Towards a well-functioning stock market in context

Critically appreciating issues in interpreting efficient markets research and its regulatory implications

Received 15 January 2018
Revised 18 March 2018
Accepted 7 April 2018

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Abstract

Purpose – The purpose of this paper is to summarise and reflect upon key issues at the interface of prices, information and regulation with a focus upon the stock market in context. Reflecting upon academic research in the area of efficient markets, and regulatory policy, the concern is to discern issues in terms of policy and support for policy. What does the research imply for policy? Is it possible that the research, perhaps given its rhetoric, can be misinterpreted in relation to policy? The study is also concerned to develop avenues for future research based on these considerations.

Design/methodology/approach – The paper is an analytical and critical review and writing.

Findings – The reading of the research suggests a pragmatic regulatory policy that should be concerned to improve stock market functioning, including with respect to information, as well as the context of which this is part. At the same time, the literature may be read as promoting anti-regulatory policy.

Practical implications – On the one hand, these are consistent with the pragmatic policy referred to above. On the other hand, further research is suggested to explore substantively the rhetoric of the research and its interpretation and to explore understandings of the research and its implications amongst key constituencies in practice.

Originality/value – The concern is to bring key insights from the academic literature together with a view to promoting a pragmatic policy orientation, while cautioning in a critical perspective about how this academic literature and research might be interpreted from a policy perspective.

Keywords Pricing, Policy, Regulation, Information, Market, Stock

Paper type Research paper

Introduction

In this paper, the concern is to critically reflect upon academic literature and research in the area of efficient markets and related regulatory policy. We consider what the literature and research imply for policy. We reflect upon whether the meaning of the research may be problematically read and inform problematic policy. We then aim to point to avenues for future research building upon our reflections.

We initially outline the meaning of efficient markets research by comparing and contrasting it with a naïve view expressed by an imaginary character on Wall Street. This concern to articulate the meaning reflects a probing of key texts. We next indicate how

An earlier version of this paper was given as a guest panel presentation at the Turkish Capital Markets summit, Istanbul, November, 2017. The authors acknowledge the feedback from conference participants, Sumon Bhaumik and Shuxing Yin, reviewers.

Journal of Capital Markets Studies
Vol. 2 No. 1, 2018
pp. 21-36
Emerald Publishing Limited
2514-4774
DOI 10.1108/JCMS-01-2018-0003

research might be misinterpreted, given aspects of its rhetoric, in terms of its policy implications. In concluding, we reflect further on the implications of the research and point to avenues for future worthwhile research.

Appreciating efficient markets research in relation to policy

We might imagine, on a walk down Wall Street in New York City, a chance encounter with a somewhat wild-eyed man carrying a two-sided placard. As you walk towards him you see that the placard informs you in large letters: "Prices on the Stock Exchange are correct"! As you walk past you turn to read, on the placard's other side: "No need to regulate them"!

What would those passing by (and also turning to look back) make of this? Perhaps some would be swayed by appearance to see man and messages as somewhat unreliable. But appearances can be deceptive. If such messages were delivered by a smartly dressed leader of a MBA class in Chicago, or by a SEC regulator in the USA, or even by a US judge, would they be seen differently?

Let us take the messages more seriously. What might they mean? Can they be considered valid or justifiable messages? In reflecting on these issues, we can give consideration to key issues of stock market pricing and regulation *vis-à-vis* the academic literature and policy discourse. We can aim to get a better appreciation of the latter literature and research and the policy implications.

Let us consider initially share price "correctness". By "correct", we might interpret our placard holder to mean that share prices on the NYSE reflect perfect foresight of the future. Actually, some presumptions of asset pricing models in abstract finance theory are consistent with such a proposition[1]. But these presumptions are unrealistic. In the real world, the proposition (especially unqualified) that share prices reflect perfect foresight, with all that it entails, given how difficult across the board it is to anticipate everything that can change things in future, would quite properly be dismissed out of hand.

But what might the placard holder more reasonably and realistically mean? One could conceive of prices being "correct" in that they reflect a reasonable interpretation of all the information available today (public and private). This kind of pricing (a best estimate of intrinsic or fundamental value based on all information available) might be seen as at the apex of possibilities in the real world if it is strictly a different (and more realistic) notion to that of prices reflecting perfect foresight.

