

Financial Markets: Market Failure and Government Failure

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Comments welcome.

Abstract

Though there is hardly any free lunch in financial markets, there can be *serious* anomalies. Why? First, noise traders cause pecuniary externalities - a case of market failure in finance. Second, there are market failures elsewhere, which the government corrects by providing a public finance and macroeconomic policy regime. However, the government fails to avoid its adverse implications for financial markets. This extensive paper considers innovative policies (refinements to usual policy solutions have yielded diminishing returns). To reduce effective participation of noise traders, lessons can be drawn from the legal-regulatory framework used in a very different field viz., Medicine. Also, tax rules can be devised to reduce asset price volatility. Finally, the prevailing central bank policy of regulating interest rates can *increase* asset price volatility. This can be avoided by an explicit tax-subsidy scheme, which is unlike the tax-subsidy scheme that is implicit in regulated interest rates.

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1 Introduction

In the context of the financial crisis in the US around 2007, Caballero (2010) wrote, “... the current core of macroeconomics ... has begun to confuse the precision it has achieved about its own world with the precision that it has about the real one. This is dangerous ... we should be in “broad-exploration” mode.” This is well said. However, the crisis involved failures not only in Macroeconomics but also in Financial Economics - perhaps even more so. So, there is an equal, if not a greater, need for such an approach in Financial Economics as well. This paper may be viewed as such an attempt.

This paper is inter-disciplinary in two senses. First, it attempts to learn some lessons from the legal-regulatory framework (LRF) used in a very different field viz., Medicine for the purpose of improving the functioning of financial markets. Second, it uses key ideas in several sub-disciplines within Economics, which include Financial Economics, Law and Economics, Public Finance, Macroeconomics and Monetary Economics. This is indeed an extensive paper. However, it is by no means a comprehensive treatment of the issues involved. Furthermore, the explanations of issues included tend to be brief.

The empirical evidence on financial markets throws up two stylized facts: (a) there is hardly any free lunch (Fama (1970); for a similar but more recent view, see Cochrane (2011)), and (b) there is mispricing and excess volatility. In this perspective, financial markets are efficient in one sense and inefficient in another sense. The literature on Efficient Market Hypothesis (EMH) has typically emphasised fact (a) whereas the literature on Behavioural Finance has typically emphasised fact (b). This somewhat reconciles the positions taken on the two sides of the debate (Barberis and Thaler 2003). However, there is another issue. If financial markets are inefficient or there are serious anomalies, what are these due to? Is there a market failure or a government failure? What can be done about such failure(s)?

Let us first consider possible market failure in financial markets. There can be mispricing and excess volatility in financial markets due to the presence of noise traders (or effectively irrational traders) and due to the limits of arbitrage on rational traders (for a survey of the issues involved, see Barberis and Thaler (2003)). Noise traders’ actions can have pecuniary externalities. These may be corrected by a standard Pigouvian tax. However, a better policy in this case can be a change in the LRF within which financial markets operate. At present, the LRF is very permissive in the sense that it allows participation of noise traders

in financial markets *on the basis of their own knowledge* (or more often the lack of it). Such an LRF is not natural or inevitable. It can be quite different from what it is at present. It is, in fact, quite different in other fields such as Medicine where there can be infectious diseases (which may be viewed as negative externalities) and the government undertakes to discourage self-medication which can be harmful. We will see that there is an important lesson to be learnt from the LRF that is used in the field of Medicine. A change in the LRF for financial markets can reduce, if not totally avoid, negative pecuniary externalities, and also avoid a reduction in noise traders' own expected utility. Some readers may find it surprising that a comparison is being made between the LRF in Finance and the LRF in Medicine. However, we will see that such an exercise can be rewarding. In any case, there have been diminishing returns to refinements made in traditional approaches. Also, this paper somewhat complements recent efforts at an inter-disciplinary analysis of financial markets (Cincotti et al. 2012). At present, the literature treats the presence of noise traders as exogenously given (see, for example, Angeletos, et al. (2010), Campbell, et al. (2011) and Shiller (2013)). However, their presence can be endogenous. It can be an outcome of the LRF within which asset markets operate. We will see that the proposed LRF has far reaching implications for theory and policy related to financial markets. It may be viewed as a paradigm shift (section 2).

We just considered market failure in financial markets, and how this can be corrected. In what may seem a digression, observe that there can be market failures outside of financial markets. It is in this context that we have *inter alia* the public finance and macroeconomic policy regime as a corrective measure. Such a regime has been indeed useful in correcting various market failures outside of the financial markets.² However, the said policy regime has, as we will see, adverse side-effects on the functioning of the financial markets. So, there is need for an alternative approach to correcting market failures outside of financial markets such that there are minimal adverse side-effects for financial markets. We will outline such a policy regime.

Public finance policies are at present formulated typically with a view to (1) minimizing distortions, (2) improving distribution of income and wealth, and (3) helping with macroeconomic stability (Musgrave 2008). The standard Public Finance literature hardly pays any attention to the effect of taxes on stability of asset markets (though there is a large

²There have been complaints about macroeconomic policy of late, and rightly so. The alternative policy regime proposed here can be useful in this context.

literature on the effect of taxes on portfolio choice; see, for example, Dammon and Spatt (2012)). When there is excess volatility in an asset market, there could be a market mechanism to reduce this. This is because excess volatility can throw up arbitrage opportunities. If such opportunities are exploited, then the fluctuations can be fewer and, more important, they cannot last long. However, taxes can come in the way of arbitrage. Though this is an obvious argument, it has not received adequate attention in the context of asset price volatility. This paper will suggest suitable changes in tax policies in order to reduce asset price volatility (section 3).

Next, we will reconsider the macroeconomic policy regime within which financial markets function. Let us motivate this. In 2007, the US was hit by a serious financial crisis followed by the Great Recession. The FED responded by reducing long-term interest rates (Fama 2013) (though this is more familiar as a reduction of short-term interest rates). While this policy may have helped in restoring macroeconomic stability, it appears to be aggravating the problem of asset price volatility. See, for example, Giavazzi and Giovannini (2010). The advocates of the prevailing macroeconomic policy regime have either disregarded such concerns or they have suggested some (typically minor) changes while retaining the basic policy regime (Blanchard, et al. (2010), Woodford (2012), and others). There is, however, a need for more basic changes.

Following a set of writings (Singh (2014) and Chapter 11 in Singh (2012)), this paper observes that there is an implicit tax-subsidy scheme that is inbuilt into the central bank's policy of varying interest rates. When the long-term interest rate is lowered, there is an implicit subsidy for investing entities and there is an implicit tax on savers. While such a policy may help increase investment and output, it can aggravate asset price volatility (low interest rates lead to high asset prices, and vice versa). This raises an interesting question.

Can we have an alternative macroeconomic policy that can push up investment and output without causing asset price volatility? This paper will show that this is indeed possible. The treasury instead of the central bank can be involved for this purpose. The treasury can provide an explicit subsidy on interest cost incurred by investing entities in a recession and impose an explicit tax on interest cost incurred by investing entities in a boom. In this way, there can be a change in the effective interest rate in the real sector only. Such a policy does not have the side-effect of causing asset price volatility in the financial sector (section 4).

2 Legal-Regulatory Framework (LRF)

There is a large literature on prudential regulation of financial markets. This has grown further and rapidly since 2007. However, the fact that the LRF for financial markets is basically imprudent has been overlooked (see, for example, Acharya, et al., (2011)). The prevailing LRF is permissive and allows noise traders to ‘freely’ participate. Though Singh (2009) dealt with the required change in the LRF, it did not look into the nature of the market failure involved.³ This section will address this issue. It also provides a brief restatement and a refined version of the proposed LRF.

Mandatory prescription

It may seem obvious but it is important to stress that finance is a serious discipline, which is why there are Nobel Prizes for Financial Economics, PhD degrees, large research grants, professorships, and so on. While academically Finance is indeed taken seriously (at least in good universities), the same cannot be said for Finance in practice. This can be due to the LRF within which finance is practised.

