9TH JACQUES POLAK ANNUAL RESEARCH CONFERENCE
NOVEMBER 13-14, 2008

Global Liquidity, Risk Premiums and Growth Opportunities

Gianni De Nicolò
International Monetary Fund

Iryna Ivaschenko
International Monetary Fund

Paper presented at the 9th Jacques Polak Annual Research Conference
Hosted by the International Monetary Fund
Washington, DC─November 13-14, 2008

Global Liquidity, Risk Premiums and Growth Opportunities*

Gianni De Nicolò
IMF, Research Department

Iryna Ivaschenko
IMF, European Department

First draft: June 19, 2008
This draft: October 31, 2008

Abstract

This paper constructs new indicators of liquidity for equity, bond and money markets in major advanced and emerging market countries, documents their evolution and co-movements, and assesses the extent to which such measures are determinants of selected spreads and proxy measures of countries' growth opportunities. Three main results obtain. First, there is evidence of an historical increase in market liquidity since the early 1990s,in part as a result of advances in international financial integration, but markets have been increasingly exposed to global systemic liquidity shocks. Second, liquidity indicators appear to be important determinants of bond spreads in advanced economies and EMBI spreads in emerging markets. Third, improvements in market liquidity have significant real effects, as liquidity indicators have a significant positive impact on proxy measures of countries' growth opportunities.

* We thank without implication Francis Longstaff, Pete Kyle, and participants to the 7th Oxford Finance Symposium and the October 2008 Bundesbank-CESIfo Conference on "Liquidity: Concepts and Risks", for comments and suggestions. The views expressed in this paper are those of the authors and do not necessarily represent those of the IMF or IMF policy.

I. INTRODUCTION

Until recently there was a popular notion that the "the global economy is awash with liquidity". Underlying this notion was the idea that "liquidity" is associated with "abundance" of money, and in particular with the possible existence of "excess" *volumes* of monetary aggregates, or "excess liquidity". It has been conjectured that this "excess liquidity" has been prompted by accommodative monetary policy stances of central banks in the U.S. and other countries, and that has been an important driver of the decline of risk premiums in financial markets. Yet, in mid-August 2007 "global liquidity" seemed to vanish suddenly and, as of October 2008, does not seem to have returned yet.[1]

Different—often vaguely-defined—notions of liquidity have been used in press commentaries and policy discourse. Indeed, defining liquidity and deriving appropriate measures using a well-defined modeling framework is not an easy task. In particular, the integration of liquidity into standard general equilibrium macroeconomic models is still in its infancy, as it involves modeling a role for fiat and inside money on which established theory paradigms are still lacking.[2]

---

[1] See IMF (2007) for a review. For various citations about a world "awash with liquidity", see the introductory section of Rueffer and Stracca (2006) and Moody's (2007). Brunnermeier (2008) attempts to rationalize the meaning of "being awash with liquidity" by defining "funding liquidity" as "the ease with which expert investors and arbitrageurs can obtain funding......Funding liquidity is high—and markets are said to be "awash with liquidity''—*when it is easy to borrow money, either uncollateralized or with assets as collatera*l (our italics)". A complementary rationalization is in Adrian and Shin (2007, 2008), where fluctuations in financial institutions' balance sheets are associated with expansions or contraction of credit to the economy.

[2] However, progress in the macroeconomic area is underway. For example, the incomplete markets modeling framework proposed by Kiyotaki and Moore (2008) appears promising in integrating an essential role for money in standard dynamic macroeconomic models, and in delivering testable implications and theory-based measurement of liquidity in an aggregate context.

Progress in the finance literature has been swifter. In a general equilibrium context, the liquidity of markets can be associated with the costs with which trading mechanisms allow agents to realize gains from trade (see e.g. Rahi and Zigrand, 2008). The finance literature has devoted increasing attention to modeling and measuring liquidity premiums and identifying liquidity risk.[3] Yet, with few recent exceptions discussed below, most of the empirical literature has focused on measures of liquidity for U.S. markets using detailed data typically unavailable for other countries. Importantly, no study has explicitly documented longer-term development in markets' liquidity possibly related to advances in international financial integration and increasing openness of financial markets occurred in the past two decades, and, most importantly, assessed their *real* impact. This paper aims at filling in these gaps.

Our contribution to the literature is threefold. *First*, we construct new indicators of market liquidity based on basic finance theory, which have the advantage of using only readily available market price data .Our indicators are also likely to improve on other indicators used in the literature by capturing the dynamics of liquidity shocks, as they are based on models of returns with time-varying volatility. We construct liquidity indicators for equity, bond, and money markets in major advanced and emerging market countries, both at a national and global levels, and document their co-movements across markets and countries. Furthermore, these indicators are also used to construct measures of *global systemic liquidity*

[3] The finance microstructure literature (reviewed in Hasbrouck, 2007) has focused on modeling and measuring illiquidity costs, starting from the seminal contributions of Roll (1984) and Kyle (1985), among others. Notable recent contributions on market liquidity include Morris and Shin (2003), Pastor and Staumbaugh (2003), Acharya and Pedersen (2005), Brunnermeier and Pedersen (2007), An excellent survey of this work as related to asset pricing is in Amihud, Mendelson and Pedersen (2005).

shocks, and document their evolution and joint dynamics across markets. *Second*, we assess the extent to which our liquidity indicators, both national and global, can be viewed as risk factors embedded in bond spreads. The analysis is performed for both advanced economies (bond yield spreads over the risk-free rate) and emerging markets (EMBI spreads). *Third*, because of the lower cost of capital firms may face when operating in more liquid equity markets, and in light of the positive effects of financial integration on *both* growth opportunities and a measure of liquidity of equity markets documented in De Nicolò and Ivaschenko (2008), we assess the extent to which liquidity indicators are positively associated with proxy measures of countries' growth opportunities.

Accordingly, three main results obtain. *First*, during the last decade market liquidity has increased in all countries and markets, accompanied by stronger cross-country co-movements between liquidity indicators, and hence, increased incidence of systemic liquidity shocks. Specifically, liquidity indicators increased in virtually all markets and countries since at least the mid-1990s, with the most pronounced advances witnessed in emerging markets. In addition, correlations between liquidity indicators increased, likely as a result of financial integration and globalization. Moreover, the evolution of indicators of global systemic liquidity shocks suggests indicate increased incidence of such shocks. It appears that market developments and increased market linkages brought about increased exposure of country financial markets to common liquidity shocks and enhanced the transmission of these shocks.

Second, the liquidity indicators appear to be important determinants of bond premiums (bond yield spreads for industrial countries and EMBI spreads for emerging markets). Both national and US liquidity indicators appear to be important determinants of bond spreads in most countries, the latter evidence being consistent with the increases sensitivity of risk premiums to global risk factors.

Third, national, as well as US liquidity indicators of equity markets appear to be significant determinants of price-earnings ratios in many countries. These results, coupled with the evidence documented in our earlier paper on the role of financial integration as a factor enhancing the equity market liquidity, suggest that market liquidity is one important channel through which a more efficient resource allocation prompted by financial integration translates into higher real growth.

The remainder of the paper consists of five sections. Section II outlines a simple model underpinning our liquidity indicators and details their construction. Section III documents their evolution and co-movements Section IV examines their explanatory power as potential risk factors for bond spreads in advanced economies and EMBI spreads in emerging markets. Section V examines their explanatory power for proxy measures of countries' growth opportunities. Section VI concludes.

II. Liquidity Indicators: Theory and Measurement

A. A simple model of liquidity

We construct liquidity indicators with three desiderata in mind. First, these indicators should be rooted in basic finance theory. Second, they should be easily computable for a large set of asset classes and markets using readily available and comparable data. Third, we would like our indicators to capture liquidity of a market rather then specific assets in a market. As detailed in Rahi and Zigrand (2008), the overall (welfare) benefits of market liquidity may be best captured in a general equilibrium world in which agents, as in reality, make non trivial asset allocation decisions among multiple assets traded in markets with different degrees of liquidity.[4]

We borrow from the microstructure literature, using a version of a model described in Hasbrouck (2007), which extends the model of transaction costs by Roll (1984) to include stylized illiquidity costs due to asymmetric information among traders about the true value of assets as in Kyle (1985).[5]

The model makes assumptions about the evolution of the (log) of the fundamental price, denoted by V_t, and the (log) price at which trades are executed, denoted by P_t. The law of motion of the fundamental price and the trading prices are given by:

$$V_t = V_{t-1} + \lambda_t q_t + \sigma_t \varepsilon_t \qquad (1)$$

$$P_t = V_t + c_t q_t \qquad (2)$$

The direction of trade at date t is denoted by the indicator variable q_t, The trade is a "sell" (ask) if $q_t = +1$,and it is a "buy" (a bid) if $q_t = -1$, assumed to occur with equal probability . The term $\lambda_t q_t$ represents the information content of the trade at date t, where

---

[4] In an asset allocation context, Longstaff (2001) shows that an increase in liquidity can reduce the risk faced by investors in allocating their wealth in a portfolio of assets. For given levels of risk tolerance, investment opportunities become less risky as liquidity increases. As a result, a larger portion of investors' wealth may be invested in "risky" assets even though risk tolerance has not changed. This is because the liquidity risk component of each asset has decreased.