A dominant strand of Modern Finance Theory, nearer to its purer economic-analytical form and still influential at the very least in the theoretical realm, sees security prices as being determined by a particular theoretical asset pricing model. Academics influenced by mainstream economics reasoning and a particular way of appreciating and measuring risk (which includes a recognition of the possibilities of portfolio diversification) is suggestive of a model by which share prices or the prices of shares invested in should be determined (at least following this mainstream economistic reasoning). Key to this asset pricing model is the notion of value as the discounted value of future cash flows – these being discounted at a discount rate reflecting the riskiness of the investment given appreciation of the value of portfolio diversification in the marketplace. While this model is somewhat unrealistic, it suggests real-world approximations and we can consider its character as helping to shape the meaning of reasonable in the reference to "reasonable interpretation" in the immediately preceding paragraph.

Tobin's (1982) view or understanding of "fundamental value" reflects consistent economistic reasoning. It means a share price reflecting the "rational expectations" of the future payments to which the asset to be priced gives title, where those payments include resale value to third parties (see also Copeland and Weston, 1983; Malkiel, 1985).

A perspective claiming share prices to be correct (or accurate, a word more commonly used in the academic literature) might, then, begin to approach realism and reasonableness if it is suggesting that prices are "correct" in terms of something like the above asset pricing

model (to the extent that the model is itself reasonable). This implies a link to information. In the influential abstract theorising, information is somehow assumed to exist, whereas theorising that is a stage more realistic requires costly information to be somehow mobilised and reflected into the prices. Thus, the prices would be "correct" in terms of reflecting a reasonable interpretation of all the information we have today (i.e. at the time of the pricing) consistent with the pricing model[2]. Such pricing requires some active process that inputs information into prices which must be a continuous process in a dynamic context (where new price-sensitive information manifests). And somehow the decisions of the market actors have to be translated into prices that are "correct"/accurate.

Leaving aside for the moment, the desirability of such pricing from a social welfare perspective (and the desirability of moving towards it), we can consider how valid a view it is that prices actually are formed in this sense in practice. How could the proposition that prices are accurate be tested so that it might be given some validity (or otherwise)? One does not have to reflect on this question for too long before concluding that directly testing this proposition is fraught with difficulties (more especially if one is sceptical about the validity of the proposition in the first place – as one properly should be) (see McGoun, 1990). The "information we have today" – all of the public and the private information that is there – is not easy to grasp, more especially given a private realm that values confidentiality/secrecy (Gallhofer and Haslam, 2007). In practice, how is the relevant information content to be assembled? How is this content to be translated into the relevant forecasts of future cash flows? How could the riskiness of these cash flows and in the context of diversification possibilities be determined (and without reference to the actual market prices we are seeking to assess)? And these issues would arise even assuming there are no controversies concerning the asset pricing model itself (e.g. concerning how it measures risk – which has actually been a particularly controversial matter)[3]. Given how difficult the proposition is to test, it is near impossible to be confident about the validity of any stated view that share prices are "correct" in the sense deemed more reasonable above. And as we shall return to later, tests of accuracy in practice are not direct tests but are tests of derived and corollary propositions.

But even as part of an abstract theory (i.e. leaving aside the questions of "testing"), "correctness"/accuracy here strictly implies something unrealistic in at least a pure form, namely the instantaneous translation of any new information into prices[4]. We need to allow into the theory (as many have now done, e.g. Diamond and Verrecchia, 1981; Ippoliti, 1989; Elton *et al.*, 1993; Gordon and Kornhauser, 1985) that information is both costly and has to be actually translated into prices. Regarding this process of translation, in the absence of a public official charged with the task (which would obviously itself not be costless), what would be the motivation for anyone to be active and input the (costly) information? Presumably, the motivation is to trade on the anticipated adjustment and to make a return. With competition to make this return, the average return would tend to fall to one just enough to keep active investors in the market. It is possible to imagine a market of substantively two classes of investors, one that is active and that (in competitive conditions) tends on average to make a "normal" profit from trading and one that just accepts the price (and makes normal returns consistent with an investment strategy based on such an acceptance) (see Copeland and Weston, 1983). But everyone just accepting or taking prices would not make sense – except in the sense and case of a temporary price equilibrium that all happen to agree upon until new information, and information-arbitrage opportunities, come along – how do prices then reflect new information that comes along? These points indicate the impossibility of a pure "correctness" in the above terms even at an abstract theoretical level (once the more realistic assumptions are incorporated), as Stiglitz and others have recognised (see, for instance, Lorie and Hamilton, 1973; Grossman and Stiglitz, 1980; Sorensen, 1983; Wang, 1986; Stiglitz, 2000, 2001; McGoun, 1990). And it is the case in the real-world context that significant sums are spent on investment research (see Stanley *et al.*, 1980, for an early appreciation of this).