Before we come to the LRF proposed for financial markets, let us first consider a stylized version of the LRF within which Medicine is practised in developed countries.⁴ This has, as we will see, lessons for regulation of finance. Population may be divided into two categories: licensed medical doctors and all others. The latter are free to buy medicines but they cannot do so on the basis of their own knowledge or the lack of it. It is *mandatory* that they first obtain a prescription from a medical doctor, and then use the prescription to be able to buy medicines. Most medical doctors are not influenced by commercial interests of firms that produce medicines, related equipment, and so on. The LRF for medicine avoids the harm that people may do to themselves and to others in case of infectious diseases. The LRF for medicine imposes restrictions on individuals. Yet, it is typically not viewed as being contrary to the idea of freedom of an individual in a market economy. Finally, it is possible to become a medical doctor only after clearing serious examinations.

³See also Basu (2010), Singapore Monetary Authority (2011).

⁴It is true that in many emerging and developing economies (and even some developed economies), there are many weaknesses in the way medicine is practised. However, this is part of weaknesses in institutions, and in enforcement of laws and regulations in practice in these economies. This is part of the general problem in Development Economics and is not specific to the practice of Medicine alone. We will abstract from these issues of Development Economics in this paper.

This paper visualizes an LRF for financial markets, which is, *mutatis mutandis*, similar to that used in the field of Medicine. Analogously, a stylized version of the proposed LRF for financial markets is as follows. Adult population may be divided into two categories: licensed finance doctors and all others. The latter are free to invest in financial markets. However, they cannot do so on the basis of their own knowledge or the lack of it. It is *mandatory* that they first obtain a (financial) prescription from a finance doctor⁵, and then use it to make investments. Finance doctors are by and large not influenced by commercial interests of financial institutions, brokerage houses, and so on (more on this later). The LRF for financial markets avoids the harm that people may do to themselves and to others in case of pecuniary externalities (see Laffont (2008) and Jeanne and Korinek (2010a, 2010b) for related issues). There is hardly any reason to believe that the proposed LRF for financial markets is contrary to the idea of freedom of an individual in a market economy. The requirement of a *professional license* with a finance doctor should not be confused with, say, the requirement of an *industrial license* which can come in the way of freedom of enterprise.⁶ Finally, it is possible to acquire a finance doctor's license only after clearing serious examinations.

We have drawn lessons from the LRF in the field of Medicine to the LRF in the field of Finance. Is it appropriate to do so? It may be argued that in financial markets, sentiment matters which is hardly the case in the field of Medicine. So the two are arguably different and so it does not, it may be argued, make sense to compare the LRF for Finance to the LRF for the field of Medicine. This argument is appealing but not quite valid for the simple reason that sentiment is not exogenous. It matters a lot in Finance (and it hardly does in professional medical care) but this is only because the LRF in Finance is different and faulty. Under a revised LRF in Finance, sentiment is unlikely to matter in Finance any more than it does in Medicine (this will become clear as we proceed).

It is true that there are weaknesses in the practice of not only finance but also in the practice of medicine. This suggests that the LRF for medicine may not be the ideal to

⁵Interestingly, in practice, there is an advisory firm with the name Finance Doctor (see <https://www.askfinancedoctor.in/index.php>).

⁶In some markets, there are hardly any restrictions on buying or selling. To take a simple example, in the soap market, anybody can buy. Similarly, anybody can sell (though there may be requirements on safety of the chemicals used, and so on; we will abstract from such restrictions in this paper). Some goods (like narcotics) and services (like prostitution) are banned in many countries though there may be illegal trade. We will abstract from such markets.

aspire for. However, we do not live in an ideal world and it is all relative. The scale of problems is far greater in finance than it is in medicine.⁷ So, there are indeed lessons to be learnt from the LRF in the field of medicine (even as there is a need to improve the situation in medicine as well).

In any field where specialized knowledge is required, it is important to have only qualified agents who are in-charge of operations. Incidentally, specialized knowledge need not always mean very advanced knowledge. Consider an example outside both Finance and Medicine. One needs to learn how to drive a car *and* obtain a driving license before one can drive a car.⁸ This is a case of simple knowledge. The complexity or advanced knowledge can vary. To fly an aeroplane, one needs to have a pilot's relatively more advanced training and also a license. We can give many more examples. One just needs to extend this analysis to its logical conclusion, which means that the licensing requirement needs to be applied more generally. In Finance, there should be a legal requirement for a finance practitioner's license before one can practice finance. This is the basic point. However, this basic premise has been ignored altogether in the academic literature on finance and in the LRF within which finance is carried out in practice. It is not surprising at all then that there are various problems like excess volatility in finance!

It is true that we do have financial advisors at present and yet there are difficulties. This may suggest that financial advice is not the key to regulation of financial markets. This argument is not valid. There are two difficulties at present. First, *advice from a competent, registered and independent advisor is not mandatory*. Second, the competence of present day financial advisors is questionable. The notion of a qualified finance practitioner can be similar and equally serious as the notion of a medical practitioner (who needs to have an MBBS or MD type of degree). At present, we do have qualified advisors for ordinary investors. However, their qualifications and competence usually do not compare in seriousness with those in the field of medicine. This is not to cast an aspersion on finance advisors or the certifying agencies at all. This is only a criticism of the LRF within which certification standards in Finance are determined. They are typically not as stringent as

⁷Recall that we had a financial crisis in the US, Europe and elsewhere in and around the year 2007. There has hardly been any comparable, what we may call, medical crisis in the sense of instability in the market for medical treatment; the recent debate on 'ObamaCare' is about restructuring.

⁸In many countries, the frequency of car accidents is very high. An important reason is that driving licenses are given without ensuring that the driver can drive *safely*.

they are in the field of Medicine. This immediately explains why it is not just ordinary households who make mistakes but even many advisors do. See Li and Li (2014).

It is also true that not only financial advisors but even finance professors and regulators have made serious errors in finance. However, their errors are really in the context of inability to foresee and then cure extreme events like ‘sub-prime crises’. Their competence in the context of the more regular volatility in the markets for stocks and bonds is not disappointing. Let us give credit where it is due.

To return to the requirement of a driving license, this does not prevent non-license holders from travelling. It only prevents them from driving. They can always travel in a car that is driven by a license holder. The restriction on “the ignorant” is only on self-driving only. Similarly, a license for medical practice obviously does not prevent non-license holders from buying medical treatment. The restriction only says that the purchase of medicines must be after obtaining a prescription from a qualified medical practitioner. Now let us return to finance. A licence for finance practitioners does not prevent people from investing or even trading. It only prevents them from doing so on the basis of their own (possibly half-baked and seemingly correct) knowledge.

Incidentally, it is an important topic of research to understand how a basic need for a finance practitioner’s license could have been left out even while the need for such a license is commonplace elsewhere. But this issue in epistemology is outside the scope of this paper.

The positive side of noise traders - Missing the woods for the trees

The motivation for the above LRF is to reduce, if not remove, the effect of noise traders’ decisions on asset prices - decisions that are taken on the basis of inadequate knowledge. However, it has been argued in the literature that there is also a positive side of the participation of noise traders. They increase liquidity in the financial markets. In this context, our proposed LRF may be considered unsuitable. However, this argument misses the woods for the trees. Liquidity in financial markets helps investors get a good price. However, the basic problem in pricing is that noise traders are present. So the larger picture is that mispricing and excess volatility can be reduced under the proposed LRF though trading cost, bid-ask spreads, etc. can go up somewhat under the proposed LRF. The increase in costs due to such factors should not be overestimated in these days of computerization, internet, etc. which have reduced costs of search and matching between buyers and sellers. The larger point is that mispricing and excess volatility can be reduced.

Dodd-Frank Act, 2010

Dodd-Frank Wall Street Reform and Consumer Protection Act (hereafter, the Act) took effect on July 21, 2010 in the US.⁹ It attempts to *inter alia* protect (finance) consumers. This paper has a similar purpose. So the Act seems to be doing something similar to what we have suggested. This may be taken to imply that the proposed change in LRF is not needed. However, the emphasis of the Act is on imposing restrictions on the supply side. It dictates what institutions and individuals (the banks, funds, distributors, etc.) can and cannot do on the supply side. The Act takes for granted that there is irrationality and vulnerability on the demand side. It does not ask why this exists and what can be done about this. This paper attempts to fix the demand side. It is suggested that ordinary investors act only after obtaining (mandatory) advice from a finance doctor. The suppliers can be more or less free to supply. It is interesting that they will effectively not be able to sell if a finance doctor does not prescribe the products that the suppliers may be interested in selling (as is the case in the field of Medicine). So the problem of consumer protection is tackled in a way that is different as compared to the Act.