[5] For a similar illustration of several types of microstructure models, see Biais, Glosten and Spatt (2005).

$\lambda_t > 0$ for each date. The sequence λ_t, can be interpreted as the *illiquidity* parameter introduced by Kyle (1985), capturing the extent of adverse selection in the market.[6] The larger is the information content of a trade, the lower will be adverse selection in the market . This corresponds to a lower value of λ_t.

Thus, the bid and ask prices are set symmetrically around $V_{t-1} + \sigma_t \varepsilon_t$ and the spread is given by $2(c_t + \lambda_t)$. The sequence c_t reflects non-informational costs of trades (clearing costs, documentation costs, etc.) and, as observed, λ_t reflects illiquidity costs owing to adverse selection in the market. The error $\sigma_t \varepsilon_t$ has a time varying component and ε_t is a random variable with zero mean and unit variance.

The date *t* return is given by:

$$R_t \equiv P_t - P_{t-1} = \lambda_t q_t + \sigma_t \varepsilon_t + c_t (q_t - q_{t-1}) \qquad (3)$$

Under the assumptions that $\operatorname{cov}(q_t, \varepsilon_t) = 0$ and that c_t and λ_t are deterministic sequences, the covariance of returns between *t* and *t-k, with* $k \geq 1$, and the variance are given respectively by:

$$\begin{aligned} \operatorname{cov}_t(R_t, R_{t-k}) = \lambda_t^2 E q_t q_{t-k} + \lambda_t c_t (E q_t (q_{t-k} - q_{t-k-1}) + E q_{t-k} (q_t - q_{t-1})) + \\ c_t^2 E (q_t - q_{t-1})(q_{t-k} - q_{t-k-1}) \qquad (4) \end{aligned}$$

$$var_t(R_t) = \lambda_t^2 + \sigma_t + (1 - E q_t q_{t-1}) 2 c_t (\lambda_t + c_t) \qquad (5)$$

[6] In the equilibrium of Kyle's strategic trade model, λ is an increasing function of the ratio of a measure of fundamental value uncertainty divided by the variance of noise trading.

From (4), it is apparent that the structure of autocovariances tracks the evolution of liquidity as related to transaction and adverse selection costs.[7] The variance of returns in (5) will be generally larger (when $Eq_t q_{t-1} < 1$) than the variance of the return based on the fundamental price, given by $\lambda_t^2 + \sigma_t$.

Consider first the case in which $Eq_t q_{t-k} = 0$ for all $k \geq 1$, that is "buy" and "sell" decisions are independent. Then, $\text{cov}_t(R_t, R_{t-k}) = -c_t(\lambda_t + c_t)$ and all covariances for $k \geq 2$ are zero. This is the case considered by Roll (1984), in which illiquidity generates negative first order autocorrelation, and the first order autocovariance can be used to estimate the effective bid-ask spread.[8]

If $Eq_t q_{t-k} \neq 0$ for some $k \geq 2$, either because of "momentum" strategies ($Eq_t q_{t-k} > 0$) or because of "contrarian" strategies ($Eq_t q_{t-k} < 0$), then $\text{cov}(R_t, R_{t-k}) \neq 0$ for all k's for which $Eq_t q_{t-k} \neq 0$, and the evolution of these covariances will track the impact on liquidity of trading and adverse selection costs.

B. Measurement

Measures of effective bid-ask spread have been proved satisfactory in capturing liquidity at high frequencies (one day or less, see Goyenko, Holden and Trczinska, 2008),

[7] A similar property is shared by models of non-synchronous trading. For an illustration, see section 3.1 in Campbell, Lo and McKinlay (1997).

[8] Illiquidity generating negative serial correlation in returns is also obtained in the models by Ho and Stoll (1981), Grossman and Miller (1988), Campbell, Grossman, and Wang (1993), and Huang and Wang (2008).

but relevant estimators have not been judged satisfactory at lower frequencies (see e.g. Biais, Glosten and Spatt, 2005). Yet, we wish our liquidity indicators to be useful even at lower frequencies. In this application, we focus on monthly frequency. Based on our simple framework, we construct monthly liquidity indicators as follows.

Let the monthly investment horizon t be divided in K trading days. By definition, the product of price ratios (returns) in the subintervals within the investment horizon satisfy $\frac{P_t}{P_{t-1}} = \prod_{s\in K} \frac{P_{t-1+s+1}}{P_{t-1+s}}$. Taking log returns, we get $R_t = \sum_{s\in K} R_s$.

To account for time variation in volatility, we assume that daily returns follow a GARCH(1,1) model, and variances and covariances below denote estimated values from this model. The variance of the return at a one-month horizon is therefore:

$$\mathrm{var}_t(R_t) = \sum_{s\in K} \mathrm{var}_t(R_s) + 2\sum_{i,j\in K, i\neq j} \mathrm{cov}_t(R_i, R_j) \qquad (6)$$

If there are no liquidity costs within the investment horizon, then the autocovariance terms of the expression above should be zero: this is an extreme form of "market efficiency" under no liquidation costs. Under the more realistic assumption that illiquidity is a key form of market friction, and such friction embeds execution and transaction costs, borrowing constraints, and costs of gathering and processing information under information asymmetries, then illiquidity would generate larger covariances in returns.[9]

As observed, the covariance terms in the summation in (4) can be either positive or negative, depending on trading strategies of market participants, the size of liquidity shocks

---

[9] Similarly, Chan et al (2006) document illiquidity of hedge funds portfolios looking at their returns autocorrelations.

and their propagation, etc. To capture all potential sources of illiquidity, our indicator is constructed as the ratio of the sum of absolute values of negative covariances and positive covariances of daily returns within the investment horizon, divided by the same sum added to the sum of the variances of daily returns within the one-month investment horizon:

$$L_t = \frac{2(|\sum_{i,j\in K,i\neq j}\mathrm{cov}_t(R_i,R_j)_-| + \sum_{i,j\in K,i\neq j}\mathrm{cov}_t(R_i,R_j)_+)}{\sum_{s\in K}\mathrm{var}_t(R_s) + 2(|\sum_{i,j\in K,i\neq j}\mathrm{cov}_t(R_i,R_j)_-| + \sum_{i,j\in K,i\neq j}\mathrm{cov}_t(R_i,R_j)_+)} \qquad (7).$$

As defined, the range of the liquidity indicator is the unit interval. The *smaller* L_t is, the *higher* is liquidity.

Our measure is novel in three important respects. First, it is likely to capture liquidity effects embedded in the entire autocovariance structure of within-period returns, which can be due to complex interactions between the evolution of liquidity shocks, the revelation of information, and the trading strategies of investors. This structure has not been typically taken into account by a variety of measures used in the past. For example, variance-ratio measures, allow positive covariances to offset negative covariances (see, for example, Amihud and Mendelson (1987) or Hasbrouck and Schwartz (1988). Our measure may also overcome some of the limitations of some measures used in the recent literature. In recent studies of liquidity in international equity and bond markets, Bekaert, Harvey and Campbell (2007) and Hunt and Lesmond (2008) use as a low frequency measure of illiquidity the capitalization-weighted fraction of *zero* returns across all listed firms, averaging this fraction over a month, following the use of such measures by Lesmond (2005) and Lesmond, Ogden and Trzcinka (1999). Bekaert, Harvey and Campbell explicitly discuss the limitations of this type of measure in reflecting the dynamics of information flows and transaction costs.[10]

Second, our measure allows for time-varying variances and covariances of returns, which is a standard empirical regularity found in the data, and can better track possibly complicated dynamics of transaction and asymmetric information costs.

Third, our measure is easy to compute and applicable to a wide range of financial instrument in a uniform fashion, since it is based only on price data. It can be also readily computed for price indexes, as we do. This allows us to measure the liquidity of a value weighted price of a set of securities, which can capture the overall liquidity of the set of securities traded in a market.

III. LIQUIDITY INDICATORS: EVIDENCE

A. Data

Liquidity indicators are constructed for value-weighted price indices in a sample of 30 countries, including G-7, five Australasian industrial countries, a group of emerging markets, and at a global level. [11]. The choice of countries was guided by the availability of pricing data for (at least) stock and government bond markets. We collected available daily and monthly data for the period from January 1, 1980 to April 31, 2008 on broad stock

[10] Indeed, Goyenko, Holden and Trzcinka (2008) find that zero-type measures are the worst among a large class of measures to track *actual* spreads.

