THE FUTURE OF FINANCE

The LSE Report

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CHAPTER THREE

Why Are Financial Markets So Inefficient and Exploitative—And a Suggested Remedy

By Paul Woolley

This chapter offers a new understanding of how financial markets work. The key departure from conventional theory is to recognize that investors do not invest directly in securities but through agents such as fund managers. Agents have better information and different objectives than their customers (principals) and this asymmetry is shown as the source of inefficiency—mispricing, bubbles and crashes. A separate outcome is that agents are in a position to capture for themselves the bulk of the returns from financial innovations. Principal–agent problems do a good job of explaining how the global finance sector has become so bloated, profitable and prone to crisis. Remedial action involves the principals changing the way they contract with, and instruct, agents. The chapter ends with a manifesto of policies that pension funds and other large investors can adopt to mitigate the destructive features of delegation both for their individual benefit and to promote social welfare in the form of a leaner, more efficient and more stable finance sector.

3.1 Introduction

Much has come to pass in financial markets during the last ten years that has been at odds with the prevailing academic wisdom of how capital markets work. The decade opened with the technology stock bubble that caused large-scale misallocation of capital and was the forerunner of many of the subsequent problems in the global economy. To forestall recession when the bubble burst, central banks countered with a policy of ultra-low interest rates that in turn fuelled the surge in debt, asset prices and risk-taking. These excesses were accompanied by an explosive rise in profits and pay in the banking industry. A sector with the utilitarian role of facilitating transactions, channelling savings into real investment and making secondary markets in financial instruments came, by 2007, to account for 40% of aggregate corporate profits in the US and UK,

I wish to thank Bruno Biais (Toulouse School of Economics), Ron Bird (UTS), Jean-Charles Rochet (University of Zurich) and Dimitri Vayanos (LSE) for their invaluable contributions to the ideas set out here. All the errors are mine.

even after investment banks had paid out salaries and bonuses amounting to 60% of net revenues. The jamboree came to a juddering halt with the collapse of the mortgaged-backed securities markets and the ensuing banking crisis with its calamitous repercussions on the world economy.

Prevailing theory asserts that asset prices are informationally efficient and that capital markets are self-correcting. It also treats the finance sector as an efficient pass-through, ignoring the role played by financial intermediaries in both asset pricing and the macroeconomy. The evidence of the past decade has served to discredit the basic tenets of finance theory. Given that banking and finance are now seen as a source of systemic instability, the wisdom of ignoring the role of financial intermediaries has been called into question.

Some economists still cling to the conviction that recent events have simply been the lively interplay of broadly efficient markets and see no cause to abandon the prevailing theories. Other commentators, including a number of leading economists, have proclaimed the death of mainstream finance theory and all that goes with it, especially the efficient market hypothesis, rational expectations and mathematical modelling. The way forward, they argue, is to understand finance based on behavioural models on the grounds that psychological biases and irrational urges better explain the erratic performance of asset prices and capital markets. The choice seems stark and unsettling, and there is no doubt that the academic interpretation of finance is at a critical juncture.

This chapter advances an alternative paradigm which seems to do a better job of explaining reality. Its key departure from mainstream theory is to incorporate delegation by principals to agents. The principals in this case are the end investors and customers who subcontract financial tasks to agents such as banks, fund managers, brokers and other specialists. Delegation creates an incentive problem insofar as the agents have more and better information than their principals and because the interests of the two are rarely aligned. Asymmetric information has been partially explored in corporate finance and banking but hardly at all in asset pricing, which is arguably the central building block in finance. Incorporating delegation permits the retention of the assumption of rational expectations which, in turn, makes it possible to keep much of the existing formal framework of finance. Introducing agents both transforms the analysis and helps explain many aspects of mispricing and other distortions that have relied until now upon behavioural assumptions of psychological bias.

3.2 Outline of the Chapter

The chapter opens by showing how the theory of efficient markets has influenced the beliefs and actions of market participants, policymakers and regulators. This is followed by a description of new work showing how asset pricing models based on delegation can explain momentum and reversal, the main source of mispricing which in extreme form causes bubbles and crashes. Any new theory should meet the criteria of relevance, validity and universality. Revising asset pricing theory in this way throws a clearer light on a number of well-known but hard-to-explain pricing anomalies. This alternative paradigm carries important implications for every aspect of finance from investment practice through to regulation and policymaking.

The second key consequence of asymmetric information is the ability of financial intermediaries to capture 'rents', or excess profits. Rent extraction has become one of the defining features of finance and goes a long way to explaining the sector's extraordinary growth in recent years, as well as its fragility and potential for crisis. Mispricing and rent capture are the two main culprits in what might appropriately be described as 'dysfunctional finance'. Each is damaging, but in combination they are devastating. We show how the two effects interact to cause loss of social utility and exploitation on a scale that could ultimately threaten capitalism.

Through a better understanding of the dysfunctionalities of finance, it becomes possible to propose solutions. So far, academics and policymakers have focused on improved regulation as a means to prevent future crises. But regulation is a negative approach based on restrictions, targeted mainly at banks, that bankers will resist and circumvent. This chapter proposes an alternative, though complementary, approach that goes to the source of all the trouble in finance. Since bubbles, crashes and rent capture are caused by principal–agent problems, the solution lies in having the principals change the way they contract and deal with agents. One group of principals with the power and incentive to act are the Giant funds. These are the large pension funds, the sovereign wealth, charitable and endowment funds around the world. They are the principal custodians of social wealth and they have found their assets and returns badly eroded over the last decade or so. Revising the way Giant funds instruct agents is a positive approach in that they have a self-interest in taking such action. If a critical mass of them were to adopt these measures, social benefits would then accrue in the form of more stable and less exploitative capital markets.

