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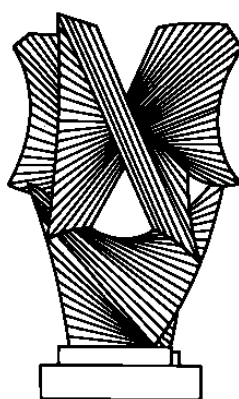
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**THE LAW SCHOOL
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A Proposal for Limiting Speculation on Derivatives: An FDA for Financial Innovation
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Abstract. The financial crisis of 2008 was caused in part by speculative investment in sophisticated derivatives. In enacting the Dodd-Frank Act, Congress sought to address the problem of speculative investment, but merely transferred that authority to various agencies, which have not yet found a solution. Most discussions center on enhanced disclosure and the use of exchanges and clearinghouses. However, we argue that disclosure rules do not address the real problem, which is that financial firms invest enormous resources to develop financial products that facilitate gambling and regulatory arbitrage, both of which are socially wasteful activities. We propose that when investors invent new financial products, they be forbidden to market them until they receive approval from a government agency designed along the lines of the FDA, which screens pharmaceutical innovations. The agency would approve financial products if and only if they satisfy a test for social utility. The test centers around a simple market analysis: is the product likely to be used more often for hedging or speculation? Other factors may be addressed if the answer is ambiguous. This approach would revive and make quantitatively precise the common-law insurable interest doctrine, which helped control financial speculation before deregulation in the 1990s.

Introduction

Financial products are socially beneficial when they help people insure or hedge against risk, but when these same products are used for speculation and regulatory arbitrage they can instead be socially detrimental. The difference between hedging and speculation is that hedging enables people to reduce the risk they face whereas speculation increases it. A person who purchases financial products in order to hedge essentially pays someone else to take a risk on her behalf. The counterparty is better able to absorb the risk, typically because she has a more diversified investment portfolio or owns assets whose value is inversely correlated with the risk taken on. By contrast, when a person speculates, that person exposes herself to increased net risk without receiving money to compensate her for the excess risk: she merely gambles. Speculation is a zero-sum activity, which, in the aggregate, harms the people who engage in it and which can also produce negative third-party effects, for example, by increasing systemic risk in the economy.

Different types of financial products lend themselves to socially beneficial hedging or socially costly speculation; many types can be used in both ways. The deregulatory approach to financial markets of the 1990s assumed that the benefits outweigh the costs. The financial crisis of 2008 has stimulated an intellectual retrenchment. The costs of speculation are now widely recognized, and it clear that speculation was facilitated by the financial innovations of the last thirty years. The current challenge for public policy is to develop a regulatory regime that preserves beneficial financial innovation while eliminating harmful products.

To address this problem, we propose the creation of an agency modeled on the FDA (or the appropriate transfer of functions to an existing agency such as the Consumer Financial Protection Bureau), which will screen applications for approval of new financial products. Investment banks and other financial innovators will no longer be allowed to market any product they invent. Instead, like pharmaceutical manufacturers, they will first need to obtain approval from an agency. The agency will evaluate proposed financial products by weighing benefits (generally in the form of hedging) against costs (generally, speculation), and approving financial products only when the benefits exceed the costs. In the remainder of this paper, we describe this proposal in detail and defend it against criticisms.

Benefits and Harms of Financial Innovation

Financial markets produce two major benefits: hedging/insurance and capital allocation.

Hedging/insurance. Most individuals face a variety of idiosyncratic risks in their lives related to the sources of their labor income (their firm, industry, country, etc.), the price level that faces them (currency risk, transport costs, housing prices, etc.), natural disasters, and other shocks.¹ In the absence of liquid financial markets, they may also face risks associated with the limited pool of capital investments available to them. Financial markets clearly help solve these problems by facilitating insurance (through reinsurance markets), by allowing more diversified financial investments, and by allowing everyone from farmers to nations (via sovereign wealth funds) to hedge commodity and currency risk. Shiller (1993) argued that new financial products should be introduced to track the health of regional industries, housing prices, and other shocks that affect many individuals' livelihoods. The key thing to note about this hedging is that the conditions under which it provides a satisfying explanation for financial activity are simple and clear. Individuals on the two sides of a trade should be differentially exposed to some source of risk and the trade they undertake should mitigate this. For example, health insurance benefits the insured by reducing variance in wealth in the healthy and unhealthy states of the world; the insurer reduces the risk by insuring thousands of people whose risk of poor health is uncorrelated. Insurance, by its nature, must pay out in states of the world when money is more valuable, usually when it is scarce, and collect premia in the reverse states.