[11] The Australasian industrial countries are: Australia, New Zealand, Korea and Singapore. The Emerging Market countries are : Mexico, Argentina, Brazil, Chile, Colombia and Peru (Latin America); China, India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand (Asia); Czech Republic, Hungary, and Poland (Europe).

indices, government bond indices for all the countries, and money market indices for industrial countries. Similar data were collected for a world aggregate. In addition, we collected data on bond yields and spreads. Data on stock markets for all countries, and government bond and money markets for industrial countries are from the DataStream (JP Morgan bond indices and Citigroup cash indices), while the data on bond market returns, yields, and spreads for emerging markets (and Korea) are from the Bloomberg (JP Morgan EMBI index and its constituents).

The choice of specific indices was guided by the objective of obtaining the largest coverage by country and time using data constructed by one primary proprietary source to enhance cross-country comparability. The length of time series varies across countries, depending on data availability. In general, stock market data for most countries start January 1980, industrial bond markets on January 1985, and emerging bond markets and spreads—from between January 1988 to March 1993.

The monthly data on inflation and interest rates were obtained from the IFS database, while P/E rations for the broad stock market by country ere taken from the DataStream.

B. Descriptive Statistics

Figure 1 depicts global liquidity indicators for equity, bond and money markets. These indicators are characterized by significant fluctuations, track well-know episodes of market turbulence, and pick up the most recent contraction of market liquidity with remarkable timing precision. When looking at indicators by country, these features are common to liquidity indicators for both advanced and emerging economies (Figures 2-5).

Our measures also rank liquidity across countries and markets in expected ways. As shown in Figure 6, during the period examined the liquidity of stock and bond markets in advanced economies was greater, on average, than that in the financial markets of emerging markets, while the volatility of liquidity in financial markets of advanced economies was lower than that of emerging market countries. Moreover, stock market liquidity was lower than government bond market liquidity in every market, and in turn government bond market liquidity was lower than money market liquidity in advanced economies.

C. Dynamics and Co-Movements

Has market liquidity increased world-wide? To assess this, we estimated for both the entire panel of countries, as well as each market and country a simple regression positing the evolution of the log of liquidity indicators as simple autoregressive processes:

$$Ln(L_t) = \alpha + \beta t + \gamma Ln(L_{t-1}) + \varepsilon_t \qquad (8)$$

Table 1 reports results of the panel estimation, and Figure 7 reports point estimates of the coefficient β and relevant p-values. Indeed, during the last decade liquidity appears to have increased in almost all markets, as suggested by the negative coefficient associated with a time trend in the above regression. Specifically, liquidity increased in virtually all markets and countries since at least the mid-1990s, with the most pronounced advances witnessed in emerging markets, with the notable exceptions of Russia and Turkey.

As shown in Figure 8, liquidity indicators are (generally) positively correlated across domestic markets, as well as with the global liquidity indicators constructed on the basis of global price indexes. This suggests that for many applications, liquidity of either a single market within a country or across markets in different countries should not be considered in isolation—especially in increasingly connected and integrated financial markets—as linkages across markets appear to have become stronger. Figures 8 also suggests that liquidity indicators for different markets tend to move together, especially when liquidity become scarce in at least one market.

The correlations described above suggest that inter-dependencies in market liquidity may have increased. To assess whether co-movements between liquidity indicators have become stronger over time across both equity and bond markets, we estimated versions of the following simple model:

$$\bar{\sigma}_X^2(t) = A_0 + A_1 t + A_2 \bar{\sigma}_X^2(t-1) + A_3 CO_t + \eta_t \qquad (9),$$

where $\bar{\sigma}_X^2(t)$ is the *cross-sectional variance* of the liquidity measures, t is a time trend, and CO_t denotes the number of countries in the cross-section to control for changes in the number of markets included in the cross-section.

Results of two versions of the model are reported in Table 1. In the first version (Panels A and B), we considered conditioning only on lagged values of the cross-sectional variance for each market (as described in (8)). In this case, the coefficient associated with the time trend for the stock markets regressions is negative and highly significant, indicating increased correlations of liquidity across these markets. The relevant coefficient for bond markets is also negative, but it is not significant at conventional significance levels, suggesting a prevalent heterogeneity in government bond liquidity across countries.

In the second version of the model (Panels C and D), we conditioned on the lag cross-sectional variance of liquidity of its own and the other asset market. Interestingly, a decline in the cross-country variance of government bond liquidity predicts a decline in the cross-country variance of equity markets liquidity, suggesting that co-movements in liquidity of connected markets may be mutually reinforcing. .

The increased co-movements across equity markets during the past fifteen years—as well as greater importance of the global factors in driving liquidity for each country—could be a result of rapid financial integration taking place at the same time. Indeed, the evidence reported in De Nicolò and Ivaschenko (2008) indicates that measures of financial integration based on equity market data predict improvements in equity market liquidity.

D. Systemic Liquidity Shocks

The increased linkages between markets also suggests that the impact and transmission of liquidity shocks may have increased. In fact, our liquidity measures for each market and country can be combined to obtain indicators of *systemic liquidity shocks*. These indicators are defined as the percentage of countries that recorded the value of the national liquidity indicators in the upper 10^{th} percentile of the historical distribution of the liquidity indicators for that particular country. Two indicators are constructed, for both stock and bond markets.

As shown in Figure 9, the dynamics of global liquidity indicators clearly illustrate that the incidence of global liquidity shocks increased recently across the world, in both stock and bond markets. The contemporaneous correlation between the two systemic liquidity shocks measure is also significantly high (0.55) , consistent with increased inter-dependencies in markets' liquidity.

To gauge the extent of the transmission of liquidity shocks across markets, we estimated a simple bi-variate VAR(1) with the two indicators, reported in Table 3. Here we find that a systemic liquidity shock to equity markets results in a decline of liquidity in bond markets, but not vice versa. Thus, systemic liquidity shocks in the equity markets are transmitted to bond markets, while the reverse does not necessarily hold. Following Goyenko and Sarkissian (2008), if reductions in equity and bond market liquidity are associated with flight-to-quality and flight-to liquidity effects respectively, then this results indicates a spillover effect from flight-to quality to flight to liquidity.

IV. LIQUIDITY AND BOND PREMIUMS

If a measure of liquidity captures important trading frictions related to asymmetric information and trading costs, then it should represent a risk factor priced in the market. As markets are interconnected, measures of liquidity of one market relative to another market could also be risk factors priced in a given financial instrument. Therefore, here we assess the extent to which our measures can be viewed as risk factors embedded in selected spreads and examine the extent to which global components drive such spreads.[12] Our assessment is based on simple statistical models that can be viewed as reduced forms of factor models of selected spreads for markets in advanced and emerging market economies.

[12] Assessing the extent to which global components drive spreads appears particularly important in light of the finding of a common liquidity component by Korajczyk and Sadka (2008) for several measures of liquidity across US stock markets, A counterpart to this result might be found in international financial markets that are sufficiently integrated.

A. Advanced Economies

For advanced economies, we consider the spread between the yield on a long-term government bond (typically 10 year) and a three month short term interest rate, denoted by *BSPREAD*. This measure has been widely used in the literature as a proxy measure of the slope of the term structure of nominal interest rates, which has been a variable included in several factor models of equity returns at least since the contribution of Chen, Roll and Ross (1986). .

We estimate the following fixed effect dynamic panel regression (and its time series counterpart for each country):

$$\Delta BSPREAD_{it} = \alpha_i + a_1 BL_{it} + a_2 SL_{it} + a_2 CL_{it} + a_4 BLUS_t + a_5 SLUS_t + a_6 CLUS_t + a_8 USBSPREAD_t + a_9 BSPREAD_{it-1} + \varepsilon_{it} \qquad (10)$$

$\Delta BSPREAD$ denotes the first difference in the bond spread, while α_i denote country fixed effects. Variables BL, SL and CL denote the liquidity indicators of domestic government bond, equity and money markets respectively. $BLUS$, $SLUS$ and $CLUS$ denote the relevant liquidity measure of U.S. markets, included to account for global liquidity factors and international liquidity spillovers. Variable $USBSPREAD$ is the relevant spread for the US, included to control for interconnected expectations about global growth and inflation. Indeed, Ang, Bekaert and Wei (2008) find that in the US, changes in the slope of the nominal term structure are strongly associated with changes in expected inflation.

The results are reported in Table 4. Note first that in the panel regression with domestic liquidity indicators only (equation (1)), none of them has a significant impact on the bond spread. When we add the US liquidity indicators, however, *all* these indicators have a significant impact on bond spreads (equation (2)).[13] Specifically, an increase in the liquidity of the US bond market (a decline in the relevant liquidity indicator) is associated with a significant decline in the bond spreads. Indeed, the significant impact of U.S. liquidity indicators for bond spreads in other countries is consistent with the increases sensitivity of bond spreads to global risk factors.

