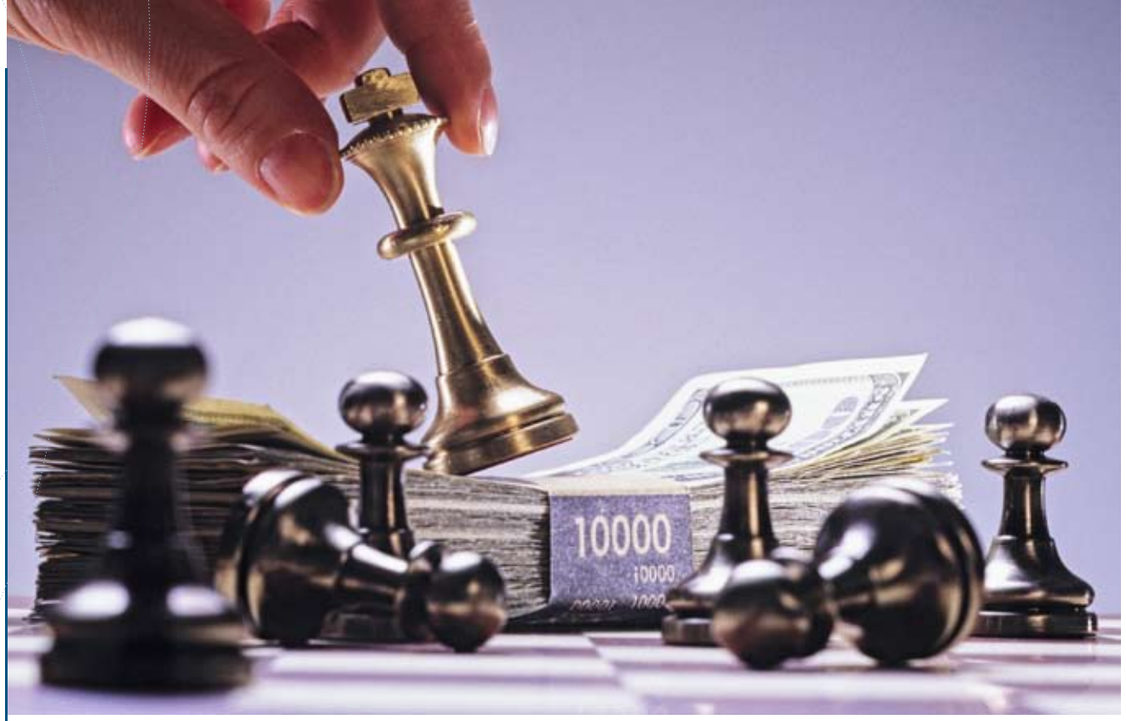


Financial Markets Dynamics

A new approach to active funds allocation*

By Raffaele Mugno, RCM Trust Founder & Portfolio Manager

Forecasting markets movements is at the heart of the financial industry, from traders to policymakers.

Contemporary economists, continue to pursue the perfect economic forecast despite abundant evidence that it does not, and cannot, exist.

In the economics profession the leading inheritors of this communistic mindset are the proponents of rational-expectations theory, which assumes that the economy and the individuals within it act with perfect foresight. Equally weak are the more fashionable school of behavioural economics, or at least those of its practitioners who claim that although people are irrational, their irrationality can be modelled so precisely that the future can be forecast with great precision.

There is nothing new in economics about the idea that people must make decisions based on imperfect knowledge. Frank Knight gave his name to "Knightian uncertainty" thanks to his 1921 book, "Risk, Uncertainty and Profit", which noted that most business decisions involve a step into an unknown that is to some degree immeasurable. And John Maynard Keynes observed that "human decisions affecting the future, whether personal or political or economic, cannot depend on strict mathematical expectation, since the basis for making such calculations does not exist."

Basing my model on imperfect-knowledge, the main aim is to show that financial markets dynamics present regularities that can be classified and used to effectively allocate funds.