Capital allocation. Financial markets also play an important role in the allocation of capital. Venture capitalists, loan officers, and other investors in small firms make decisions about which firms are financed that can have important impacts on the real economy. Their incentives to make good decisions are, in turn, influenced by the prospects of cashing out or "exiting" to liquid equity markets or selling the loans (usually securitized). Thus, financial market activity that helps prices adjust to their true value can influence the allocation of capital among potential products and thus improve economic efficiency. Improving the informational efficiency of prices is only useful to the extent that it reflects the fundamental (social) value of the asset and affects the allocation of capital in the real economy. Fluctuations too

¹ Firms also face hedging needs, but these are only relevant for privately held firms since publicly held firms' risk is already diversified by their broad ownership.

unpredictable, too driven by expectations of other traders' behavior or shifts in prices over too short time-scales to have any impact on the real economy, cannot have value under this argument.

The two types of social costs produced by financial markets are mirror images of the benefits.

Speculation. Different individuals within financial markets often have or effectively act as if they have different views about future economic events. These (de facto) differences of opinions are deeper than mere differences in information. Some are simply the outcomes of differing opinions and beliefs, which are not terribly different than those motivating betting. Others represent the fact that tax or regulatory treatment is different for various market participants and thus equivalent assets may be of differing values to different participants without being of different social value in the hands of the participants; such "speculation" is really a form of regulatory or tax arbitrage. Similar effects may arise even when no explicit regulations are in place but investors judge assets based on imperfect heuristics; if agents in one jurisdiction use the rating of a bond, for example, as an imperfect proxy for risk, they will effectively act as if they believe that such bonds are of uniformly lower risk than other assets even if, in individual situations, this is not the case.

As argued by Gilboa et al. (2004) and Weyl (2007), speculation is harmful because it exposes the speculators to risk without fully compensating them. When two people bet over whether a coin will turn up heads, they each incur the risk that they will be poorer in the future, when, assuming that they are risk-averse, the gain will not be sufficient to outweigh the loss in terms of utility. Thus, rational people will not engage in speculation in the first place unless (1) they like to gamble (in which case there are cheaper ways, like casinos, to satisfy this preference), (2) at least one party is confused (which we believe is extremely common), or (3) they are engaging in regulatory arbitrage (which is also extremely common). Thus, there is no social gain from permitting speculation.

Speculation has its telltale signs, almost precisely opposite those of insurance. Speculation typically occurs between individuals who differ in some belief, heuristic, or exposure to some tax/regulatory provision, either directly or indirectly (through financial intermediaries who have had risk transferred to them through contracts). The speculative bet increases risk by being uncorrelated to the individuals' current portfolio of lifetime.

Informational racing. This problem takes its most extreme form in the phenomenon of high-speed trading, where hedge funds invest large resources to obtain information a nanosecond earlier than their rivals. In the recent film "Margin Call," the CEO of the large investment bank at the center of the film lectures his assembled staff that on Wall Street there are three ways to make money: "Be smarter. Be first. Or cheat. I don't cheat and while we have a lot of smart people in this organization it's a hell of a lot easier just to be first." The race to be first is epitomized by a recent \$300 million dollar tunnel through the earth's crust from Chicago to New York to establish a direct line of sight that shaves three milliseconds off communication times between the two locations (Dellinger 2011). This project was profitable because of the opportunities it created for numerous small arbitrages between the two markets

using automated trading algorithms. Society gains little, if anything, from this tiny speed-up as there are few, if any, real economic opportunities to use the information in the relevant interim. For example, a farmer deciding whether to plant corn or wheat does not benefit from obtaining market prices a nanosecond earlier. This effect was first studied by Hirshleifer (1971) and is widely accepted in the economics community. Note that it does not only occur in extreme cases of very high frequency trading but any time a firm can make more money from having information first than society gains from the early arrival of this information for fundamental allocative purposes. Again, the hallmarks of racing are in many ways the flip side of capital allocation. High frequency trading happens much more rapidly, unpredictably, and erratically than could impact real capital allocations. It also responds indiscriminately to any force likely to move markets not merely “true” information that affects fundamental social values of assets.