3.3 Efficient Markets Theory

Forty years have passed since the principles of classical economics were first applied to finance through the contributions of Eugene Fama (see Fama 1970) and his now renowned fellow economists. Their hypothesis that capital markets are efficient is grounded in the belief that competition among profit-seeking market participants will ensure that asset prices continuously adjust to reflect all publicly available information. Prices will equate to the consensus of investors' expectations about the discounted value of future attributable cash flows. The theory seemed to have common sense on its side: who, it was argued, would pass up the opportunity to profit from exploiting any misvaluations on offer and by doing so, take the price back to fair value? The randomness of prices and the apparent inability of professional managers to achieve returns consistently above those of the benchmark index were taken as validation of the theory. Over the intervening years, capital market theory and the efficient market hypothesis have been extended and modified to form an elegant and comprehensive framework for understanding asset pricing and risk.

A second aspect of competition in financial markets has received more attention from policymakers than academics. It is well known that financial intermediaries can extract rents by exploiting monopoly power through some combination of market share, collusion and barriers to entry. For example, trading in securities has some elements of a natural monopoly. Trading venues with the largest turnover offer the customer the highest levels of liquidity and therefore the best chance of dealing, thereby providing a magnet for business, which the operator of the venue can then exploit through monopolistic pricing. Competition authorities have been alert to blatant instances of monopoly or price-fixing in banking as in any other industry. Apart from collusion or market power, competition has been assumed to work its usual magic and prevent the capture of rents.

Broadly speaking, the finance sector has been viewed as the epitome of competitive perfection. Its scale, profitability and pay therefore went largely unremarked upon by commentators and academics. The logic implied that bankers' rewards reflected their talent and success in offering customers the services they wanted and valued. Theory implied that vast profits were a sign of a job done vastly well. So nobody enquired whether society was being well served by the finance sector.

The efficient market hypothesis also beguiled central bankers into believing that market prices could be trusted and that bubbles either did

not exist, were positively beneficial for growth, or could not be spotted. Intervention was therefore unnecessary. Regulators, too, have been faithful disciples of the efficient market, which explains why they were content with light-touch regulation in the years before the crisis. The pressures of competition and self-interest were deemed sufficient to keep banks from pursuing strategies that jeopardized their solvency or survival. Regulators were also leaned on by governments keen to maintain each country's international standing in a global industry. Another role of supervision is to approve new products. Here again regulators followed the conventional view that any innovation which enhances liquidity or 'completes' a market by introducing a novel packaging of risk and return is welfare-enhancing and warrants an immediate seal of approval.

Faith in the efficient market has also underpinned many of the practices of investment professionals. The use of security indices as benchmarks for both passive and active investment implies a tacit assumption that indices constitute efficient portfolios. Risk analysis and diversification strategy are based on mean–variance analysis using market prices over the recent past even though these prices may have displayed wide dispersion around fair value. Investors who may have doubted the validity of efficient market theory and enjoyed exploiting the price anomalies for years have nevertheless been using tools and policies based on the theories they disavow or disparage.

3.4 A New Paradigm for Asset Pricing

Once a dominant paradigm is discredited, the search for a replacement becomes urgent. At stake is the need for a science-based, unified theory of finance that is rigorous and tractable; one that retains as much as possible of the existing analytical framework and, at the same time, produces credible explanations and predictions. This is no storm in an academic teacup. The implications for growth, wealth and society could not be greater.

The first step in the search for a new paradigm is to avoid the mistake of jumping from observing that prices are irrational to believing that investors must also be irrational, or that it is impossible to construct a valid theory of asset pricing based on rational behaviour. Finance theory has combined rationality with other assumptions, and it is one of these other assumptions that has proved unfit for purpose. The crucial flaw has been to assume that prices are set by the army of private investors, or the 'representative household' as the jargon has it. Households are assumed to invest directly in equities and bonds and across the

spectrum of the derivatives markets. Theory has ignored the real world complication that investors delegate virtually all their involvement in financial matters to professional intermediaries—banks, fund managers, brokers—who therefore dominate the pricing process.

Delegation creates an agency problem. Agents have access to more and better information than the investors who appoint them, and the interests and objectives of agents frequently differ from those of their principals. For their part, principals cannot be certain of the competence or diligence of the agents. Introducing agents brings greater realism to asset-pricing models and, more importantly, gives a far better understanding of how capital markets function. Importantly, this is achieved whilst maintaining the assumption of fully rational behaviour by all participants. Models incorporating agents have more working parts and therefore a higher level of complexity, but the effort is richly rewarded by the scope and relevance of the predictions.

The authors of a recent paper (Vayanos and Woolley 2008) have adopted this approach and are able to explain features of asset price behaviour that have defied explanation using the standard 'representative household' model. The model explains momentum, the commonly observed propensity for trending in prices, which in extreme form produces bubbles and crashes. The existence of momentum has been extensively documented in empirical studies of securities markets, but has proved difficult to explain other than through herding behaviour. The presence of price momentum is incompatible with the efficient market and has been described as the 'premier unexplained anomaly' in asset pricing (Fama and French 1993).

Central to the analysis is that investors have imperfect knowledge of the ability of the fund managers they invest with. They are uncertain whether underperformance against the benchmark arises from the manager's prudent avoidance of overpriced stocks or is a sign of incompetence. As shortfalls grow, investors conclude the reason is incompetence and react by transferring funds to the outperforming managers, thereby amplifying the price changes that led to the initial underperformance and generating momentum.