Notably, the impact of the US liquidity indicators of equity and money markets is *negative* and significant, meaning that an improvement in liquidity of say, in the US equity market, *given* the liquidity of all other markets, entail an increase in the bond spread. This result suggests that bonds and stocks or money market instruments may serve as substitutes in investors' portfolios, and higher liquidity of one of these markets may increases the attractiveness of these instruments relative to bonds in another market, driving up their spreads. In other words, an improvement in the liquidity of the equity market, keeping constant that of the bond market, is equivalent to a decline of the liquidity of the bond market *relative* to that of the equity market.

The country-by-country regressions (equations (3)-(11)) confirm that the main results of the panel regression are not driven by data of a particular country or group of countries: declines in bond spreads are associated with an increase in liquidity of the US bond markets in all countries (only the relevant coefficient for Japan is not statistically significant, albeit it

[13] The panel regressions with or without the US data produce virtually identical results. For brevity, we report only the former in Table 4.

is positive). Interestingly, in these regressions the liquidity indicators of domestic money markets have a significant impact on bond spreads in most countries.

In sum, US bond and domestic money market liquidity indicators appear to be significant risk factors embedded in bond spreads. This is evidence of increased liquidity interconnectedness both within countries and globally.

B. Emerging Economies

For emerging economies, we consider the natural logarithm of EMBI bond spreads. Since their time series exhibit unit roots, we model first (log) differences of these spreads, denoted by $\Delta LEMBI$ as follows:

$$\Delta LEMBI_{it} = \alpha_i + a_1 SL_{it} + a_2 BLUS_t + a_3 SLUS_t + a_4 CLUS_t + a_5 \Delta LEMBI_{it-1} + e_{it} \quad (11)$$

$\Delta LEMBI$ denotes the first difference of natural logarithm of EMBI spreads, while α_i denote country fixed effects. Variable SL denotes the liquidity indicator of domestic equity markets. The inclusion of this domestic liquidity indicator as the only country-specific liquidity indicator is simply justified by the desire to increase the sample size, since the availability of indicators of bond market liquidity with a sufficiently long series is limited to only few emerging economies. In this light, we can view this indicator as a proxy of domestic financial market liquidity. As before, $BLUS$, $SLUS$ and $CLUS$ denote the relevant liquidity measure of U.S. markets, included to capture global liquidity factors.

Table 5 reports the panel estimations for the entire sample and for three regional subgroups. Three main results stand out. First, there is a negative relationship between domestic markets' liquidity and EMBI spreads, as the coefficient associated with *SL* is positive and significant at standard confidence levels. This suggests that an increase of liquidity in these markets entails lower spreads. Second, improvements in US equity market liquidity are significantly associated with lower EMBI spreads—as witnessed by a positive and significant coefficient associated with US equity market liquidity—suggesting that improvements in global liquidity may be an important driver of EMBI spreads. Third, a worsening of US bond market liquidity *relative* to domestic market liquidity is significantly associated with a decline in EMBI spreads, as shown by the negative and significant coefficient of the US bond liquidity indicator.

To sum up, domestic as well as global liquidity indicators appear to be important risk factors embedded in EMBI spreads. Similarly to what we found for bond spreads in advanced economies, the significant impact of US liquidity measures on EMBI spreads appears consistent with the increases sensitivity of risk premiums to global risk factors as a result of increased financial integration.

V. LIQUIDITY AND GROWTH OPPORTUNITIES

Ceteris paribus, firms in countries with more liquid equity markets may face a lower cost of capital, which could be an important factor enhancing their growth opportunities. Therefore, improvements in equity market liquidity may translate into a *real* benefit of financial market development.

To assess the impact of equity market liquidity on growth opportunities, we take price-earnings ratios (PE) of national stock markets as our proxy measure of (domestic) growth opportunities. As shown by Bekaert et al. (2007), this PE ratio predict real GDP growth. We estimate the following panel regression for the whole sample, for advanced and emerging economies separately, and for regions within emerging economies:

$$\Delta PE_{it} = \alpha_i + a_1 SL_{it} + a_2 SLUS_t + a_3 PEW_t + a_4 PE_{it-1} + \varepsilon_{it} \qquad (12)$$

The dependent variable is the first difference in the *PE* ratio, while variables SL and $SLUS$ denote the liquidity measure of domestic and US equity markets. The variable PEW is the "world" price-to-earnings ratio, computed on the basis of a global market index, and is included as a proxy for a global risk factor.

Table 6 reports the results. In the panel regression with all countries included (equation (1)), US equity market liquidity has a significant positive impact on growth opportunities, as an increase in liquidity (a decrease in the liquidity indicator) is associated with an increase in the price-to-earnings ratio. By contrast, domestic market liquidity does not appear to have a significant impact on price-to-earnings ratios.

However, results differ when we split the sample between advanced and emerging economies. In the G-7 sample and that of all advanced economies (equations (2) and (3)), *both* domestic and US equity market liquidity have a significant positive impact on PE ratios. By contrast, in all samples with emerging economies (equations (4)-(7)), while US equity market liquidity retains a positive impact on PE ratios, domestic market liquidity does not have a significant impact.

In sum, improvements in equity market liquidity at a global level appear to foster country's growth opportunities. However, improvements of liquidity in domestic equity markets appear to contribute positively to growth opportunities only in advanced economies.

Furthermore, these results support the conjecture we made in our earlier paper, namely, that liquidity is one of the channels through which benefits of financial integration (i.e. lower cost of capital) are translated into higher real growth opportunities, as this result complements our previous result that financial integration fosters equity market liquidity.

VI. CONCLUSION

We have constructed novel measures of liquidity for equity, bond and money markets in major advanced and emerging market countries based on a simple model that maps the evolution of market liquidity into the autocovariance structure of asset returns. We have documented an historical increase in market liquidity likely due to advances in international financial integration, but at the same time financial markets have been increasingly exposed to global systemic liquidity shocks. We also showed that these liquidity indicators appear to be important determinants of bond spreads and of proxy measures of countries' growth opportunities.

Our measures could be compared with other liquidity measures, could be extended to other markets and/or could be applied to different assets of the same markets. These extensions could provide useful insights about the evolution of market liquidity as an important facet of financial development. One pressing question is whether the recent turmoil in financial markets represents just a temporary reversal of the progress in market liquidity witnessed in the past decade, or a more permanent break in international financial development and integration. The exploration of this and related issues is left to future research.

REFERENCES

Acharya, Viral and Lasse Heje Pedersen, 2005, "Asset Pricing with Liquidity Risk", *Journal of Financial Economics*, 77, 375-410.

Adrian, Tobias and Hyun Song Shin, 2007, "Liquidity and Leverage", manuscript (revised BIS presentation).

Adrian, Tobias and Hyun Song Shin, 2008, "Liquidity, Monetary Policy and Financial Cycles", *Current Issues in Economics and Finance*, FED New York, Vol. 14, no.1.

Amihud, 2002, "Illiquidity and stock returns: cross-section and time series effects", *Journal of Financial Markets*, vol.5, 31-56.

Amihud,Yakov and Haim Mendelson, 1987, "Trading Mechanisms and Stock Returns: An Empirical Investigation", *Journal of Finance*, Vol. 42, no. 3, 533-553.

Amihud,Yakov, Haim Mendelson and Lasse Heje Pedersen, 2005, "Liquidity and Asset Pries", *Foundations and Trends in Finance*, Vol. 1, no. 4, 269-364.

Ang, Andrew, Geert Bekaert, and Min Wei, 2008, "The Term Structure of Real Ratres and Expected Inflation", *Journal of Finance*, 63(2), 797-849.

Bekaert, Geert, Campbell Harvey and Christian Lundblad, 2007, "Liquidity and Expected Returns: Lessons from Emerging Markets", *Review of Financial Studies*, Vol 5, n,9, 1783-1831.

Bekaert, Geert, Campbell Harvey, Christian Lundblad and Stephan Siegel, 2007, "Global Growth Opportunities and Market Integration", *Journal of Finance*, 62(3), 1081-1137.

Biais, Bruno, Larry Glosten and Chester Spatt, 2005, "Market Microstructure: A Survey of Microfoundations, Empirical Results, and Policy Implications", *Journal of Financial Markets,* 8, 217-264.

Brunnermeier, Markus K, and Lasse Heje Pedersen, 2007, "Market Liquidity and Funding Liquidity', NBER Working Paper # 12939.

Brunnermeier, Markus K, 2008, "Deciphering the 2007-2008 Liquidity and Credit Crunch', paper presented at the conference "The Role of Money Markets", New York, May 29-30,2008, ttp://www.newyorkfed.org/research/conference/2008/rmm_program.html

Campbell, John. Y., Andrew Lo and A. Craig MacKinlay, 1997, *The Econometrics of Financial Markets*, Princeton University Press, Princeton, New Jersey.

Campbell, J. Y., S. J. Grossman, and J. Wang, 1993, "Trading Volume and Serial Correlation in Stock Returns," *Quarterly Journal of Economics*, 108, pp. 905-939.

Chan, Nicholas, Mila Getmansky, Shane M. Haas, and Andrew W. Lo, 2006, "Do Hedge Funds Increase Systemic Risk?", *Federal Reserve Bank of Atlanta Economic Review*, Fourth Quarter, 49-80.