In Keynes's sense, uncertainty is related not only to economic data, but more interestingly to the very structure of the models adopted to interpret the economic reality. Hence, the existence of different points of view on the evolution of the economy, even when the valuations are based on the same information set. Adding to this is the existence of different objectives characterising different financial institutions (for instance between a hedge Fund and a life insurance company), which also imply different time horizons hence distinct reaction functions. Therefore, in a system characterized by uncertainty markets dynamics depend on complex interactions. To start with, the new information is filtered and interpreted, generating also conflicting valuations on the new fair price. (For instance, the recent FED funds rate cut –12/2/07- and the coordinated auctions package to alleviate the credit crunch, are to be interpreted as an intervention able to solve the current money-market problems or as the Central Bank's anxiety that the economy at large is going into deeper waters than previously thought).

Second, a dynamic response follows from the market, not an immediate adjustment, which depends on the complex interaction among different models and different functions of reaction.
Third, the specific price path is diversely interpreted by different market participants. Some of them can consider the price getting closer to its new equilibrium, while others may interpret that dynamics as an accumulation of disequilibria. Moreover, the specific market dynamics can, with time, lead some market participants to change their view on the level of the new equilibrium.
At last, normally the appearance of new interpretative models initially polarizes the reaction functions, being followed by its assertion as the new sector's best practices, hence producing market homogeneity of reactions.

Despite such a complex system, the methodology presented in this note shows that a finite number of dynamic regularities are observable, and can be classified and consequently used to anticipate market movements and build strategies to actively allocate funds. To this end, an optimisation process is run to analyse the frequency of regularities occurring, and a stochastic model is built to compute the probability that any given pattern of behaviour will complete.

Though not perfect, this methodology often gives a high probability of anticipating the forthcoming market movement.

To show how this works, I have defined three major market dynamics and examined the Mini Dow Jones Industrial Average futures market (YM) from 2002 to 2007 on daily price bars –continuous contract, regular trading hours-. These model's conditions have been validated with simulated trades recorded in official Audit Reports from a major international Brokerage House.

Model's Pillars

In my analysis, financial markets are complex adaptable systems, where participants determine market cycles.

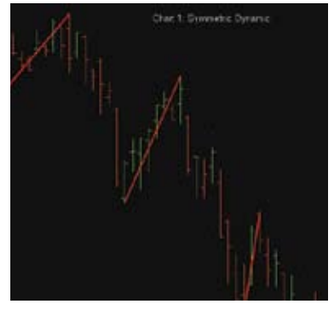
Market cycles are the results of participants' reactions to the inflow of information, which includes all types of markets related news, from a quarterly result to a FOMC voting member speech.

All this information inflow, will lead to short term and long term patterns of behaviour that will form different, yet repetitive, market dynamics. For the sake of simplicity and to avoid deviations from the main aim of this note, I am not going to refer to 'micro types' dynamics and risk management model applied to portfolio allocation. Instead, I will concentrate on three major markets dynamics, which show participants interactions at a macro-market level.

Macro market dynamics

1) The first macro market dynamic is a pattern of behaviour determining a trend-up or down. As the trend develops, regular prices retracements are observable, which take a symmetrical form as shown by the red segments in Chart 1, where YM 2007 Daily Open-High-Low-Close (OHLC) price bars are represented. This is a -down trend-Symmetric dynamic where the markets are driven by a predominant presence of big size traders who re-determine the market value. These phases are characterized by above average volume. The High-Low range over the trend period is medium to large.

Chart 1:



2) The second macro market dynamic is a pattern of behaviour determining regular and repetitive Ups and Downs of prices, which take a Zig-Zag form as shown by green (Ups) and red (Downs) segments in Chart 2, where YM 2006

* I am particularly grateful for the detailed comments and suggestions on the content of this note (provided by professor Mario Tonveronachi , University of Siena, Italy).

مؤسسة الضمان تطلب من أصحاب المهن والحرف والعاملين لحسابهم الخاص بالمبادرة في الانتساب الاختياري بتأمين الشيخوخة والعجز والوفاة

طلبت المؤسسة العامة للضمان الاجتماعي من أصحاب المهن الخاصة والفردية والعاملين لحسابهم الخاص بالمبادرة في الانتساب اختياريا في تأمين الشيخوخة والعجز والوفاة بهدف تحقيق الأمان والاستقرار المادي والنفسي والحماية الاجتماعية لهم ولأفراد أسرهم ويأتي ذلك في إطار توجهات المؤسسة وخطتها الرامية إلى توسعة مظلة شمول الأردنيين بالضمان الاجتماعي.