3.5 How Momentum Arises

The technology bubble ten years ago provides a good illustration of this process at work. Technology stocks received an initial boost from fanciful expectations of future profits from scientific advance. Meanwhile,

funds invested in the unglamorous 'value' sectors languished, prompting investors to lose confidence in the ability of their underperforming value managers and to switch funds to the newly successful growth managers, a response that gave a further boost to growth stocks. The same thing happened as value managers themselves began switching from value to growth to avoid being fired.

Through this conceptually simple mechanism, the model explains asset pricing in terms of a battle between fair value and momentum. It shows how rational profit-seeking by agents and the investors who appoint them gives rise to mispricing and volatility. Once momentum becomes embedded in markets, agents then logically respond by adopting strategies that are likely to reinforce the trends. Indeed, one of the unusual features of a momentum strategy is that it is reinforced, rather than exhausted, by widespread adoption, unlike strategies based on convergence to some stable value. There are other sources of momentum as well, such as leverage, portfolio insurance and adherence to guidelines on tracking error, all of which augment the initial effect.

Explaining the formation of asset prices in this way seems to provide a clearer understanding of how and why investors and prices behave as they do. For example, it throws fresh light on why value stocks outperform growth stocks despite offering seemingly poorer earnings prospects. The new approach offers a more convincing interpretation of the way stock prices react to earnings announcements and other news. It shows how short-term incentives, such as annual performance fees, cause fund managers to concentrate on high-turnover, trend-following strategies that add to the distortions in markets, which are then profitably exploited by long-horizon investors. Much of the recent interest in academic finance has been in identifying limits to arbitrage—the forces that prevent mispriced stocks from reverting to fair value. The significance of the model described here is that it shows how prices become thrown off fair value in the first place.

While the model is set in terms of value and momentum in a single equity market, the analysis applies equally to individual stocks, national markets, bonds, currencies, commodities and entire asset classes. Moreover, when the pricing of the primary market is flawed, it follows that the corresponding derivative market will also be mispriced. All the options and futures which are priced by reference to the underlying assets will be subject to the same momentum-based distortions. In short, it will no longer be acceptable to say that competition delivers the right price or that markets exert their own self-discipline.

It seems self-evident that the way forward must be to stop treating the finance sector as a pass-through that has no impact on asset pricing and risk. Incorporating delegation and agency into financial models is bound to lead to a better understanding of phenomena that have so far been poorly understood or unaddressed. Because the new approach maintains the rationality assumption, it is possible to retain much of the economist's existing toolbox, such as mathematical modelling, utility maximization and general equilibrium analysis. The insights, elegance and tractability that these tools provide will be used to study more complex phenomena with very different economic assumptions. Hopefully a new general theory of asset pricing will eventually emerge that should relegate the efficient market hypothesis to the status of a special and limiting case.

Of course, investors may not always behave in a perfectly rational way. But that is beside the point. The test of any theory is whether it does a better job of explaining and predicting than any other. Of course, theories do not have to be mutually exclusive and behavioural finance theories can be helpful in providing supplementary or more detailed insights.

The impact of the new general theory will extend well beyond explaining asset prices.

- Policymakers can only regulate the banking and finance sectors effectively if they have a reasonable idea of how markets work. If regulators believe that capital markets are efficient, they will adopt light-touch regulation with the results we have seen over the past couple of years. On the other hand, if they recognize that markets are imperfect they will regulate accordingly and cause them to become more efficient as a result.
- Macroeconomics has also treated finance as a pass-through and would benefit from changing the economic emphasis and focusing more on the impact of agency and incentives in the savings and investment process. Some macroeconomic models take account of a rudimentary finance sector but more needs to be done in this direction now it is clear that the finance sector can destabilize the real economy. Until now, disruptions were expected to flow the other way, from the overall economy to the banks.
- Corporate finance and banking theory have both been developed under the pro forma assumption of price efficiency and will now need to accommodate mispricing. Corporate managers will now have a better understanding of how equity issuance can be managed

to take account of the relative cheapness or dearness of a company's shares. The same applies to bids and deals.

- The fact and scale of mispricing invalidates much of the existing toolbox of fund management. Security market indices no longer constitute efficient portfolios and are no longer seen as appropriate benchmarks for either active or passive investment. Risk analysis based on past prices and used to assess the riskiness of portfolios and the basis for diversification will be seen as flawed. Risk analysis has often failed investors when they needed it most, but now the reason for this can be seen. The risk that is being measured in these models is that based on market prices, which are driven by flows of funds unrelated to fair value. The flows that matter are the underlying cash flows relating to the businesses themselves, for it is on these that a share's value ultimately depends. The distinction between short-horizon and long-horizon investing also becomes critical and this is discussed later. For policymakers, bankers and corporate accountants, the principle of mark-to-market will be recognized as inappropriate and damagingly procyclical in impact.

3.6 Rent Capture by Financial Intermediaries

A second consequence of delegation is the ability of financial agents to capture rents. To understand how this comes about one needs no formal economic model. If a fund manager spots an investment opportunity with a known and certain payoff, he can finance it directly from his own or borrowed funds and enjoy the full gain for himself. His client might like to participate and would be prepared to pay close to the full value of the gain in fees for the privilege. The client would be in pocket so long as the investment, net of fees, gave him a return above the riskless rate. Whether he borrows the funds or raises them from the client, the fund manager captures the bulk of the gain thanks to his superior knowledge of available opportunities. Of course, formal models must take account of risk and learning, but the outcome is similar. A recent paper presents a dynamic rational expectations model showing the evolution of a financial innovation and reveals how competitive agents are able to extract progressively higher rents to the point at which the agent is capturing the bulk of the gain (Biais *et al*. 2009). The key assumption is that of information asymmetry.