Financial Innovation

Many financial products bring benefits to the markets; others are costly; and still others can be used productively or abused to bad ends. Life insurance, for example, which was created in the nineteenth century, is largely a beneficial product. A breadwinner cares about the well-being of her spouse, and knows that if she dies, her spouse’s income will fall considerably. The breadwinner could save a portion of income in anticipation of this event, but a cheaper approach is to buy life insurance, which pays the spouse if and only if the breadwinner dies. Life insurance increases the individual welfare of the insured and the beneficiary by equalizing the beneficiaries’ wealth over states of the world. A person is better off with the same income regardless of whether his spouse lives or dies, than with a high income if his spouse lives and a low income if his spouse dies.

However, life insurance can also be abused to speculative ends. In eighteenth century England, people would buy life insurance on politicians and other celebrities so that, if the named person died, the purchaser of the insurance would receive a payout. While in principle people could in this way hedge against risks—for example, the risk of an economic crisis and loss of one’s income if a statesman is assassinated—in practice people used life insurance products to gamble. Gambling is a socially wasteful activity because it increases the variance of one’s income rather than (as in the case of insurance) reducing it. The law responded by developing the insurable interest doctrine, which prohibited insurance policies written on people in whom the buyer of the policy does not have a direct financial or emotional interest (Clark 1999).

The modern derivatives market replays at a higher level of complexity the basic tradeoffs seen in the eighteenth century life insurance market. Some products can be used only for hedging, and do not serve speculative purposes. For example, one of the most important financial innovations of the middle part of the 20th century was the creation of mutual funds, particularly mutual funds that closely tracked market indices. Mutual funds brought clear benefits by allowing individuals to diversify and thus hedge risk associated with their investments in the stock market. In the past, an individual wishing to purchase a diversified portfolio of stocks required a large capital stock and had to spend large amounts on transaction fees to assemble such a portfolio.

Additionally, mutual funds, especially index funds, brought little if any value to speculators or high frequency traders. Shares were regulated so that they could only be purchased by individuals. Speculators and high frequency traders typically deal in large volumes that gained little from the ability to buy a diversified portfolio at low transaction costs. Mutual funds were also specifically designed as investment vehicles for individuals and thus unlikely to be useful for institutions, speculators, etc. All these features were apparent at the birth of the mutual fund and much remarked upon even prior to such funds being widely available (Bogle, 1951).

Other products can be used for both hedging and speculation but have proven over time to be mainly useful for hedging purposes. Futures contracts have played an important role in allowing farmers, firms, and countries to hedge their risk on commodity prices. Farmers must plant long in advance of the harvest, when the market price of their produce will be determined. To protect themselves from a decline in market price, farmers can, in effect, sell their produce before they plant using the futures market, so the risk of a drop in the market price is incurred by the buyer. People can also gamble on futures contracts; they do so when buying a futures contract increases the riskiness of their portfolio without increasing its expected value. However, on the whole, futures contracts appear to be beneficial rather than harmful.

Then there are products that appear to have no social value. Naked credit default swaps (CDSs) were illegal in most jurisdictions until the summer of 2005. These insurance contracts on the default of debts were prohibited because insurance regulations require that one have an insurable interest: you may only purchase insurance on a bond that you actually own. Under intense lobbying from the financial services industry, these restrictions were repealed and credit default swaps quickly became a boom industry (Tett, 2009). In the end, these derivatives are widely considered to have contributed significantly to the instability of financial markets in the credit crisis as well as to the misallocation of risk in the run up to it.

Covered CDSs (with an insurable interest) were never illegal and were essentially never used because, as Giglio (2012) points out, a CDS exposes the individual to counter-party risk and insurance against the bond can be achieved simply by selling the bond and purchasing a treasury. CDSs are only useful as a way to avoid having to hold substantial offsetting short and long positions on treasuries and the relevant bond in order to take speculative positions in these bonds. Thus they serve almost exclusively as speculative devices or to promote high frequency transactions. The swaps were deregulated by the state of New York, which believed it could gain a large fraction of the business created by these swaps without bearing much of the consequences of any problems they created. Little if any debate around the decision centered on the systemic or broader consequences of allow these derivatives.