The approach to regulation in this paper is better than that used in the Act. This is because it is better targeted; it fixes the problem where it originates. In contrast, the Act is not well targeted. There are two difficulties with its approach. First, it may not be able to stop the supply of all undesirable activities. Second, it may stop many desirable activities. Critics of the Act have emphasised such errors. However, they have not provided any alternative means for protecting the investors and the economy. This paper provides an alternative way; it indeed provides an alternative way of thinking about the problem. This is not to say that there will not be any error in our approach. However, there are no rigid do's and don'ts for anybody in our approach. Instead, the idea is to have a finance doctor who can provide advice that can differ from case to case.

Specific regulations like mandatory disclosures, blue sky laws, movement against boiler rooms, and so on can be far more meaningful under the proposed larger LRF than they

⁹In India, Securities and Exchange Board Of India (Investment Advisers) Regulations, 2013 has been passed. There are, however, several problems. There are 10 exemptions! The eleventh exemption says "Any other person as may be specified by the Board [is exempted]." Newspapers (include financial dailies), gurus, popular books, news channels can advise. This regulation treats finance, economics, accountancy, law, marketing similarly. However, only theory of asset pricing in finance is relevant. Most important, advice for investment is not mandatory.

are at present. Also, institutions like Securities and Exchange Commission can be more effective if the proposed LRF is in place.

Warren Buffet

There is one estimate that sound financial advice to ordinary investors can improve returns of an ordinary investor by 3 percentage points per annum (Dalbar, 2010). By implication, good advice for ordinary investors can reduce earnings of ‘geniuses’ like Warren Buffet and others. (Given the size of the corporate earnings, it is only because some investors earn little that other ‘geniuses’ can earn more.) The basic change required is in the LRF that prevails at present.

Improving participation

Recall that we suggested a stylized classification of agents into two categories into finance doctors and all others. The latter include two kinds of investors - noise traders who are not aware of their ignorance of financial markets and yet they invest in financial markets, and others who are aware of their ignorance and choose not to invest in ‘complex’ products such as stocks and even mutual funds. This category of “all other” agents does not invest in stocks given the prevailing LRF but they may do so if the LRF is changed and advice from serious finance doctors is available for a reasonable fee. So a revised LRF can have two effects. First, it can reduce participation of noise traders on the basis of their own knowledge. Second, it can increase participation of those who keep away from financial markets at present; they may feel encouraged to participate after getting serious advice from a finance doctor. It is plausible that the second effect is larger than the first effect. If so, this implies that there can be greater participation and more investment in equity markets as a result of the revised LRF. In any case, the proposed LRF improves the quality of participation for any given size of participation.

Separation of returns from talent

A corollary of the above analysis is that an investor’s own IQ can be irrelevant in determining returns on investment (just as a patient’s own IQ or knowledge can be irrelevant if he or she is treated by a professional medical practitioner; we are abstracting from the role of money in screening an advisor). This is a simple point that has been missed in Grinblatt, et al. (2011) which finds that an investor’s IQ has an effect on returns on investments, *given the prevailing LRF*.

Training and experience

In our proposed LRF, there is emphasis on (serious) education and license before finance can be practised. In contrast, it is often said that one needs more experience than education to deal with financial markets. We would like to make two observations in this context. *First*, the emphasis on experience in financial markets is more in the context of understanding behaviour of the crowds in the markets than in the context of understanding ‘fundamentals’ that can affect asset prices. The need for such experience arose in the context of an educational system in which textbooks did not include behavioural finance. This has changed somewhat already and it is a matter of time before there is further change in this regard. So, the need for experience can be relatively less in future with an updated syllabus and an appropriate set of readings. *Second*, the need for experience or training in understanding of behaviour of crowds is obviously in the context of the currently prevailing LRF which permits, if not encourages, effective participation of noise traders. It is in this context that there is a need to understand their behaviour through experience (or through training). However, a change in this LRF can reduce, if not obviate, the need for such experience or training. Then education can matter as much in Finance as it does in Medicine.

Macro-inefficiency

The critics of EMH now somewhat accept that financial markets are primarily *macro-inefficient*.¹⁰ What can explain macro-inefficiency? We will see that the answer to this question too is rooted in the LRF that prevails at present for financial markets.

There is empirical evidence to show that assets under management (AUM) with mutual funds are pro-cyclical (Malkiel, 2011, Exhibit One, p. 261). Noise traders buy more when market prices are high and sell when market prices are low. Accordingly, fund managers are compelled to buy at high prices, and are compelled to sell when prices are low, even if they would have liked to do exactly the opposite. Fund managers can become helpless in dealing with fluctuations in average price of assets. The manager of a particular fund can make a portfolio choice typically within an asset class but cannot get away from the mandate of sticking to the asset class even if the average price is high for assets. At the most, their portfolio choices can remove errors in relative prices as they are free to choose

¹⁰There can be micro-efficiency or macro-efficiency (Samuelson 1994). Micro-efficiency refers to the case in which most relative stock prices are correct. Macro-efficiency refers to the case in which the average stock price is correct. See also Jung and Shiller (2005).

the specific stocks. This explains why markets are by and large micro-efficient but not macro-efficient. In this context, the proposed LRF helps. Under this LRF, entry or exit from stocks, mutual funds, hedge funds, etc. is possible only after a prescription is obtained from a truly qualified expert. Then pro-cyclical movement of AUM can be reduced, if not altogether stopped.

Financial literacy

There is a simple but far reaching implication of adopting the proposed LRF for asset markets. Ordinary investors need not be barred from risky, if not “dangerous”, outlets like hedge funds, private equity funds, dynamic funds, high leverage,¹¹ actively managed funds, initial public offers (IPOs), sectoral funds, small cap funds, international funds, derivatives, complex products, short-selling, etc. It is the finance doctor’s role to ensure that the right funds are entered or exited after taking into account the nature of the investor and the state of the market. So all such products can be available but they can be purchased only on the basis of a finance prescription under the proposed LRF. There is also hardly any need for lock-in period, exit load on withdrawals after a short period, and so on. This is because a finance doctor is not likely to prescribe frequent churning of portfolios, and such a prescription is mandatory under the proposed LRF. There is no need for such things like *financial literacy* any more than there is a need for medical literacy, engineering literacy, and so on. The recent emphasis on financial literacy is quite misplaced. It is missing the basic point!

Endogenous irrationality

If the proposed LRF is adopted, there is hardly any scope for bubbles and crashes in asset prices. Accordingly, there is hardly any need for the central bank to make large scale asset purchases of mortgage-backed securities, etc. (there is also hardly any rationale for Volcker Rule if the proposed LRF is in place). Concepts or concerns like equity premium puzzle, Keynesian beauty context, social contagion, investment assets as consumption goods, accredited investors, qualified purchasers, animal spirits, irrational exuberance, noise trader

¹¹Geanakoplos (2010) shows how a leverage cycle can build up and asset prices can fluctuate. Though his model has so-called rational agents, they have very different optimism levels. All this is in the absence of advice from truly qualified finance professionals. Under a revised LRF, all this can change. House buyers would not have been advised by truly qualified finance doctors to take large loans.

risk, predatory lending, effect of experience on noise traders' performance over time,¹² large compensation for management, Save More Tomorrow programme, and so on could become much less relevant, if not completely outdated after the proposed LRF is adopted. Finally, it has been emphasised by psychologists that in the context of financial decisions Prospect Theory is more realistic than Expected Utility theory. There is no denying this. However, this is true under the prevailing LRF. The outcome could be very different under the LRF proposed in this paper because investment decisions would be based on a prescription from a finance doctor who is trained and is conscious of biases that can creep into decision making. Indeed, various attributes like over-confidence, over-trading, bias in attention, gambling behaviour in stock markets, representative heuristics, anchoring, magical thinking, quasi-magical thinking and so on could be far less important in financial markets under the proposed LRF than they are at present under the prevailing LRF.

Savings glut

Factors like savings glut (and global imbalances) are often held responsible for a push to home prices in the US and elsewhere. However, this analysis in the context of the prevailing LRF. If the LRF proposed in this paper was in place, then home prices would not have got pushed up even if there was a savings glut and low interest rates (this will become clear).

