to the extent that compensation is dependent on the value of interests of stakeholders other than common shareholders.¹¹⁸ However, its proposed application would appear to be limited to the highest levels of financial firm management, perhaps because the complexity of designing a compensation structure tied to the interests of stakeholders other than common shareholders is seen to be worthwhile only for key decision makers. Because of greater simplicity of second-order design details,¹¹⁹ a claw-back mechanism would probably be much easier to apply through the entire ranks of a financial institution, including traders and other front office personnel who also have considerable decision leverage in the use of firm assets.¹²⁰

¹¹⁷ See Bebchuck & Spamann, *supra* note 112, at 255-265 (emphasizing that the combination of equity-based compensation and bank capital structure provides executives with an incentive to place highly levered bets on assets that is not eliminated by measures to more closely align executive compensation arrangements with the interests of common shareholders). See also Bebchuck et al., *supra* note 112, at 261-270 (emphasizing the cash out of large amounts of bonus compensation by executives of Bear Stearns and Lehman Brothers during the period 2000-2008); Sanjai Bhagat & Brian Bolton, *Bank Executive Compensation and Capital Requirements Reform* (May 2011), available at <http://ssrn.com/abstract=1781318> (recommending that (i) incentive compensation for senior bank executives should consist exclusively of shares and/or share options that cannot be sold or exercised for two to four years after leaving office, and (ii) bank capital requirements should be increased considerably for equity-based incentives to be effective); FRENCH ET AL., *supra* note 113, at 82 (recommending that a holdback of a fixed amount of compensation include deferred compensation in the form of restricted stock or stock options since such compensation aligns the interest of executives with common shareholders by permitting "... both to capture the upside when things go well, and transfer at least some of the losses to taxpayers when things go badly.").

¹¹⁸ But see also Anat R. Admati & Paul C. Pfleiderer, *Increased-Liability Equity: A Proposal to Improve Capital Regulation of Large Financial Institutions* (Stanford University Graduate School of Business Research Paper No. 2043, Mar. 2010), available at <http://ssrn.co/abstract=1532484> (proposing an "Equity Liability Carrier" that holds safe assets and thereby reduces fragility while alleviating distortions attributable to conflicts of interest between debt and equity holders).

¹¹⁹ A claw-back requirement uniquely requires specification of a trigger event. See e.g., FRENCH ET AL., *supra* note 113, at 83 (suggesting that trigger events should include extreme events such as publicly-funded capital injections and unusual government guarantees as well as less extreme events such as accessing lender-of-last resort facilities available from a central banking authority).

¹²⁰ See e.g., Wolf, *supra* note 12, at 235 (suggesting that "... regulators would also have a say in the remuneration structures of the non-key decision makers in the firm.").

These two proposed reforms to the structure of compensation in the financial sector are not mutually exclusive; and they could be implemented as part of prudential regulatory regimes. Taxation of bonus and performance-based compensation intended to encourage adoption of compensation structures with either or both of these suggested features would be required only where they are not incorporated as part of prudential regulatory regimes and are left to market practice.¹²¹ Bebchuck and Spamann argue, for example, that existing regulatory regimes could accommodate consideration of compensation structures in setting risk-weighted capital requirements.¹²² Where regulatory regimes are incomplete, a tax instrument could be used either as part of a tax base measuring returns to risk in the form of rents or as a stand-alone tax. With either tax instrument, compensation in excess of a specified level could be subject to tax to the extent that it was not subject to a defined claw back or not suitably weighted to account for interests of stakeholders other than common shareholders. This type of tax would be preferable to a denial of a deduction for income tax purposes at the employer level, primarily because the rate could be set independently of the income tax rate of a particular employer, as well as independently of the income tax rate faced by particular employees. Experience with the denial of a deduction for compensation of senior executives of public corporations in excess of \$1 million would tend to support the presence of a behavioral response in the form of a change in the structure of targeted compensation.¹²³ It is not clear, however, what rate should be used with an excise tax on bonus and performance-based compensation where the purpose is to induce a

¹²¹ See Goodhart, *supra* note 56, at 160 (observing that the case for claw back of compensation rests on public perception of what is “ethically appropriate” rather than empirical evidence that existing compensation structures led bank executives to consciously take risks knowing that a substantial portion of any losses would be socialized); Clementi et al., *supra* note 51, at 210-13 (recommending compensation of traders “through the cycle” to account for good and bad times but apparently assuming that market practice would realize this result). See also Jennifer Liberto, ‘Likely’ JP Morgan Clawbacks Rare on Wall Street, CNN MONEY, June 13, 2012; Liz Moyer, Banks Bow to New York on Clawbacks, WALL ST. J., Mar. 13, 2013.

¹²² Bebchuck & Spamann, *supra* note 112, at 278-286. *But see* Wolf, *supra* note 12, at 234-35 (assuming that a system of claw back of executive compensation would be the subject of regulatory specification).