In respect of the point about the impossibility of pure form "correctness", one might argue, however, not unreasonably that as seen here it would be a too fussy or demanding normative (or prescriptive) criterion. It is possible to imagine very speedy price adjustments – in the "correct" direction – if not literally instantaneous ones (see McGoun, 1990). The proposition that all prices are "correct"/accurate is too strong on theoretical/analytical grounds. But, theoretically, prices could be at least pretty close to being accurate at any moment in time, or such closeness (in the absence of further new information) would pretty soon manifest.

Let us return, then, to the issue of testing. How are tests on the "correctness"/accuracy (or near "correctness") proposition actually done in the research literature? Attempts to provide evidence by focusing upon share price volatility and related phenomena (as in the work of Shiller) are acknowledged as approximate (see, e.g. Grossman and Shiller, 1981; Shiller, 1981a, b, 2005, 2014; Shiller *et al.*, 1984; Mankiw *et al.*, 1985). The results of these tests, which focus on properties that ought to follow from the assumption of "efficiency", and which translate that assumption in the first place for practical purposes are difficult to interpret. Issues include the significance of excluded data, the link between dividend policies and underlying economic realities and presumptions about model validity. Results of these tests are in these ways inconclusive, although they tend to indicate (and have been interpreted as indicating) that share prices have not tended to be accurate (see LeRoy and Porter, 1979; Grossman and Shiller, 1981; Shiller, 1981a, b, 2005, 2014; Shiller *et al.*, 1984; De Bondt and Thaler, 1985; for debate see LeRoy and Porter, 1984; Kleidon, 1986; Marsh and Merton, 1986; MacKinlay, 1995; Fama and French, 1996). The finding, reflecting or consistent with the intuitive position elaborated in Arrow (1982), is consistent with Keynes (1936), who argued that share prices are not only determined by economic fundamentals (see Ackley, 1983; Kosmicke, 1984).

In more recent times, behavioural finance research, emphasising the importance of investor psychology in asset pricing (as Shiller does, see also Hirshleifer, 2001), tends to confirm such a proposition (see Barberis and Thaler, 2003; Shiller, 2003, 2005, 2014; see Fox, 2009). Black (1986) articulates a sense of how far prices might depart from the fundamental value at a given time and suggests quite a wide range around the fundamental value. In more recent times, there has been a view that fundamental value might predict long-term stock price with an acknowledgement that short-term stock price can fluctuate – together with an acknowledgement that it is extremely difficult to prove (or indeed to disprove) such propositions. Many see crashes (such as the 1987 crash, the internet/technology bubble collapse of 1999-2000 and the global financial crisis of 2008) as *ex post* evidence of mispricing, although not everyone is convinced of this (see, for consideration of various views, Langervoort, 1992; Ball, 1989, 2009; Siegel, 2009a, b; Shiller, 2014).

Approaches that more indirectly test the correctness proposition by testing corollary propositions thereto (in spite of Samuelson's warnings about corollary views, see Samuelson, 1965) are more typically advocated and carried out. The most significant corollary proposition is that with respect to the information – and thus by (further) implication any sub-set thereof – it is not possible for anyone to consistently make abnormal returns (returns in excess of the normal), or at least that the "average" person (or investor force) in the marketplace does not consistently make abnormal returns from trading on the information (with the non-average being chance outliers or reflecting a combination of extraordinary skill and speed).