Chen, N F., Richard Roll and Stephen Ross, "Economic Forces and the Stock Markets", *Journal of Business*, 59, 383-403.

De Nicolò, Gianni and Iryna Ivaschenko, 2008, "Financial Integration and Risk-Adjusted Growth Opportunities", IMF Working paper # 08/126. Washington, D.C.

Grossman, S. J., and M. H. Miller, 1988, "Liquidity and Market Structure," *Journal of Finance*," 38, pp. 617-633.

Goyenko, Ruslan Y., Craig W. Holden and Charles A. Trzcinka, 2008, "Do Liquidity Measures Measure Liquidity?", *Journal of Financial Economics,* forthcoming

Goyenko, Ruslan Y., and Sergei Sarkissian, 2008, "Flight-to-Liquidity and Global Equity Returns", working paper, September

Hasbrouck, Joel and Robert A. Schwartz, 1988, "Liquidity and Execution Costs in Equity Markets", *Journal of Portfolio Management* Vol. 14, no.3, 10-16

Hasbrouck, Joel, 2007, *Empirical Market Microstructure*, Oxford University Press, Oxford, United Kingdom.

Ho, T., and H. R. Stoll, 1981, "Optimal Dealer Pricing Under Transactions and Return Uncertainty," *Journal of Financial Economics*, 9, pp. 47-73.

Huang, J., and J. Wang, 2008, "Liquidity And Market Crashes," NBER Working Paper 14013

Hund, John and David A. Lesmond, 2008, "Liquidity And Credit Risk in Emerging Debt Markets, Working Paper, March.

International Monetary Fund, 2007, "What is Global Liquidity?", in World Economic Outlook, April 2007, Washington, D.C.

Korajczyk, Robert A. and Ronnie Sadka, 2008, "Pricing the Commonality Across Alternative Measures of Liquidity", *Journal of Financial Economics*, 87, 45-72.

Kyle, A. S., 1985, "Continuous Auctions and Insider Trading", *Econometrica,* 53, 1315-1335..

Longstaff, Francis A.,2001, "Optimal Portfolio Choice and the Valuation of Illiquid Securities", *Review of Financial Studies,* Vol. 41, No. 2, 407-431.

Moody's, 2007, "Why is Credit Risk Priced so Low? A Perspective on Global Liquidity", Moody's International Policy Perspectives, February.

Morris, L. and Shin, 2003, "Liquidity Black Holes", European Journal of Political Economy, vol. 111, 642-685.

Pastor, L. and R. Staumbaugh, 2003, "Liquidity Risk and Expected Stock Returns", Journal of Political Economy, vol. 111, 642-685.

Rahi, Rohit and Jean-Pierre Zigrand, 2008, "A Theory of Strategic Intermediation and Endogenous Liquidity", manuscript, http://vishnu.lse.ac.uk/Rohit_Rahi/Homepage.html

Roll, Richard, 1984, " A Simple Implicit measure of the Effective Bid-Ask Spread in an Efficient Market", *Journal of Finance,* vol. 39, no.4, 1127-1139.

Rueffer and Stracca, 2006, "What is Global Excess Liquidity, and Does it Matter"; ECB Working Paper no. 696.

Fig.1: Global Liquidity Indicators

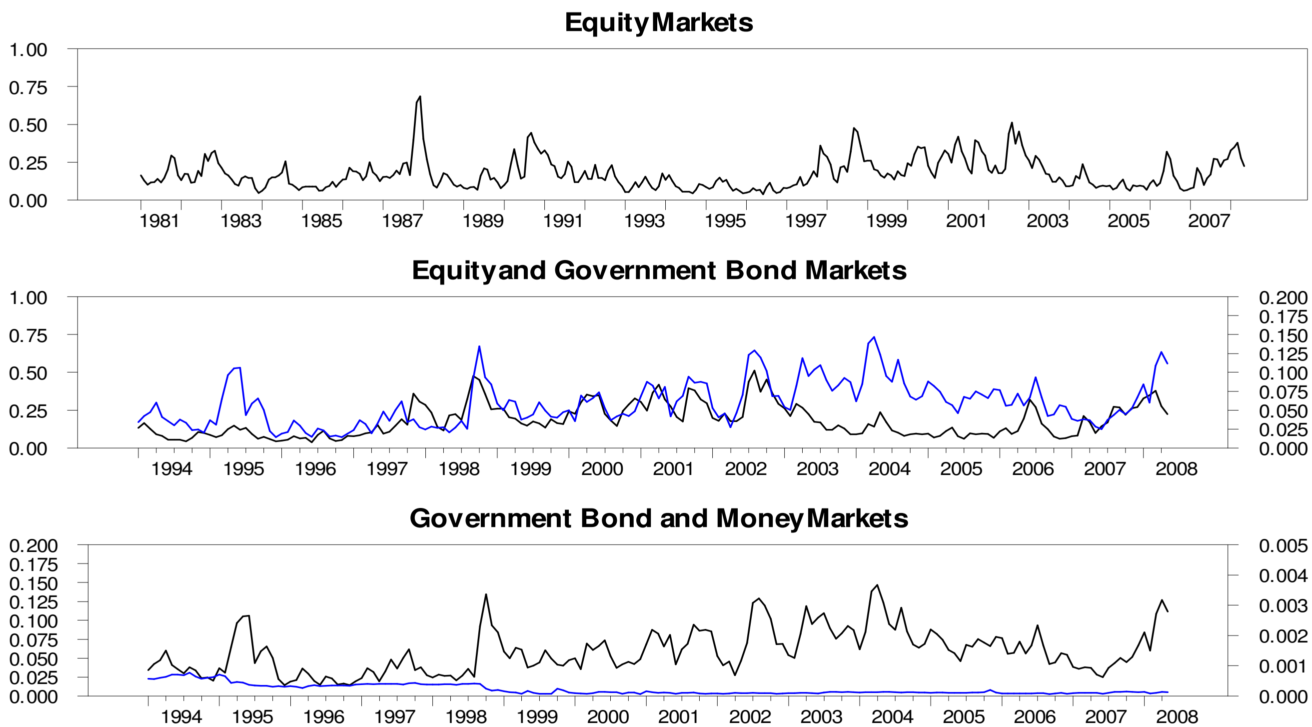


Fig. 2: G-7 Equity and Bond Liquidity Indicators

Equity (left) and Bonds (right)

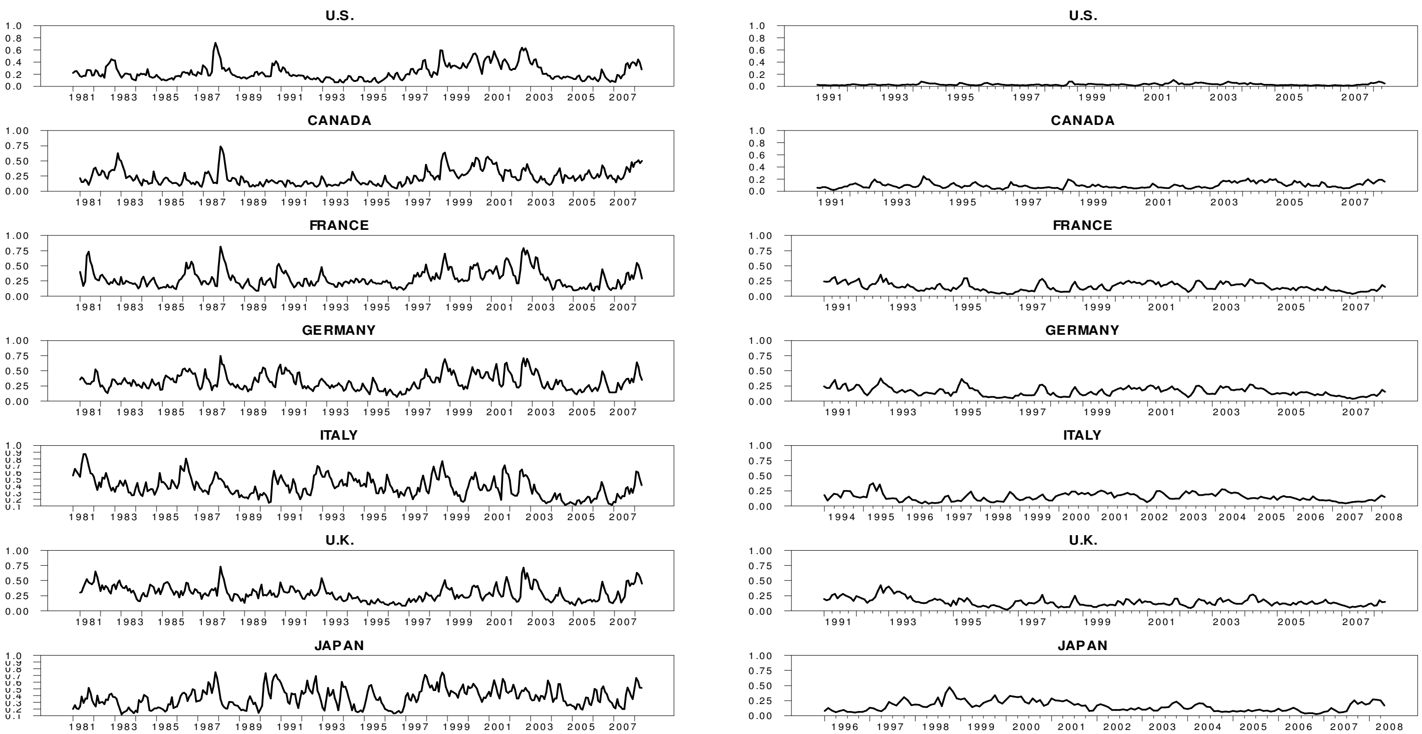


Fig. 3: Emerging Markets Liquidity Indicators: Latin America

Equity(left) and Bonds (right)