Economic inequality

Economic inequalities are high and rising within some countries. Various redistribution policies have been advocated in this context (Piketty 2014). However, one aspect is usually forgotten in such an analysis, if it is recognized at all. One reason for economic inequality is that some people do while others do not realize the importance of some or all of the following factors: saving, investing in right asset classes, compounding of returns, and so on. *Ceteris paribus*, those who realize the significance of such factors can have a higher rate of increase in income and wealth whereas others' position improves slowly. So inequalities can increase due to ignorance *and* lack of mandatory advice. This aspect can be dealt with if the proposed LRF is adopted. Then inequalities may not rise as much as they have within countries like the US (though other policies may be required as well for re-distributional purposes).

Caveat emptor

¹²See Campbell, et al. (2013).

As mentioned earlier, noise traders can lead to externalities. In Public Economics, the usual solution to deal with the problem is to use a Pigouvian tax-subsidy scheme. In financial markets, the problem of externalities is different and so it requires a different solution viz., a revised LRF. Noise traders can not only harm others but they can also reduce their own expected utility. This is unlike what happens in a typical problem of externalities in Public Economics. A factory that pollutes a river may be harmful to others but possibly not harmful at all to owners of the factory. So there the main idea is to protect people other than the factory owners (in fact, they need to be punished). In financial markets, the main idea is to protect both the noise traders and the others (we will come to the principle of *caveat emptor* shortly). So an approach that is different from the one prescribed by Pigou is required in this case. The different solution is a change in the LRF for financial markets.

It is true that the principle of *caveat emptor* can absolve the government of the need to protect noise traders. However, it is important to make a distinction. *Caveat emptor* can be a principle that is accepted on ideological considerations, in which there is no need to protect noise traders. Alternatively, *caveat emptor* may be used as a way of cautioning buyers in a world where the government cannot ensure complete safety at reasonable cost. In the latter case, the government may intervene up to a point and only thereafter pronounce *caveat emptor*. In this case, the government has the need to make an attempt to protect noise traders if this is possible at a reasonable cost. Now we have argued that it is indeed possible to protect noise traders (and others) by shifting to a very different LRF for financial markets. So, in this case, there can be a rationale for providing an appropriate LRF and not rely on the principle of *caveat emptor*. This is of course under the assumption that the costs of the proposed LRF are reasonable.

Coordination

The proposed LRF can serve another purpose. To see this, note that under the prevailing LRF even the truly rational investors can have a difficulty in operating in financial markets. They need to keep in mind that noise traders can behave erratically. They need to study this erratic behaviour, which is difficult. So it is not surprising that they may not do well consistently. (Sir Isaac Newton lost money in the stock market; he famously said that he cannot predict madness of crowds). All this is true even if the initial influence of noise traders is not very large to begin with. But the overall effect can become large if rational traders get occupied in studying the behaviour of noise traders, and in studying the behaviour of

other rational traders in response to their understanding of noise traders' behaviour, and so on. The difficulties can get compounded (see Kogan et al. (2006) for a related model). It is true that if all the rational investors simply focus on fundamentals if their portfolio sizes are large relative to the size of portfolio with noise traders, then the latter will hardly any effect on asset prices. However, while this is desirable it may not be a likely outcome. This is because there can be a coordination problem among the rational traders. It is here also that the proposed LRF can help. It acts as a coordination mechanism.

In this section, we have considered a case of market failure and how this may be corrected by an overhaul of the LRF within which financial markets function. In the next two sections, we will consider a different case in which there is a government failure in providing an appropriate macroeconomic policy and public finance policy regime. We will also see how the policy regime can be suitably changed to correct the government failure. In the next section, we will consider public finance policy regime. Thereafter, we will turn to macroeconomic policy regime.

3 Public Finance Principles

We will see in this section tax rules that can come in the way of arbitrage and can thereby increase asset price volatility. There is a need to reduce and possibly even abolish some taxes (and make minor suitable increases in many taxes elsewhere to meet various objectives of public policy). We will consider four tax rules that can come in the way of asset price stability.

Capital gains tax even where proceeds are reinvested

Consider an investor with two separate funds - one is an equity fund and the other is a debt fund. Suppose that there is a crash in the equity market and prices are lower than fundamental values. What can a (long-term) investor do? For her, there is a need for change in the portfolio choice with a greater share of equity fund and a smaller share of debt fund as compared to what was held initially. The way to do this is for the investor to sell part of the debt fund and buy more of the equity fund. However, there is a problem now. The investor must pay taxes on capital gains realized on sale of debt fund. If this tax is more than the expected gains on change of portfolio choice, then the investor will not make the change. Then equity prices stay low (till funds come from elsewhere and are used to buy

equity; all this can take time). So, it can become difficult to bring about normalcy in the equity market after an unwarranted crash has occurred.

Let us note a few features. First, what the capital gains tax does in the above case is to bring about segmented markets. There is a need to integrate the different asset markets. One way to do this is to improve tax laws. Second, we considered two asset classes (an equity fund and a debt fund) for simplicity. However, the above argument is more general. Third, it is true that not many households are active investors who will exploit available opportunities. However, there are many high net worth investors and firms that may not be reluctant to exploit profitable opportunities (that are also socially desirable).

In view of the above analysis, our policy suggestion is as follows. The treasury can remove tax on the so-called 'realization' of capital gains *if the proceeds are reinvested in another asset in the same asset market or in a different asset market*. In other cases where proceeds are not used for reinvestment (they may be used for consumption), the treasury can retain tax on long-term capital gains. The proposed change in tax laws will pave the way for arbitrage by investors who can choose to be active to exploit low prices in one asset market and relatively high prices in another asset market. This will reduce large gaps between prices in one market and those in another market. In the process, there will be reduced fluctuations in prices within an asset market. This aspect has not received much attention in the public finance literature.

There has been a different debate lately regarding the long-term capital gains tax in the US. The tax rate is less than the tax rate on some incomes earned by the less affluent. So, it has been argued that the long-term capital gains tax rate should be *increased* for egalitarian considerations. We would like to make two observations here. First, we have suggested abolition of tax only on that part of the long-term capital gains, which is used for reinvestment; the remaining part can be taxed - even at a higher rate (as suggested by some in recent years). Second, though there is a loss of revenue due to proposed abolition of tax on long-term capital gains that are reinvested, various other taxes can be increased to maintain revenue neutrality, and to ensure fairness of tax system as a whole.

Financial transaction tax

A financial transaction tax is a small tax imposed on financial transactions. There are two difficulties with the tax from the viewpoint of asset price stability. First, even though the tax is small, it can discourage stabilizing speculation in normal times. It can also reduce

liquidity in the financial markets. Second, though it can potentially discourage destabilizing speculation, it is too small to have an effect in this context. This is because the price movements can be large (relative to the financial transaction tax) at a time when there is destabilizing speculation. So it is not a suitable tax for the purpose of curbing destabilizing speculation. Though this is recognized in the literature (Darvas and Weizscker, 2011), there is often reluctance to suggest that it should be abolished for lack of an alternative policy measure that can reduce destabilizing speculation. This paper has suggested an alternative LRF that goes to the heart of the matter and is better targeted (see the previous section on the proposed LRF). Such an LRF reduces, if not completely obviates, the need for a financial transaction tax. So this tax can be abolished, given that the proposed LRF is in place.

‘Home bias’, and relatively higher taxes on foreign investments

At present, much of the investment by household tends to be in their home country. While this may provide some comfort, there is actually a country risk involved. Much of the investment is concentrated in a single country. This is for various reasons. But suppose now that an investor realizes and would like to diversify by investing both in the domestic equity market and in the international equity market. There can be a difficulty in this in some countries. At present, there is often a higher tax on income from investments made abroad. An example is tax rules in India. There is a long-term capital gains tax which is imposed on investments made outside the country. The corresponding tax rate on investments made within India is zero. When the domestic equity prices are high relative to equity prices elsewhere, there is an apparent opportunity to sell stocks in home country and buy stocks abroad. This can be of course profitable for the investor but it can also serve a social purpose. If there are significant sales of this kind, then prices are unlikely to rise too much. So there can be reduced volatility. However, there is actually a disincentive to shift from Indian equity market to the international equity market due to tax rules. So one mechanism by which households could diversify and possibly reduce volatility is discouraged by the government!