واشترطت المؤسسة بأن لا يقل عمر المؤمن عليه الراغب بالاشتراك الاختياري عن ستة عشر عاما ولا يتجاوز سن الشيخوخة وهو سن الستين للرجل والخامسة والخمسين للمرأة.

ويكون المشترك اختياريا مؤمنا في تأمين الشيخوخة والعجز والوفاة بحيث يحقق الحصول على راتب تقاعد الشيخوخة الوجوبي أو المبكر ويكون محميا ومغطى بالتأمين ضد الوفاة الطبيعية والعجز الطبيعي سواء الكلي أو الجزئي علما بأن المؤسسة لا تشترط وجود فترات اشتراك سابقة له بأحكام القانون.

ويعتبر مقدم الطلب في حال تقدمه للاشتراك بصفة اختيارية لأول مرة ولم يسبق له الاشتراك بالضمان عن فترات سابقة مشمول بأحكام التأمين اعتبارا من بداية الشهر الذي يقدم فيه الطلب المقترن بتسديد اشتراك الشهر الأول شريطة اجتيازه الفحوصات الطبية التي تقررها المؤسسة وعلى نفقته الخاصة وفيما يتعلق بالوثائق المطلوبة من المشترك صورة مصدقة عن دفتر العائلة أو البطاقة الشخصية الصادرة عن دائرة الأحوال المدنية وكتاب عمل ساري المفعول يثبت مكان عمله أو رخصة المهن ويحدد الأجر الشهري الذي يؤدى على أساسه الاشتراكات الشهرية التي يختارها شريطة أن لا يقل عن (150) دينار ولا يزيد عن (1000) دينار.

أما إذا سبق للمؤمن عليه الراغب بالاشتراك الاختياري بأن شمل بأحكام قانون الضمان الاجتماعي عن فترات سابقة كان يعمل خلالها لدى إحدى المنشآت المشمولة بأحكام قانون الضمان الاجتماعي فيعتبر مشمولا بأحكام التأمين بعد موافقة المؤسسة على طلبة اعتبارا من بداية الشهر الذي يقدم فيه الطلب شريطة اجتيازه الفحوصات الطبية التي تقررها المؤسسة وعلى نفقته الخاصة وله الحق بالاختيار بين أن يشمل على أساس أجرة الشهري الأخير الذي كانت تؤدي عنه الاشتراكات عند تركة العمل شريطة أن لا يقل عن (150) ديناراً أو على أساس زيادة أجرة الذي كانت تؤدى عنة الاشتراكات بنسبة لا تزيد عن (12%) سنويا عن كل سنة من السنوات التي انقطع بها عن الاشتراك شريطة أن لا يزيد هذا الأجر عن (1000) دينار أما فيما يتعلق بالوثائق المطلوبة منه فهي تتضمن صورة مصدقة عن دفتر العائلة أو صورة مصدقة عن هوية الأحوال المدنية.

واستثنت المؤسسة من شرط اجتياز الفحوصات الطبية المؤمن علية الذي أكمل المدة الموجبة لاستحقاق راتب تقاعد الشيخوخة الوجوبي وهي (180) اشتراك ولم يكمل السن القانونية (60 للرجل و55 للمرأة) شريطة أن يتقدم بطلب الاشتراك الاختياري خلال مدة أقصاها ثلاثة أشهر من تاريخ خروجه من نطاق تطبيق القانون.

أما فيما يتعلق بنسبة الاقتطاعات الشهرية التي يجب أن يؤديها المشترك اختياريا فيؤدى المؤمن عليه الاشتراكات الشهرية المقررة لهذا التأمين بنسبة (14.5%) من الأجر الشهري الذي تم تحديده ويجوز له أن يسدد أية مبالغ مقدما على حساب اشتراكه ويحق للمؤمن عليه زيادة أجره الخاضع للاقتطاع بنسبة لا تزيد عن (12%) سنويا اعتبارا من شهر كانون الثاني من كل عام على ان يقدم طلب الزيادة خلال مدة أقصاها الخمسة عشر يوما الأولى من شهر شباط من ذلك العام ويحق له إلغاء طلب الزيادة خلال نفس الفترة من ذلك العام.