In relation to testing, Wang (1986), following Tobin (1982), makes a distinction between "fundamental-valuation" efficiency (tested albeit, as suggested above, with issues by Shiller and others) and "information-arbitrage" efficiency, a distinction that is rarely highlighted explicitly by researchers. Most research is done on information-arbitrage efficiency (testing is relatively easier) in spite of it being the case that a market might be information-arbitrage efficient but not fundamental-valuation efficient – and the latter being, on the face of it, the more important phenomenon (Summers, 1986; Wang, 1986; see Black, 1986; Shleifer and Summers, 1990; Thaler, 1999). Unsurprisingly, given the difficulty of grasping

the total information set, which includes private information, most tests are done on publicly available information or a sub-set thereof (this argumentation being dependent upon understanding the information set tested in the weak-form tests as a sub-set of publicly available information). We might note here that, where tests are carried out on the rewards to inside information (and already there is a focus here on a particular type of information, rather than anything like the total information set), results have often tended to be particularly inconclusive or to point to inefficiency (Wang, 1986) (Wang, 1986, p. 343 notes that some tests of the strong form – arguably misleading further – have been particularly restrictive in defining the information set, including information that might more reasonably be considered as publicly available[5]).

Fama comes to distinguish between three types of information set: the total information set (which includes private/insider information); publicly available information, i.e. excluding private information (the publicly available information including various types thereof apart from the type referred to immediately next here); and, information in the past prices themselves (this being a particular type of publicly available information – information in trends and past movements of share prices – not included in the immediately aforementioned types) (Fama, 1965, 1970, 1976). These three information sets are associated with strong form, semi-strong form and weak-form tests, respectively.

In these tests, one can point to various issues, including (as Summers, 1986, noted) statistical or econometric issues (e.g. related to sample size), the appropriateness of the model used to determine normal returns and in particular to measure risk – and, following Roll (1977), one must recognise that tests of "informational efficiency" (see below) are always joint tests of the pricing model (see also, Jensen, 1972; Lo and MacKinlay, 1990); further, the models used in testing have moved away from consistency with economic reasoning, see Copeland and Weston, 1983; Fama and French, 1996) – quality of data concerns and the quality of estimates of trading costs made (where it is necessary to estimate them) – trading costs being a real-world feature (see Ball, 1989). Hines (1988) suggests that if researchers want to evidence support for hypotheses in this area they may well be able to do so (see also Lowe *et al.*, 1983; Williams, 1989; McGoun, 1992; Reiter, 1997; Reiter and Williams, 2000). One can perhaps all too easily blame results indicating a lack of efficiency on things such as the model or poor estimates of transactions costs. Usage of the word proof in relation to what is tested by these tests would be very suspect from any reasonable philosophy of method (and, further, findings of a particular time and place may not in any case apply to another time and place). Most (if far from all) of the semi-strong form and weak-form tests have tended to conclude that the information sets focussed upon in these tests do not allow investors (or the average investor) to consistently make abnormal returns from trading upon these information sets (once trading costs are taken into account). And there have been improvements in respect of some of the issues in testing that are referred to above over time (although this context has also seen the rise in behavioural finance, see Kahneman and Tversky, 1979; Tversky and Kahneman, 1986; Shleifer and Vishny, 1997; Barberis and Thaler, 2003; Shiller, 2003, 2005)[6]. But what do these findings really mean?

Towards an appreciation of how efficient markets research might be misread in relation to regulation

The tests discussed here are often articulated as tests of the "efficient market hypothesis" (EMH) (it being at least suspicious that in these terms – there is no reference to information – the hypothesis suggests that much more is at stake, i.e. the "efficiency" of markets in general, than what is actually involved in the hypothesis and then tested). Hence, there are tests of the weak-form, semi-strong and strong form versions of the EMH. The usage or choice of the word efficient here is worth reflecting upon. In the EMH, efficiency is understood positively. There are some who might see efficiency always in positive terms. Who could doubt

something that is efficient? Hopwood (1984) elaborates upon the usage of the word efficiency in relation to public sector discourse and makes this kind of point (see Macey and Miller, 1990). Others might draw from the organisational effectiveness literature (see, for instance, Wilson and Chua, 1983 for a summary account) to point out that you could be very efficient at doing the wrong thing (since efficiency is simply a relationship between inputs and outputs). With the EMH, it is possible that support for it may point to something good in social welfare terms: for instance, it may be part of a more holistic set of findings uncovering information-arbitrage efficiency, fundamental-valuation efficiency, economic efficiency and social welfare (or social well-being). But it is also possible, for instance, at nearer to the other end of the scale, that it indicates only that it is difficult to consistently make abnormal profits from trading in securities that are priced by what are actually very irrational processes yielding prices that are poorly related to economic reality and somewhat dysfunctional from a social welfare perspective (see Bozeman, 2002; cf. Bator, 1958; Stout, 1988; Dow and Gorton, 1997).