The tax on returns on investments made abroad makes the international markets somewhat segmented. It may be argued that this is not a bad idea when volatility in one country can get transmitted to another country. We will make two observations here. First, in the next section, we will, following Jeanne and Korinek (2010a), consider a (somewhat large)

tax that can be used to discourage sudden international capital flows when they happen. This obviates the need for a *regular* tax on returns on investments, which is higher than the tax on returns on domestic investments by households. Second, the tax rules used at present are in the context of the prevailing LRF for financial markets. Consider a world in which there is an appropriate LRF so that noise traders are absent and financial markets are efficient. In such a world, it is good to have integrated markets (as would be suggested by textbooks). We have already discussed in the previous section how such an LRF can be devised. That will remove the original sin so that there is no need for a special or higher tax on capital gains made on investments abroad.

Owner-occupied homes, rented homes, and stocks

The tax treatment of owned houses and rented houses is typically different. It is interesting that this, in turn, impacts volatility elsewhere - in the stock market! We turn to this next.

Consider a choice between two kinds of homes - owned homes and rented homes. Assume that there is no tax on imputed income from owner-occupied homes but there is a tax on income earned elsewhere which can be used for payment of rent in case of a rented home. This differential tax treatment encourages home ownership and discourages renting of homes (Wolswijk 2010). Home ownership, in turn, encourages home loans. The latter are often taken by the young. This is where there is an effect on the stock market. The young are the people who have a long horizon and so are in a position to invest in the equity market which can give large expected returns in the long-term. However, due to their commitments to use their savings to repay housing loan with interest, many of them get more or less out of this equity market. There is hardly any money left for investing in the equity market. This has an adverse implication for stock market participation - particularly participation by the young (Cocco 2005). This is bad enough but there is a further implication in the context of stock market stability.

The young remain outside the stock market not only in normal times but also in times of a crash in stock market! This is because they do not have funds to invest, given their commitments on loan repayments. The result is that if equity markets crash, this does not attract new (young) buyers. So the fallen prices can stay low for quite a while. They can even drop further.¹³

¹³It may be argued that there can be a possibility to use additional borrowing by the young in such situations for the purpose of investing in the equity market in such times. However, there can be serious

The policy implication from the above diagnosis is clear. It is important to get to the root of this problem. There is a need to avoid the differential tax treatment of ownership of homes and renting of homes. For this reason, there can be a tax on imputed income earned from staying in owned home.¹⁴ This removes the artificial advantage that is enjoyed in case of ownership of homes. Young people will then rent more homes and accordingly buy fewer homes. There will also be less home loans. The young can then invest their savings elsewhere - in equity market and in debt market. They can vary the proportion if there are bubbles or distress conditions in one market and not in the other. If there is a crash in equity market, they can buy more equity and less debt, and vice versa in a boom. This helps to stabilize the stock market.¹⁵ Investors can get advice on such matters from a competent advisor (see the proposed LRF in the previous section).

In some countries, there is another tax-benefit given on home loans. The income tax liability gets reduced if a tax payer has a home loan and is paying interest on the loan. This can also encourage home ownership. By implication it discourages investment in stocks. This is true in normal times and also in times of very low prices of stocks. It becomes difficult to use the opportunity and thereby also reduce asset price volatility.

This completes our discussion of tax changes in order to bring about greater asset price stability. For simplicity, we considered a change in taxes in asset markets only. Obviously, this can have adverse implications for tax mobilization. There can then be a need to raise taxes elsewhere, which will have its own cost. A more complete analysis of tax structure is where asset price stability is a consideration in devising tax rules just as efficient allocation of resources, distribution of income and wealth, and macroeconomic stability are.

Summing up, we have seen in this section that there can be a government failure to provide an appropriate public finance policy regime within which financial markets can function well. We have also seen how this government failure can be corrected by alternative tax rules. In the next section, we will reconsider the macroeconomic policy regime and its effects on financial markets.

difficulties in the credit market.

¹⁴There is an alternative. Tax on income that is used to pay rent can be waived.

¹⁵Incidentally, there is another advantage in this policy proposal. If there is more renting of homes, then fewer people invest in homes. Such investments are typically bulky. So there is risk due to a concentrated portfolio. This can be reduced with a diversified portfolio that includes assets like stocks, bonds, REITs, etc.

4 Macroeconomic Policy Regime

This section will propose a major change in macroeconomic policy regime. The motivation for this is as follows. Let us consider an important feature of the central bank policy, which is usually used to maintain macroeconomic stability. Typically the central bank lowers interest rate in times of recession to boost investment demand. The policy also tends to boost asset prices, which can, in turn, boost consumption demand. An increase in investment and consumption demand is expected to boost output and employment. However, often the central bank needs to keep long-term interest rates low for an “extended period” of time for this purpose, and there is usually a difficulty in finding an exit route. There can be a push to asset prices initially, which has to be eventually reversed. So we can have asset price volatility as a result of macroeconomic policy! This is what seems to be happening at present in the US and elsewhere. (In the 1980s, there was an opposite problem. There were high interest rates which led to serious difficulties for Savings and Loan Associations.) All this is a motivation for reconsidering the macroeconomic policy regime.

In what follows, we will present an alternative policy regime that takes care of both asset price stability and general macroeconomic stability. We will consider a macroeconomic policy regime that includes inflation targeting (IT), which is familiar in the literature. However, the policy regime also includes, what we have called extended fiscal policy (EFP), which is unfamiliar in the literature. This section is in two parts. The first part is on IT. The second part is on EFP.

Suppose that the central bank targets low and stable *core* inflation (this can be consistent with the lender of last resort (LLR) facility, as we will see a little later). This can contribute to macroeconomic stability. However, the other part of macroeconomic stability is taking care of *cost-push* inflation, output (and employment), capital adequacy in financial intermediaries, and external balance. Though IT can be useful in this more general context, there may be no *divine coincidence* between low and stable core inflation on one hand and other parts of macroeconomic and financial stability on the other hand. In this context, we will show that EFP can take care of these other aspects. Two of the concerns viz., cost-push inflation and external balance may not be important in developed countries but that is not the case in many developing and emerging economies. So, we will consider these as well in our proposed macroeconomic policy regime. But before we come to EFP, we will first consider IT.

4.1 Inflation Targeting (IT)

There is empirical evidence to show that stock prices are stable if inflation rate remains low and stable. This immediately implies that it is good to have IT from the viewpoint of asset price stability. While this is important in itself, there is more to the story. IT can be useful in other ways as well for asset markets.

Asset prices depend on the rate of discount used. This depends on the return on ‘waiting’ and return on risk-taking. The return on ‘waiting’ may be arrived at after subtracting expected inflation rate from the nominal interest rate on safe asset. In what follows, we will assume that the market return on waiting per se is constant. So, the discount rate can vary if expected inflation and risk premium change over time. Risk premium has received considerable attention (see, for example, Cochrane (2011)). Here, we will focus on changes in expected inflation. But before we do so, it is important to comment on central bank policy on interest rates.

Typically, the central bank uses its interest rate policy to maintain macroeconomic stability. This has the obvious implication that interest rates can vary over time. This runs counter to the argument made in this subsection that IT can lead to stable inflation, stable interest rates and stable asset prices. Now note that in our macroeconomic policy regime, we have not only IT but also EFP. The latter, as we will see, obviates the need for the central bank to vary very much its interest rate for the purpose of macroeconomic stability. So in what follows in this subsection, we can meaningfully consider stable interest rates.