ويجب على المؤمن تأدية الاشتراكات شهريا خلال الخمسة عشر يوما الأولى من الشهر التالي للاستحقاق وفي حال تأخره يدفع فائدة تأخير مقدارها (2%) شهريا عن الاشتراكات التي تأخر عن أدائها بحيث لا تزيد قيمة هذه الفائدة عن (12%) من قيمة الاشتراكات السنوية.

وفي حال تخلف المؤمن عليه المنتسب اختياريا عن تسديد الاشتراكات المستحقة مدة ستة أشهر أو أكثر فيعتبر اشتراكه في التأمين موقوفا من تاريخ تخلفه عن التسديد وتسوى حقوقه وفقا لأحكام القانون أما في التحاقه بعمل مشمول بأحكام القانون فيوقف اشتراكه الاختياري ويكون الأجر الذي يتقاضاه لقاء عمله هو الأساس لتأدية الاشتراكات كما يوقف اشتراك المؤمن عليه بناء على طلبه بإيقاف اشتراكه.

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Daily OHLC price bars are represented. This is a Zig-Zag dynamic, where the markets are influenced by medium-big size traders who preserve and determine regular and continuous turning points in the market cycles. These phases are characterized by average volumes. The high-low spread over the Zig-Zag period is significant.

Chart 2:

3) The third macro market dynamic is a pattern of behaviour determining sudden price spikes out of low volume and volatility trading. Although with different forms (Random) price spikes preceded and followed by low volume-volatility trading are always observed.

In Chart 3, where YM 2005 Daily OHLC price bars are represented, the grey segments represent the low volume-volatility periods, the green and red ones are the up and down prices spikes respectively. This is a Random dynamic.

sacting low volumes, enough to provide liquidity but not significant to define any market direction. The high-low spread over these periods is not significant.

Because of low volumes, these markets phases are exposed to manipulation that could be one explanation of the subsequent spikes.

During spikes periods there is a predominant presence of medium-big size traders transacting medium-heavy volumes, enough to define market direction. The high-low spread over these periods is significant.

To come to the point, let us see how the concepts of revision of expectations and 3 major market dynamics can assume a major role in building a 'universal' and 'stable' strategy to allocate funds.

Chart 3:

Revision of expectation as a 'universal' process

Revision of expectations applies to every business activity, where the participants need to adjust their economic decisions according to the inflow of information. Since the revision of expectations can be seen as a 'universal' process, it should also be possible to find the same regularities on different markets. In other words, once the information inflow defines short and long term patterns of behaviour, those should form different, yet repetitive, dynamics over a range of markets.

Repetitive markets dynamics

Certainly the definition of market dynamics has value for itself because it explains how the markets behave under particular conditions. I have also verified that these three macro dynamics do appear in any time frame, from tick data to yearly periodicity, confirming their explanatory power. Yet, the most important fact for defining markets dynamics is that it shows a finite number of them, making it reasonable to suggest that markets move in a repetitive fashion.

When we affirm that markets have characteristic of repetitiveness, we can refer to a well known phenomenon: if in a repetitive environment the same set of decisional rules are always applied, then the output will be stable.

Agreeing with these concepts, it is then possible to build a 'universal' and 'stable' strategy to allocate funds. Of course, the performance of a strategy built on these foundations depends on the accuracy of the chosen set of decisional rules, which refers to the regularities singled out to identify markets cycle and its turning points, which in turn depends on the analysis design.

Double diversification

The classic diversification is based on different assets classes, in order to allocate a portfolio with no significantly correlated financial products.

Since the approach described can lead to a 'universal' and 'stable' market strategy, it is possible here to add two new diversification types. The first is by the strategy itself, the second by different time frames. The implications of those go beyond the aim of this note, that topic could be covered in a forthcoming article.

Empirical evidence:

The results validated up to now are encouraging. However, the model must demonstrate that it can consistently maintain explanatory power over a range of markets. In order to do so, I am undertaking the RCM Trust Portfolio Manager Project. It is a certified portfolio management simulation, where all the transactions occurring in any account will be registered by a state of the art trading platform and recorded in the official Audit reports from a major international Brokerage House.

The portfolio will manage USD 2.000.000 in real time on Daily price bars. It is composed of two simulated trading accounts each funded with USD 1.000.000. The model will be tested on 12 US electronic futures markets. In particular: Mini DJIA, Mini S&P 500, Mini Nasdaq 100, Mini Russel 2000, 10 Year US Treasury Notes, EUR/USD Futures, Mini Sweet Crude, Mini Natural Gas, Gold 100 Troy oz, Wheat, Corn, Soybeans.

