

A FUNDAMENTAL RE-EXAMINATION OF EFFICIENCY IN CAPITAL MARKETS IN LIGHT OF THE GLOBAL FINANCIAL CRISIS

GILL NORTH* AND ROSS P BUCKLEY**

The global financial crisis ('GFC') has severely shaken scholarly and regulatory belief in the efficient market theory and the capacity of markets to respond to issues such as information asymmetry, conflicts of interests and risk anomalies. Policy makers, regulators and scholars are fundamentally re-examining their theoretical and empirical efficiency frameworks. Tony D'Aloisio, the Chairman of the Australian Securities and Investments Commission ('ASIC') indicated in a recent speech that we are seeing the start of a

re-think of the fundamental underpinning of the international regulatory framework ... Much of the economic underpinning to regulation in the last 20 to 30 years has come from the theories around the 'Efficient Markets Hypothesis'. In Australia this is seen in the work of the Wallis Inquiry, whose recommendations underpin much of the Corporations Act ... We would benefit from a fundamental re-think of the conceptual framework and operational assumptions that should be applied to post-GFC securities regulation.¹

Most readers probably have some knowledge of the Fama efficient markets theory² and the Efficient Capital Markets Hypothesis ('ECMH').³ However, the ultimate goal of the efficient markets theory, the ECMH assumptions, empirical research on efficiency in capital markets, and the policy implications flowing from efficiency theories and research are not well understood. Much of the prior debate on efficiency in markets within the legal scholarly and policy material has been narrowly based. Alex Erskine, the chief economist at ASIC, suggests the GFC 'showed a considerable information deficit and lack of understanding of the economics of securities markets and the interconnections with the broader

* Research Fellow, Faculty of Law, University of New South Wales.

** Professor of International Finance Law, Faculty of Law, University of New South Wales; Fellow, Asian Institute of International Financial Law, University of Hong Kong. The authors would like to thank the Australian Research Council for the Discovery Grant that made this research possible, and Jeff Coulton and Martin North for their helpful comments. All responsibility rests with the authors.

1 Tony D'Aloisio, 'Developments in the Global Regulatory System' (Speech delivered at the Financial Services Council Annual Conference, Melbourne, 12 August 2010) 8. See also Commonwealth of Australia, *Australian Financial System Inquiry Final Report* (1997) 175, 177, 196, 197 ('Wallis Report').

2 Eugene Fama, 'Efficient Capital Markets: A Review of Theory and Empirical Work' (1970) 25 *Journal of Finance* 383, 383–8.

3 *Ibid* 388–416.

finance sector and the economy.⁴ He argues that within ‘academic policy-making and regulatory circles, the operations of the financial sector were very much an unpacked “black box”’.⁵ We agree with Erskine that the existing literature tends to focus on micro rather than broader issues, and that understanding of the role and impact of modern financial activity on capital markets and the broader economy tends to be poor.

In this article we argue that the theoretical bases of the ECMH are sound. Accepting the Fama assumptions of freely available information and rational investment by fully informed companies and investors, markets would generally produce competitive resource allocations. The problem is that empirical and observational evidence suggests that the assumptions underpinning the EMCH often fail to be reflected in modern capital markets, particularly in unregulated areas of a market and most markedly over short periods. For the Fama efficient market theory to operate effectively, the assumptions require consistent and bold regulatory reinforcement and support. Even then, the most that regulatory effort can achieve is the provision of comprehensive, accurate information. There is considerable evidence of irrational market behaviour and long periods of security prices deviating substantially from fundamental valuations that can lead to crises as markets overshoot or otherwise collectively misprice risk.

The accumulated evidence on inefficiencies in capital markets is extensive. However, global policy makers and some legal scholars seem to have largely ignored this mounting evidence in the belief that markets will generally provide optimal outcomes if left to function with minimal interference.⁶ There are no perfect or complete policy responses to market efficiency issues. Markets are complex, the links between price, market and allocative efficiency are often diffuse and uncertain, and the extent to which empirical research can inform policy decisions is limited. In such environments, policy makers and scholars need to take a broad perspective and be very clear about the ultimate goal of efficiency in capital markets. Future debate on efficiency in markets and capital market policy should explain: why efficiency in markets matters; the ultimate efficiency goal; the timeframe over which efficiency is measured; and who will benefit from the particular efficiency goal selected.

There are many notions and measures of efficiency within markets and economies. For the purposes of this article, we define ‘price efficiency’ as an individual security price that accurately reflects the underlying economic value, ‘optimal market efficiency’ as a market in which the prices of the market securities most closely reflect their underlying economic values, and ‘optimal

4 Alex Erskine, ‘Rethinking Securities Regulation After the Crisis: An Economics Perspective’ (Working Paper, ASIC, 9 July 2010) 4–5.

5 Ibid 9.

6 See, eg, Parliamentary Joint Committee on Corporations and Financial Services, Parliament of Australia, *Inquiry into Financial Products and Services in Australia* (2009) 7. See also Sheen Kassouf, ‘Towards a Legal Framework for Efficiency and Equity in the Securities Markets’ (1974) 25 *Hastings Law Journal* 417, 418; Harry McVea, ‘Financial Services Regulation under the Financial Services Authority: A Reassertion of the Market Failure Thesis?’ (2005) 64 *Cambridge Law Journal* 413, 447–8; Erskine, above n 4, 4–5.

allocative efficiency' as an economy which produces the optimal allocation of real resources or capital. We conclude that the appropriate efficiency rationale for capital market policy, such as disclosure, insider trading, and competition regulation, is long-term allocative efficiency.

This article is not proposing a new efficiency theory. Instead, we are calling for policy makers, regulators and the judiciary to enact, enforce and interpret capital market regulation through a clearer lens refocused to assess regulatory efficiency issues over longer periods and for their ultimate effects on the real economy and the country as a whole. Fama provided the appropriate perspective in 1971 when he indicated that '[t]he primary role of the capital market is allocation of ownership of the economy's capital stock'.⁷ We then emphasise the need for allocative efficiency issues to be considered over a longer horizon. Over the years, the focus in capital markets has become increasingly short-term.⁸ Within the policy arena, the move to short-term price efficiency rationales and goals has resulted in weak regulation, difficult judicial interpretation, conservative enforcement and incoherent theoretical frameworks.⁹

Regulation can enhance the efficient operation of markets, promote the efficient allocation of scarce capital, and improve long-term economic returns. However, to achieve these goals, capital market policy must be designed to serve the 'public interest' of a country rather than the interests of some market participants. Policy intended to enhance efficiency in capital markets and regulatory efforts to 'maintain, facilitate and improve the performance of the financial system ... in the interests of efficiency and development of the economy'¹⁰ should be based on a high level efficiency rationale, growth in the real economy, and a long time horizon. A long-term allocative efficiency rationale enables the policy and regulatory efforts to be assessed holistically, incorporating competing systemic efficiency measures, incentives issues, public interest factors, and longer-term costs and benefits.

The article is in four parts. Part I summarises the efficiency framework adopted by global regulators. Part II reviews the efficient markets theory and the ECMH. Part III analyses and critiques the empirical and observational bodies of

7 Fama, above n 2, 383.

8 See, eg, The Aspen Institute, *Overcoming Short-Termism: A Call for a More Responsible Approach to Investment and Business Management* (9 September 2009) 3.

9 This article is a foundational paper for subsequent discussion. For instance, we argue in other papers that the lack of clarity around the efficiency rationale in Australia has resulted in significant uncertainty around the company disclosure and insider trading regimes: See, eg, *R v Firms* (2001) 38 ACSR 223, 230. President Mason states that 'parliament left the courts with [an insider trading] scheme embodying the ambiguous embrace of the market fairness/"equal access" and market efficiency theories.' See also Gill North, 'A Re-Examination of the Manne Efficiency Theory & the Insider Trading and Company Disclosure Efficiency Rationale' (Working Paper, University of New South Wales, 2010); Gill North, 'The Insider Trading Generally Available and Materiality Carve-Outs: Are They Achieving Their Aims?' (2009) 27 *Company and Securities Law Journal* 234.

10 *Australian Securities and Investments Commission Act 2001* (Cth) ('ASIC Act') s 1(2). Section 1(2) states that in performing its functions and exercising its powers, ASIC must strive to: 'maintain, facilitate and improve the performance of the financial system ... in the interests of commercial certainty, reducing business costs, and the efficiency and development of the economy'.

evidence on price, market and allocative efficiency. Part IV discusses the appropriate policy response arising from this analysis.

We begin by reviewing the analysis of efficiency in markets in the Turner Review¹¹ and the 2010 ASIC Summer School Report.¹² The Turner Review was written by the domestic financial regulator in the United Kingdom ('UK') in response to the GFC. Similarly, the focus of the 2010 ASIC Summer School was securities and investments regulation beyond the crisis.

I THE EFFICIENCY FRAMEWORKS ADOPTED BY REGULATORS

A Introduction

Company, financial and securities regulators around the globe are charged with a range of tasks and goals. However, the primary regulatory goals are to ensure fair and efficient markets.¹³ The fairness goal is generally discussed in terms of investor protection, equality of access, market integrity and investor confidence. The efficiency goal is less clear. Regulatory discussion on efficiency is generally limited to price discovery or price formation concepts.

Over the last 20 to 30 years, policy makers, regulators and some scholars seem to have generally assumed efficiency in markets, with the rationale for the regulatory frameworks left largely unarticulated. For example, a recent submission by ASIC to a parliamentary inquiry into financial products and services indicated that the

fundamental policy settings ... are based on 'efficient markets theory', a belief that markets drive efficiency and that regulatory intervention should be kept to a minimum to allow markets to achieve maximum efficiency. The 'efficient markets theory' has shaped both the [financial services] regime and ASIC's role and powers.¹⁴

However, the scope and severity of the GFC has led to increased questioning of the assumptions that markets are efficient and able to 'deal with themselves'.¹⁵ This is most clearly reflected in the Turner Review. In 2008, the UK government asked the domestic financial regulator, the Financial Services Authority ('FSA'),

11 Financial Services Authority, *The Turner Review: A Regulatory Response To The Global Banking Crisis* (March 2009) <http://www.fsa.gov.uk/pubs/other/turner_review.pdf>. See also Adair Turner, 'Economics, Conventional Wisdom and Public Policy' (Speech delivered at the Inaugural Conference of the Institute for New Economic Thinking, Cambridge, April 2010).

12 ASIC, *Securities and Investment Regulation: Beyond the Crisis* (1–3 March 2010, Melbourne, Australia) <[http://www.asic.gov.au/asic/pdf/lib.nsf/LookupByFileName/SS10-Summer%20School%202010%20Report-web.pdf/\\$file/SS10-Summer%20School%202010%20Report-web.pdf](http://www.asic.gov.au/asic/pdf/lib.nsf/LookupByFileName/SS10-Summer%20School%202010%20Report-web.pdf/$file/SS10-Summer%20School%202010%20Report-web.pdf)> ('ASIC Summer School 2010').