Declarations that the EMH (in whatever form) is supported have often been, it is reasonable to argue, made with something of a rhetorical flourish. It appears to be the case that the finding of support is seen as the finding of support for a good thing. This good thing has sometimes been articulated, even explicitly, as suggesting that prices on the stock market do reflect fundamental (or intrinsic) value (or at least are very quickly corrected to this value where they depart therefrom) (see Fama, 1965, 1970, 1976; Malkiel, 2003; Schuster, 2006). Moreover, including in finance textbooks, the case for support has often tended to be overstated, while the case for doubt has been understated, even heavily suppressed. This is the sort of usage of language that writers like McCloskey (1981, 1985) and Klamer (1985, 1987) analyse and highlight (see Simons, 1990; Fischer and Forester, 1993; see also Ball, 1992; Thaler, 1999; Mackenzie, 2006; cf. Alback, 1995). It appears to be the case, then, that not only is the finding of support seen as the finding of support for a good thing but that the very finding of support is seen as a good thing too (see Tinker *et al.*, 1982; Hines, 1988; Shubik, 1988; Tinker, 1988; Williams, 1989; Langervoort, 1992; McGoun, 1995; Reiter, 1997; Gallhofer *et al.*, 2001; Mackenzie, 2006; Frankfurter, 2007; Thomas Goodnight and Green, 2010; Chabrak, 2012).

We have cast doubt on the finding of support. But even if there were no issues such as the statistical issues, the weak-form and semi-strong tests (and indeed in practice, as we have suggested, the strong form tests) while not without meaning (and worthwhile doing) are somewhat partial and limited. Take the weak-form tests – it would be surprising in a competitive market if it was possible (for anyone) to consistently make abnormal profits from what amount to forms of technical analysis based on very particular information sets (assuming that the strategies investigated are easily operationalized)[7]. So, the surprising thing here are the "anomalies" as they are often called (the language again has a problematic rhetorical aspect) where the EMH is not so well supported. It would be stretching things considerably to argue on the basis of such findings that the proposition that market prices are "correct" or reasonably close thereto (a proposition that could be considered as underlying the corollary hypothesis tested) was substantiated. The tests, more generally (outwith, in principle, tests of the strong form hypothesis – but in practice those tests also are more indirect tests or tests of corollary propositions), do not suggest (even where findings are very supportive of the EMH) that you cannot improve pricing by having better information input into prices (Whittington, 1987, 1993) – a point that has come to be widely acknowledged (indeed, Ball, 2009, indicates that beyond the strong fundamental value efficiency positions, efficient markets research does point to the importance of adequate public disclosure; see Fox, 2004, for a more expansive elaboration[8]). While the weak-form tests provide a good case to illustrate these points, they apply (to a significant, even if lesser, degree) in the case of the other tests.

Yet maybe the rhetorical flourish could mislead. Maybe it is meant to or it all too easily fits with and bolsters the hegemonic discourse (see Hines, 1988). And here we should note that promotions of the EMH (as a validated hypothesis) have been linked to promotions of a

neo-liberal project that not only stresses how well markets (in general) work but that point to the case for taking the State out of the economy as much as possible (see Arnold, 2009). Here, we can consider the other side of the placard. The expression indicating that there is no need to regulate the prices might be considered as capturing the neo-liberal view as we have characterised it[9].