Expected inflation keeps varying unless the central bank has adopted IT in one way or another. Then we may take expected inflation to be a constant and equal to the inflation rate targeted by the central bank. This can be used to arrive at the real interest rate, which can be used for valuation of assets. Accordingly, asset prices can be, *ceteris paribus*, stable i.e. they will not change due to inflationary expectations that are anchored if the central bank adopts IT.¹⁶

¹⁶If investors are irrational, they tend to use nominal interest rates for discounting the (real) income stream from an asset (Modigliani and Cohn, 1979 and Shiller 2008). However, under the proposed LRF discussed in the previous section, we need not worry about irrationality in the market. But even if we allow for irrationality, IT can be very useful. The reason is simple. If the nominal interest rates are volatile, asset prices become volatile. Nominal interest rates can be volatile if inflation expectations keep changing. Under IT, inflation expectations are, however, stable. This makes nominal interest rates stable. Accordingly, asset prices can be, *ceteris paribus*, stable. It is true that the valuation of assets is not correct in this case but at

Assets include long-term bonds. Their prices too can be stable under IT due to stable nominal long-term interest rates. This has an interesting implication for short-term finance, and financial stability. Typically economic agents who are interested in investing for a short maturity prefer to invest in short-term bonds. Why? The reason may seem obvious but it is not so. Why do they not buy, say, a zero-coupon long-term bond and hold it for a short while? This could also serve the same purpose of a short-term investment. (Assume for simplicity that transaction costs are the same in the two cases.) One reason the alternative mentioned is not used is that the price of long-term bond can fluctuate in the short run. This is supposed to be market risk. However, the basic underlying uncertainty is due to changing long-term interest rates, which can change prices of long-term bonds. The long-term interest rate can, in turn, fluctuate due to changing inflationary expectations. This is the risk that short-term investors want to avoid, and so they invest in short-term bonds.

Now let us come to the interesting part of the story. If long-term interest rates are stable, then there is less risk in holding long-term bonds for a short duration. So there can be higher demand for long-term bonds if long-term interest rates are stable. Accordingly, there will be less demand for short-term bonds. This can serve a social purpose. Observe that an important reason for the troubles at investment banks, etc. in the financial crisis in 2007 was considerable use of short-term funding. This has been condemned very much. However, an alternative has not been suggested. The above analysis has shown that if IT is adopted, then inflation rate is stable, long-term interest rate are more stable, prices of long-term bonds are more stable, and there can be less demand for short-term instruments. This

least the valuation does not keep changing with changing inflation expectations; the latter are stable under IT.

It may help to give an example of how changing interest rates can affect stock prices. Till about 1980, nominal interest rate used to be high due to the high inflation that prevailed in the US (and elsewhere). Starting from around 1980, inflation rate was brought down in the US. Accordingly, nominal interest rates fell though the fall was slow and spread out. As predicted by Modigliani and Cohn (1979), the fall in the nominal interest rates, in turn, led to an increase in stock prices in the market. Indeed falling nominal interest rates appear to be an important part of the boom story in the US stock market in the 1990s (and even in the 1980s). Eventually there was a crash in the stock market in 2000 (though this story was overshadowed by the more visible crash at NASDAQ in the year 2000). The message from this experience is that a fall in nominal interest rates led to asset price volatility. Now consider a counterfactual. If the US had low and stable inflation all through, then nominal interest rates would have been stable and there would not have been long-term stock price volatility on this account. So, it would have helped if the US had adopted IT formally or informally a long time ago.

can lead to a rise in the short-term interest rate. Then investment banks, etc., would cut down their short term funding. This will contribute to general financial stability - thanks to IT!

IT helps provide stable returns to bond holders. This stability can, in view of some economists and policy makers, have a negative side to it. Bond holders (and other fixed income recipients) are often viewed as *rentiers*; in this context there are hardly any sympathies for their losses due to increased inflation. This often becomes the rationale for not adopting IT. Note that this is effectively a redistribution argument against IT. Even assuming that this argument is correct, the purpose can be served by an explicit tax policy without causing a macroeconomic disturbance. There can be a higher (and explicit) tax on incomes of rentiers. This obviates the need for a jump in inflation now and then, which may be viewed as a macroeconomic disturbance. In other words, there is indeed a rationale for IT - notwithstanding the possible need for a redistributive policy.

IT is useful for financial stability in another way. IT is, broadly speaking, not in conflict with the LLR facility, which is very important for stability of financial institutions. The central bank can make loans to financial intermediaries by issuing new *base money* in the event of a systemic bank run. This by and large does not translate into increase in *money supply with the public*.¹⁷ Since the money supply remains more or less unchanged despite the use of the LLR facility, the core inflation rate need not change (using the simple Quantity Theory of Money argument).¹⁸ So, IT is by and large not in conflict with the LLR facility. We may say that IT does not come in the way of stability of financial institutions even as the central bank is focused on *core* inflation. Stability of financial institutions is a part of macroeconomic stability in the economy. So, IT which contributes to stability of financial institutions also contributes to macroeconomic stability.

Though IT can be very useful in maintaining low and stable core inflation, it tends to pay inadequate attention to other macroeconomic objectives. It is in this context that

¹⁷Assume that the inflation rate is zero. Consider

$$M = mH = \frac{1+c}{c+r}H,$$

where M , H , m , c and r stand for money with the public, base money, money multiplier, currency-deposit ratio, and reserve-deposit ratio respectively. If H increases and r also goes up, then m falls and so there need not be any rise in M .

¹⁸After 2007, there has been massive increase in base money in the US and in Europe. However, the inflation rate has not increased.

there is discomfort with IT among many academics and policy makers. However, in the next subsection, we will see how the other macroeconomic objectives can be taken care of.

4.2 Extended Fiscal Policy (EFP)

This subsection does not deal with asset price stability *per se*. However, it serves two purposes from the view point of asset price stability. First, it shows how EFP can take care of objectives other than maintaining low and stable core inflation in a way that asset price stability is not disturbed (unlike what happens under the usual macroeconomic policy regime). In this sense, EFP contributes to asset price stability. Second, as EFP takes care of objectives other than control of core inflation, it paves the way for the central bank to meaningfully focus on IT (the central bank need not worry too much about other macroeconomic objectives). We have already shown that IT is useful for asset price stability (see the previous subsection). So, in this sense, EFP contributes indirectly but crucially to asset price stability.

What is EFP? One part of it is Keynesian fiscal policy, which is familiar. In this case, the treasury increases its own demand for goods or provides tax incentives or even subsidies to increase private demand in a recession. In a boom, the treasury attempts to do the opposite. The basic idea behind Keynesian fiscal policy is to stabilize aggregate demand in the economy. This can, in turn, stabilize aggregate output and employment.

The taxes used in Keynesian fiscal policy are typically direct taxes rather than indirect taxes. Furthermore, the attempt is to boost consumption demand in the economy. There is much less emphasis on changes in taxes/subsidies related to investment. Sometimes an *investment tax credit* is introduced (or increased further, if it exists already) to affect investment demand. But this is more often than not hardly anything more than a footnote in Keynesian fiscal policy rather than at the very heart of the policy. At this point, we make a departure and suggest a fiscal policy that goes well beyond Keynesian fiscal policy.

EFP includes major changes in indirect taxes/subsidies to affect both investment demand and consumption demand in the economy. (It also includes, as will become clear, some other activities that require an expenditure on the part of the treasury and that involve other government departments that deal with oil, food, and so on.) The use of indirect taxes/subsidies is not in the context of resource allocation in the economy, as is usually the case in the public finance literature. Instead, it is with a view to stabilize aggregate demand

in the economy. Since investment forms the more unstable part of aggregate demand, there is a need to pay a lot more attention to this through fiscal policy than is the case at present. But fiscal policy can also be used to boost consumption demand. Consumption taxes can be reduced and even subsidies may be given in a recession, if required. These changes can be phased out over time as the economy comes out of recession. In a boom, the treasury can impose higher taxes on consumption. This serves two purposes. It stabilizes demand and it balances government's inter-temporal budget.

Let us now come to the more important and less familiar part of EFP that can be used to stabilize investment demand. In stabilizing investment demand, the broad idea is to give a subsidy on interest cost incurred on investment in a recession. This policy can push investment at a time when it tends to be very low. On the other hand, the policy can be to impose a tax on interest cost incurred on investment in a boom. This can reduce investment at a time when it tends to be high. With a tax-subsidy policy, investment can possibly be stabilized.

The subsidy and tax may be computed on the interest cost (and not on the total cost) if the purpose is to change the effective interest rate for investing entities. The motivation for this is to relieve the central bank from the burden of varying the interest rate to influence investment in the economy so that it can focus on IT without worrying about investment (and output more generally). It becomes then the role of the treasury to affect investment and output by varying not the market interest rate but by varying the effective interest rate. This theme is explained at greater length under the head 'Output stability' a little later.