13 See, eg, International Organization of Securities Commissions ('IOSCO'), *Objectives and Principles of Securities Regulation* (June 2010) 3, which states that the three objectives of securities regulation are protecting investors; ensuring that markets are fair, efficient and transparent; and reducing systemic risk.

14 Parliamentary Joint Committee on Corporations and Financial Services, above n 6, 7.

15 ASIC, above n 12, 46.

to review what went wrong during the financial crisis and provide a regulatory response. The final report, the 'Turner Review',¹⁶ provides a summary of efficiency within capital markets as a preview to its policy proposals.

B The Turner Review Efficiency Framework

The Turner Review's discussion of efficiency begins with the argument that previous regulatory approaches have been built on the following intellectual assumptions:

- (i) market prices are good indicators of rationally evaluated economic value;
- (ii) the development of securitised credit, since based on the creation of new and more liquid markets, has improved both allocative efficiency and financial stability;
- (iii) the risk characteristics of financial markets can be inferred from mathematical analysis, delivering robust quantitative measures of trading risk;
- (iv) market discipline can be used as an effective tool in constraining harmful risk taking; and
- (v) financial innovation can be assumed to be beneficial since market competition would winnow out any innovations which did not deliver value added.¹⁷

The Turner Review suggests that the predominant financial markets theory of the last 20 to 30 years asserts that

- (i) efficient and liquid financial markets deliver major allocative efficiency benefits by making possible a full range of contracts, thus enabling providers and users of funds more effectively to meet their preferences for risk, return and liquidity;
- (ii) markets are sufficiently rational as to justify a strong presumption in favor of market deregulation; and
- (iii) that even if markets are theoretically capable of irrational behaviour, policymakers will never be able to judge when and how far they are irrational with sufficient confidence to justify market intervention.¹⁸

The Turner Review indicates that the outlined assumptions and theory are subject to theoretical and empirical challenge. It claims that 'in the face of the worst financial crisis for a century ... the assumptions of efficient market theory have been subject to increasingly effective criticism'.¹⁹

The Turner Review argues that individual behaviour is not entirely rational and empirical evidence illustrates large scale herd effects and market overshoots.²⁰ It highlights the criticisms that:

- market efficiency does not imply market rationality;
- individual rationality does not ensure collective rationality; and
- allocative efficiency benefits have limits.²¹

16 FSA, above n 11.

17 Ibid 39.

18 Ibid 40.

19 Ibid 40.

20 Ibid 41.

The criticism that market efficiency theory does not imply market rationality is explained as ‘the fact that prices move as random walks and cannot be predicted from prior movements in no way denies the possibility of self-reinforcing herd effects and of prices overshooting rational equilibrium levels’.²² The main point of this argument is not clear. As explained more fully in Part II, when prices move randomly under the Fama ECMH model, a market is weak form efficient. This means that it is not efficient on a fundamental basis²³ and security prices or patterns of price change cannot be objectively valued. In such a market, prices would not move in accordance with rational equilibrium levels. Nevertheless, as outlined in Part III, there are large bodies of scholarly and other empirical evidence confirming that market participants including professional investors act irrationally at times, both as individuals and on a combined basis. The key issue is how scholars, policy makers and regulators should appropriately respond to the existence of irrational behaviour.

The criticism that individual rationality does not ensure collective rationality argues that

even if individuals are rationally self interested, their actions can, if determined in conditions of imperfect information and/or determined by particular relationships between end investors and their asset manager agents, result in market price movements characterised by self-reinforcing momentum.²⁴

This is an extension of the herding and irrational behaviour debates. As outlined in Part III, there is significant scholarly and other empirical evidence confirming herding behaviour in markets. Once again, the difficult question for all parties is how to appropriately respond to this evidence.

The argument that allocative efficiency benefits have limits is a more significant issue. The Turner Review suggests that

[b]eyond a certain degree of liquidity and market completion, the additional allocative efficiency benefits of further liquidity and market completion may be relatively slight, and therefore easily outweighed by additional instability risks which increasing liquidity or complexity might itself create. It is for instance arguable that the allocative efficiency benefits of the creation of markets for many complex structured credit securities (e.g. CDO-squareds) would have been at most trivial even if they had not played a role in creating financial instability.²⁵

The Turner Review efficiency summary concludes that policy makers ‘have to recognise that all liquid traded markets are capable of acting irrationally, and can be susceptible to self-reinforcing herd and momentum effects. [However, this] does not imply that liquid and efficient markets have no benefits’.²⁶

The Turner Review suggests that

21 Ibid 40–1.

22 Ibid 40.

23 Fundamental analysis seeks to value companies and their securities based on the present value of the estimated future earnings and distributions. See, eg, Baruch Lev and S Ramu Thiagarajan, ‘Fundamental Information Analysis’ (1993) 31 *Journal of Accounting Research* 190.

24 Financial Services Authority, above n 11, 40–1.

25 Ibid 41.

26 Ibid 41.

regulatory approaches should be based on striking a balance between the benefits of market completion and market liquidity and the potential disadvantages which may arise from inherent instabilities in liquid markets. ... The optimal balance may moreover be different when considering securitised credit markets compared with other markets (such as those for equities and commodities).²⁷

The Turner Review efficiency summary makes a series of interesting and credible points. However, it does not explain how the identified efficiency issues justify regulatory intervention, what the regulatory invention seeks to achieve, or even how the proposed regulation connects with the efficiency arguments or conclusion. This analysis leaves the reader with an undefined efficient markets theory, empirical evidence that suggests that markets are not always efficient on a fundamental basis, and confirmation that as humans we do not act entirely rationally within markets. One might well ask, so what? Why does efficiency in markets matter? To what end is efficiency sought? What degree of efficiency is required? How is efficiency best assessed or measured? Over what timeframe should efficiency be assessed? What form of efficiency is ultimately sought? And who benefits or suffers detriment from market efficiency or inefficiency?

Some of the points made in the Turner Review were reiterated at the 2010 ASIC Summer School.

C 2010 ASIC Summer School Report: Securities and Investments Regulation Beyond the Crisis

One of the sessions at the ASIC Summer School entitled 'Rethinking the Fundamentals' included discussion on the efficiency of markets. The presenters provided various descriptions of the efficient market hypothesis. Guillermo Larrain, Chairman of the International Organization of Securities Commissions ('IOSCO') Emerging Markets Committee, provided the definitions that 'market prices coincide with fundamentals except for noise',²⁸ and '*rational* traders will not miss the opportunity to make a gain provided there is enough *relevant* information'.²⁹ He concluded that the efficient markets hypothesis is a 'theory. It's a nice piece of intellectual work ... [but] from the perspective of regulation, ... it is of limited value'.³⁰

Professor Ian Harper, a director of Access Economics, described the efficient markets hypothesis as 'a very narrow proposition about whether traders can make money... [It] says nothing about stability. ... It also says nothing about Pareto efficiency'.³¹ He indicated that whether the GFC has invalidated Fama efficiency is an empirical question. Harper argued that the 'GFC has widened the scope for government intervention to override Pareto-inefficient competitive market outcomes'. He suggested that Pareto efficiency asks: 'Is there another set of

27 Ibid 42.

28 Robert Shiller, 'From Efficient Markets Theory to Behavioral Finance' (2003) 17(1) *Journal of Economic Perspectives* 83, cited in ASIC, above n 12, 29.

29 Ibid citing Robert Lucas (emphasis added).

30 Ibid 39.

31 Ibid 40.

prices and allocations which Pareto-dominates the outcome of trading on competitive markets?’³² He concluded that it ‘turns out that asymmetric information is more pervasive’ than we thought. He defined the real issue as:

can you rely upon competitive markets to produce allocations that a regulator couldn’t dominate? And I think the GFC has demonstrated that the scope for regulatory intervention is clearly wider than we thought it was ... So it’s about expanding the scope of regulatory intervention and changing the way in which it’s done, relative to the sort of neat division that I and my colleagues on Wallis came up with 14 years ago.³³

Dr John Stuckey, a senior advisor at McKinsey & Company, suggested that the finance theory definition of efficient markets is a quite different topic to allocative efficiency in the way markets work well.³⁴ Roel Campos, previously a commissioner at the United States (‘US’) Securities and Exchange Commission, indicated that in the US they are facing the difficulties of ‘getting away from what was believed, strongly, almost religiously, that the markets would deal with themselves’.³⁵

Hence, most of the ASIC Summer School presenters suggested that the Fama efficient market theory is not concerned with allocative efficiency and is largely irrelevant for policy decision making. The proposed alternative frameworks centred around Pareto or allocative efficiency. We argue that the efficient market theory remains relevant for policy development because its ultimate goal is allocative efficiency. However, for the Fama principles to operate effectively, the assumptions underpinning the ECMH require regulatory support. We illustrate this by reviewing the Fama efficient markets theory and the ECMH from original sources.

II THE FAMA EFFICIENT MARKETS THEORY

Scholarly and policy commentary on efficiency in markets tends to cite the Fama ECMH. It is generally assumed that readers understand the efficient markets model and how it applies to the market or allocative efficiency arguments presented. However, the ultimate goal of the efficient markets theory, the ECMH assumptions, empirical research on efficiency in capital markets, and the policy implications flowing from the efficient markets theory and empirical research are not well understood.

A The Efficient Markets Theory

Fama indicates that ‘[t]he primary role of the capital market is allocation of ownership of the economy’s capital stock’.³⁶ His stated ideal market is one

32 Ibid 37.

33 Ibid 40.

34 Ibid 41.

35 Ibid 46.

36 Fama, above n 2, 383.

in which prices provide accurate signals for resource allocation: that is, a market in which firms can make production-investment decisions, and investors can choose among the securities that represent ownership of firm's activities under the assumption that security prices at any time 'fully reflect' all available information.³⁷

B The Efficient Capital Markets Hypothesis

Fama developed the efficient markets model in the 1960s to empirically test whether security prices 'fully reflect' particular information subsets.³⁸ To the extent markets reflect these information subsets they are called strong, semi-strong or weak form efficient.³⁹ In a strong form or perfectly efficient market, security prices fully reflect all currently known information, including public and private information. Fama does not expect this extreme model to be an exact description of the world; instead it provides a benchmark against which deviations can be measured.⁴⁰ The information subset tested in the semi-strong form is limited to publicly available information. The weak form is limited to historical price sequences.⁴¹

The ECMH suggests that when a market is strong form or perfectly efficient, no investor can benefit from new information, including persons that possess inside information or information not publicly available, because the prices will already reflect such information. In a market with a semi-strong form of efficiency, a person may earn superior returns from information that is not publicly available, but no investor can earn excess returns by fundamental research or the identification of mispriced securities on the basis of publicly available information.⁴² In a market with weak-form efficiency, investors cannot earn superior returns by technical analysis or the study of past security pricing or volume trends.⁴³ In such a market, price changes occur randomly, so that security prices or patterns of price change cannot be objectively valued and future movements cannot be predicted.