Interpreting regulatory implications. Let us first note that the view seems to at least threaten to ignore the pervasive nature of regulation. In socio-economic theory, forces of the state and the market (as well as other things that might be called the "community", including e.g. civil society) interact together to "regulate". Polanyi's (1994) analysis indicates how state regulatory infrastructure is required for a well-functioning marketplace (see Shubik, 1988; Kay, 2003; cf. North, 1991). Actually, Friedman (1962) acknowledges the point about the need for some basic infrastructure for markets to function. Polanyi (1994) traces out how the constructing of the market system in Britain was accompanied with a massive extension of the state regulatory infrastructure. The general point of relevance here is that there has never been a market system in history functioning without at least basic legal and regulatory support. In this sense, at the very least, the view that there is no need to regulate markets is an eccentric one indeed. Perhaps our placard holder is suggesting that there is no need to further regulate markets in a particular way or he is opposing a particular regulation that might have been proposed. But we have seen that the results of actual tests on the EMH do not provide very strong evidence against the view that pricing could be improved by some sort of state-like regulation, e.g. intervention for better quality (including more informative) information (and this has been taken up by a current in the literature that has had some impact on policy, see Coffee, 1984). And rhetorically such statements as those of the placard holder might encourage deregulatory programmes: ironically perhaps, since any "correctness" in prices may be linked to existing regulations.

There have been a number of suggestions that an anti-regulatory drive combined with a neo-classical economics reasoning in the accounting realm (around the construct "fair value", see Zhang and Andrew, 2014; Cooper, 2015) is and actually was contributory to financial crisis (see Boyer, 2007; Cooper, 2008; Shiller, 2008, 2012, 2013; Arnold, 2009; Fox, 2009; Soros, 2009; Akerlof and Shiller, 2010; Baker, 2010; Hoarau, 2014; Cooper, 2015; cf. the different views in Siegel, 2009b; it is interesting to read Merino and Neimark, 1982, for historical perspective here)[10]. Baker (2010) elaborates on an "intellectual capture" of regulation in the banking sphere, suggesting that the EMH strongly shaped the BASEL II accord and regulatory orientation more generally (including the G7's round of meetings between finance ministers and central bank governors) – although captures of banking regulation more generally have a long history (see Calomiris and Haber, 2014). Reflecting on the 2008 crisis, Crotty (2009, p. 577) argues that: "Efficient financial theory must be replaced as the guide to policy making by the more realistic theories associated with Keynes and Minsky […] most elected officials responsible for overseeing US financial markets have been strongly influenced by efficient markets ideology[11]". Fox (2009) suggests that the EMH spawned overconfidence in markets and paved the way for deregulation and laissez-faire policy.

Readings of EMH research as suggesting that prices are in effect near "correct" in fundamental value terms (there is rarely a distinction between information-arbitrage and fundamental-valuation efficiency) have impacted – including in the realm of information-related matters – upon policy discourse, policy and legal deliberation (see, e.g. Saari, 1977; Kripke, 1979; Barry, 1981; Fischel, 1982; Pickholz and Horaham, 1982; Easterbrook and Fischel, 1984; Wolfson, 1984; Schulte, 1985; Seligman, 1985; see the elaboration in Wang, 1986; see Langervoort, 1992). This is in spite of one commentator on legal theory suggesting that the "efficiency" of the market scarcely mattered to the law (Levmore, 1984). Sometime before the 2008 financial crisis, Gilson and Kraakman (1984) argued that the EMH had become the context in which policy discussion

concerning the securities markets takes place. Here, we must acknowledge substantively two key currents of regulatory implications. Along with the generic ideological tendency against state and quasi-state regulation, there is, drawing especially upon the semi-strong test results, the perspective that it is important to buttress the quality of public information and disclosure. Yet, as we return to below, policy in respect to information has nevertheless been weak in practice, while only focusing on information may be considered not enough.

A more holistic as well as economistic view. In any case, is it a good thing for prices to be "correct" in the sense considered? Fundamental value pricing is only one aspect of what is relevant from a holistic perspective. So, one might argue in response to this question that it all depends. Prices on the stock market might be "correct" (or fair, as Fama put it) but the producers of goods and services in the marketplace might operate in conditions of oligopolistic or monopolistic competition. This means you cannot conclude on the basis of one well-functioning and competitive market that all markets are equally well-functioning and competitive (see Bator, 1958; Bozeman, 2002; cf. Stout, 1988). But, further, let us consider the implications of the analysis of Lipsey and Lancaster (1956). They argue that where a market is characterised by imperfections in more than one dimension, just improving one of the dimensions has unclear or ambivalent consequences. Thus, improving the "correctness" of prices in the stock market could even be negative in terms of the overall impact on economic welfare (see Laughlin and Puxty, 1983; Gallhofer and Haslam, 2007; cf. Ng, 1975; Jacklin and Bhattacharya, 1988; Dranove *et al*., 2003). For instance, consistent with Cournot (see Touffut, 2007), more openness might allow oligopolies and monopolies to more easily collude over pricing. Further, given that confidentiality/secrecy adds to the profitability of research and development, too much openness or transparency about that might reduce the effective motivation to invest in research and development activity, consistent with Arrow's reflections (see Arrow, 1984, 1996; see Hirshleifer, 1971). By implication, reversing the logic, if prices are "correct" on the stock market, perhaps it would be better if they were not (in the sense of not reflecting everything of the information, given what that would imply for other dimensions of the economy) (see also considerations such as those discussed by Levin, 2001, drawing on Akerlof, 1970).