3.7 A Description of the Model

First consider the frictionless benchmark case in which principals and agents have access to the same information. The principals are a set of rational, competitive investors and the agents are a set of similarly imbued fund managers. A financial innovation is introduced but there is uncertainty about its viability. As time goes by, investors and managers learn about this by observing the profits that come from adopting the new technique. If it generates a stream of high profits, confidence grows that the innovation is robust. This leads to an increase in the scale of its adoption and therefore the size of the total compensation going to managers. Because of the symmetry of information, these gains are competitively determined at normal levels and the innovation flourishes. Alternatively, profits may deteriorate, market participants come to learn of its fragility and the innovation withers on the vine. In both cases, while learning generates dynamics, with symmetric information there is no crisis. This differs from previous analyses of industry dynamics under symmetric information where the learning model was specified so that certain observations could trigger crises (see Barbarino and Jovanovic 2007; Pastor and Veronesi 2006; Zeira 1987, 1999). As discussed below, in the framework of this model, it is information asymmetries and the corresponding rents earned by agents which precipitate the crisis.

In practice, innovative sectors are plagued by information asymmetry. It is hard for the outsider to understand everything the insiders are doing and difficult to monitor their actions. The implications of the lack of transparency and oversight are explored using optimal contracting theory. The model assumes that managers have a choice. They can exert effort to reduce the probability that the project will fail, even though such effort is costly. Alternatively they can cut corners and 'shirk'—the term used by economists and familiar to every schoolboy. When agents shirk they fail to evaluate carefully and to control the risks associated with the project. The handling of portfolios of CDOs in the run-up to the recent crisis illustrates this well. Fund managers could either scrutinize diligently the quality of the underlying paper or they could shirk by relying on a rating agency assessment and pass the unopened parcel on to the investor. Securitization is a potentially valuable innovation but requires costly effort to implement properly.

The second assumption is that managers have limited liability, either in the legal sense or because the pattern of payoffs enables them to participate in gains but to suffer no losses. The inability to punish gives rise

to the moral hazard that characterizes finance at every level from individual traders to the banks that employ them (the simple model of moral hazard used by Biais *et al*. is in line with that of Holmstrom and Tirole (1997)).

The combination of opacity and moral hazard is the nub of the agency problem. Investors have to pay handsomely to provide managers with sufficient incentive to exert effort, and the greater the moral hazard, the larger the rents are likely to be. The model shows that the probability of shirking is higher when the innovation is strong than when it is weak. After a period of consistently high profits, managers become increasingly confident that the innovation is robust. They are tempted to shirk and it becomes correspondingly harder to induce them to exert continuing effort. As the need for incentives grow, the point is reached where agents are capturing most of the gains from the innovation.

The analysis does not end there. Investors become frustrated at the rents being earned by the agents and at their own poor return and withdraw their participation. The dynamics are such that when confidence in the innovation reaches a critical threshold, there is a shift from equilibrium effort to equilibrium shirking. The innovation implodes as managers cease to undertake the necessary risk assessment to maintain the viability of the innovation. In the end, an otherwise robust innovation is brought down by the weight of rents being captured.

3.8 Relating the Model to the Real World

If this model bears any relation to the way that finance functions in practice, the implications are profound. The innovations in question occur mainly in investment banking and fund management rather than in the more prosaic activities of utility banking. The past decade has seen a surge of new products and strategies, such as hedge funds, securitization, private equity, structured finance, CDOs and credit default swaps. Each came to be regarded as a worthwhile addition that helped to 'complete' markets and spread risk-bearing by offering investors and borrowers new ways of packaging risk and return.

Ominously in light of the model described above, most of these innovations have been accompanied by increased opacity, creating the scope for elevated moral hazard. Hedge funds shroud themselves in mystery with regard to strategies, holdings, turnover, costs and leverage. It is hard to monitor the diligence and competence of their managers in the absence of information on the sources of performance. The growth of structured

finance and CDSs has meant greater reliance on over-the-counter trades that circumvent the discipline of open markets and regulation.

The theoretical results are consistent with the empirical findings of Philippon and Reshef (2008). They observe a burst of financial innovation in the first half of this decade, with rapid growth in the size of the finance sector accompanied by an increase in the pay of managers. They estimate that rents accounted for 30–50% of the wage differential between the finance sector and the rest of the economy during this period. They point out that the last time this happened on a similar scale was in the late 1920s bubble—also with calamitous consequences. It is significant that a high proportion of the net revenues of banks and other finance firms goes to the staff rather than shareholders. In terms of the model, this implies that rent extraction is occurring at all operating levels within the institutions.

The model's second prediction is that innovations under asymmetric information are vulnerable to implosion. The current crisis seems to validate this prediction since structured credit, CDOs and CDSs were the immediate cause of the global financial crisis.

3.9 Policy Prescriptions

The policy imperatives are to reduce opacity both in the functioning of capital markets and in the actions of individual institutions. Trades should be conducted in transparent markets so that investors can use price, trades and quotes information to monitor and discipline agents. Transactions should be cleared in open markets with clearing houses requiring call margins and security deposits. This would enable principals and regulators to monitor the risky positions of agents and prevent excessive risk-taking. Risky positions and portfolio structure should also be disclosed to investors and regulators. Hedge funds and private equity need to be less secretive about what they are doing and why.

Moral hazard can also be reduced by extending the period over which performance of portfolios and individual traders is measured and compensation determined—three or four years would be a reasonable horizon.

Policymakers are always looking for ways to anticipate trouble in time. The model shows how a combination of high confidence in finance sector innovations and high rents for finance managers might act as a lead indicator of crisis. If warning signs are showing, policymakers should demand an increase in transparency.