The ECMH is intended to test the extent to which security prices reflect available information. In practice, markets are not totally inefficient or strong form efficient so meaningful discussion on efficiency in capital markets concerns

37 Ibid 383.

38 The ECMH formally evolved in the 1960s from the PhD dissertation of Fama. However, its origins date back to a dissertation by Bachelier, a student of the French mathematician, Henri Poincare. Bachelier analysed the French commodities market in 1900 and found the market prices to be unbiased estimates of future prices, with changes in pricing the result of new information, the emergence of which was random.

39 Fama, above n 2, 383, 388.

40 Ibid 414.

41 Ibid 389–409.

42 Ibid 404–9.

43 Technical analysis looks at patterns based on security prices and trading volumes and presumes that future patterns are predictable based on previous patterns of security prices and trading volumes.

the relative efficiency of one market to another or how to enhance or optimise the efficiency of a particular market.⁴⁴

As outlined in Part III, one measure of the level of a market's efficiency is the relative speed and accuracy of share prices in reaching new equilibrium levels when new information becomes available⁴⁵ – or 'the extent to which prices anticipate earnings information and the completeness with which prices react to earnings news'.⁴⁶

It is important here to understand the role of scholarly models and theories. There is generally a trade-off between the theoretical strength of a measure and the extent of its applicability.⁴⁷ Theoretical assumptions cannot fully reflect real world complexities. A scientific theory is by necessity based on abstraction. However, an 'important test of a theory is its ability to explain reality'.⁴⁸ To put it another way, the 'important point is whether the assumptions that underlie ... theories are more or less in accordance with reality. In other words, the question is an empirical one'.⁴⁹

Economic models establish only partial relationships and their conclusions and predictions are only valid with respect to the assumptions and arguments specified. Economic models break up phenomena into more manageable portions by abstracting those variables that are believed to have a significant influence on choice and subjecting them to deductive reasoning based on a set of accepted axioms. The conclusions must be translated into propositions about the real world, and these propositions or hypotheses must be compared to actual behaviour and experience, either by observation or statistical methods.⁵⁰

The Fama model assumes that investor expectations are homogeneous, companies and investors act rationally in their economic self-interest, and information is costless and freely available to all market participants.⁵¹ Fama acknowledged that investor expectations may differ to some degree, no company or investor acts entirely rationally, information is not costless, and information may not be available to all participants.⁵² He indicated that the goal of empirical

44 Ronald Gilson and Reinier Kraakman, 'The Mechanisms of Market Efficiency' (1984) 70 *Virginia Law Review* 549, 560; Andrew Lo (ed), *Market Efficiency: Stock Market Behaviour and Theory and Practice* (Edward Elgar Publishing, 1997) vol 1, xvii; Donald Langevoort, 'Revisiting Gilson and Kraakman's Efficiency Story' (2003) 28 *Journal of Corporation Law* 499, 500.

45 D Craig Nichols and James Wahlen, 'How Do Earnings Numbers Relate to Stock Returns? A Review of Classic Accounting Research with Updated Evidence' (2004) 18 *Accounting Horizons* 263, 270.

46 Ibid 281.

47 Richard Posner, *Economic Analysis of Law* (Aspen, 6th ed, 2003) 17. See also Guido Calabresi and A Douglas Melamed, 'Property Rules, Liability Rules and Inalienability: One View of the Cathedral' (1972) 85 *Harvard Law Review* 1089, 1128.

48 Posner, above n 47, 17. See also Karl L Popper, *The Logic of Scientific Discovery* (Hutchinson, 1959). Popper argues that a 'theory' is a net 'cast to catch ... "the world"; to rationalize, to explain, and to master it': at 59.

49 Joel Seligman, 'The Historical Need for a Mandatory Corporate Disclosure System' (1983) 9 *Journal of Corporation Law* 1, 9.

50 Posner, above n 47, 17.

51 Fama, above n 2, 387–8.

52 Ibid 388.

work was to examine the extent to which the model assumptions applied in real world markets.⁵³ Empirical studies on efficiency in markets, including empirical tests of the ECMH, are outlined in Part III.

C Criticisms of the ECMH

In 1978, Jensen boldly stated that ‘there is no other proposition in economics which has more solid empirical evidence supporting it than the Efficient Market Hypothesis.’⁵⁴ However, as the Turner Review highlighted and the 2010 ASIC Summer School emphasised, a growing number of parties question the validity of the ECMH on theoretical and empirical grounds. Some critics point to the bodies of empirical research that identify short-term inefficiencies, whilst others question the assumptions underpinning the ECMH, including the rational investor assumption, the use of the capital asset pricing model for testing, and the extent of alignment between price, market and allocative efficiency.

1 *The Capital Asset Pricing Model*

Fama admits that ‘market efficiency per se is not testable. It must be tested jointly with some model of equilibrium, [such as] an asset-pricing model’.⁵⁵ The asset-pricing model generally used in conjunction with the ECMH is the Capital Asset Pricing Model (‘CAPM’). The CAPM is a measurement of expected risk for a stock added to a well-diversified portfolio. This model assumes that investors rationally adopt a fundamental valuation approach to individual security investments and they seek to minimise portfolio risk through diversification. It posits that shares will earn the risk-free rate of return plus a risk premium. The risk premium only applies to the element of risk in the portfolio that cannot be eliminated by diversification, or the specific risk of an individual investment. The specific risk represents the component of the return that is uncorrelated with general market moves. The non-diversifiable risk element is known as the market or systematic risk. There are significant issues with the CAPM as an accurate model of how markets work in practice.⁵⁶ Beta is used as the measure of the volatility or systematic risk of a security or a portfolio in comparison to the market as a whole. This measure is generally based on historical volatility, which is often a poor predictor of the future. Thus, some

53 Ibid 388.

54 Michael Jensen, ‘Some Anomalous Evidence Requiring Market Efficiency’ (1978) 6 *Journal of Financial Economics* 95, 95.

55 Fama, above n 2, 387–8; Eugene Fama, ‘Efficient Capital Markets: II’ (1991) 46 *Journal of Finance* 1575, 1575–6.

56 Jeffrey Gordon and Lewis Kornhauser, ‘Efficient Markets, Costly Information and Securities Research’ (1985) 60 *New York University Law Review* 761, 785; James Patell, ‘Discussion on the Usefulness of Earnings and Earning Research: Lesson and Directions from Two Decades of Empirical Research’ (1989) 27 *Journal of Accounting Research* 193, 197.

parties question the appropriateness of beta to determine the risk of an investment or portfolio.⁵⁷

There are many price moving mechanisms within markets that are complex and inter-related making it difficult for market participants to acquire, understand and trade on all available relevant securities information.⁵⁸ Some parties suggest it would be more efficient if all investors put their monies into index funds or funds that reflect the total market or selected index movements. Investment in an index fund means that investors are still exposed to market or systematic risk but not company specific risk.⁵⁹ However, '[m]arkets do not become efficient automatically. It is the actions of investors, sensing bargains and putting into effect schemes to beat the market, that make the markets efficient'.⁶⁰ A market only remains efficient if there are sufficient market participants who act as though it is not and who continue to engage in the necessary research to ensure the market's efficiency. In practice, investors can only earn a return on their research if the market is sufficiently inefficient.⁶¹ In other words, there 'is a fundamental conflict between the efficiency with which markets spread information and the incentives to acquire information'.⁶² While various theories or approaches are proposed to reconcile this conflict,⁶³ the research and informational paradoxes remain. The links or relationships between access to information, analysis of information, the production of research, and achievement of market and allocative efficiency, are difficult to determine or measure.⁶⁴ The questions of how many investors are needed to continue to engage in market and security valuation analysis to ensure a market remains optimally efficient, how much research is required, and what type of research, have not been resolved. The impacts of specific research strategies on efficiency in markets are still poorly understood.⁶⁵

57 Janet Lowe, *Warren Buffett Speaks* (John Wiley & Sons, 1997) 160; Seth Klarman, 'A Response to Lowenstein's Searching for Rational Investors in a Perfect Storm' (2005) 30 *Journal of Corporation Law* 561, 561.

58 Gilson and Kraakman, above n 44.

59 Many investors invest on an index basis, particularly in the US.

60 Aswath Damodaran, *Investment Valuation: Tools And Techniques For Determining The Value Of Any Asset* (John Wiley & Sons, 1996) 149.

61 Edmund Kitch 'The Law and Economics of Rights in Valuable Information' (1980) 9 *Journal of Legal Studies* 683 708, 711; John Barry, 'The Economics of Outside Information and Rule 10b-5' (1981) 129 *University of Pennsylvania Law Review* 1307, 1333.

62 Sanford Grossman and Joseph Stiglitz, 'On The Impossibility of Informationally Efficient Markets' (1980) 70 *American Economic Review* 393, 405.

63 See, eg, *ibid* 393. Grossman and Stiglitz suggest that a perfectly efficient market is an impossibility because there is no incentive for arbitrageurs or investors to acquire information. They therefore redefine the efficient market concept and provide a model in which there is an 'equilibrium degree of disequilibrium'. Under this model, security prices only partially reflect available information, leaving sufficient price uncertainty for investors to earn a return to compensate them for resources spent to obtain information. They argue that the price uncertainty arises due to noise interference.

64 Ian Lee, 'Fairness and Insider Trading' (2002) 1 *Columbia Business Law Review* 119, 175; Kenneth Boudreaux, 'Competitive Rates, Market Efficiency, and the Economics of Security Analysis' (1975) 31 *Financial Analysts Journal* 18, 22.

65 Gordon and Kornhauser, above n 56, 792.

2 Rational Investor Assumption

Scholars have long highlighted issues with the ECMH assumption that investors optimise their economic position on a self-interested basis. In 1936 Keynes described the stock market as a beauty contest in which one wins by ‘anticipating what average opinion expects the average opinion to be.’⁶⁶ Some behavioral economists suggest that investors are often, if not always, irrational in a predictive way.⁶⁷ They argue that most people tend to overreact to unexpected and dramatic news events.⁶⁸ Others argue that ‘there is no fundamental psychological principle that people always tend to over-react or ... underreact’.⁶⁹ Thaler and Sunstein describe the assumption that almost all people, almost all of the time, make choices that are in their best interests as false.⁷⁰

Some scholars claim that certain groups of investors are more prone to irrational trading than others. However, as Hirshleifer highlights, ‘man is neither infinite in faculties, nor in apprehension like a god. Nor is fallibility shed at the doorstep of the stock exchange’.⁷¹ None of us act entirely rationally at all times.⁷²

3 Misalignment Between Market and Allocative Efficiency

Capital markets impact on the real economy through, first, the inclusion of savings or investments in the national income and secondly, the market processes that allocate the capital to companies for production or investment.⁷³ Allocative efficiency depends on optimal real capital or investment decisions.⁷⁴ However, there are sometimes significant discrepancies for long periods of time between price, market and allocative efficiency measures.