Beyond the conventional economics focus. Beyond mainstream economics, one could clearly envisage situations where in social and environmental terms we have serious problems even where the stock market prices were near "correct" and markets generally were well-functioning (see Cooper and Sherer, 1984; Tinker, 1984; Reiter, 1988; Gray, 2002; Frankfurter, 2006). So, again, this accuracy would need to be supported by a wider regulatory policy attending to social and environmental dimensions if social welfare or well-being is to be properly attended to (see Frankfurter, 2006).

Concluding comments

A review of key aspects of the literature on information, pricing, social well-being and regulation suggests a pragmatic policy. More meaningful notions of efficient markets (with respect to information) are extremely difficult to validate in practice (they are difficult to refute with evidence too, given all the things that can be blamed when ostensible refutation manifests – and basically given the difficulty of testing). Rhetoric, with a scientific reference, is fashioned in relation to prevailing hegemony. It is important to interpret empirical work cautiously and with a great suspicion of the language in which it is framed. Not being able as a midstream investor to consistently make abnormal profit from various strategies using information available (public and/or private) does not necessarily mean prices are very close to fundamental value (no strong argument against improving regulation is entailed by the former finding). If prices were near "correct" in the fundamental value terms articulated then if we could isolate the stock market from everything else that would suggest that the particular regulatory mix (State-market-other) was working ok (it would not suggest that we can do without any regulation). But we cannot

isolate the stock market in this way. Although analytical reasoning is suggestive of the positive potentialities of markets, well-functioning stock markets do not imply that other markets function well and do not imply that other aspects of the context function well. The impacts on social well-being of the stock market are dependent on the character of other markets and more generally on the social and environmental context. A regulator concerned about well-being is concerned about improvement in all these dimensions, which can be so difficult to achieve in practice (and things may well vary between contexts – countries and cultures for instance – while there are also similarities and contexts may learn from each other). If seeking to improve things is not costless, from the evidence and contextual analysis, it would be somewhat wild to conclude against trying to improve stock market regulation, including with respect to information, as well as trying to improve other contextual dimensions. We have suggested the case for pragmatic regulation. This includes being concerned to intervene to improve the quality of information. It also includes being concerned to intervene to improve the wider economic, social and environmental context. Detailed suggestions in the financial regulatory sphere can be found in the literature (see, for instance, Crotty, 2009; Crotty and Epstein, 2009; Baker, 2010; see Frankfurter, 2006, 2007; Thaler and Cunstein, 2009; Shiller, 2012). Here we have given emphasis to taking (more) seriously the need to improve information and as a regulatory device in relation to pricing[12]. It cannot be currently argued that enough is done currently in relation to the quality of information. For instance, to give just one idea, in the sphere of stock market pricing the case for the monitoring of prices through a kind of audit function, while not straightforward, could be a corrective to "irrational exuberance" (notwithstanding that this may clearly not be a perfect process)[13]. A pragmatic concern to progress well-being should be suspicious of approaches suggesting that there is nothing else to do except leave things to markets, particular or general, even while valuing the positive actualities and possibilities thereof. In our current context, many see at least the positive potential of quality pricing in terms of an allocative function (see Coffee, 1984). And the phenomenon of stock market crashes (which can be exacerbated in the combination of modern trading with fraud and market manipulation, see Easley *et al.*, 2011), which most see as at least *ex post* evidence of manifestations of poor quality pricing, is for many linked to very negative outcomes. Even given some doubt about pricing in this context, a regulator concerned about social well-being should seek to do something to intervene. The issue then would be to do so at some reasonable level of cost. In our view, our reflections are suggestive of avenues for future research. For instance, building upon the work done on problematic rhetoric including very detailed analysis of key texts is here suggested. And exploring the understandings and interpretations of efficient markets research by key constituencies throughout the world, including in developed as well as emerging markets, would be useful research.