For another example, consider statistical derivatives (on volatility, correlation, and collateralized debt obligations). Volatility derivatives pay off based on the average daily volatility of a stock or index over a period. Correlation swaps pay off based on various measures of correlation between the movements of stocks in a cluster (usually an index) over a period. Most popular are instruments that allow the taking of positions on the correlation

structure of debt defaults, Collateralized Debt Obligations (CDOs), including the infamous CDOs of Asset-Backed Securities (CDO of ABS).

These instruments appear to play a few roles in the markets. First, many hedge funds extensively model the statistical properties of assets, as these modeling exercises are useful in pricing other derivatives, and thus believe they have expertise on these. They use bets on these exotic derivatives to take positions directly in these properties. Second, investment banks have created structured products which imbed these properties and sell them to consumers. It seems to be easy to market such positions to consumers as they appear to remove various components of risk that Taleb (2007) shows investors tend to overweight (the risk of small fluctuations of individual stocks) in some cases and underweight in others (the risk of systemic disaster). Third, investment banks and hedge funds create products which satisfy various rules used to determine credit ratings for assets in ways that do not require actually reducing the relevant-to-investor risks. This led to large amounts of AAA-rated paper being churned out of CDOs despite this paper being highly systemically risky. That is, these derivatives are extremely useful for regulatory and evaluator arbitrage. Finally, sophisticated financial institutions use these products to engage in tax arbitrage (Hariton, 1987-8, 2003-4).

A Test for Evaluating Financial Innovation

The examples above suggest a series of tests based on economic analysis that could be applied to determine whether a new financial product is likely to be beneficial or harmful on net. While such procedures may seem novel, they are analogous to procedures used by the U.S. government to evaluate proposed horizontal mergers; indeed, they are likely to involve greater rigor, detail, and quantification than the horizontal merger standards, which are implemented by more than one hundred civil servants with PhDs in economics. Much like the process for evaluating mergers, we imagine the evaluation of a new financial product as being based on a core test of whether it will primarily encourage speculation or hedging, with other criteria being incorporated as potential mitigating or exacerbating factors.

Volume of hedging versus speculation. The agency's fundamental standard would be whether the welfare gains from insurance allowed by a new product exceeded the likely costs created by the speculation it facilitates. Its evaluation of a financial product would begin with a market demand analysis of the sort performed by any firm planning to market a new financial product, to identify the likely sources of demand. The agency would then classify these sources of demand as hedging or speculation and quantify the benefits and harms arising from each. This analysis would be facilitated by the data which firms would be required to submit in order to obtain regulatory approval. If needed, the agency would also have subpoena power, which it could use to gather additional information. In most practical cases the relevant concerns for any given product are likely to be sufficiently focused that the core of the test would be straightforward. We provide three brief examples, the first of which we expand on in greater detail in an Appendix attached to the paper:

1. Suppose that the primary speculative concern about the product related to simple differences in beliefs. Athanasoulis and Shiller (2001) and Simsek (2011) provide a

detailed quantitative, prospective analysis of this sort for derivatives based on the performance of national economies. They use economic modeling and publicly available data on how individuals' consumption and wealth moved with the performance of their national economies and how surveyed opinions about the future path of the economy differed across individuals. While Athanasoulis and Shiller found that such derivatives offer substantial potential opportunities for hedging, Simsek showed that the likely speculation they would cause greatly outweighs such hedging and thus, under our standard, the agency should reject these derivatives. To provide a clearer sense of how a detailed analysis might proceed, our Appendix at the end of this paper discusses the Athanasoulis-Shiller-Simsek approach in greater detail. In practice, an agency could improve on their analysis using the higher-quality proprietary data it would likely have access to.