Markets are generally acknowledged to be fundamentally efficient

if stock prices respond to available information not only quickly but *accurately*, so that market prices mirror the best possible estimates, in light of all available information, of the actual economic value of securities in terms of their expected risks and returns.⁷⁵

66 John Maynard Keynes, *The General Theory of Employment, Interest and Money* (Macmillan, 1936) 156.

67 Lo, above n 44, 7.

68 Werner De Bondt and Richard Thaler, ‘Does the Stock Market Overreact?’ (1985) 40 *Journal of Finance* 793; Werner De Bondt and Richard Thaler, ‘Further Evidence On Investor Overreaction And Stock Market Seasonality’ (1987) 42 *Journal of Finance* 557.

69 Shiller, above n 28, 101–2.

70 Richard H Thaler and Cass R Sunstein, *Nudge: Improving Decisions about Health, Wealth and Happiness* (Yale University Press, 2008) 9.

71 David Hirshleifer, ‘Investor Psychology and Asset Pricing’ (2001) 56 *Journal of Finance* 1533, 1576.

72 Kahneman, a Nobel prize-winning economist, argues that business decision makers are not always rational. He indicates that ‘businesses do not invest in trying to figure out what they’ve done wrong. This is not an accident. They do not want to know’: Michael Schrage, ‘Daniel Kahneman: Thought Leader Interview’ (2003) 33 *Strategy+Business* 125. Similarly, Choi and Pritchard argues that regulators as well as investors suffer from cognitive failings and behavioural biases: Stephen Choi and AC Pritchard, ‘Behavioral Economics and the SEC’ (2003) 56 *Stanford Law Review* 1, 72.

73 Irwin Friend, ‘The Economic Consequences of the Stock Market’ (1972) 62 *American Economic Review* 212, 212.

74 Ibid 213.

75 William Sharpe, ‘Efficient Capital Markets: A Review of Theory and Empirical Work’ (1970) 25 *Journal of Finance* 418, 418.

Fundamental efficiency may be achieved ‘when there are large numbers of rational, profit-maximisers actively competing with each other to predict future market values of individual securities’.⁷⁶ However, there are many reasons ‘why stock prices deviate from their fundamental value: lack of information, misassessment of information, speculative trading, and liquidity crunches’.⁷⁷ Security price inaccuracies may result from short-termism, excess market volatility, random short-run inaccuracies, industry-wide inaccuracies or systematic discounts.⁷⁸

Few experienced market practitioners assert that security prices are always or even consistently fundamentally efficient on a short-term basis. However, individual security and market returns over long periods tend to be steadier than short-term price volatility suggests, reflecting an eventual move back towards alignment between security prices and their underlying economic values.⁷⁹ As McHugh J indicated in *Gambotto v WCP Ltd*,⁸⁰ ‘in the long term the share price of a company will reflect its fundamental earnings capacity or value’.⁸¹ However, the intrinsic value of a company can remain unnoticed by the market for long periods of time. Share prices are far more volatile than the underlying assets that they represent because ‘[t]he “herd mentality” exists in the stock market as in other areas of life’.⁸²

As previously outlined, Fama specifically called for empirical testing of the assumptions underlying the ECMH.⁸³ In an ideal world, all aspects of efficiency in capital markets would be empirically tested using scientific or statistically approved techniques to ensure credibility. In Part II, we outline and discuss econometric and observational studies on efficiency in markets, including tests of the ECMH.

76 Scott Russell, ‘Regulation Fair Disclosure: The Death of the Efficient Capital Market Hypothesis and the Birth of Herd Behaviour’ (2002) 82 *Boston University Law Review* 527, 550. Some academics use the term intrinsic value rather than fundamental value. For example, Dodd and Cottle viewed efficiency in terms of deviations from ‘intrinsic’ value: Benjamin Graham, David Dodd and Sidney Cottle, *Security Analysis, Principles and Techniques* (McGraw-Hill, 4th ed, 1962). Intrinsic value can be defined in a number of ways but is generally close to, or synonymous with, fundamental value.

77 Marcel Kahan, ‘Securities Law and the Social Costs of “Inaccurate” Stock Prices’ (1992) 41 *Duke Law Journal* 977, 988.

78 Ibid 994–7.

79 See, eg, Tim Brailsford, John Handley and Krishnan Maheswaran, ‘Re-examination of the Historical Equity Risk Premium In Australia’ (2008) 48 *Accounting and Finance* 73, 87.

80 (1995) 182 CLR 432 (*‘Gambotto’*).

81 Ibid 18. *Gambotto* is the only case law the authors could find in Australia that directly discusses efficiency in capital markets. Seminal commentary on the fairness and efficiency rationales underpinning the insider trading regime is provided in *R v Firms* (2001) 38 ACSR 223. The majority (Mason P and Hidden J) indicated that the equal access and market efficiency rationales are in conflict. We suggest in other papers that conflict between the dual rationales only arises when the adopted efficiency rationale is short-term price efficiency. See North, ‘A Re-Examination of the Marine Efficiency Theory’, above n 9; North, ‘The Insider Trading Generally Available and Materiality Carve-Outs’, above n 9.

82 *Gambotto* (1995) 182 CLR 432, 458.

83 See Fama, above n 2, 388.

III EMPIRICAL AND OBERVATIONAL EVIDENCE ON EFFICIENCY WITHIN MARKETS

There are many bodies of empirical research that examine the efficiency of markets. However, it is important to understand the strengths and limitations of scholarly empirical designs. Empirical studies on efficiency in markets generally examine whether, and the extent to which, narrowly defined proxies of efficiency hold under specified conditions. Most of this empirical testing uses econometric or statistical methodologies. Proxies used as efficiency measures include the speed and accuracy of price adjustment to new information,⁸⁴ liquidity,⁸⁵ spreads,⁸⁶ volatility,⁸⁷ transaction costs,⁸⁸ and the inability to earn persistent abnormal returns.⁸⁹

A Security Price Efficiency

There are many empirical studies that examine how quickly new information is incorporated into security prices. This research is closely aligned to the Fama ECMH. These studies are usually designed as event studies around earnings releases. The tests generally compare the returns of the securities directly effected by the earnings release against other comparable securities, for specified periods before and after the release, to assess whether the information was already reflected in the security price by the time the release was made.

Seminal research by Brown and Ball in the 1960s found that the market anticipated company earnings throughout an entire year.⁹⁰ By the time the actual profit was announced, about 85 per cent of the adjustment was incorporated within the share price, and by the time the annual report was released, the share price fully reflected its content.⁹¹ These findings have been confirmed in subsequent studies. An updated study found a pattern of adjusting share prices over the year, with a strong correlation between annual stock returns and income

84 See, eg, Catherine Woodruff and AJ Senchack Jr, 'Intradaily Price-Volume Adjustments of NYSE Stocks to Unexpected Earnings' (1988) 43 *Journal of Finance* 467; Paul Mahoney, 'Market Microstructure and Market Efficiency' (2003) 28 *Journal of Corporation Law* 541, 549.

85 See, Carole Comerton-Forde et al, 'Time Variation in Liquidity: The Role of Market-Maker Inventories and Revenues' (2010) 65 *Journal of Finance* 295; Allaudeen Hameed, Wenjin Kang and S Viswanathan, 'Stock Market Declines and Liquidity' (2010) 65 *Journal of Finance* 257.

86 See, eg, Lawrence Glosten and Lawrence Harris, 'Estimating the Components of the Bid/Ask Spread' (1988) 21 *Journal of Financial Economics* 123.

87 See, eg, Brian Bushee and Christopher Noe, 'Corporate Disclosure Practices, Institutional Investors, and Stock Return Volatility' (2000) 38 *Journal of Accounting Research* 171, 200; John Campbell et al, 'Have Individual Stocks Become More Volatile? An Empirical Exploration of Idiosyncratic Risk' (2001) 61 *Journal of Finance* 1.

88 See, eg, Louis Chan and Josef Lakonishok, 'Institutional Trades and Intraday Stock Price Behaviour' (1993) 33 *Journal of Financial Economics* 173.

89 See, eg, Jeffrey Busse, Amit Goyal and Sunil Wahal, 'Performance and Persistence in Institutional Investment Management' (2010) 65 *Journal of Finance* 765.

90 Ray Ball and Philip Brown, 'An Empirical Evaluation of Accounting Income Numbers' (1968) 6 *Journal of Accounting Research* 159, 176.

91 *Ibid* 176.

changes.⁹² This area of empirical research suggests that information disclosed by companies to some investors is generally quickly absorbed into security prices.

Some parties argue that uninformed or unsophisticated investors do not require the protection of mandatory disclosure because they are protected by the efficiency of the market.⁹³ However, there is general consensus that developed capital markets are either semi-strong form or weakly efficient.⁹⁴ In markets that are semi-strong or weak form efficient, uninformed investors are not protected in trades where the counterparty has private information.⁹⁵

B Short-term Anomalies or Inefficiencies

Critics of the ECMH point to the many bodies of empirical research that identify short-term inefficiencies (commonly referred to as anomalies). For instance, one area of research suggests that markets are sometimes slow to fully reflect company earnings announcements. This phenomenon is commonly referred to as post-earnings announcement drift.⁹⁶ Another body of work identifies evidence of security price volatility that suggest inefficiencies.⁹⁷ Other studies examine whether parties or entities are able to achieve performance significantly different from the market.⁹⁸ These performance tests were referred to by some of the 2010 ASIC Summer School presenters.⁹⁹

The efficient markets theory assumes that investors cannot outperform the market over the long run. Most empirical studies confirm this hypothesis. Early studies in the US concluded that fund managers and analysts were not able to earn returns above the general performance of the market.¹⁰⁰ Later research found

92 See, eg, Nichols and Wahlen, above n 45, 263, 265.

93 Frank Easterbrook and Daniel Fischel, 'Mandatory Disclosure and the Protection of Investors' (1984) 70 *Virginia Law Review* 669, 693–4; Christopher Donald, 'A Critique of Arguments for Mandatory Continuous Disclosure' (1999) 62 *Saskatchewan Law Review* 85, 112–55; Homer Kripke, *The SEC And Corporate Disclosure: Regulation In Search Of A Purpose* (Law and Business, 1979) 14–16, 284–6.

94 William Bratton and Michael Wachter, 'The Case Against Shareholder Empowerment' (2010) 158 *University of Pennsylvania Law Review* 653, 691.

95 When only some investors have valuable private information, it takes time for the relevant security price to incorporate the information. During this period, informed traders are trading against uninformed investors, who are not aware of the private information and who generally have no means of knowing the other party is better informed.

96 See, eg, Ross Watts, 'Systematic "Abnormal Returns" After Quarterly Earnings Announcements' (1978) *Journal of Financial Economics* 127; Victor Bernard and Jacob Thomas, 'Post-Earnings-Announcement Drift: Delayed Price Response or Risk Premium?' (1989) 27 *Journal of Accounting Research* 1, 5.