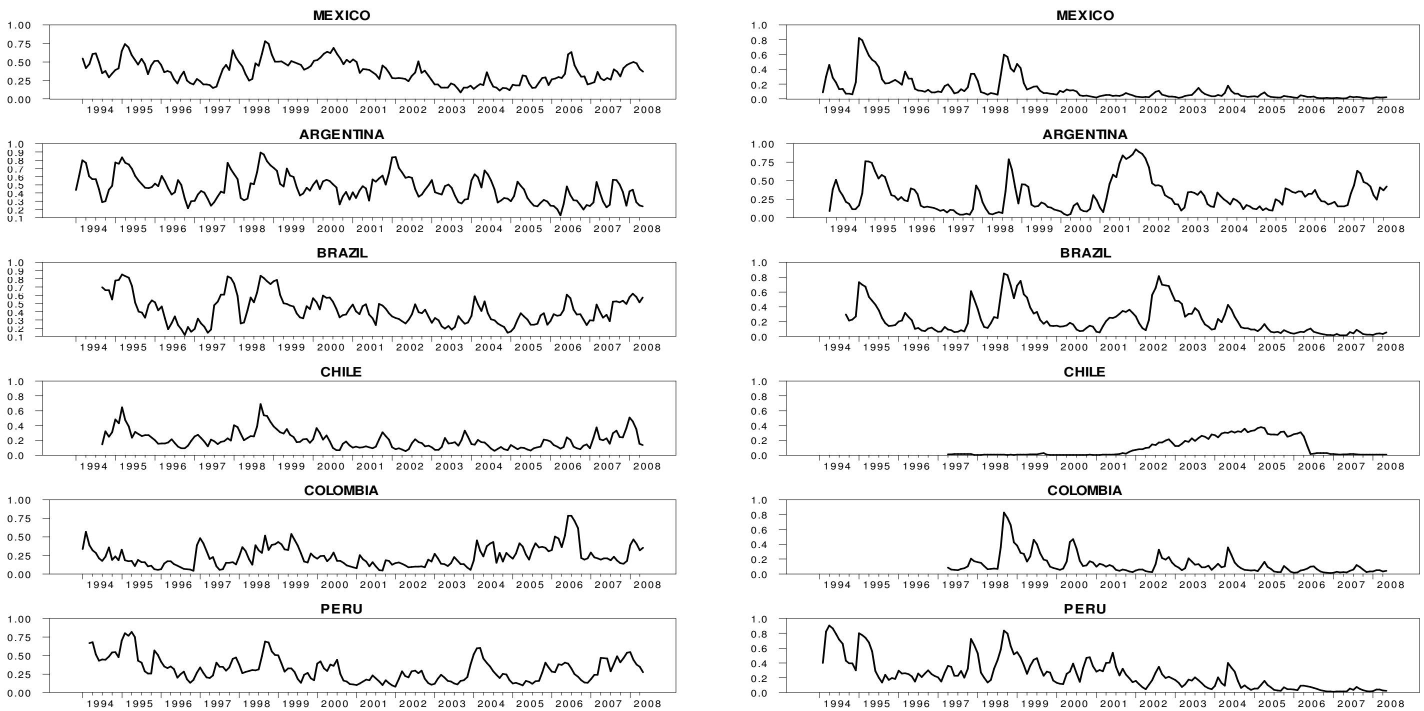


Fig. 4: Emerging Markets Liquidity Indicators: Asia

Equity(left) and Bonds (right)

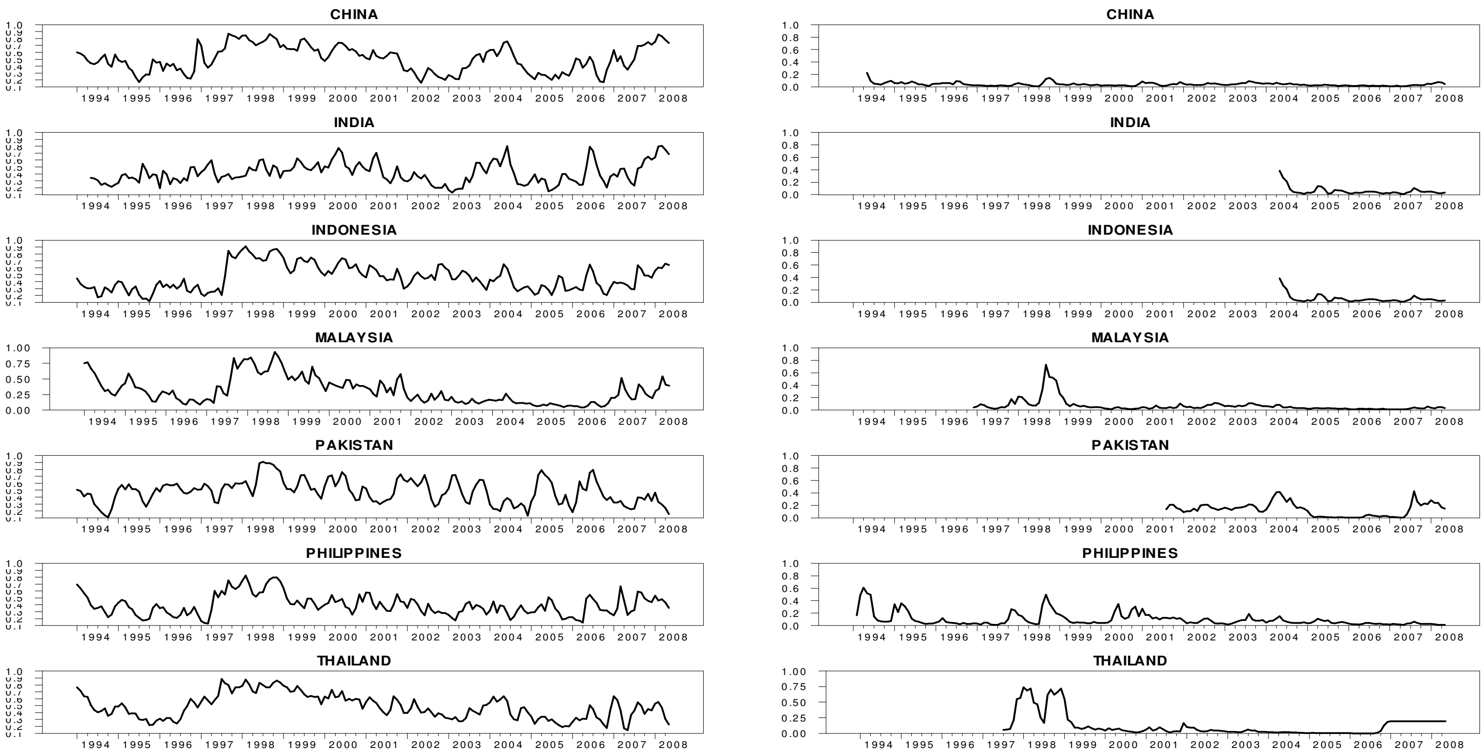


Fig. 5: Emerging Markets Liquidity Indicators: Europe

Equity(left) and Bonds (right)

