

ECONOMIC POLICY FORUM  
EXPLAINING AND FORECASTING EXCHANGE RATES WITH ORDER FLOWS

COMMENTS

on Richard K. Lyons's "Explaining and Forecasting Exchange Rates with Order Flows"

by **Avinash Persaud**<sup>1</sup>

Financial market participants have adopted ambivalence to much of academic finance in recent years, but mention order flows to the market intelligentsia and the same two or three names come up. Professor Richard Lyons is one of them. Along with Ken Froot and Paul O'Connell and Richard Portes and Helene Rey, Richard Lyons's work has been at the vanguard of examining the empirical relationship between order flows and prices and the micro-economic foundations of that relationship. He has made important contributions to both of these areas. No one coming to the economics of order flow can afford not to read Mr. Lyons.

This is a relatively new field. There is still much up for grabs in terms of what we can say we know for sure and, for that matter, what its significance is. After all, for every buyer there is a seller, so why should orders matter? We are better informed thanks to the work of Mr. Lyons and others, but we are only now leaving the point of informed speculation. Advance has been limited by the shortage of publicly available data – and I fear that some of Mr. Lyons's conclusions and analysis suffer from this too. Richard Lyons does make the interesting and plausible point (though not very *Popperian*) that if the data was not interesting, why are the banks so keen to keep it to themselves? Large portfolio holdings databases are held at State Street, Bank of New York and J.P. Morgan Chase and these are kept private to a degree beyond the albeit onerous requirements of client confidentiality.

Since the mid-1990s, State Street Bank has provided access to part of its portfolio holdings database – the largest in the world – to Professor Ken Froot of Harvard Business School and Dr. Paul O'Connell of State Street Associates. This database is derived from State Street's position as the world's largest asset servicer. I hope that access to the historic data will be widened out one day, but as global head of research at State Street I have been a keen student of the behaviour of the indices that Froot and O'Connell have produced from the underlying data. From this study and the general thinking that it has sparked, I depart from and return to Richard's conclusions in a couple of areas.

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One of the interesting features of financial markets today is that although markets have grown substantially in terms of market capitalisation and flows; although market participants and regulators are more sophisticated in terms of risk management and although they are all better informed, financial markets are less stable. Markets are bigger; yet thinner. To say that markets are less stable is not without contention beyond most market participants. I would point to the fact that the number of 2.0% days in equity markets are far more frequent than before and that the number of currency crashes have increased over the decades. The price impact of trading in equity and currency markets, a measure of liquidity made possible by flow data, have not trended towards zero as volumes have grown. At the very least there is no evidence that markets have become more stable, which might be expected given their growth.

At the heart of this conundrum, is a significant change in the pattern of investor behaviour, which has had significant impact and sheds light on the relationship between prices and order flows. Flows arise when there is a difference of opinion. If a natural disaster lowers the profitability of an insurance company and traders mark down its stock price and everyone agrees that this new price assimilates the new information, then there will be no flow and prices will still have fallen. Indeed, prices will fall until non-traders believe the traders have marked prices down too far and start to buy from traders. Often you will see the combination of price declines and investor net purchases, which is quite elementary when you think about it, but quite opposite to the common perception that price falls are caused by actual investor sales. Call up a broker and ask why the price of your stock is falling and, nine out of ten times, she will say that her clients are selling. *Caveat emptor*.

Let me transgress for a moment to raise a point that I think Richard Lyons does not make enough of. For every buyer there is a seller, but what is interesting for the future is who is doing the buying today and why. The correlation co-efficient between cross-border investor flows today and market prices tomorrow is generally positive but not stable over long periods of time. That tells us that sometimes cross-border investors are driving prices and sometimes the "other", in this case, domestic investors are driving prices. The instability is not a source of statistical disappointment but represents an opportunity to observe if there are any patterns when foreigners drive prices and when locals do. I think there is and it relates to the degree of uncertainty. But let us get back to diversity of opinions and flows.