97 Guy Charest, 'Dividend Information, Stock Returns and Market Efficiency' (1978) 6 *Journal of Financial Economics* 297. See also Robert Shiller, 'Market Volatility and Investor Behavior' (1990) 80 *American Economic Review* 58.

98 See, eg, Christopher Barry and Stephen Brown, 'Differential Information and the Small Firm Effect' (1984) 13 *Journal of Financial Economics* 283; Hemang Desai, Bing Liang and Ajai Singh, 'Do All-Stars Shine? Evaluation of Analyst Recommendations' (2000) 56 *Financial Analysts Journal* 20, 20; Joshua Coval, David Hirshleifer and Tyler Shumway, 'Can Individual Investors Beat the Market?' (Working Paper 04–025, Harvard University, September 2005).

99 See outlined comments from Larrain and Harper in Part I: ASIC, above n 12.

100 See, eg, Irwin Friend and Douglas Vickers, 'Portfolio Selection and Investment Performance' (1965) 20 *Journal of Finance* 391; JG Cragg and Burton Malkiel, 'The Consensus and Accuracy of Some Predictions of the Growth of Corporate Earnings' (1968) 23 *Journal of Finance* 67.

some evidence of persistence,¹⁰¹ however, more recent studies explain this outperformance as expense ratios and stock return momentum.¹⁰²

Nevertheless, there is international research indicating that some investors are able to achieve persistent outperformance.¹⁰³ Similarly, Australian studies indicate that while most institutional funds are unable to earn superior risk-adjusted returns,¹⁰⁴ some individual managers achieve excess returns.¹⁰⁵

C Rational and Irrational Trading Activity

Another growing area of empirical research seeks to identify whether, and the extent to which, investors act rationally within markets. These studies confirm that investors are heavily influenced by behavioural trends. The type of market activity underlying the behavioural models is important among all investor groups, including professionals.¹⁰⁶ Shiller highlights that the distinction between zealots and smart money is not always sharp. Instead, 'there are ... gradations in between, especially since the objective evidence about the fundamental value of individual stocks is somewhat ambiguous'.¹⁰⁷

Empirical research confirms that investors may be overconfident,¹⁰⁸ prone to overreact,¹⁰⁹ loss averse,¹¹⁰ subject to herding,¹¹¹ incapable of assessing

101 See, eg, Bruce Lehmann and David Modest, 'Mutual Fund Performance Evaluation: A Comparison of Benchmarks and a Benchmark of Comparisons' (1987) 42 *Journal of Finance* 233; Mark Grinblatt and Sheridan Titman, 'The Persistence of Mutual Fund Performance' (1992) 47 *Journal of Finance* 1977; Darryl Hendricks, Jayendu Patel and Richard Zeckhauser, 'Hot Hands in Mutual Funds: The Persistence of Performance 1974–1988' (1993) 48 *Journal of Finance* 93.

102 Mark Carhart, 'On Persistence in Mutual Fund Performance' (1997) 52 *Journal of Finance* 57; Busse, Goyal and Wahal, above n 89.

103 Desai, Liang and Singh, above n 98, 20; Coval, Hirshleifer and Shumway, above n 98; Ravi Jagannathan, Alexey Malakhov and Dmitry Novikov, 'Do Hot Hands Exist among Hedge Fund Managers? An Empirical Evaluation' (2010) 65 *Journal of Finance* 217.

104 Ron Bird, Helen Chin and Michael McCrae, 'The Performance of Australian Superannuation Funds' (1983) 8 *Australian Journal of Management* 49; Terence Hallahan and Robert Faff, 'An Examination of Australian Equity Trusts for Selectivity and Market Timing Performance' (1999) 9 *Journal of Multinational Financial Management* 387.

105 See, eg, David Gallagher, 'Investment Manager Characteristics, Strategy, Top Management Changes and Fund Performance' (2003) 43 *Accounting and Finance* 283; Ray da Silva Rosa, 'The Efficacy of Active and Passive Investment Strategies among Institutional and Retail Funds' (Working Paper, University of Sydney, 2007).

106 See, eg, Shiller, above n 28; Nicole Choi and Richard Sias, 'Institutional Industry Herding' (2009) 94 *Journal of Financial Economics* 469.

107 Shiller, above n 28, 98.

108 Brad Barber and Terrance Odean, 'Online Investors: Do the Slow Die First?' (2002) 15 *Review of Financial Studies* 455; Andy Chui, Sheridan Titman and KC John Wei, 'Individualism and Momentum Around the World' (2010) 65 *Journal of Finance* 361.

109 See, eg, Werner De Bondt and Richard Thaler, 'Further Evidence On Investor Overreaction And Stock Market Seasonality' (1987) 42 *Journal of Finance* 557; Daniel Kent, David Hirshleifer and Avanidhar Subrahmanyam, 'Investor Psychology and Security Market Under and Overreactions' (1998) 53 *Journal of Finance* 1839.

110 See, eg, Shlomo Benartzi and Richard Thaler, 'Myopic Loss Aversion and the Equity Premium Puzzle' (1995) 110 *Quarterly Journal of Economics* 73; Stephen Bainbridge, 'Contemporary Issues in the Law of Business Organizations: Mandatory Disclosure: A Behavioural Analysis' (2000) 68 *University of Cincinnati Law Review* 1023, 1047.

probabilities,¹¹² subject to regret,¹¹³ biased towards past behaviour or the status quo,¹¹⁴ or subject to fads.¹¹⁵ There is also evidence that cultural biases have a significant effect on stock return patterns.¹¹⁶ Investor overconfidence can lead to reduced returns, excess volatility and stock mispricing.¹¹⁷ Trading on noise can also result in lower returns.¹¹⁸ Those who believe that markets are significantly influenced by noise and investor psychology point to market bubbles and crashes as examples of inefficiencies based on non-fundamental signals.¹¹⁹

D Alignment between Price, Market and Allocative Efficiency

As previously highlighted, optimal price, market and allocative efficiency are not always aligned. At any point in time, price efficiency may or may not be aligned with optimal market efficiency and the degree of market efficiency may or may not reflect optimal allocative efficiency. The price of an individual security may be a poor reflection of the underlying value of the security for many reasons.¹²⁰ Moreover, the prices across a market do not always reflect real economic values.

Most of the regression based empirical research, which examines specific efficiency characteristics and determinants, does not comment on efficiency effects across an *entire* market or economy because of the difficulties or dangers in doing so. The endogeneity of the variables means that tests designed to measure efficiency determinants over the entire market are inherently ambiguous. That is, the efficiency proxies are interrelated and it is often not possible to accurately separate out and ‘test’ for efficiency effects across a full market on a controlled basis.

The most significant measure adopted as a proxy of market efficiency is cost of capital or the cost paid by listed companies to raise new capital. There is a significant and growing body of empirical research that associates or links

-
- 111 Gur Huberman and Tomer Regev, ‘Contagious Speculation and a Cure for Cancer: A Non-Event that Made Stock Prices Soar’ (2001) 56 *Journal of Finance* 387; Choi and Sias, above n 106. Herding behaviour occurs when a decision maker imitates the actions of others, while ignoring his or her own information and judgment with regard to the merits of the underlying decision.
 - 112 David Laibson, ‘Golden Eggs and Hyperbolic Discounting’ (1997) 112 *Quarterly Journal of Economics* 443.
 - 113 Roger Clarke, Scott Krase and Meir Statman, ‘Tracking Errors, Regret and Tactical Asset Allocation’ (1994) 20 *Journal of Portfolio Management* 16.
 - 114 Bainbridge, above n 110, 1041–4.
 - 115 Choi and Pritchard, above n 72, 72; David Hirshleifer, ‘Investor Psychology and Asset Pricing’ (2001) 56 *Journal of Finance* 1533, 1576; Bainbridge, above n 110, 1040.
 - 116 Chui, Titman and Wei, above n 108.
 - 117 Kent, Hirshleifer and Subrahmanyam, above n 109, 1867.
 - 118 Andrei Shleifer and Lawrence Summers, ‘The Noise Trader Approach in Finance’ (1990) 4(2) *Journal of Economic Perspective* 19.
 - 119 Joseph Stiglitz, ‘Symposium on Bubble’ (1990) 4(2) *Journal of Economic Perspective* 13, 17; Shleifer and Summers, above n 118, 19.
 - 120 Gordon and Kornhauser, above n 56, 769; Kassouf, above n 6, 424.

reductions in information asymmetry with lower costs of capital.¹²¹ One stream of empirical research links the reductions in information asymmetry and lower cost of equity capital with a reduction in investors' estimation risks. Another stream links reductions in information asymmetry and a lower cost of equity capital with reduced transaction costs or increased liquidity.¹²² There are difficulties associated with all of the established measures of cost of capital that are not easily resolved. Nevertheless, it is suggested that while individual studies on cost of capital are not perfect, 'the bulk of the literature suggests that greater disclosure reduces the cost of equity capital'.¹²³ This analysis confirms the importance of the Fama assumption of transparent company disclosure to market efficiency outcomes.

The link from capital markets to allocative efficiency is not easy to empirically test and there are weaknesses in all of the models used. The greatest value of applied empirical research comes from analysis across bodies of work and the search for consistent indicators across a wide range of models and assumptions.

Some finance, economic and business scholars use global comparative studies and examine characteristics of individual countries and markets that point towards enhanced allocative efficiency. A study by Wurgler across 65 countries concluded that financial markets appear to improve the allocation of real capital.¹²⁴ He found that countries with developed markets had increased investment in their growing industries and, conversely, decreased investment in their declining industries compared to those with undeveloped markets.¹²⁵ A more recent study by Francis et al suggests that a country's corporate transparency environment contributes to efficient resource allocation.¹²⁶ Francis et al argue that transparency improves firms' access to lower cost external financing, contributes to more informative stock prices and plays an important governance role by allowing greater monitoring by outside investors. Their findings suggest 'an improved information environment may enhance intersectoral asset allocation, irrespective of other underlying country characteristics and institutions'.¹²⁷

121 See, eg, Christian Leuz and Robert Verrecchia, 'The Economic Consequences of Increased Disclosure' (2000) 38 *Journal of Accounting Research* 91, 121; David Easley and Maureen O'Hara, 'Information and the Cost of Capital' (2004) 59 *Journal of Finance* 1553, 1553, 1555–6, 1578; Christine Botosan, 'Disclosure and the Cost of Capital: What Do We Know?' (2006) *Accounting and Business Research International Accounting Policy Forum* 31, 39; Richard Lambert, Christian Leuz and Robert Verrecchia, 'Information Asymmetry, Information Precision, and the Cost of Capital' (Working Paper No 14881, National Bureau of Economic Research, April 2009).