2. In many cases, it may be possible to determine that the average speculative trade dollar causes the same harm as an average hedging dollar generates benefits. For example, under standard economic assumptions, if the average size of hedging and speculative trades is the same, the volume of each determines the harms and benefits. In this case, the test would be complete at its first stage and all that is necessary is a basic demand analysis and labeling exercise, which are part and parcel of market research in developing the product.
3. In some cases, it will be clear that the harms from speculation arise from a specific source such as tax or heuristic arbitrage. In the former case, because firms often consult with tax lawyers to design products to take advantage of potential tax arbitrage, a government agency can also perform this analysis or contract out with tax consultants. In the latter case, analysis of interaction with investor evaluation heuristics, such as home bias, sensitivity to commonly reported financial statistics (volatility, yield since inception, etc.), and credit rating criteria, could be conducted in a straightforward manner using standard economic models of the demand for financial products based on these characteristics. The results of this analysis could then be compared to the actual risk characteristics of the product to determine the expected excessive demand arising from exploiting such heuristics.

If these analyses, in their most general or one of their simplified forms, were to yield a clear answer, the inquiry could stop there. But if there is ambiguity, regulators can ask additional questions which require more judgment to answer, including the following:

What role does the derivative play in the allocation of capital? Interviews with investment bankers and private equity firms could reveal whether the new instrument will play an important role in directly facilitating the reallocation of capital across firms. Benefits indirectly facilitated by improving the informational efficiency of prices would be more difficult to gauge and might require further research.

How does the instrument affect the speed with which transactions can take place? This could be judged easily by discussing the question with market makers and other experts on the

industry. Almost certainly these players will have a good sense of the ease with which different derivatives can be used over different periods and the liquidity that various markets have.

Will the instrument create positive informational externalities? In theory, some financial instruments may generate positive externalities by revealing to the market information about underlying events. Prediction markets have been praised for this function; if the wisdom of crowds is revealed through betting on the winner of the next presidential election, then people can more easily plan their lives with this information. A similar claim has been made about CDSs. However, we are skeptical about this claim in most cases, and would require a heavy burden of proof for the applicant. The market price of a CDS for a government bond reveals no more information about the likelihood of sovereign default than the price of the bond itself relative to the price of a baseline risk-free security. Moreover, speeded-up disclosure of information is socially valuable only when it helps people plan in the real economy, and, as we have noted, private incentives to obtain information and the public benefit are not necessarily aligned.

An FDA for the Financial Market

Legal tests can be implemented in two major ways. First, Congress can vest regulatory agencies with the authority to use them as screens, so as to prevent harmful behavior from taking place. Second, Congress can create a private right of action, so that individuals who are harmed under the test can obtain legal remedies *ex post*. Both approaches have their virtues, and often they are used in combination, but we will focus on the former.

The basic idea is that an agency (either an existing agency like the Consumer Financial Protection Bureau or a newly created agency) will have the authority to screen new financial products. Thus, the inventor of a financial product will not be able to market it without first submitting an application to the agency. The agency will evaluate the product using the test that we described above. The agency will approve, reject, or approve the project subject to certain conditions. The inventor and others will then be able to market an approved product subject to the conditions, if any. Anyone who markets a product without approval will be subject to legal sanctions.

There are two useful analogies for such an agency. The first is the review of new pharmaceuticals by the Food and Drug Administration. Manufacturers must submit applications to the FDA and obtain approval before marketing new drugs. The major portion of the review process involves expensive and time-consuming randomized clinical studies. This approach provides a model for the review of financial innovations; however, the analysis of proposed financial products should be much cheaper and quicker because it will rely on existing publicly available data and will involve relatively mechanical number-crunching in most instances.

The second is the review of proposed mergers by the Department of Justice and the Federal Trade Commission. When two firms seek to merge, they must obtain the approval of one of those agencies. The relevant agency then evaluates the proposed merger using a test

embodied in the Horizontal Merger Guidelines. Essentially, the test requires the agency to balance any anticompetitive effects resulting from the increase in market power of the merged entity against any efficiency benefits resulting from economies of scale or other sources. Like in our approach to financial innovation, applicants must obtain ex ante approval from government agencies by satisfying a test that combines quantitative and qualitative factors. The main difference is that a merger is a one-shot contract; unlike a financial innovation, it does not involve the creation of intellectual property. Also, the primary justification for regulating new financial products is the direct harm they cause to their consumers, as with medicine, rather than the externalities they cause, as with mergers.