¹²³ *Internal Revenue Code of 1986*, §162(m). Introduced in 1993 by the Clinton Administration, the deduction denial includes an exception for stock-based and other performance-based compensation. Not surprisingly perhaps, the exception is associated with some tax-driven substitution of stock-based awards for salary of executives of public corporations. See e.g., Brian J. Hall & Jeffrey B. Liebman, *The Taxation of Executive Compensation*, 14 TAX POLICY & THE ECONOMY 1 (2001).

reduction of risk taking to a level that is socially optimal in the sense that private and social marginal costs are equated. As with the choice between prudential regulatory regimes and corrective taxation generally, the same informational constraint applies equally, but a regulatory response may again be the preferable policy instrument if the social marginal cost curve associated with excessive risk taking is steeper than the private marginal cost curve.

To the extent that prudential regulatory regimes incorporate requirements governing compensation and thereby serve the same function as a tax instrument intended to alter the structure of compensation,¹²⁴ the principal goal of a special tax on financial sector compensation becomes the raising of revenue, and any desirable behavioral response should be seen as entirely secondary because of the use of comparable regulatory mandates.¹²⁵ This revenue-raising function could again be realized either as part of a base intended to tax returns to risk taking by the financial sector or as a stand-alone tax on bonus and performance-based compensation.¹²⁶ But as with the taxation of returns to risk taking generally by the financial sector, the revenue imperative is muted by the adoption of a bank leverage tax. Moreover, the attempt to tax bonus and performance-based compensation, in particular, is susceptible to shifting of key personnel in the absence of a multilateral response. A tax on compensation in the financial sector intended to alter compensation structures would, of course, be much different in the articulation of the tax base, and in its motivation, than the temporary bonus taxes introduced by the United Kingdom and France. Because of the exception for the portion of compensation that is suitably structured, such a tax might be able to be adopted unilaterally by a country without undesirable shifting of its incidence or shifting of the location of employees and/or operations. The United Kingdom and

¹²⁴ See e.g., *Directive 2013/36/EU* (proposing limit on variable pay of 100 percent of total fixed pay or 200 percent with shareholders' approval and requiring: (i) 50 percent of variable pay to consist of shares or equivalent ownership interests; (ii) 3 to 5-year deferral of 40 percent of variable pay; and (iii) exposure to claw back of up to 100 percent of variable pay); Dodd-Frank Act, section 954 (requiring the Securities and Exchange Commission (SEC) to direct prohibition on listing of securities of issuers that have not developed and implemented compensation claw backs).

¹²⁵ Devereux, *supra* note 8, at 21 ("If the tax and the regulation are perfectly in alignment, then it seems likely that the tax would have no effect on behaviour beyond what is required by regulation.").

¹²⁶ As an example of a stand-alone excise tax, Italy has adopted a surtax of 10 percent on financial sector bonuses in excess of 300 percent of wages). See IMF, *A Fair and Substantial Contribution*, *supra* note 6, at 40.

France acted bilaterally to avoid the latter,¹²⁷ but the temporary nature of the tax appears to have caused shifting of its economic incidence, with anecdotal evidence that firms grossed up or otherwise altered compensation levels to hold affected employees harmless from the tax.¹²⁸ This practice might not be as prevalent in the presence of a tax targeting compensation structures. Provided that this type of tax applies across a wide range of financial sector personnel, nontax factors dictating a presence in a country could tend to act as a more effective binding constraint on tax-driven migration.

V. CONCLUSION

This paper considered three possible taxes on the financial sector post crisis: bank leverage taxes, taxation of returns to risk taking, and an excise tax on bonus and performance-based compensation. It was suggested that the ability of bank leverage taxes to realize relatively modest revenue goals, while potentially providing a desirable behavioral response, makes their use as the tax instrument of choice of policymakers unsurprising. And given this policy preference, the rejection of taxation of returns to risk taking in the financial sector is similarly unsurprising. In the presence of bank leverage taxes, adoption of this additional tax base must be motivated by revenue generation concerns that are not as precisely quantifiable, and in the absence of a clearer revenue imperative, its weak behavioral properties have diminished its appeal. Although excise taxes on bonus and performance-based compensation have been largely disparaged in the literature as politically motivated, a plausible case can be made for this base as an instrument to alter the structure of compensation. The failure to adopt such a tax may be attributable, in part at least, to redundancy where constraints with similar intended effects can be imposed through regulatory regimes.

¹²⁷ See Doina Radulescu, *The Effects of a Bonus Tax on Manager Compensation and Welfare* (CESIFO Working Paper No. 3030 Apr. 2010), available at www.CESifo-group.org/wp (finding that a bonus tax is borne by bank shareholders where relocation possibilities exist but the results may be reversed where relocation possibilities do not exist).

¹²⁸ See George Parker & Megan Murphy, *UK Fails to Alter Bank Bonus Culture*, FINANCIAL TIMES, Jan. 6, 2010; Sara Schaefer Munoz, David Gauthier-Villars & Martin Vaughan, *France Joins UK Bonus Tax; Not Germany, US*, WALL ST. J., Dec. 14, 2009.