122 Botosan, above n 121.

123 Ibid 31.

124 Jeffrey Wurgler, 'Financial Markets And The Allocation Of Capital' (2000) 58 *Journal of Financial Economics* 187.

125 Ibid 187, 209–10.

126 Jennifer Francis et al, 'Does Corporate Transparency Contribute to Efficient Resource Allocation?' (2009) 47 *Journal of Accounting Research* 943.

127 Ibid 982.

Empirical evidence from finance scholars suggests public trust is an important factor underlying stock market participation.¹²⁸ This is confirmed in the global securities market research. La Porta et al have carried out a series of studies over the last decade. In the earlier research, they found evidence suggesting that countries with better investor protection, measured by the character of the legal rules and the quality of law enforcement, have more valuable markets, larger numbers of listed securities per capita, and a higher rate of initial public offering activity than do countries with worse investor protection.¹²⁹ They suggest that companies in countries with greater minority shareholder protection are valued more highly.¹³⁰ In a later study, they found evidence suggesting that laws in a country mandating disclosure and facilitating private enforcement through liability rules benefit the stock market.¹³¹ La Porta et al indicate that the answer to the question of whether securities laws matter is a definite yes. They assert that '[f]inancial markets do not prosper when left to market forces alone ... [E]xtensive disclosure requirements and standards of liability facilitating investor recovery of losses are associated with larger stock markets'.¹³² They suggest these results 'point to the importance of regulating the agency conflict between controlling shareholders and outside investors to further the development of capital markets'.¹³³

Jackson and Roe, both Harvard law professors, found that 'financial depth regularly, significantly and robustly correlates with stronger public enforcement'.¹³⁴ The study results showed a robust relationship between the intensity of public enforcement and the size of a country's capital markets. Disclosure was also shown to be a significant factor.¹³⁵ They conclude that

public enforcement is overall as important as disclosure in explaining financial market outcomes around the world and more important than private liability rules. Hence, policy makers who reject public enforcement as useful for financial market development are ignoring the best currently available evidence.¹³⁶

128 Luigi Guiso, Paola Sapienza and Luigi Zingales, 'Trusting the Stock Market' (2008) 63 *Journal of Finance* 2557.

129 Rafael La Porta et al, 'Legal Determinants of External Finance' (1997) 52 *Journal of Finance* 1131, 1131. See also Rafael La Porta et al, 'Law and Finance' (1998) 106 *Journal of Political Economy* 1113, 1152.

130 Rafael La Porta et al, 'Investor Protection and Corporate Valuation' (2002) 62 *Journal of Finance* 1147, 1166–9.

131 Rafael La Porta, Florencio Lopez-de-Silanos and Andrei Shleifer, 'What Works in Securities Laws?' (2006) 61 *Journal of Finance* 1, 1, 27–8.

132 Ibid 27.

133 Ibid 28. See also, Stephen Choi, 'Law, Finance, and Path Dependence: Developing Strong Securities Markets' (2002) 80 *Texas Law Review* 1657, 1726; Brian Cheffins, 'Law As Bedrock: The Foundations of an Economy Dominated By Widely Held Public Companies' (2003) 23 *Oxford Journal of Legal Studies* 1.

134 Howell Jackson and Mark Roe, 'Public and Private Enforcement of Securities Laws: Resource-Based Evidence' (2009) 93 *Journal of Financial Economics* 207, 207.

135 Ibid 236. The authors indicate that evidence supports the view that public regulation plays an important role in setting the institutional foundation for securities markets.

136 Ibid 207.

These studies and other similar empirical research confirm that capital markets have the potential to allocate scarce capital efficiently. They suggest that carefully designed regulation can enhance allocative efficiency by promoting the Fama assumptions of full disclosure and open and competitive markets. Importantly, they also suggest the need for strong public enforcement of securities and financial market regulation. In other words, this body of research suggests that the guiding belief underpinning some regulatory and scholarly frameworks about capital markets, that markets will perform best with minimal regulatory interference, is simply wrong.

Nevertheless, markets experience periods of boom and bust where security valuations move away from fundamental valuation trend lines.¹³⁷ Arguably, the likelihood and potential extent of misalignment of these cycles have increased in contemporary markets. Total market trading has always included primary trading around new capital raisings as well as secondary trading of existing securities. There is an indirect connection between trading on secondary issues and new capital raisings because parties infer information for and about investment decisions from stock prices.¹³⁸ However, the amounts traded on capital markets around the globe (particularly trading in the form of derivative instruments) have increased dramatically over the last 20 years. Empirical data on market trading levels and underlying economic activity varies depending on the precise nature of the figures used. However, trading levels are astounding by any measure. Schulmeister indicates that the ratio of the volume of financial transactions relative to nominal world GDP in 2007 was 75.3, compared to 15.3 in 1990.¹³⁹ He suggests this change is exclusively due to the boom in trading in derivatives because spot transactions of stocks, bonds and foreign exchange grew roughly in line with nominal world GDP.¹⁴⁰ Schulmeister argues that 'the volume of derivative transactions is just much too big to be accounted for by hedging'¹⁴¹ and observations of the trading patterns including the high levels of technical trading

suggest that financial markets are characterized by excessive liquidity and by excessive volatility of prices over the short run as well as over the long run ... Strong and persistent deviations of asset prices from their fundamental equilibria ('overshooting') are rather the rule than the exception.¹⁴²

137 See, eg, Stephan Schulmeister, 'Boom-Bust Cycles and Trading Practices in Asset Markets, the Real Economy and the Effects of a Financial Transaction Tax' (Working Paper 364, Austrian Institute of Economic Research, March 2010); Stiglitz, above n 119, 17.

138 James Dow and Gary Gorton, 'Stock Market Efficiency and Economic Efficiency: Is there a Connection?' (1997) 52 *Journal of Finance* 1087, 1115.

139 Stephan Schulmeister, 'A General Financial Transactions Tax: A Short Cut of the Pros, the Cons and a Proposal' (Working Paper No 344, Austrian Institute of Economic Research, October 2009) 5.

140 Ibid 5.

141 Ibid 8.

142 Ibid 7.

E Empirical Evidence on Efficiency: Summary

Empirical research on efficiency provides valuable evidence to support the debates on efficiency in markets and capital market policy. However, empirical evidence needs to be cited with care. Empirical studies require defined assumptions and proxies, and the credibility and relevance of individual studies depend on the accuracy and relevance of the selected model and assumptions. Efficiency proxies as measured within a narrowly defined study may or may not effect efficiency across an entire market and may or may not effect allocative efficiency. For instance, the studies that suggest that security prices quickly absorb information (including private and public information) do not fully explain whether markets are optimally efficient or real capital is allocated efficiently.

In addition, empirical research efficiency proxies are highly interdependent. Improvement in one proxy in specified circumstances may be negated by reductions in other efficiency measures. For example, if transaction costs and ease of transacting are selected as the efficiency proxies, markets have become far more efficient over time.¹⁴³ However, the reduction in transaction costs and the enhanced ability to transact may have had negative impacts on other efficiency measures such as volatility and price accuracy.

The time period over which efficiency is measured is very important.¹⁴⁴ Short-term improvements in specified efficiency proxies may be negated over longer periods of time. Much of the short-term growth created from market activity during the 1990s was not economically efficient in light of the enormous economic and human costs flowing from the GFC. Similarly, while insider trading may in some circumstances enhance short-term price accuracy and liquidity, empirical research suggests that any price efficiency gains arising from insider trading are likely to be outweighed over the long run by increases in market volatility¹⁴⁵ and reductions in other efficiency measures such as bid ask spreads, liquidity, price accuracy and capital costs.¹⁴⁶ Global research also suggests that countries with insider trading laws have greater liquidity in their markets, more accurate pricing, a lower cost of capital and higher economic returns.¹⁴⁷

143 Lawrence Summers and Victoria Summers, 'When Financial Markets Work Too Well: A Cautious Case For a Securities Transaction Tax' (1989) 3 *Journal of Financial Services Research* 261, 262, 264.

144 Kahan, above n 77, 981, 987, 994–1043.

145 Julian Du and Shang-jin Wei, 'Does Insider Trading Raise Market Volatility?' (2004) 114 *Economic Journal* 916, 916, 940.

146 Bradford Cornell and Erik Sirri, 'The Reaction of Investors and Stock Prices to Insider Trading' (1992) 47 *Journal of Finance* 1031, 1055; Raymond Fische and Michael Robe, 'The Impact of Illegal Insider Trading in Dealer and Specialist Markets: Evidence From a Natural Experiment' (2004) 71 *Journal of Financial Economics* 461, 461–2, 481.

147 Utpal Bhattacharya, Hazem Daouk and Michael Welker, 'The World Price of Earnings Opacity' (2003) 78 *Accounting Review* 641; Laura Beny, 'Do Insider Trading Laws Matter? Some Preliminary Comparative Evidence' (2005) 7 *American Law and Economics Review* 144; Laura Beny, 'Insider Trading Law and Stock Markets Around the World: An Empirical Contribution to Theoretical Law and Economics Debate' (2007) 32 *Journal of Corporation Law* 237.

Market conditions are also critical to efficiency measures. For instance, empirical studies indicate that liquidity responds asymmetrically to changes in asset market values. Liquidity decreases far more in conditions where market returns are decreasing than in positive markets.¹⁴⁸ Illiquidity issues are also subject to contagion. Research evidence is consistent with the view that market liquidity drops after very large market falls because the available collateral of market participants falls and many security holders are forced to sell, resulting in a lack of liquidity precisely when the market most needs it.¹⁴⁹

Broad analyses of the empirical studies on efficiency suggest that well developed financial markets improve the allocation of real capital. However, market participants do not act entirely rationally within markets and during some periods, this irrational behaviour can be widespread. Moreover, empirical studies point to short-term anomalies in various efficiency proxies. Empirical evidence on efficiency across entire markets is more complex. There is research that highlights periods when market valuations spike and move away from the underlying economic values or the fundamental valuation trend lines. There is some evidence of increased levels of market volatility.¹⁵⁰ There is also clear evidence of excessive levels of market trading relative to real world economic activity. These studies can be variously interpreted. However, in practice, long bull or bear cycles and excessive levels of trading and volatility not related to economic fundamentals diminish the signalling function and impede resource allocation.¹⁵¹

The empirical evidence on a combined basis suggests the Fama assumptions of homogeneous investor expectations, rational behaviour, costless information, and the ready availability of information often fail to reflect conditions in contemporary capital markets, particularly over short periods.

Given this empirical and observational evidence on efficiency in capital markets, how should policy makers respond? In the final part, we outline some broad principles.