Commentators have criticized the FDA process and the merger-approval process but a consensus appears to exist that these screening mechanisms are socially desirable even if they can be improved along the margins. Nonetheless, it is clear that they are exceptional. Most other products in American society are not under such rigorous control: while the government may occasionally inspect for safety, test properties of products, and allow lawsuits if harms occur, pre-approval of new products is uncommon outside of medicine. The question thus arises why financial innovation is more like pharmaceutical innovation than like other products of the U.S. economy. There are a number of answers.

Subjective preferences and expertise. The best medicine for an individual to take is not something highly idiosyncratic to that individual, conditional on her observable symptoms. While different individuals usually respond differently to different treatments, this reaction is usually as unpredictable to the individual as it is to the doctor treating her or to anyone else prior to the treatment being administered. Thus the key consideration in determining the appropriate medicine is usually the use of the medical community's expertise to determine the objectively best treatment for the patient rather than the treatment that she subjectively prefers. Not only do individuals usually consult doctors about the best medicine; doctors usually base their opinions on centrally-conducted research.

These features of the market for medicine contrast sharply with those of most consumer products. When shopping for TVs, computers, or books, individuals usually know far more about their tastes than any expert would be capable of learning in any reasonable period of time. This capability makes allowing individual choice and providing individuals with richly detailed information (rather than a blunt permission or prohibition) far more important in most product markets than in health. And it makes access to expert advice much more important in health than in other product markets.

Economic theory teaches us that finance is much like medicine. Individuals' optimal investment portfolios differ between individuals relatively little, except in ways that can be readily observed and described based on a small number of individual characteristics. These characteristics include risk-preferences, age, industry in which one is employed, and where one lives. On the other hand, optimal financial planning is a complicated computational problem that is at the frontiers of both economic theory and computer science (Campbell and Viciera, 2002). The vast majority of the well-off seek advice about the allocation of their financial assets, but rarely do so about other life decisions.

Delayed and uncertain feedback. A classic mechanism that corrects poor decision-making in many standard settings, and that actually allows individuals to learn far more about their settings than experts can, is prompt and clear feedback about their success or failure. This has been demonstrated in a wide range of economic and psychological experiments. An important problem in medicine is that such feedback often comes with long delays and is often garbled by uncertain outcomes and placebo effects. Medicines that are inefficacious often do not show themselves to be so until the medication has been used for a long period and efficacious medicines are often only effective on a small number of patients. Medicines can often have subtle but corrosive long-term side effects or may only have negative side effects with small probability. Whether on net the medicine is worth it, therefore, is something that requires detailed scientific analysis, as is forced by the clinical trials required for FDA approval.

This delayed and uncertain feedback is actually far more prevalent in finance. While most medicines usually yield some results within a year or two, many financial instruments do not show their underlying frailty until a once-in-a-lifetime financial crisis hits. Many ex ante sensible investments turn sour and many ex ante ludicrous investments prosper, at least for some period. Thus individuals can persist in making poor investment decisions for very long periods without receiving clear feedback about this.

Extent of potential danger. If you buy the wrong food you may get sick and if you buy the wrong cell phone you may face a serious disruption to your work life. But the potency of medicines tends to mean that making the wrong decision has a very severe left tail that, while it may be relatively low probability, can be devastating in the case it occurs. Anesthetics administered to women during labor during the 1950s are widely blamed for a wave of autism cases, for example. This makes extensive testing to ensure such outcomes are avoided crucial in medicine. As Americans discovered during the recent financial crisis, financial markets can have severe negative effects not just for individuals, but for whole societies. Thus the dangers of financial products seem at least as extreme as the dangers of medicines.

Criticisms and Qualifications

We anticipate a number of criticisms of our proposal. Below we sketch out some responses, but we acknowledge that a more complete response will require further work.