3.10 Together, Mispricing and Rent Capture Create the Perfect Storm

To summarize so far, asymmetric information is responsible for creating the twin social bads of mispricing and rent capture. Mispricing gives incorrect signals for resource allocation and, at worst, causes stock market booms and busts that lead to macroeconomic instability. Rent capture causes the misallocation of labour and capital, transfers substantial wealth to bankers and financiers and, at worst, induces systemic failure. Both impose social costs on their own, but in combination they create a perfect storm of wealth destruction.

3.11 Impact of Mispricing on the Demand for Financial Services

It seems trite to observe that the demand for most goods and services is limited by the physical capacity of consumers to consume. Yet the unique feature of finance is that demand for financial services has no such boundaries. Take the case of a pension fund seeking to meet its long-run objectives expressed in terms of risk and return. The trustees observe a market subject to significant price distortion. They eschew passive investment on the grounds that the market portfolio is inefficient, and instead hire active managers to exploit the mispricing. Because of agency problems, active investing does nothing to resolve the mispricing. The cycle of hiring, firing and price distortion therefore continues unabated.

Active management is not confined to the stock and bond markets but blossoms and thrives in the derivatives markets as well. Given the interdependence of pricing between the two, the pricing flaws in the underlying securities are carried over into the derivatives markets. The field of battle for excess return is thus extended and subject only to the creativity of agents in finding new instruments to trade. Much of asset management takes place in this virtual world of derivatives, which has grown exponentially in the last decade with aggregate outstanding positions reaching $600 trillion at one point last year.

Investors' attempts to control risk have similar results. Observing volatile conditions, the investor decides to reduce his downside risk by buying a put option on his portfolio. The seller of the put seeks to neutralize his own risk by shorting the underlying stock, thereby triggering the decline from which the investor sought protection in the first place. The sequence continues because volatility has now increased and the original investor reacts rationally by raising further his level of protection.

There is a similar effect where principals specify tracking error constraints on the divergence of the portfolio return in relation to the benchmark return. The agent is obliged to close down risk by buying stocks that are rising and selling those that are falling, thereby amplifying the initial price moves. In an inefficient market, fund flows put prices in a constant state of flux which leads in turn to an ever-expanding demand for asset management services.

The analysis has implications for the social utility of derivatives, and of finance generally. The creation of new instruments, coupled with the development of option-pricing models in the 1980s, has been applauded as value-creating. Investors will trade these instruments, so the argument goes, only if they derive utility from using them. On this logic, the scale of the derivatives markets is perceived as a measure of their social utility. This would be true in an efficient market, but is not true in an inefficient one. If the theory of mispricing is accepted, the scale of the finance sector becomes testimony to its malfunctioning, not—as the pundits would have it—its efficiency.

The size of the finance sector is also significant because the larger it is, the more damaging the impact on the real economy when it fails. As in the boxing analogy, 'the bigger they are, the harder they fall'. In light of the latest crisis, the idea that banking crises are contained within the realm of money is no longer possible to sustain.

3.12 The Shortening of Investment Horizons

The shortening of investment horizons has been a feature of capital markets over the past two decades. The best indicator of short-termism is the length of time investors hold securities. Turnover on the major equity exchanges is now running at 150% per annum of aggregate market capitalization which implies average holding periods of eight months. The growth in trading of derivatives, most of which have maturities of less than a year, is also symptomatic of shortening horizons.

Markets that display trending patterns encourage short-termism. In most equity markets the optimal momentum strategy is to buy stocks that have risen most in the preceding 6–12 months and to hold them for a further 6–12 months. Fund managers have a choice between investing based on fair value, momentum investing or some combination of the two. Those who are impatient for results or who have no ability or desire to undertake the hard work of fundamental analysis to find cheap stocks will use momentum. In fact, in the short run, momentum investing is

usually the best bet. There is a self-fulfilling element here because the more investors use momentum strategies, the more likely it is to work.

The design of the contract between principal and agent influences how agents manage money. Fee structures based on short-term performance encourage short horizons and momentum trading and are the reason this is the dominant strategy among hedge funds. Transaction costs also have a bearing on turnover levels. The move from fixed to competitive brokerage commissions in the US and UK in the late 1970s was a watershed in this respect and the relentless expansion of turnover dates from this period.

Momentum trading, and the distortions to which it gives rise, are part and parcel of the trend towards the increasing short-termism and high trading volumes in finance. Both have their origins in principal–agent problems and both contribute to the loss of social utility. There is one justification that is always wheeled out to support the case for increased trading. It is that trading raises liquidity and liquidity is an unalloyed benefit because it enables investors to move in and out of assets readily and at low cost. That is true as far as it goes, but it ignores a crucial point. Liquidity is undeniably welcome in an efficient market, but the case becomes more problematic in one subject to mispricing. Lowering the frictional costs of trading opens the door to short-termism and momentum trading which distort prices. Under these conditions liquidity often comes and goes depending on the price swings that are occurring at any moment. The investor is happy to know he can always trade, but the ability to trade may have come at the cost of increased volatility. In an inefficient market, therefore, liquidity should never be assessed in isolation from the volatility of the asset.

High turnover comes at a heavy cost to long-term investors. Active management fees and its associated trading costs based on 100% annual turnover erode the value of a pension fund by around 1.0% per annum. Pension funds are having their assets exchanged with other pension funds twenty-five times during the life of the average liability for no collective advantage but at a cost that reduces the end-value of the pension by around 30%.

