The Great Diversification and its Undoing

Vasco M. Carvalho - Xavier Gabaix

October 25, 2010

We investigate the hypothesis that macroeconomic fluctuations are primitively the results of many microeconomic shocks, and show that it has significant explanatory power for the evolution of macroeconomic volatility. We define “fundamental” volatility as the volatility that would arise from an economy made entirely of idiosyncratic microeconomic shocks, occurring primitively at the level of sectors or firms. In its empirical construction, motivated by a simple model, the sales share of different sectors vary over time (in a way we directly measure), while the volatility of those sectors remains constant. We find that fundamental volatility accounts for the swings in macroeconomic volatility in the US and the other major world economies in the past half century. It accounts for the “great moderation” and its undoing. Controlling for our measure of fundamental volatility, there is no break in output volatility. The initial great moderation is due to a decreasing share of manufacturing between 1975 and 1985. The recent rise of macroeconomic volatility is due to the increase of the size of the financial sector. We provide a model to think quantitatively about the large comovement generated by idiosyncratic shocks. As the origin of aggregate shocks can be traced to identifiable microeconomic shocks, we may better understand the origins of aggregate fluctuations.

(JEL: E32, E37)
FX Comovements: Disentangling the Role of Market Factors, Carry-Trades and Idiosyncratic Components

José Gonzalo Rangel†
Bank of Mexico

Preliminary Draft
(March 10, 2011)

This paper models high and low frequency dynamic components of FX excess return correlations and examines their relationship with economic fundamentals. A factor currency pricing model is used to characterize the correlation structure of FX excess returns. I provide evidence on high levels of comovement in FX markets during the post-crisis (or recovery) period following the 2008 financial turmoil. I find that while the low frequency component of systematic volatility shows an increasing trend during this recent period, the low frequency component of idiosyncratic volatilities presents declining patterns. These two effects explain the increase in average long-term correlations. In terms of idiosyncratic effects, my results suggest that country-specific inflation levels and real output growth significantly affect the time-series and cross-sectional variation of long-term FX idiosyncratic volatilities.

Keywords: Comovements, FX markets, global factors, idiosyncratic volatilities, economic fundamentals.

JEL classification: F31, G12, G15.
We introduce a dynamic volatility model in which stock market volatility varies around a time-varying fundamental level. This fundamental level is determined by macroeconomic risk, quantified using a MIDAS structure to account for changes in the recently introduced ADS Business Conditions Index. The new model outperforms the benchmark in fitting asset returns and in pricing options, especially around the 1990-1991 and 2001 recessions. The benchmark model exhibits a counter-cyclical option-valuation bias across all maturities and moneyness levels, and the newly introduced model removes this cyclical bias by allowing the conditional expected level of volatility to evolve with business conditions. We extract the volatility premium implied by the model and find that an economically significant 13% of its variation through time can be explained by the impact of macroeconomic risk.

Keywords: Business Conditions, Macroeconomic Risk, Generalized Autoregressive Conditional Heteroscedasticity, Mixed Data Sampling, Option Valuation, Volatility

JEL Classifications: C22, E32, G13
This paper presents predictability evidence from the difference between implied and expected variances or variance risk premium that: (1) variance risk premium predicts a significant positive risk premium across equity, bond, and credit markets; (2) the predictability is short-run, in that it peaks around one to four months and dies out as the horizon increases; and (3) such a short-run predictability is complementary to that of the standard predictor variables—P/E ratio, forward spread, and short rate. Using a general equilibrium model of economic uncertainty under recursive preference, I provide calibration evidence that stochastic volatility-of-volatility can potentially explain both the variance risk premium dynamics and its short-run predictability across financial markets. However, it remains a challenge to simultaneously match both the level and the predictability in bond returns and credit spreads.

JEL classification: G12, G13, G14.

Keywords: Short-run predictability, variance premium dynamics, equity premium puzzle, bond risk premia, credit spread puzzle, macroeconomic uncertainty, recursive preference.
A GARCH Option Model with Variance-Dependent Pricing Kernel

Peter Christoffersen
Rotman, CBS, and CREATEs
March 10, 2011

We develop a GARCH option model with a variance premium by combining the Heston-Nandi (2000) dynamic with a new pricing kernel. While the pricing kernel is monotonic in the stock return and in variance, its projection onto the stock return is nonmonotonic. A negative variance premium makes it appear U-shaped. We present new semi-parametric evidence to confirm this U-shaped relationship between the risk-neutral and physical probability densities. The new pricing kernel substantially improves our ability to reconcile the time series properties of stock returns with the cross-section of option prices. It provides a unified explanation for the implied volatility puzzle, the overreaction of long-term options to changes in short-term variance, and the fat tails of the risk-neutral return distribution relative to the physical distribution.

JEL Classification: G12

Keywords: Pricing kernel; variance premium; stochastic volatility; GARCH; overreaction.
Is the Potential for International Diversification Disappearing?

Peter Christoffersen
Rotman, McGill, CBS and CREATESS

Vihang Errunza
McGill University

Kris Jacobs
University of Houston

Hugues Langlois
McGill University

March 11, 2011

Quantifying the evolution of security co-movements is critical for asset pricing and portfolio allocation, and so we investigate patterns and trends in correlations and tail dependence over time using weekly returns for developed markets (DMs) and emerging markets (EMs) during the period 1973-2009. We use the standard DCC and DECO correlation models, but we also develop a nonstationary DECO model as well as a novel dynamic skewed t-copula to allow for dynamic and asymmetric tail dependence. We show that it is possible to characterize co-movements for many countries simultaneously. Correlations have significantly trended upward for both DMs and EMs, but correlations between EMs are lower than between DMs. The tail dependence has also increased for both EMs and DMs, but its level is still very low for EMs as compared to DMs. Thus, while our correlation analysis suggests that the diversification potential of EMs has reduced over time, the tail dependence analysis suggests that EMs offer diversification benefits during large market moves.

JEL Classification: G12

Keywords: Asset allocation, dynamic conditional correlation (DCC), dynamic equicorrelation (DECO), dynamic copula, asymmetric dependence. * Christoffersen, Errunza and Jacobs gratefully acknowledge financial support from IFM2 and SSHRC. Errunza is also supported by the Bank of Montreal Chair at McGill University. Hugues Langlois is funded by NSERC and CIREQ. Without implication we thank Lieven Baele, Greg Bauer, Phelim Boyle, Ines Chaieb, Frank de Jong, Rene Garcia, Ernst Schaumburg, and seminar participants at the Bank of Canada, EDHEC, HEC Montreal, Tilburg University and WLU for helpful comments.
We use a quantile-based measure of conditional skewness or asymmetry of asset returns that is robust to outliers and therefore particularly suited for recalcitrant series such as emerging market returns. We study the following portfolio returns: developed markets, emerging markets, the world, and separately 73 countries. We find that the conditional asymmetry of returns varies significantly over time. This is true even after taking into account conditional volatility effects (GARCH) and unconditional skewness effects (TARCH) in returns. Interestingly, we find that the conditional asymmetry in developing countries features low correlation with that in emerging markets. This finding has implications for portfolio allocation, given the fact that the correlation of the returns themselves has been historically high and is increasing. In contrast to conditional volatility fluctuations, which are hard to explain with macroeconomic fundamentals, we find a strong relationship between the conditional skewness and macroeconomic variables. Moreover, the low correlation between conditional asymmetry across developed and emerging markets can be explained by macroeconomic fundamental factors in the cross-section, as both markets feature opposite responses to those fundamentals. The economic significance of the conditional asymmetry is also demonstrated in an international portfolio allocation setting.