Delay and bureaucratic risk-aversion. Critics of the FDA argue that it imposes unnecessary delays on the marketing of drugs, driven in part by bureaucratic risk-aversion—FDA officials will be hauled before Congress if they wrongly approve a drug that causes death or severe side effects but not if they excessively slow down approval even when the social costs of doing so are greater than the risks. As a result, the FDA relies too much on extremely rigorous clinical tests, and not enough on other forms of research. We do not know whether this criticism is accurate, but even if it is, we believe that bureaucratic risk-aversion poses less of a threat to financial innovation than it does to pharmaceutical innovation. There are two reasons for this. First, despite the terrible effects of dangerous financial products, their harms are not as vivid as birth defects or premature deaths, so the publicity value of grilling errant regulators will be lower. Second, we believe that the benefit of additional financial innovation

is less than the benefit of additional pharmaceutical innovation, because it is already possible to use financial products to hedge quite efficiently. Accordingly, even the most promising recent financial innovations, such as the Case-Shiller housing derivatives, have met with limited market demand. Thus the cost of false negatives is lower.

Line-drawing problems and issues of generality. Possibly the most difficult problem is defining a “financial product” for the purpose of review. Consider, for example, the CDS. Should the inventor of the first CDS have been required to obtain approval, or only the inventor of the first naked CDS, or the inventor of the first naked CDS to be used to insure against sovereign bonds, or just Greek bonds? Our initial view is that the inventor of the initial CDS should be required to obtain agency approval. In the case of a financial product with many potential uses, the agency may determine that it will be approved only for certain uses (akin to the approval of new pharmaceuticals). The inventor or subsequent inventors may then seek approval for more specialized uses based on additional data or changes in market conditions.

Failures of expertise. A frequent complaint is that agencies cannot attract the top talent, and as a result are unable to understand and regulate the products under their jurisdiction. Thus, critics of the SEC argue that it was simply unable to evaluate the financial products that ultimately contributed to the 2008 financial crisis. This criticism is overdrawn. Many agencies—including the FDA, the Justice Department, and the Fed—have attracted top talent, and can also contract out for it by paying consultants. Furthermore, requiring pre-approval will provide firms seeking approval an incentive to hire experts to provide the market research necessary to establish the value of a product as happens extensively in both merger and new pharmaceutical review, thus reducing the evaluative burdens on the agency. Our financial innovation agency would, of course, though, need to be designed, like the FDA or the Fed, so that its officials are adequately compensated.

The regulation of existing products. The statute that created the FDA grandfathered existing drugs; we would do the same. It would be just too difficult for a financial products agency to review every financial instrument that exists. Critics might argue that we would therefore fail to regulate many of the financial products that contributed to the 2008 crisis, including our *bête-noir*, the naked CDS. Nonetheless, new products are usually the most harmful: since market participants have had little opportunity to adapt to them, they create the greatest confusion and opportunity for regulatory arbitrage. Thus our focus is prospective, but does not preclude existing financial instruments from being regulated in some other way.

Elimination of incentives to innovate because of loss of intellectual property. The invention of the CDS required a major intellectual and financial investment, as related by Tett (2009). Investment banks invent these products because they expect to profit from them, and they profit by making them available to customers before competitors have developed similar products. Once the idea becomes public, competitors can duplicate it, driving down the price and profits. Investment banks may therefore not engage in financial innovation if they can expect their products to be stuck in review for a substantial period of time, during which the details become publicly available.

This concern is exaggerated. Investment banks probably already have excessive incentives to invest in new financial products, which, as we have seen, only have ambiguous net social benefits. In addition, original financial products are potentially patentable, although the doctrine at present is extremely murky. But if insufficient incentives turn out to be a problem, a possible solution is to grant investment banks limited intellectual property protection—for, say, one year—after their products have received approval.

Less burdensome alternative forms of regulation. One might believe that less heavy-handed forms of regulation are possible, including disclosure and labeling requirements or taxes. We do not reject alternative forms of regulation but we do not believe that they are sufficient. Disclosure rules are notoriously weak (Ben-Shahar and Schneider 2011); this approach is clearly inadequate for pharmaceutical regulation, where people, even with the help of their doctors, have trouble evaluating the effects of drugs. The other major approach is to reintroduce the insurable interest requirement, but this approach would probably be excessively burdensome, since hedging opportunities may be available in cases even where an insurable interest, as defined in the common law, does not exist. Indeed, our proposal could be understood as vesting in an agency the authority to decide when an insurable interest exists in the first place as a substitute for the crude common law approach.