الغلاف

تم اختيار هذا الغلاف ليعكس الحصة الكبرى من هذا العدد وهو التمويل الإسلامي، وما يشكله هذا القطاع المالي من حلول مناسبة لفئة كبيرة ومتنامية من المجتمع العالمي وليس فقط الإسلامي.

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يحمل درجة الدكتوراه في المحاسبة، وله باع طويل في العمل المصرفي عمل من خلاله في معظم إدارات وأقسام البنوك. التحق بالبنك العربي الإسلامي الدولي في شهر حزيران 2007 مديراً لفرع الشميساني بعد خدمة مصرفية امتدت 12 عاما في البنك العقاري المصري العربي، حيث تم التدرج بالعمل في مختلف الدرجات والمستويات الإدارية وفي عدة مواقع من موظف كاونتر في دائرة العمليات الأجنبية إلى مدير دائرة الشؤون الإدارية. باحث متخصص في المحاسبة وإعداد الموازنات التقديرية للبنوك والمؤسسات المالية. يعمل محاضر غير متفرغ لدى الأكاديمية العربية للعلوم المالية والمصرفية ومعهد التدريب التابع لها ومدرب لمشروع إنجاز.

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Gaile Gong is Head of Global Research for Lionhart. Lionhart is a global multi-strategy hedge fund with a strong track record in capital preservation. Established in 1993, Lionhart's management team, which has more than 60 years' collective market experience, is led by founder Terry Duffy and manages assets of more than 700m USD globally across a variety of strategies and funds. Lionhart's presence in key financial markets enables its traders to seek investment opportunities across all time zones and across all asset classes. The fund's strong operational and corporate governance infrastructure supports an innovative approach to investment by Lionhart's experienced and committed trading team.

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Working with top financial institutions such as Arab Bank, Societe Generale, Jordan Commercial bank, Moutasem holds more than 17 years of significant experience in banking and finance. Currently he is the Deputy General Manager of CHF International – MEMCC, where he is heading the credit department. During his work, Moutasem gained outstanding skills in projects Assessment & Evaluation, Client Relationship Management, Communication, Statistical and Analytical Skills. In addition to that, Moutasem worked in structuring and reengineering project to leading financial institutions. He is a trainer to many educational as well professional institutions.

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Dr Pézier has been with the ICMA Centre since 2002. He teaches courses in Portfolio Management, Hedging, Fixed Income and Financial Engineering for MSc students. He carries research with his PhD students in asset management, risk management and financial engineering.
For 20 years he worked in the City of London, most recently as Managing Director, Head of Marketing and, previously, General Inspector, Head of Risk Management at Crédit Agricole Lazard Financial Products (CAL FP) Bank. He has also been Executive Director, Head of Research and Product Development with Mitsubishi Finance International plc (MFIL, now TMI) and a Director of the Equities Risk Management Unit of Barclays, de Zoete Wedd (BZW).
He started his career in Academia (Lecturer at the Thayer School of Engineering, Dartmouth College, USA, and Assistant Professor at HEC/ ISA, Jouy-en-Josas, France) before moving into consulting in decision analysis for Stanford Research Institute (SRI) and then for Investment Intelligence Systems Corporation (IISC), a consulting boutique he started with a few SRI colleagues and which specialized in decision systems in finance.
He is a graduate from Ecole Centrale (Paris) and holds a DEA in Mathematical Physics (Institut Poincaré, Paris) and a PhD in decision theory (Thayer School of Engineering, Dartmouth College, Hanover, USA).

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Raffaele's financial experience covers a wide range of institutions, Department of Economics - University of Siena, Italy
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Raffaele is author of scientific publications on Investment strategies and labour market, he has researched for Fondazione Monte dei Paschi di Siena for Developing a Global Equity Indexes Forecasting model, and for the Ministry for University and Scientific Research, for analysis on Turning Points in Business Cycles. Raffaele holds a Laurea Cum Laude in Economics from University of Siena (Italy), a Master degree in International Securities, Investment and Banking, one of the ten winners of ICMA Scholarship Competition, from University of Reading, UK, and a MPhil in Banking, final grade: 70/70 , from University of Siena (Italy)

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