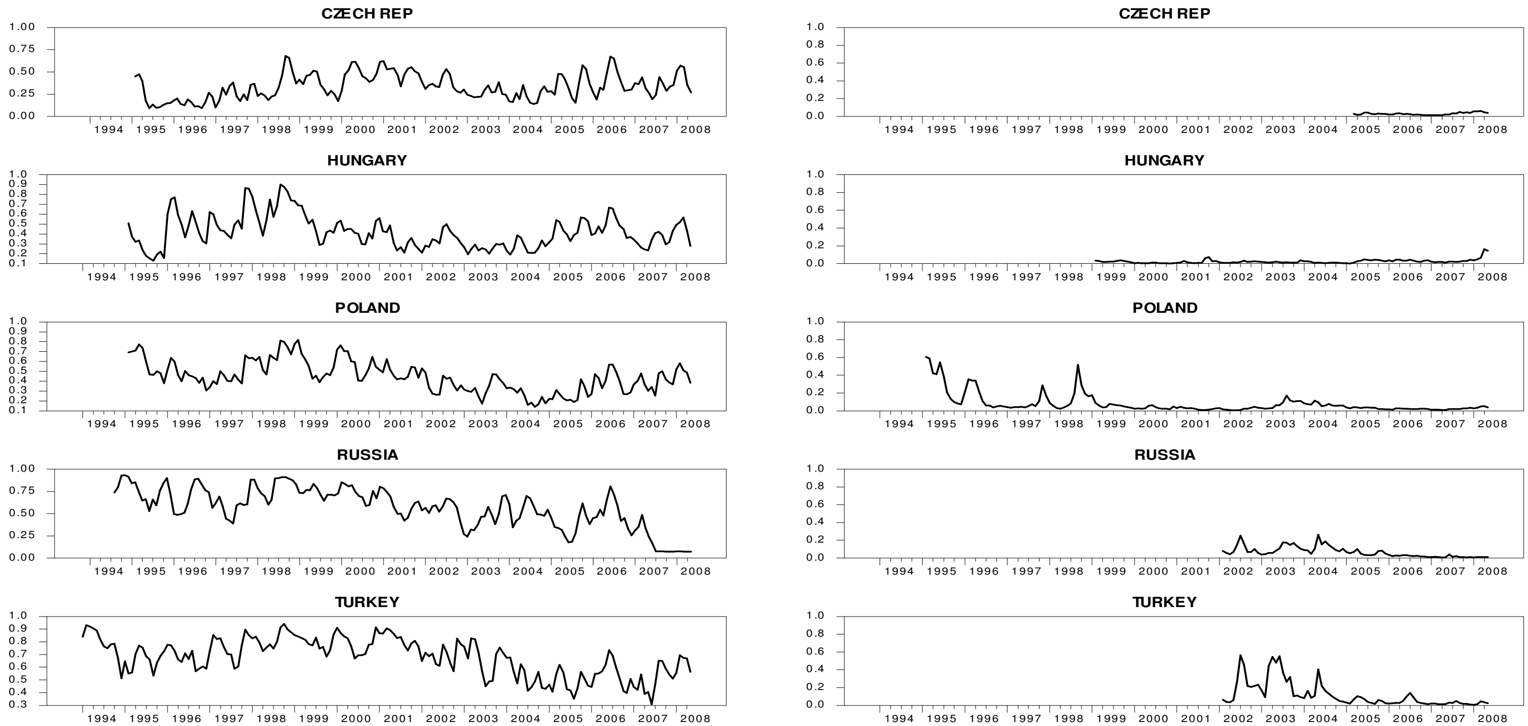


Figure 6. Liquidity Indicators: Mean and Standard Deviation

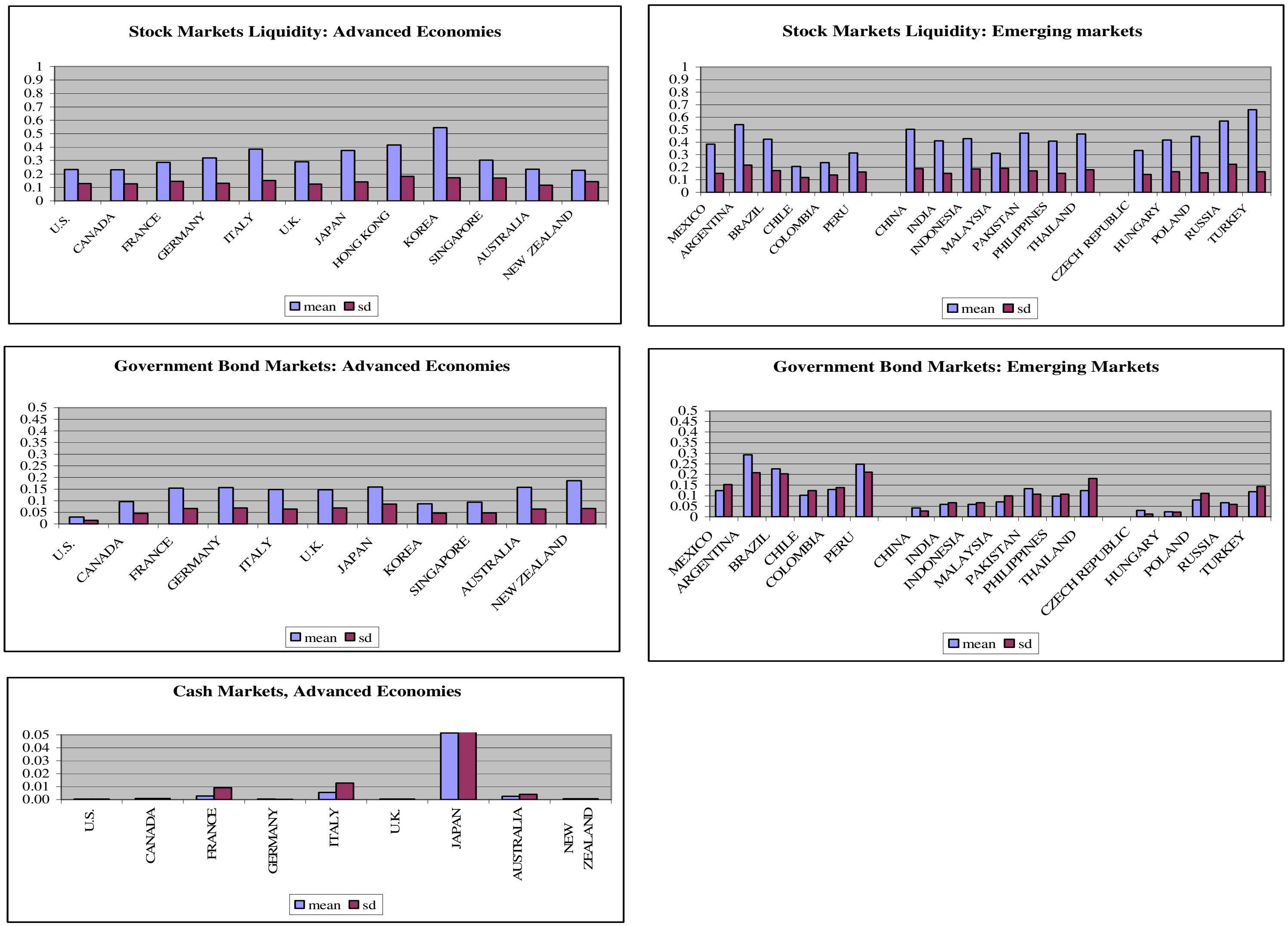


Table 1. Fixed Effect Panel Regressions

$$Ln(L_{it}) = \alpha_i + \beta t + \gamma Ln(L_{it-1}) + \varepsilon_{it}$$

A. Equity Markets

	Coef.	SE	t	P>|t|		
					R-sq:	0.81
					Observations:	7788
time	0.000	0.000	-2.060	0.040		
lsl	0.846	0.007	118.100	0.000		
_cons	-0.167	0.010	-16.260	0.000		

A. Governement Bond Markets

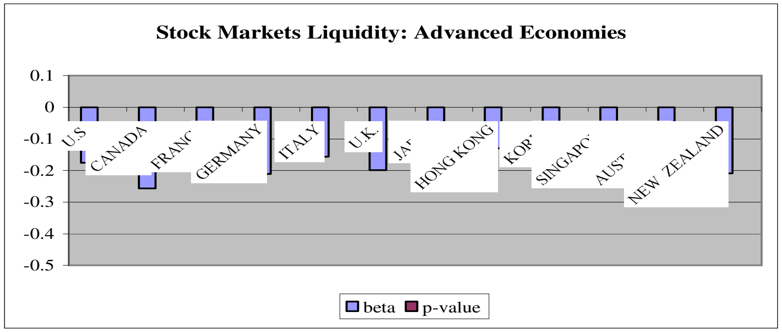
	Coef.	SE	t	P>|t|		
					R-sq:	0.91
					Observations	4264
time	0.000	0.000	-3.220	0.001		
lbl	0.892	0.012	77.520	0.000		
_cons	-0.196	0.039	-4.990	0.000		