3.13 Hedge Funds: A Microcosm of Finance

The hedge fund industry provides a clear and unflattering insight into the problems of modern-day finance. Hedge funds have the veneer of a worthwhile innovation in several respects. They enjoy the freedom to

implement negative views through short selling and to target absolute return instead of return relative to an index benchmark. They are also able to use derivatives and borrowing to leverage fund performance. All this should work to the advantage of their investors and help make markets more efficient. But the bad features of their behaviour outweigh the apparent merits.

First, their fee structures encourage short-termism and momentum-type trading. Hedge funds charge a base fee, usually 2% per annum of the value of assets, and a performance fee, typically 20% of any positive return each year. This makes for a classic case of moral hazard; the hedge fund gains on the upside, but receives no penalty for underperformance and even keeps the base fee. To make the most of the lopsided payoff, the manager plays the momentum game because that gives him the best chance of winning quickly and then moving on to the next momentum play. High charges also make investors impatient for success and the performance fees make the manager more so.

Hedge funds' use of momentum contaminates pricing in the various asset classes they occupy. In recent years they have accounted for around one-third of daily trading volume in equity markets and are often the marginal investors driving the direction of prices. Their investors receive patterns of return that reflect the risky strategies associated with situations of moral hazard—erratic performance with frequent blow-ups and redemption blocks at times of liquidity stress. Some hedge funds sell volatility instead of buying it, but this can be as risky as momentum strategies since it involves receiving a steady premium in return for crippling payouts in the event of crisis.

As discussed in an earlier section, hedge funds display all the features that contribute to a high level of rent extraction. To put this in context requires information on performance. A number of recent studies have sought to calculate the return on indices of hedge funds, making appropriate allowance for the high failure rate among funds. They conclude that the long-run returns have been no better than a passive investment in the S&P or FT indices (see Ibbotson *et al*. 2010; Bird *et al*. 2010). These returns are calculated using the conventional time-weighted returns which represent the return per dollar invested. Once allowance is made for investors buying into funds *after* they have done well and moving out *after* they have done badly—which a money-weighted return does—investors are shown to have fared worse still. This disappointing performance is largely explained by the high fees charged—all the alpha, or excess returns, that hedge funds achieve from investing the funds is absorbed in fees, leaving

the principals with the residual of indexed performance at best. The successful funds are in effect making more in fee revenue than the customers derive in cash returns from their investments.

An unremarked feature of hedge funds is how much alpha they capture from the market. Even to deliver index-like returns net of fees, they have to extract sufficient alpha from the zero-sum game to meet both their fees and their costs. We can observe the investors' returns and we can estimate the managers' fees, but we can only hazard a guess at the costs of the complex trading they undertake with prime brokers, the borrowing costs incurred through leveraging, and investment bank fees in general. Altogether hedge funds probably need to capture three times the return they report simply to meet these overheads. Traditional asset management has to be making losses equal to hedge funds' gross winnings in order to satisfy the identities of the zero-sum game. Hedge funds are far from the innocuous sideshow they often purport to be.

3.14 The Need for a Resolution

One tangible measure of the impact of all this on the end investor is the declining trend in pension fund returns. The annual inflation-adjusted return on UK pension funds for the period 1963–2009 averaged 4.1% (IFSL 2010, chart B9). For the most recent ten years, 2000–2009, the average real return collapsed to 1.1% per annum with high year-to-year volatility. These poor results have exposed massive pension fund deficits, necessitating subventions from sponsoring companies, reductions in benefits and scheme closures. The performance of pension funds in the US and of Giant funds globally reveal a similar decline.

In their attempts to make capital markets safer and more socially constructive, policymakers are focusing on bank levies and tighter regulation. Bankers will resist and circumvent taxes and restrictions and there are bound to be unintended consequences. Governments also need to agree collective actions because no country will be prepared to disadvantage itself by taking unilateral action. This will take time and have limited chance of success so it would be far better if the private sector could deal with the problem.

This chapter has shown how principal–agent problems lie at the heart of mispricing and rent extraction. The solution lies in having the principals recognize the nature and extent of the problems and then change the way they contract and deal with agents. The group of principals best placed to act in this way are the world's biggest public, pension and charitable funds. They constitute a distinct class of end investor insofar as

they are charged with representing the interests of their beneficiaries and, unlike mutual funds, do not sell their services commercially. Sadly these Giant funds have been failing to act in ways that advance and protect their beneficiaries and have instead been acting more like another tier of agents.

3.15 Manifesto for Giant Funds

Set out below is a manifesto of ten policies that Giant funds are urged to introduce to improve their long-run returns and help stabilize markets. Each fund that adopted these changes could expect an increase in annual return of around 1–1.5%, as well as lower volatility of return. The improvement would come from lower levels of trading and brokerage, lower management charges and, importantly, from focusing on fair value investing and not engaging in trend-following strategies. The gains would accrue regardless of what other funds were doing. These are the private benefits that funds could capture as price-takers by revising their approach to investment and changing the way they delegate to agents.

Once these policies became widely adopted, there would be collective benefits enjoyed by all funds in the form of more stable capital markets, faster economic growth, less exploitation by agents and lower propensity for crisis. The ultimate reward achievable from both private and collective gains could be an increase of around 2–3% in the real annual return of each fund.

1. Adopt a long-term approach to investing based on long-term dividend flows rather than momentum-based strategies that rely on short-term price changes. Investing on the basis of estimated future earnings and dividends wins out in the long run. Investing on the basis of short-term price changes, which is synonymous with momentum investing, may win over short periods but not in the long run. It is rather like the hare and the tortoise. The hare is boastful and flashy (rather like hedge funds) and has bursts of success. The tortoise plods steadily on concentrating on real value and wins the race in the end.