As mentioned earlier, EFP extends fiscal policy well beyond Keynesian fiscal policy. What this means is that the treasury can affect aggregate demand in not just the standard ways but also in some unconventional ways. What EFP does not mean is that the size of the fiscal stimulus is increased indefinitely. It is an argument about changing the form of the stimulus though some increase in the size is possible. Moreover, there is stress on not only increased government expenditures and/or lower revenues in a recession but also reduced expenditures and/or increased revenues in a boom. Though this aspect is stressed in Keynes's General Theory, it is often lost sight of. It is important to remember this.

EFP is a new topic and a complete treatment is outside the scope of this paper.¹⁹ What

¹⁹For more, see this author's related writings - chapter 11 in Singh (2012), and Singh (2013) and Singh (2014).

follows here is a brief statement of the key ingredients involved in analysis of EFP. The argument that follows is very simple but it may seem difficult due to the fact that it is very different from the standard arguments in the literature. We will see how EFP can be useful in dealing with cost-push inflation, stability of output, capital adequacy in financial institutions, and external balance. The treatment is very brief here.

Cost-push inflation

Cost-push inflation is primarily jumps in prices of food and oil. We will show how EFP can be useful in dealing with food price inflation. A similar case can be, *mutatis mutandis*, made in the case of oil price inflation. The arguments are primarily in the context of emerging and developing economies which is where this problem is serious.

Consider food inflation. A simplified and stylized version of the proposed policy to deal with the problem is as follows. *First*, the treasury can buy or it can help other government departments to buy (non-perishable) food in times of low prices, store these, and sell when there is scarcity in the market. This helps avoid jumps in food prices. *Second*, in normal times the treasury can buy *call options* in the international market. These give the buyer the option, but not the obligation, to buy food at a pre-determined price. Such options may be exercised in the event of high market prices. This policy helps increase supply of food in the domestic market in times of high food prices. Similarly, the treasury can buy *put options* that can be exercised in the event of low prices. Thus it can sell food abroad at a pre-determined price when the market prices are low. *Third*, the treasury can help by changing taxes imposed on international trade. It can lower import duties (and even give subsidies) on imports of food in the event of high prices at home. Similarly, it can increase import duties in the event of low prices at home. Thus, food prices can be stabilized.

It is interesting that real price of food in the long-term does not show any clear upward trend. This immediately implies that periods of jumps in food prices are followed by periods of fall in food prices. So it is primarily a problem of volatility of food prices over time. This can be taken care of by the treasury. The three policies described above help avoid or reduce the so-called cost-push inflation related to food prices.

Let us provide a perspective. Inflation may be decomposed into two parts: Core inflation and cost-push inflation. The upshot of the analysis of inflation in this section as a whole is that cost-push inflation can be taken care of by EFP even as core inflation is taken care of by IT. So, *the macroeconomic policy regime that includes IT and EFP can take care of*

inflation in general in the economy.

Output stability

We come now to the most important part of the EFP, which directly contributes to output stability and indirectly contributes to asset price stability.

As mentioned earlier, to maintain output stability, the treasury can change the effective interest rate. First, it can give a somewhat large subsidy on interest cost incurred on investment carried out in a recession. Second, it can impose a tax on interest cost incurred on investment carried out in boom periods. The first step pushes investment and output in a recession. The second step reduces investment and output in a boom. So the two steps together stabilize output over time.

Note some features of the EFP:

1. There is an explicit tax-subsidy scheme in our policy regime. This is used in lieu of a tax-subsidy scheme that is implicit in the central bank policy to vary interest rate in response to recession. To see how the tax-subsidy scheme is implicit in the central bank policy, note that when the central bank lowers the interest rates in a recession, it lowers these for both savers and investing entities. It is as if in the standard central bank policy, there is an implicit tax on interest income of saving households, there is an implicit subsidy on interest cost on investment by firms, and tax collected from savers is paid as subsidy to investing firms.
2. In our policy regime, the explicit tax-subsidy scheme by the treasury involves investing firms only; savers are not involved. So there is no redistribution between saving entities and investing entities. Instead, there is redistribution from investing firms in future to investing firms at present when there is a recession. In contrast, in the prevailing central bank policy, there is a redistribution from saving entities to investing entities in a recession. Savers have lost considerably due to the policy of reduction of long-term interest rates in recent years. This effect is avoided in our policy regime.
3. In our proposed policy of an explicit tax and explicit subsidy, there is a subsidy for investing firms in a recession phase and a tax on investing firms in normal or boom years. The scheme operates over long periods of time over a complete business cycle. This is unlike the implicit tax-subsidy scheme that operates within the recession period. There is an implicit subsidy for investing firms and an implicit tax on savers - all in

the same period. Similarly, there can be both tax and subsidy within a boom period.

4. There is a subsidy in some years and taxes in other years in our proposed explicit tax-subsidy scheme. So, there is an inter-temporal balance in the budget (in contrast to a within period ‘balanced implicit budget’ in case of the implicit tax-subsidy scheme).
5. It can be better to have an explicit tax-subsidy scheme instead of an implicit scheme because it is transparent. More important, *there is hardly any side-effect of EFP on asset prices*. This is unlike the case of the central bank policy to reduce interest rate in recession, which affects not only investment but also asset prices.

The key take-away from the above analysis is that it is possible to stabilize aggregate output without destabilizing asset prices if we use EFP as an accompaniment to IT. This is in contrast to what is achieved under usual macroeconomic policy regime. In the latter case, there is an attempt to stabilize output but this is at the cost of asset price stability. As an example, consider the policy that the FED has followed in the aftermath of the Great Recession and the financial crisis in and around 2007. The FED nudged long-term interest rates lower to boost investment. It is questionable if it was successful. Even if it was, the policy had another effect. Asset prices went up in the US (and elsewhere) in the recent past. Many analysts are of the view that this is due to low long-term interest rates that are usually associated with FED’s policy in recent years. It is feared now by many that as the FED withdraws the Quantitative Easing (QE) programme, the long-term interest rates will rise, and asset prices will fall. So we are having asset price volatility as a result of the prevailing macroeconomic policy! Our proposed policy avoids this.

We have considered policy for stability of output. However, policy makers are concerned not just with output but also with employment. While a textbook treatment often assumes that a change in output implies a change in employment, this is not always the case. So employment needs to be treated separately. This can be tackled separately through a subsidy for the unemployed and/or a subsidy for firms that increase employment in times of a recession (Phelps 1994). So again the monetary policy need not be involved in taking care of unemployment.

Next we turn to another part of macroeconomic stability where EFP can be useful. This is stability of financial institutions.

Capital needs of financial institutions

Broadly speaking, financial institutions are stable if they have adequate capital and have access to adequate liquidity. The latter requires the LLR facility. This needs to be provided by the central bank. We have already seen that this is not in conflict with central bank's policy of IT (or macroeconomic policy regime more generally). The need to ensure adequate liquidity is now well recognized among academics and policy makers. However, the same cannot be said for capital (this was an important reason for the financial crisis in US in 2007). In what follows, we will consider capital needs of financial institutions.

Capital can include contingent capital²⁰, and, what we may call usual capital. A market exists for the usual capital which has the implication that financial institutions should be able to raise such capital. So government intervention is not compelling in this case (Gangopadhyay and Singh (2000) and Admati and Hellwig (2013)). But this is not true for contingent capital (Kashyap, et al., 2008). Market hardly exists for contingent capital. The treasury can fill this gap. Ex-ante, it can agree to provide contingent capital. Ex-post, if financial institutions remain stable anyway, the treasury need not do anything. However, if there is a crisis, then the treasury needs to provide long-term funds to the financial institution(s) in difficulty. This is a step that governments usually take anyway ex-post (this happened during the recent financial crisis in the US). It is far better to have an arrangement in place ex-ante. The treasury can take a fee, monitor banks, and possibly reduce the probability of a crisis.

If financial institutions are stable, then asset prices too can be stable (as there will not be fire sales by such institutions on a large scale). We have seen that EFP can contribute to stability of financial institutions. By implication, EFP contributes to asset price stability. Observe that in this policy exercise, the central bank is not involved. So, it can focus on IT.

External balance

The use of EFP in taking care of external balance is primarily in the context of emerging and developing economies, which is where it is considered serious. The function of maintaining external balance is usually associated with the central bank and not with the treasury.