In a world where information is sparse, a lot of flows occur because buyers and sellers had, or thought they had, different information. As information has improved and informational advantages have been eroded, investors hold the same information and react to news in the same way, wanting to buy together or sell together. If we all want to buy at the same time, the price has to rise to that point that causes some of the buyers to drop out and persuades new sellers to come in to the market. The more homogenous views are, the more prices have to rise to make buyers equal sellers and this will be greater, the larger the flows are. In these circumstances more flows, means less liquidity not more. A common belief turned on its head.

Illiquidity is not “good” it raises the cost of capital and adds to risk and uncertainty, but it is not clear that this force for illiquidity is a “bad” development, or if it is, that there is anything we can do about it. Price adjustments caused by more widely available information are what price adjustments should be about it. That said, it does raise a question mark over the current orthodoxy which is that more information is always better and that it is the cheap solution to market instability – it may be a source of instability.

However, there are other forces for homogeneity that can be avoided. One of the most important is the convergence of risk management systems, encouraged, to some degree today, by regulators. Regulators have in some cases required greater use of mark-to-market pricing and measures of risk and predicted loss based on recent prices, correlations and volatility. This makes sense from an individual institutions perspective, but it only makes sense for the system as a whole if institutions had positions that were independent of each other. This is one place where finance differs from the physics upon which much financial statistics is based. Market participants and their positions are interdependent. Herding is a common and rational feature of markets with imperfect information and disproportionate costs for those who are wrong and alone. When one bank hits its risk management limit, many do and they all end up selling at the same time, forcing markets lower and leading to other banks, with less concentrated positions, to hit their risk limits.

I have discussed this in greater length elsewhere, but the reason why it is relevant here is that in observing the empirical relationship between flows and prices Richard Lyons notes that it is possible that this relationship is exaggerated by the relationship of prices to flows, but he cannot think of any logical reason why prices movements should lead flows. But here it is. A price decline which causes a risk-limit to be hit, triggers forced sales, which sends prices lower, hitting other risk-limits, triggering other sellers. Not only is this a possibility, but it is a very bleak one. It is one where the liquidity for selling disappears down a hole. I call this a liquidity black hole. Regulators initially dismissed these fears when they were first brought to their attention in late 2000. However, the decline of equity markets, in particular in the UK in 2002, when insurance companies, the biggest single holders of UK equities, were forced sellers as a result of price declines which caused their solvency ratios to be hit, appears to have followed the pattern of liquidity black holes we have described. Ultimately this forced the regulators to loosen mark-to-market regulations. One year too late of course.

If our emphasis on diversity and risk-management systems is right then we should observe a general increase in the relationship from prices to flows and this should be greater where there is least diversity. To a degree this is what we observe. Currency markets are big and the least diverse of the major asset classes – few instruments, few players and common risk management systems. Bond markets are most diverse – multiple instruments from triple AAA short-term paper to long-dated junk bonds and many different types of players and approaches to risk. Equities stand in the middle, but have become more concentrated of late with more consolidation of institutions and risk management systems. Over the past ten

years, using data on order flows from futures exchanges, currency markets exhibit the strongest positive correlation between this week's prices and next week's order flows. Government bond markets exhibit the strongest negative correlation. Equities show a move from a negative correlation to a positive one. Here is evidence that declining diversity in general and the growth of a common risk management practice in particular is creating risk.

I have postulated a theory for this disturbing development, one that ties together the reduction of diversity of information and behaviour in markets, increased volatility of markets and a more positive correlation from prices to flows. There is some evidence to support this theory. However, much further investigation needs to be done. Much is at stake for the stability of our financial systems and for financial policy. In this regard Richard Lyons has done some excellent foraging around, uncovered some gems and some conundrums and provided some sound explanations. Our eventual understanding of this field in ten years time when more data is more readily available may be a little different from Richard's first conclusions, but it is his work and that of a few others that has headed us in the right direction. I encourage him to pursue this topic further.

A. P.