The return on equities ultimately depends on dividends. Historically, the real return on equities in the US and UK has comprised the dividend yield, which grows in line with local inflation, plus a small increment of dividend growth. Real price changes have more to do with revaluation effects (changing price–earnings ratios) than with any long-term shareholder gain.

This has been forgotten in the brash new world of finance. The trend towards short-horizon investing has thrust short-term price changes to the fore and placed dividends in the background in the thinking of most investors. Such has been the shift in emphasis that a third of companies no longer bother to pay dividends but have substituted periodic share buy-backs as an opaque (though tax-efficient) substitute.

2. Cap annual turnover of portfolios at 30% per annum. There is no better way of forcing fund managers to focus on long-run value than to restrict turnover. Capping annual turnover at 30% implies an average holding period of just over three years. Turnover is measured as the lesser of sales or purchases so this limit is not as constricting as it seems, because new cash flows also permit adjustment to portfolio composition.

3. Understand that all the tools currently used to determine policy objectives and implementation are based on the discredited theory of efficient markets. Most investors accept that markets are, to greater or lesser degree, inefficient and devote themselves to exploiting the opportunities on offer. But by a nice irony, they have continued to use tools and adopt policies constructed on the assumptions of efficiency. It is a costly mistake.

The volatility and distortions that come with inefficient pricing mean that equity indices do not represent optimal portfolios and are therefore inappropriate benchmarks for passive tracking or active management. Recall that Japan accounted for 55% of the global equity index in 1990 and, ten years later, tech stocks represented 45% of the S&P index.

Risk analysis based on market prices is similarly flawed. Prices are much more volatile than the streams of attributable cash flows and earnings, meaning that risk estimates using short-run price data will overstate risk for investors such as pension funds with long-term liabilities. In consequence, they will be purchasing unnecessary levels of risk protection. The correct approach is to measure risk using dividends or smoothed earnings as inputs, rather than prices.

Endless effort is devoted by funds to discovering how best to reduce risk by diversification. The analysis is always undertaken using correlations based on asset prices. But correlations using prices will vary in response to changing patterns of fund flows and are unlikely to provide a suitable basis for spreading risk. This is best illustrated when investors move en masse into a new asset class to take advantage of low or negative correlation with their existing assets. The correlations become more

highly positive and invalidate the analysis. The answer is again to use correlations based on the underlying cash flows coming from the various asset classes.

4. Adopt stable benchmarks for fund performance. The ideal benchmark for performance is one that follows a relatively stable path over time, reflects the characteristics of the liabilities and is grounded in long-term cash flows. Giant funds target long-term performance and, in the case of pension funds, have explicit liability streams that depend on wage and salary growth. Wages and salaries grow in line with the productivity of the economy and this points to the growth of GDP as the ideal benchmark for the performance of pension assets. Giant funds will be able to beat the GDP growth, which averages around 2.5–3.0% after inflation for the advanced economies, by taking some credit risk and investing in equities. Equities offer a leveraged exposure to economic growth, through commercial and financial leverage, so the funds should set a target of GDP growth plus a risk premium.

5. Do not pay performance fees. Trying to assess whether a manager's performance is due to skill, market moves or luck is near impossible. Also performance fees encourage gambling and therefore moral hazard. If funds cannot resist paying them, performance should be measured over periods of several years and with high water marks so that performance following a decline has to recover to its previous best before the managers are eligible for further fees.

6. Do not engage in any form of 'alternative investing'. Alternative investing offers little or no long-run return advantage over traditional forms of investing, carries greater risk, and the lauded diversification benefits largely disappear once they are widely adopted. Currently the most popular categories of alternative investing are hedge funds, private equity and commodities.

Any greater levels of manager skill they enjoy, or any advantages conferred by innovation, are swallowed up in higher management fees. Most alternative investing is leveraged which increases the asymmetry of payoffs to investors and therefore moral hazard. Hedge funds mostly emphasize short-term investing, typically momentum strategies, which have a lower return expectation than fair value investing and contribute to market destabilization. Fund blow-ups, suspended redemptions and performance volatility are the result.

Hedge funds and private equity both carry high unseen costs from financing charges, advisory fees and trading costs which mean they have to withdraw large helpings of alpha from the zero-sum public markets before delivering the published returns to investors. Private equity is also plagued by opacity, resorts to quick-fix commercial strategies and expropriates gains that should have gone to public shareholders.

Commodity investment should be especially shunned. Commodities as a general asset class offer a long-run return no better than 0% after inflation, and less after fees. The cost of holding commodity positions is bedevilled by the herding of portfolio investors all seeking to roll over their futures positions at quarterly expiry dates. Commodity indices that act as the benchmark for performance can also be gamed by the investment banks that maintain them. The flood of portfolio investment going into commodities in the past few years has turned their hitherto negative correlation with equities into a high and positive correlation.

Before the middle of the last decade the prices of individual commodities could be explained by the supply and demand from producers and consumers. With the flood of passive and active investment funds going into commodities from 2005 onwards, prices have been increasingly driven by fund inflows rather than fundamental factors. Prices no longer provide a reliable signal to producers or consumers. More damagingly, commodity prices have a direct impact on consumer price indices and the role of central banks in controlling inflation is made doubly difficult now that commodity prices are subject to volatile fund flows from investors.

7. Insist on total transparency by managers with respect to their strategies, costs, leverage and trading.

8. Do not sanction the purchase of 'structured', untraded or synthetic products. Everything in the portfolio should be traded and quoted on a public market. Allowing managers to buy over-the-counter securities opens another door for agents to capture rent and should be denied. This would rule out the use of Dark Pools and other forms of opaque trading. It would also ensure that Giant funds did not hold CDOs or CDSs unless such transactions were publicly traded and recorded.