IV POLICY RESPONSE

There are no easy policy mechanisms or responses to resolve or mitigate all market inefficiencies or failures. The Turner Report, 2010 ASIC Summer School presenters and Erskine suggest that policy and regulatory actions should take irrational market behaviour and agency issues into account. We agree in principle. However, practical measures to incorporate irrationality into policy decision-making processes are difficult to conceive and implement. All capital market participants are subject to irrational behaviour at times, including policy makers, regulators, companies and investors. Such behaviour is an inherent part

148 Hameed, Kang and Viswanathan, above n 85, 291.

149 Ibid.

150 See, eg, Summers and Summers, above n 143, 267–8.

151 Ibid; Du and Wei, above n 145, 916, 940.

of being human. None of us act like economic machines. Investor education, policy nudging,¹⁵² and disclosure policy may enhance rational investment decision-making. However, policy responses cannot counter all human biases and market behaviour driven by greed or fear.

In any event, precise definitions or models of rational and irrational market behaviour in markets remain elusive. Market behaviour defined as irrational by some parties is viewed as rational by others. For instance, there are sound reasons for most investors to herd. Coffee suggests that the primary motive of professional managers is to perform no worse than their major institutional rivals and this provides a strong incentive to herd.¹⁵³ Indeed, fund managers who are cautious or who prematurely respond to new information may under perform their rivals and may lose their jobs. During a market bubble, it is dangerous to be sane in an insane world.¹⁵⁴ Gilson and Kraakman suggest that herding behaviour may be defined as rational when professional investors play the momentum game in the hope that they can profit from noise trading. Such behaviour may enhance short-term profits and ensure job security, but may also result in speculative bubbles.¹⁵⁵ These arguments apply to all capital market participants and not just to professional investors. Investment against the trend, while sometimes profitable, can be costly for retail investors, particularly if less informed than their institutional counterparts.

Similarly, it is not easy for policy makers, regulators or scholars to raise the alarm during potential boom periods, and any that do raise the alarm may find that no one wants to listen. As Jane Diplock, the Chair of IOSCO suggests,

[w]hen everybody appears to be making money, and there's exuberance in the markets, it's extremely difficult to be the Jeremiah saying: 'Look, that's a cliff you're about to run over'. Nobody wants to hear that message, least of all politicians whose funds are perhaps being swollen by the very people making all this money.¹⁵⁶

Many parties prefer to comment after crisis events. Individuals, particularly those with positions and reputations to protect, do not want to be seen to have acted to stop the money rolling in or to be shown in hindsight to have made the wrong call. Nevertheless, even accepting human foibles and irrational behaviour, open and competitive markets are likely to continue to be the best available mechanism to optimise long-term allocative efficiency.

152 Thaler and Sunstein, above n 70, 6. Thaler and Sunstein define a nudge as 'any aspect of the choice architecture that alters people's behaviour in a predictable way without forbidding any options or significantly changing their economic incentives'. They suggest that people's lives can be improved and many of society's major problems can be assisted by properly deploying incentives and nudges.

153 John Coffee Jr, 'Gatekeeper Failure and Reform: The Challenge of Fashioning Relevant Reforms' (2004) 84 *Boston University Law Review* 301, 329. See also John C Coffee Jr, *Gatekeepers: The Professions and Corporate Governance* (Oxford University Press, 2006).

154 Coffee Jr, 'Gatekeeper Failure and Reform: The Challenge of Fashioning Relevant Reforms', above n 153, 329.

155 Ronald Gilson and Reinier Kraakman, 'The Mechanisms of Market Efficiency Twenty Years Later: The Hindsight Bias' (2003) 28 *Journal of Corporation Law* 715, 736–7.

156 ASIC, above n 12, 76.

The stated goal of the Fama efficient markets theory and the ECMH is allocative efficiency or the efficient allocation of real resources or capital. Fama made critical assumptions to ensure the connections or alignments between price, market and allocative efficiency. In his ideal market, every company understands its own and its competitors' economic cost of capital, and all investors are fully informed and can readily compare investment opportunities and the associated risks and returns across a market. The vigorous competition between fully informed companies and investors drives optimal transactions, capital costs and resource allocations. Such a market is likely to lead to competitive resource allocation. However, the ECMH does not explain how much or what information is required to enable a market to be efficient and doesn't distinguish between relevant price information and misinformation.¹⁵⁷

Assuming rational market participation, what happens when:

- information required for company and investor investment decisions is not available or only some participants are informed and others are not?
- information needed to assess the risks or returns of the investments is not available or the information that is available is not complete or transparent?
- the apparent or disclosed risk and returns don't reflect the true risks and returns of a capital investment to maturity?

In practice, companies and investors participate in markets primarily to optimise their profits. They generally try to do this through some form of competitive advantage. Ways to achieve such an advantage in financial markets include:

- devising new and innovative market products with higher margins;
- preventing or holding off imitators or new entrants as long as possible;
- being better informed than your competitor;
- developing structures to reduce risk or pass risk to other parties; and
- engaging in opaque, negligent or fraudulent disclosure of the product risks or returns.

In other words, economically rational behaviour by market participants sometimes involves the creation or maintenance of information asymmetry and conduct to reduce competition and market transparency. Long time market observers see repeated use of these approaches over time and across the globe. Market participants inevitably push at the boundaries of any regulation enacted. During boom times, when it seems there is an abundance of quick easy money to be made, these boundaries are more readily crossed.

The financial crisis has starkly reminded us that the health of modern markets, real economies and people's lives are closely interconnected. When market and public scrutiny controls are not operating effectively, the economic

¹⁵⁷ Friend, above n 73, 212.

and human consequences can be huge. The drive to make money in markets is a double-edged sword. Profit incentives and greed are needed to drive markets, but at the same time, conflicts of interest and institutional and individual incentives that are not aligned with the public interest must be checked or controlled to keep the market optimally efficient.¹⁵⁸ There are many company, institutional and individual incentives and efficiencies in markets and economies.¹⁵⁹ The real question for policy makers concerns the extent to which management, institutional or individual incentives and efficiencies align with the incentives and efficiencies that serve the long-term economic interests of the nation. Sustainable policy must serve the public interest rather than the efficiency or profit interests of only some market participants such as financial institutions.

Lord Turner, the Chairman of the FSA¹⁶⁰ and the Turner Review process, argues that the City of London has grown ‘beyond a reasonable size ... [and] some of it is socially useless activity’.¹⁶¹ He suggests that

parts of the financial services industries need to reflect deeply on their role in the economy, and to recommit to a focus on their essential and economic functions ... not all financial innovation is valuable, not all trading plays a useful role, and ... a bigger financial system is not necessarily a better one ... parts of the financial services industry have a unique ability to attract to themselves unnecessarily high returns and create instability which harms the rest of society.¹⁶²

158 See, eg, Lawrence Mitchell, ‘The Morals of the Marketplace: A Cautionary Essay for Our Time’ (2009) 20 *Stanford Law & Policy Review* 171, 191; Stephany Griffith-Jones, Jose Antonio Ocampo and Joseph E Stiglitz (eds), *Time for a Visible Hand: Lessons from the 2008 World Financial Crisis* (Oxford University Press, 2010) 34–5.

159 See, eg, Mitchell, above n 158, 191. As Mitchell highlights, institutions can be efficient from a microeconomic perspective without producing real economic benefit. Indeed, they can potentially produce great harm from a macroeconomic perspective.

160 George Osborne, Chancellor of UK, has indicated there will be wide-ranging changes to the UK’s regulatory system, including the removal of some areas of responsibilities from the FSA. For example, the new government has proposed the creation of a new consumer protection and markets authority and a new economic crime agency. These proposed changes are currently subject to consultation: Her Majesty’s Treasury, *A New Approach To Financial Regulation* (July 2010). The consultation paper does not include specific discussion on efficiency in capital markets. However, the states that ‘the Government will legislate to provide the Consumer Protection and Markets Authority with a primary objective of ensuring confidence in financial services and markets, with particular focus on protecting consumers and ensuring market integrity’: at 31. It is too early to assess how a primary focus on a market fairness rationale might change the way securities regulation targeted at consumers is enforced and interpreted. An independent commission is also reviewing the banking system in UK and is due to report by September 2011.

161 Angela Monaghan, ‘Tax “Socially Useless” Banks, Says FSA Chief Lord Turner’, *Telegraph* (UK), 27 August 2009.

162 Adair Turner, (Speech delivered at the City Banquet, The Mansion House, London, 22 September 2009).

This argument is not new. Keynes argued in 1936 that when

the capital development of a country becomes the by-product of the activities of a casino, the job is likely to be ill-done. The measure of success attained by Wall Street, regarded as an institution of which the proper social purpose is to direct new investment into the most profitable channels in terms of future yield cannot be claimed as one of the outstanding triumphs of laissez faire capitalism – which is not surprising if I am right in thinking that the best brains of Wall Street have in fact been directed towards a different object.¹⁶³

Similarly, in 1989, Summers and Summers expressed concerns about

excessive volatility caused by destabilising speculation; the diversion of human and capital resources away from more socially profitable pursuits into the financial sphere; and the impact of rapid financial turnover on the way in which corporate investment decisions are made.¹⁶⁴

Many factors contributed to the GFC. Nevertheless, there seems to be general scholarly and policy consensus that key issues included misaligned incentives, conflicts of interest, greed, compensation schemes that were too short-term in focus, poor transparency, a paucity of accountability mechanisms, poor governance, and weak regulatory oversight.¹⁶⁵ Many companies transacted privately, particularly in unregulated areas of the market. Mechanisms used to generate excess profits included the introduction of increasingly complex products. The complexity provided barriers against new entrants and competitive products, and the consequential poor disclosure and understanding of the products facilitated grossly optimistic product risk assessments. Notably, the ‘excesses built up most where the financing structures [and mortgage practices] were most opaque ... [and] outright fraud had gotten to be ... a problem’.¹⁶⁶ The lack of market transparency prevented or reduced the impact of potential gatekeeper processes and responses. The nature and scope of the potential losses continued to build, with the broader public largely unaware of the issues and consequences.

Lord Turner suggests that the GFC

poses for regulators the challenge of complexity, because it involves rejecting an intellectually elegant but also profoundly mistaken faith in ever perfect and self-equilibrating markets, ever rational human behaviours; but it leaves us with no simple alternative philosophy. It is much easier to proceed in life on the assumption that either all markets are axiomatically good, or all speculation evil. The reality is more complex and requires us to make trade-offs and judgements. But there is no alternative to that complexity.¹⁶⁷

We agree that modern capital markets are complex and that more nuanced and focused discussion on efficiency within markets and policy decision-making

163 Keynes, above n 66.

164 Summer and Summer, above n 143, 263.

165 FSA, above n 11, 8, 76–81; Luci Ellis, ‘The Global Financial Crisis: Causes, Consequences and Countermeasures’ (Speech delivered at the Conference on the Implications Of The Global Financial Crisis for Australia and its Region, Victoria University, Melbourne, 15 April 2009); Ana Carvajal et al, International Monetary Fund, IMF Staff Position Note, ‘The Perimeter of Financial Regulation’ (26 March 2009).

166 Ellis, above n 165.

167 Turner, above n 162.

is needed. Policy makers and scholars need to broaden their focus to encompass the complexities of modern markets and the connections between markets and the real economy.