²⁰Contingent capital refers to funds that would be available under a pre-negotiated agreement if a specific contingency occurs. In this off balance-sheet arrangement, a party pays a capital commitment fee to a second party which undertakes (in advance) to extend a loan or purchase debt or equity security of a certain amount in case a stated situation occurs. The first party receives a critical capital injection exactly when it is needed without having to negotiate from a position of weakness.

However, the function can be carried out by the treasury, and in a simpler and more effective way. If the central bank holds foreign exchange reserves and varies these to stabilize the exchange rate, then it has to undertake *sterilized intervention* in order to prevent a change in the supply of base money. In contrast, if the treasury performs this function, there is in any case no change in money supply involved. So there is no need for sterilization in the first place. So, intervention by the treasury is simpler than that by the central bank.

What can be done to maintain external balance? First, public authorities can choose flexible exchange rate regime. This avoids the kind of problems that were faced in East Asia in 1997-98. Prior to 1997-98, somewhat fixed exchange rate were often used in some East Asian countries and these were sometimes not consistent with macroeconomic fundamentals. The inconsistency can eventually lead a crisis. Flexible exchange rates can avoid such difficulties. Second, (a separate department of) the treasury can hold foreign exchange reserves which can be used as a cushion against destabilizing speculation which can happen in a flexible exchange rate regime. The treasury can sell reserves when price of foreign currency is too high and vice versa. Thus, exchange rate can be stabilized. The treasury can finance foreign exchange reserves by issuing its own bonds in the financial markets. Third, the treasury can also buy *credit lines* from public institutions like the IMF. These credit lines are basically *options* that give the buyer the right, but not the obligation, to borrow in the event of a crisis or a near-crisis situation (when market for funds tends to dry up). There can be an optimum mix of credit lines and reserves as each has its own pros and cons. Fourth, sudden flows of international capital can have negative externalities. Accordingly, there is a case for a Pigouvian tax imposed on sudden and large capital flows. This can help stabilize capital flows and exchange rates (Jeanne and Korinek 2010a).

We are near the end of our discussion on EFP for macroeconomic and financial stability. We will make an important concluding remark on EFP before we close this section. Though we have considered EFP to maintain stability of (a) food and oil prices, (b) output, (c) capital in financial institutions, and (d) external balance separately, the policies make a coherent whole to achieve general macroeconomic and financial stability. How? The basic instrument used in each case is a tax-subsidy scheme. This can be used for several purposes simultaneously. It is true that there can be a fiscal burden in a recession due to subsidies involved in EFP. However, there can also be a jump in revenues due to taxes in boom periods, which are involved in EFP. So, there can be, as mentioned earlier, an inter-temporal balance in the government's budget. This leads us to make a strong and interesting observation here.

*There is hardly any trade-off in using extended fiscal policy (alongside inflation targeting) in order to achieve several macroeconomic objectives.*²¹

This is in contrast to the case in which the central bank is at the centre of macroeconomic stabilization efforts. If it does not adopt IT and looks after several objectives, it faces a trade-off between these. If it does adopt IT (but the treasury does not adopt EFP), then inflation is taken care of but other macroeconomic objectives get less attention. It is only when the central bank adopts IT and the treasury adopts EFP that inflation and other objectives are looked after.

This section has considered a policy regime that includes IT and EFP. It is assumed that the targeted inflation rate is positive at, say, at 2% per annum. This may be viewed as inadequate in the context of dealing with the zero lower bound (ZLB) on nominal interest rate. However, it has been shown that the ZLB problem can be taken care of even with zero (actual and expected) inflation rate; EFP can take care of this (Singh 2014). So, the analysis in this paper is more general and can be used in the case of price level targeting instead of inflation targeting.

5 Conclusion

Though it is hard to get free lunch in financial markets, there can be serious anomalies. We have seen how these can be due to both market failure and government failure. This paper has explored novel ways to deal with such failures.

There can be a market failure related to externalities due to actions of noise traders in financial markets, who behave irrationally. Though the traditional policy measure in

²¹Though EFP does not impose any inter-temporal fiscal burden, it helps to adopt the policy regime in a phased manner after building a reserve which can be used in a recession or a crisis. It does help to have fiscal space.

Do countries have fiscal space at present? While the gross debt as a percentage of GDP for advanced countries was 103.5 in 2011, the figures for emerging economies and low-income countries were much lower at 37.6 and 38.2 respectively (International Monetary Fund, 2012). Furthermore, not all the advanced economies have large debts. So the assumption of fiscal space is more meaningful in a broader perspective than it may seem given the uncomfortable fiscal situation at present in the US and parts of Europe. It is reasonable to assume that even such areas will not have fiscal difficulties forever. In any case, it has been argued that fiscal policy can be used to stabilize output without worsening the fiscal situation in the US (Ball et al. (2014).

this context is a Pigouvian tax, this paper has examined another solution to this problem. This paper has suggested an alternative LRF that can reduce, if not completely avoid, the basic problem of irrationality in financial markets. We have drawn lessons from the legal-regulatory framework (LRF) used in an altogether different field viz., Medicine. The motivation for this approach is that refinements to traditional approaches within Finance have yielded diminishing returns. The debate in recent years with regard to what can be done about excess asset price volatility has missed a basic point, which is that the prevailing LRF is permissive in a wrong way. One main policy recommendation of this paper is that it should be *mandatory* for ordinary investors to obtain a prescription from, what we have called, a finance doctor before investments can be made. This LRF is similar to that used in the field of Medicine wherein a patient can buy medicines only after obtaining a prescription from a qualified and registered medical practitioner. We explained at length why a change in LRF is required and how it can be pragmatic though it can take a while before a complete switch to the new LRF can be made. We have seen that a change in the LRF can have far reaching implications for the functioning of the financial markets and indeed for the economy as a whole.

There can be a variety of market failures in an economy. To correct these, the government needs to intervene. It is in this context that a public finance and macroeconomic policy regime has been *inter alia* instituted. Such a policy regime has indeed been useful to meet the objectives laid down. However, this policy regime can have adverse side-effects for financial markets. There can be serious mispricing and excess volatility in financial markets as a *result* of the public finance and macroeconomic policy regime in place. This may be viewed as a government failure. This paper has explored a change in such a policy regime in this context.

This paper has argued that taxation principles have paid too much attention to three objectives viz., improved resource allocation, a decrease in economic inequality, and macroeconomic stability. There is too little attention to effects of taxes on volatility in financial markets. There is a need for a correction here. There is a need to include a fourth objective before tax-subsidy programmes are worked out. This exercise suggests that some taxes are abolished or reduced in capital markets, and taxes are increased elsewhere to make the overall change consistent with revenue targets and social objectives.

Finally, this paper has reconsidered the basic thinking on macroeconomic policy, which prevails at present. This paper has recommended a macroeconomic policy regime that

ensures not only macroeconomic stability but also financial stability. We do not need to abandon inflation targeting (IT) for this purpose, as some have suggested in the aftermath of the financial crisis in the US and elsewhere in 2007. Instead, we have suggested that IT can be used alongside, what we have called extended fiscal policy (EFP), which goes well beyond Keynesian fiscal policy. While IT takes care of core inflation, EFP can take care of cost-push inflation, output stability, capital needs of financial institutions, and external balance. EFP does all this without increasing asset price volatility and without imposing any inter-temporal fiscal burden. We provided a glimpse of how the macroeconomic policy regime recommended here could have been useful in taking care of the Great Recession in the US in the years after 2007 without endangering asset price stability (as appears to be the case in 2013-14 and in the next one or two years).

A simple summary of the entire paper can be as follows.

A new LRF and an appropriate set of tax rules can be used to take care of asset price stability. This is meaningful if and only if it is accompanied by stability in financial institutions, and macroeconomic stability more generally. In this context, (a) IT by the central bank can be used to maintain low and stable core inflation and to take care of large liquidity needs of financial institutions, and (b) EFP by the treasury can take care of cost-push inflation, output and employment, contingent capital in financial institutions, external balance, and zero lower bound on nominal interest rate.

The ‘rules of the game’ outlined here are not perfect but these are sound enough. It is worthwhile to remember that “... the greatest enemy of a good plan is the dream of a perfect plan.” (The Prussian General Clausewitz)

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