People should be permitted to gamble if they want to. In economic models, people are generally assumed to be risk-averse or at least risk-neutral. For such people, it is not rational to gamble. If risk-averse or risk-neutral people end up gambling anyway, then it must be because they either enjoy gambling, or because they do not understand the transactions into which they enter.

This observation suggests that either gambling should be illegal, as it is in many jurisdictions, or should be confined to settings in which it is maximally entertaining while creating the minimum of risk. This is largely what our present system, of limited and regulated casinos and lotteries, accomplishes. When people gamble on sophisticated financial instruments, they are simply misusing a device that they probably do not understand, that generates far greater risk than traditional gambling does, and that yields minimal entertainment value. Finally, we should note that most of the speculation that is engaged in by sophisticated institutions like investment banks is probably driven by regulatory arbitrage; for example, they expect to be rescued by the government if their gambles do not pay off. This type of gambling is clearly socially harmful.

Conclusion

Any proposal to introduce new regulations will be controversial because of legitimate concerns that regulation interferes with the efficient allocation of resources and is vulnerable to capture by interest groups. In the current, highly polarized political environment, it is easy to predict that many people will regard our proposal as an excessively radical reform, one that is inconsistent with free market traditions in the United States. It is therefore important to emphasize that our proposal in large part revives an old regulatory system that served the United States well until it was dismantled in the 1990s. The insurable interest requirement slowed down (though it did not fully block) efforts to develop financial products that could be

used mainly for speculative purposes. One of our main goals is to establish a more sophisticated version of the insurable interest rule that will block speculation while permitting socially valuable hedging. Even our proposal for an FDA-like agency is not as radical as it sounds. Every state has an insurance agency that possesses the power to regulate financial instruments that have insurance-like components, as financial products frequently do. At the federal level, the CFTC and the SEC already have jurisdiction over financial products. Our goal is simply to provide them with the right powers and guidance so that they can regulate these products effectively.

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Appendix: A Sample Analysis for Derivatives Based on National Incomes

Athanasoulis and Shiller (2001) proposed the introduction of a small number (one or two) of derivative securities based on a weighted average (possibly negatively in some countries) of the GDP growth of countries in the G-7. That is, the derivatives were to pay out when the GDP of some countries rose and to lose value when the GDP of others fell. To estimate the potential gains from insurance of introducing these securities, Athanasoulis and Shiller calculated the extent to which the riskiness of countries' income would be reduced as a result of the introduction of these securities, based on data on GDP from more than forty years of data. Using a standard economic model of optimal risk-return trade-offs, and assuming that everyone in a given country is identical, they calculated that Americans could gain roughly \$400 per capita by the reduction in the uncertainty about their income from insurance.

Simsek (2011) notes that these derivatives could also be used by individuals with different beliefs to speculate on national income prospects. To calibrate this effect, Simsek considers a survey of professional forecasters by the Philadelphia Federal Reserve Bank. He assumes that the variance of beliefs about GDP among these forecasters is similar to that between individuals participating in the markets. These beliefs, in fact, widely differ across individuals. He thus calculates that if individuals engage in their optimal portfolio selection, given their beliefs, risk dramatically expands and the negative consequences of speculation swamp any gains from insurance, and lead to thousands of dollars of lost welfare per capita. In fact even if views among the public were an order of magnitude less dispersed than those among the forecasters, speculation would still outweigh hedging benefits. Thus Simsek's simple pass at the analysis we propose would lead to clear rejection of these derivatives. Furthermore, and revealingly, Simsek shows that, given this spread of beliefs, the most profitable securities would not be the ones Athanasoulis and Shiller propose but rather others which would facilitate even greater speculation and would fail our test more severely.

Of course, this analysis is extremely primitive and could be improved along a number of dimensions. An agency should use micro-level data to account for the possibility that different individuals in a given country are differently exposed to national income risk. It might also consider the interactions of the derivatives with taxes, regulations, and investor heuristics to consider arbitrage-inspired speculation. Surveys of investors rather than forecasters would be ideal. However, the Simsek analysis shows clearly how a very simple calculation, based on coarse, publicly available data and textbook economic models, can make a strong *prima facie* case against a new financial product, which then could be potentially rebutted or, if not, could form the basis of a case for prohibition or tight restrictions on marketing.

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