9. Work with other shareholders and policymakers to secure full transparency of banking and financial service costs borne by companies in which the Giant funds invest. Earnings of companies are struck after deductions of banking charges incurred by companies. Principal–agent

problems are alive and well here too. Underwriting fees have doubled over the past few years for an activity that incurs minimal risk for banks. It is a cosy arrangement among bankers and corporate managements that keeps the bankers' tills ringing happily. The OFT in the UK has just announced its intention to investigate underwriting fees.

The scope of bank services to companies is very wide and includes advisory fees for mergers and acquisitions, initial public offerings, everyday financial transactions, insurance, charges relating to loans and the purchase of pension liabilities. It is a grey, undocumented area and agents are in a position to extract in fees amounts that equate to the benefit the service confers to their customers. This is the counterpart in corporate finance of what is happening in the asset management industry.

Corporate earnings could probably be raised by a further 1.0% per annum after inflation if shareholders were successful in persuading corporate management to recognize the principal–agent problems at this level and to challenge the agents' rents.

10. Provide full disclosure to all stakeholders and allow public scrutiny of each fund's compliance with these policies.

3.16 Why the Giant Funds Have Not Acted Already

Those in charge of the Giant funds have been concerned at the poor performance of their funds, but have felt safe from criticism because their funds were suffering the same fate as their peers. The stakeholders, who have been the ultimate victims, mostly fail to grasp what is happening and see themselves without franchise and powerless.

The Giant funds seem oblivious to the depredations caused by principal–agent problems. They have been acting like another tier of agent rather than the principals they should be. This is hardly surprising given that they are advised by agents and that their trustees and staff are drawn from the investment industry or aspire to win lucrative jobs in it. They have also failed to understand the damage done to performance from following benchmarks and using risk analysis based on a defunct theory.

Another problem has been that the early success of the Harvard/Yale model of investing won a large following, especially among charitable funds and endowments in recent years. Both funds were pioneers in alternative investing, building up their exposure to hedge funds, private equity and forestry over the past two decades. They enjoyed the early success that typically accompanies innovation and enjoyed returns head and shoulders above the comparator universe. All worked well in

the early stages when they could dictate terms to their agents and while returns from alternative investments remained uncorrelated and uncontaminated by what was happening in other asset classes. But the flow of new money going into alternatives undermined their diversification attractions and the financial crisis revealed other vulnerabilities of the Harvard/Yale model with the result that the value of their funds collapsed by 25% or more in 2008. These events showed that the model was neither resilient nor scalable and Giant funds have lost what they thought to be the new paradigm of investing.

There may be reservations about adopting the policies set out here even though there are long-run return advantages to any fund that acts. The fear will be that in the early years a bubble may form that causes the rash hare to overtake the prudent tortoise. That being so, policymakers may have to step in to ensure the changes occur.

3.17 Supportive Actions Available to Policymakers

Policymakers and regulators worldwide can provide back-up to encourage adoption of the manifesto by funds located nationally. There need be no prior agreement among governments since the measures are privately beneficial to those adopting them and since there is every advantage to countries and funds from acting promptly.

1. Encourage adoption by all public funds. The ideal start would be for the IMF to apply these policies to its new $12 billion endowment fund created from the sale of the IMF's holdings of gold. The next step would be to try to encourage Sovereign Wealth Funds around the world to adopt these policies. The means to bring this about might also involve the IMF, which two years ago convened a meeting of Sovereign Wealth Funds to agree the 'Santiago Principles' setting out best practice for the management of their assets. Governments could also encourage public funds within their jurisdiction to take action.

2. Withdraw tax-exemption rights for all funds that fail to cap turnover. Giant funds worldwide enjoy exemption from taxes in one form or another. Funds should lose these rights, first on any sub-portfolio where the 30% turnover limit is breached and then across the entire portfolio if no corrective action is taken. For over thirty years the UK tax statutes have contained a clause withdrawing tax exemption for any fund deemed to be 'trading' rather than 'investing'. It has rarely been implemented, but this is the model to follow and the time to start.

3. National governments to issue GDP bonds. Issuance of GDP-linked bonds by sovereign governments would encourage the adoption of GDP as a performance benchmark for funds, as well as being an attractive proposition for investors and issuers alike. Bonds delivering a return equal to the annual growth of a country's GDP offer investors the three features that everyone wants from their investments: growth, inflation protection and relative stability of price. The last feature would be ensured by the issuance of bonds in a range of maturities. There currently exists no single instrument that offers all three characteristics and part of the volatility in asset class returns arises from investors lurching between equities, bonds and cash in their attempt to have their portfolios combine these objectives. Issuers would also find growth-related bonds appealing because of the positive correlation of tax revenue and debt service costs.

Trading in GDP bonds would contribute usefully toward greater stability of equity prices. Investors would be able to switch out of equities into GDP bonds when equity prices became over-valued. Similarly, they could switch out of the bonds into equities when shares were depressed. The existence of GDP bonds would also help anchor expectations about the realistic level of future corporate earnings.

4. Recognize that mark-to-market accounting is inappropriate when pricing is inefficient.

5. Regulators should not automatically approve financial products on the grounds that they enhance liquidity or complete markets. This manifesto and the associated policy proposals derive directly from the new and more realistic paradigm for understanding the way capital markets function outlined in this chapter. Recognizing that markets are inefficient, and doing so in a rational framework, makes it possible to construct policy measures that directly address the problems. This is no intellectual game; the stakes are high since it is doubtful that capitalism could survive a fresh calamity on the scale of the last.

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