Notes

1. And some attempts to test fundamental or intrinsic value "efficiency" – which struggle at a macro level (and at a more micro level focused on laboratory-type experiments with individual decision-makers) to grasp directly the relevant empirics – go back in time and relate past prices/movements therein to subsequent and actual dividends, e.g. in some variance-bounds studies, referring to the construct "perfect foresight" in this context (see Shiller, 2014) (later in the text we shall see that Shiller supports argumentation that the prices actually reflect behavioural factors and investor psychology).
2. It should be pointed out that the word "correct" is used in some academic texts in effect with this meaning, although in most texts the word "accurate" is used.
3. It is not here denied that (descriptive) theoretical models are always approximations of the real world. Nevertheless, there may be different levels of abstraction that potentially impact (see Hines, 1988).

4. Fundamental valuation efficiency at a given moment logically implies informational efficiency (see later in the text).
5. One distinction here is between pre- and post-analysed information. The analysis of information may improve its quality. But both may be seen as being in the same category of information, e.g. as publicly available information in the case where the pre-analysed information is publicly available.
6. Earlier studies especially tended to find support. Over time there has accumulated more evidence against efficiency (e.g. post-earnings drift, short term momentum, long-term price reversals, day of the week effect). Some of these later studies have suggested behavioural bias.
7. Here we should note that there are clearly far too many strategies to test of course and some of them are mathematically very complex. One of the authors recalls knowing a self-proclaimed technical analyst (or "chartist") and inviting him to give a lecture on a module he was running at the London School of Economics. His lecture did not of course give away his particular method. He was then coming towards the end of his career and had been employed by a city firm for many years as their resident technical analyst. He was, it appears, successful enough to keep his position but not knowing his method it is difficult to comment further. The explanation of finance theory for successful and widely replicable technical analysis would be chance.
8. If publicly available information is being reflected in prices speedily then providing better information could improve pricing.
9. This paragraph is pointing to a rhetorical current that had influence. It is de-emphasising potential regulatory implications of the efficient markets research (more particularly the semi-strong form) – implications, particularly for bettering information disclosure, that some have stressed. Nevertheless, consistent with our discussion here and the work we have drawn upon, we are reasonable in pointing to the influence at this same time of this rhetorical current, which was promoting market functioning over state and quasi-state regulation. Note that the authors are not here seeking to get rid of market processes (and see, in this regard, Rodrik, 2017).
10. It might be argued that the IASB's promotion of fair value has only marginally impacted actual accounting practice (although some of the works cited suggest that in some cases the impacts are more significant). But it may have its impacts through the changed philosophical perspective supporting it and consequently how accounting comes to be seen.
11. On Minsky, see Prychitko (2009).
12. A focus on information/pricing is of course not enough. Regulators should have questioned the high returns consistently earned by some large financial institutions. The regulators could have looked more closely at the leverage and risk-taking positions of Lehman brothers. Another weakness of the EMH hinted at above is its silence about the return distributions and how they evolve over time. There is considerable evidence that risk is non-stationary. This is another reason for regulators to control risk, especially the extreme event. In the wider discourse of economics there is of course substantial discussion on state and quasi-state regulation (see Buchanan and Vanberg, 1988; Stiglitz, 1989; Besley, 1994) and we should acknowledge that some fear state regulation in relation to market failings as making things worse (see discussion in Datta-Chaudhuri, 1990; Acemoglu and Verdier, 2000). While, on the latter, there is a Panglossian hue (see Tinker, 1988) and a problematic (and selective) lack of trust, such views indicate the need for a pragmatic balance.
13. One of the authors recalls raising the possibilities of the same to David Tweedie, then Chair of the IASB. Tweedie was, it appeared to this author, positive about this possibility as an idea that should be explored in the future. It is an idea that is consistent with distrusting markets in practice in order to realise better the benefits of their functioning.

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