A major problem with the debates on efficiency in markets and capital market policy has been the lack of a clear efficiency rationale. Many scholars and most policy makers have focused on short-term price efficiency as the end goal. Erskine suggests that 'regulators had little alternative but to see market prices as the best (or least bad) indicator of rationally evaluated economic value. As a result the best thing a regulator could do was get out of the way.'¹⁶⁸ This narrow view of the Fama model and of efficiency in capital markets more generally has had profound implications in the policy arena. The choice of an efficiency goal or concept within policy debates is often not value free.¹⁶⁹ For instance, a short-term price efficiency goal enables institutions to justify excessive levels of trading on the basis that it enhances liquidity and the accuracy of security prices. However, much of the short-term trading in markets has minimal effect on price efficiency or capital resource allocations while there are costs and inefficiencies involved.¹⁷⁰ As highlighted in the empirical section, short-term efficiency proxies may or may not benefit market and allocative efficiency. While the empirical studies can be variously interpreted, excessive trading not related to economic fundamentals diminishes the signalling function, impedes the efficient allocation of real capital and reduces total economic returns.¹⁷¹

Lord Turner has indicated that 'we [don't] know how much trading and liquidity is optimal, nor ... can [we] easily define some [market or financial] products as beneficial and others as harmful'.¹⁷² This comment is insightful. It is difficult for scholarly empirical studies to provide evidence on these issues because of the endogenous nature of the trading and liquidity efficiency proxies and the complexity of the analysis required. The phenomenon of rapid growth in

168 Erskine, above n 4, 10.

169 Beny, above n 147, 239; Donald Langevoort, 'Theories, Assumptions and Securities Regulation: Market Efficiency Revisited' (1992) 140 *University of Pennsylvania Law Review* 851, 887.

170 Joseph Stiglitz, 'Using Tax Policy to Curb Speculative Short-Term Trading' (1989) 3 *Journal of Financial Services Research* 101, 103. Stiglitz outlines an example from a paper by Stiglitz and Weiss on the economic inefficiencies of investors expending resources on private information gathering in markets. He argues that this argument can be extended to financial innovations in recent decades. The example was:

Imagine a pile of \$100 bills lying on the floor, one near each individual. Assume, given the natural lethargy of most individuals, that they all wait two periods to pick up the \$100 bill. Now consider what happens if one individual wakes up one morning and says to himself, 'All the other people are too slow to pick up the \$100 bill next to their feet. The extra \$1000 bill(s) will surely be worth the extra effort I have to put out.' But of course, if he does this, all will respond. In the new equilibrium, all the people rush to pick up the \$100 bill near their feet as quickly as they can. In the end, they have exactly the same amount of money as they did before, but now, they have had to exert energy to rush to pick it up. They are unambiguously worse off.

The paper was subsequently published as a book: Joseph Stiglitz and Andrew Weiss, 'Banks as Social Accountants and Screening Devices for the Allocation of Credit' (1990) 12 *Greek Economic Review* 85 reprinted in Mervin Lewis (ed), *Financial Intermediaries* (Edward Elgar Publishing, 1995) 197–330.

171 Stiglitz, 'Using Tax Policy to Curb Speculative Short-Term Trading', above n 170, 108; Summers and Summers, above n 143; Du and Wei, above n 145, 940.

172 Turner, above n 162.

market trading activity, particularly using derivative instruments, raises many policy issues. For the purposes of the current discussion, it suggests the need for a renewed focus on long-term allocative efficiency goals. It is important to distinguish between very short and longer-term efficiency (and inefficiency) effects, and trades that simply involve wealth transfers between market participants and those that effect capital allocations and the real economy. As highlighted previously, many of the short-term efficiency gains from activity in the 1990s resulted in enormous economic and public costs.

The GFC hasn't changed how capital markets work in practice or the economic basis upon which markets operate. Fama indicated in 1971 that 'the primary role of the capital market is allocation of ownership of the economy's capital stock'.¹⁷³ The ECMH uses short-term price efficiency as a means to an end; namely the efficient allocation of scarce capital. This point was recently reiterated by Joseph Stiglitz, the Nobel prize winning economist who chaired the recent Stiglitz Commission review of the international and monetary financial systems.¹⁷⁴ Stiglitz suggests that most capital market resources 'are not spent in raising new funds but in rearranging ownership claims on society's resources. They are part of the quest for rents. They affect who gets the returns to society's productive assets, not which investments get made'.¹⁷⁵ Stiglitz argues for a new global financial architecture. He points out that

[f]inancial markets are not an end in themselves, but a means: they are supposed to perform certain vital functions which enable the *real economy* to be more productive:

- (a) mobilising savings,
- (b) allocating capital, and
- (c) managing risk, transferring it from those less able to bear it to those more able.¹⁷⁶

ASIC argues that the efficient market theory is founded on a belief that markets drive efficiency and that regulatory intervention should be kept to a minimum to optimise market efficiency. Similarly, Coffee and Sale suggest that acceptance of the EMCH at centre stage enabled some scholars to implicitly argue that law should play only a 'secondary and severely constrained role'.¹⁷⁷ Mitchell goes further, arguing that the 'real underlying cause of the collapse is the almost religious faith in the free market (and a concomitant push for

¹⁷³ Fama, above n 2, 383.

¹⁷⁴ Commission of Experts of the President of the UN General Assembly on Reform of the International Monetary and Financial System, Report of the Commission of Experts of the President of the United Nations General Assembly on Reforms of the International Monetary and Financial System (21 September 2009) United Nations <http://www.un.org/ga/econcrisissummit/docs/FinalReport_CoE.pdf>. See also Douglas Arner and Ross Buckley, 'Redesigning the Architecture of the Global Financial System' (2010) *Melbourne Journal of International Law* (forthcoming).

¹⁷⁵ Stiglitz, 'Using Tax Policy to Curb Speculative Short-Term Trading', above n 170, 109.

¹⁷⁶ Commission of Experts of the President of the UN General Assembly on Reform of the International Monetary and Financial System, above n 174, 1. See also Arner and Buckley, above n 174.

¹⁷⁷ John Coffee Jr and Hillary Sale, 'Redesigning the SEC: Does the Treasury Have a Better Idea?' (2009) 95 *Virginia Law Review* 707, 710.

substantial deregulation) that dominated legal and economic academia'.¹⁷⁸ We suggest these are common interpretations of the efficient market theory and efficiency in capital markets more broadly, but only very partial ones. Policy makers, regulators and scholars need to refocus on the ultimate Fama goal of allocative efficiency. The Fama efficient market principles, while not perfect, provide the best available theoretical and empirical framework to optimise the allocation of scarce capital over the long run. However, the sometimes forgotten but essential underpinnings to the ECMH are the assumptions of full disclosure by companies seeking capital and open competition among fully informed investors that are able to readily compare investment opportunities and the associated risks and returns across a market.¹⁷⁹

Rather than assuming market efficiency, we need to better understand the processes that encourage the efficient allocation of scarce capital.¹⁸⁰ The cost of capital and global capital market empirical studies suggest that regulation can enhance the efficient operation of markets and economic returns by promoting transparent disclosure (disclosure to all parties that is clear, concise and effective) and vigorous competition among companies and investors.¹⁸¹ However, as highlighted, powerful market participants are often economically incentivised to create or maintain information asymmetry and to restrict competition and market transparency. Consequently, the most significant issue relating to efficiency in capital markets post-GFC concerns the extent to which policy makers are willing to promote the Fama principles of open and competitive markets. Boldness is called for, as policy makers and regulators must enact and enforce regulation against powerful institutions that seek competitive advantages in the form of lower levels and quality of public disclosure and reduced competition and accountability. As Canova suggests 'the current regulatory approach does not serve the interests of the public, but rather the far narrower interests of the regulated institutions that have captured the agencies of government and the policy-making process'.¹⁸²

We acknowledge the limits of disclosure and competition policy in capital markets¹⁸³ and the costs associated with market regulation. However, what is sometimes forgotten is that economic and other costs also arise in markets with no regulation or ineffective regulation. As Wojnilower of First Boston indicates, 'unlike a casino, the financial markets are inextricably linked with the world outside, the real economy pays the price'.¹⁸⁴ It is critically important to note who

178 Mitchell, above n 158, 189.

179 Fama, above n 2, 383, 388. See also Arner and Buckley, above n 174.

180 Charles Lee, 'Market Efficiency and Accounting Research: A Discussion of "Capital Market Research in Accounting" by SP Kothari' (2001) 31 *Journal of Accounting Finance* 233, 237.

181 See, eg, Eugene Fama and Arthur Laffer, 'Information and Capital Markets' (1971) 44 *Journal of Business Law* 289, 298.

182 Timothy Canova, 'Financial Market Failure as a Crisis in the Rule of Law: From Market Fundamentalism to a New Keynesian Regulatory Model' (2009) 3 *Harvard Law & Policy Review* 369, 369–70.

183 Further discussion on this topic must wait for another day.

184 Summers and Summers, above n 143, 262.

benefits from poor transparency in a market or the ability to transact privately without public scrutiny mechanisms, and who bears the cost.

We agree with Lord Turner and the ASIC presenters that there needs to be a fundamental change in the way parties think about efficiency in capital markets and how efficiency is assessed in policy decision processes. Capital markets are complex because they involve human participants seeking to maximise their individual or institutional profits. The time horizon of market trading has become increasingly short-term. However, a policy focus on short-term price efficiency as an end in itself is counterproductive and results in incoherent and weak regulatory frameworks.¹⁸⁵ It is true that arguments based on a short-term price signaling theory can be used to argue in defence of insider trading, selective disclosure and exceptionally high trading volumes.¹⁸⁶ The most powerful institutions often use these arguments to promote policy that enables potential wealth transfers to their representatives from uninformed investors. However, empirical research consistently points to sustained economic benefits for countries that enact and enforce regulation and policies that promote public transparency and accountability, enhanced company disclosure, and minority shareholder protection, in other words policies that promote allocative efficiency.¹⁸⁷

Thus, policy makers need to step back from the frenzy of daily trading and be clear about capital market policy objectives. '[F]inance is an industry that exists to serve the real economy rather than the other way around.'¹⁸⁸ The appropriate efficiency rationale of capital market policy in light of the GFC is long-term allocative efficiency. Short-term price efficiency is a poor proxy for allocative efficiency. The lens used by policy makers, regulators and the judiciary to determine and interpret policy intended to enhance efficiency in capital markets needs to be adjusted to assess issues over longer periods and for their ultimate effects on the real economy and the interests of the public.

¹⁸⁵ See, eg, North, above n 9.

¹⁸⁶ See, eg, Henry Manne, 'In Defence of Insider Trading' (1966) 44 *Harvard Business Review* 113.

¹⁸⁷ The empirical studies outlined in Part III are part of large bodies of research by finance, economic and accounting scholars.

¹⁸⁸ Mitchell, above n 158, 192.