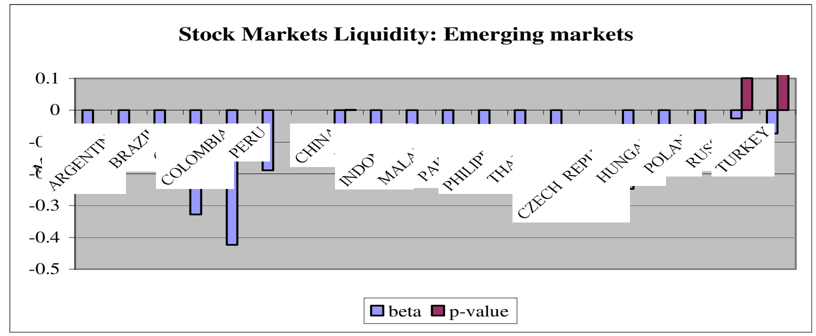
C. Money Markets

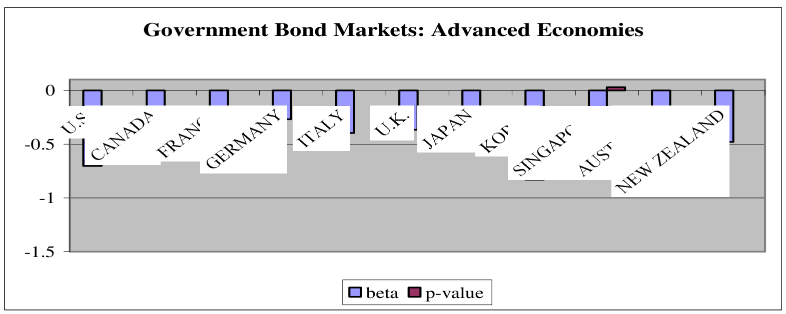
	Coef.	SE	t	P>|t|		
					R-sq:	0.96
					Observations:	2620
time	0.000	0.000	-2.740	0.006		
lcl	0.968	0.006	166.870	0.000		
_cons	-0.206	0.043	-4.800	0.000		

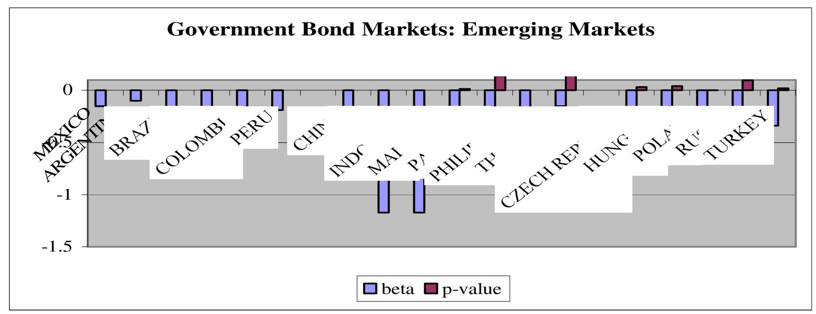
Figure 7. Liquidity Indicators: Trend Coefficients

The figures report the estimated β coefficient and relevant p-value of the regression $Ln(L_t) = \alpha + \beta t + \gamma Ln(L_{t-1}) + \varepsilon_t$ for each country.









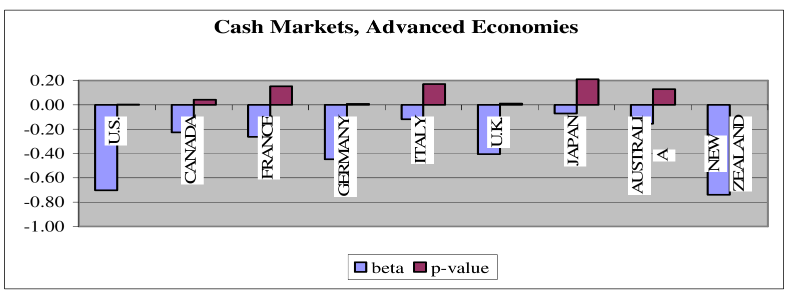


Figure 8. Liquidity Indicators: Correlations

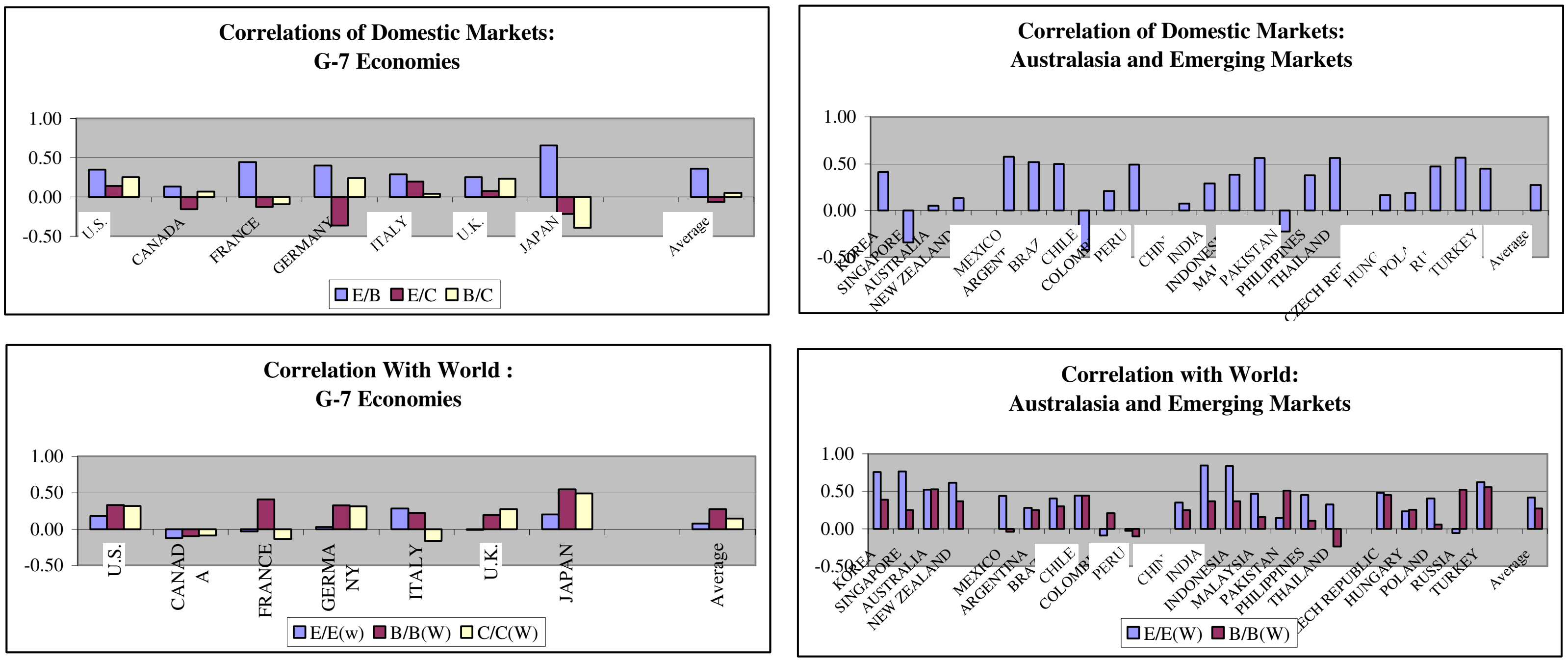


Table 2. Liquidity Indicators: Dynamics of Cross Sectional Variances

The estimated model is: $\bar{\sigma}_X^2(t) = A_0 + A_1 t + A_2 \bar{\sigma}_X^2(t-1) + A_3 CO_t + \eta_t$, where $\bar{\sigma}_X^2(t)$ is the cross-sectional variance of the liquidity measures, t is a time trend, and CO_t denotes the number of countries in the cross-section (coefficient not reported)

Variable	Coeff	Std Error	T-Stat	Signif
Panel A. Equity Markets			R Bar **2	0.76
1. Constant	-0.851557931	0.171309536	-4.97087	0.00000067
2. TREND	**-0.001357675**	**0.000455249**	**-2.98227**	**0.00286122**
3. Variance Stocks{1}	**0.807691203**	**0.040273499**	**20.05515**	**0.00000000**
Panel B. Government Bond Markets			R Bar **2	0.81
1. Constant	-0.447906230	0.216065547	-2.07301	0.03817127
2. TREND	**-0.001782381**	**0.002775936**	**-0.64208**	**0.52081940**
3. Variance Bonds{1}	**0.868526978**	**0.029932250**	**29.01643**	**0.00000000**
Panel C. Equity Markets, conditional on lagged Bond Markets Variance			R Bar **2	0.72
1. Constant	-0.567604830	0.188599638	-3.00958	0.00261613
2. TREND	**-0.001403892**	**0.000438577**	**-3.20101**	**0.00136944**
3. Variance Bonds{1}	**0.037886400**	**0.017700804**	**2.14038**	**0.03232428**
4. Variance Stocks{1}	**0.693640244**	**0.064896904**	**10.68834**	**0.00000000**
Panel D. Bond Markets, conditional on lagged Equity Markets Variance			R Bar **2	0.81
1. Constant	-0.384948566	0.318821731	-1.20741	0.22727426
2. TREND	**-0.001501698**	**0.002574780**	**-0.58323**	**0.55973608**
3. Variance Bonds{1}	**0.864364475**	**0.033518931**	**25.78735**	**0.00000000**
4. **Variance Stocks{1}**	**0.038559047**	**0.109958164**	**0.35067**	**0.72583581**

Fig. 9: Indicators of Global Systemic Liquidity Shocks

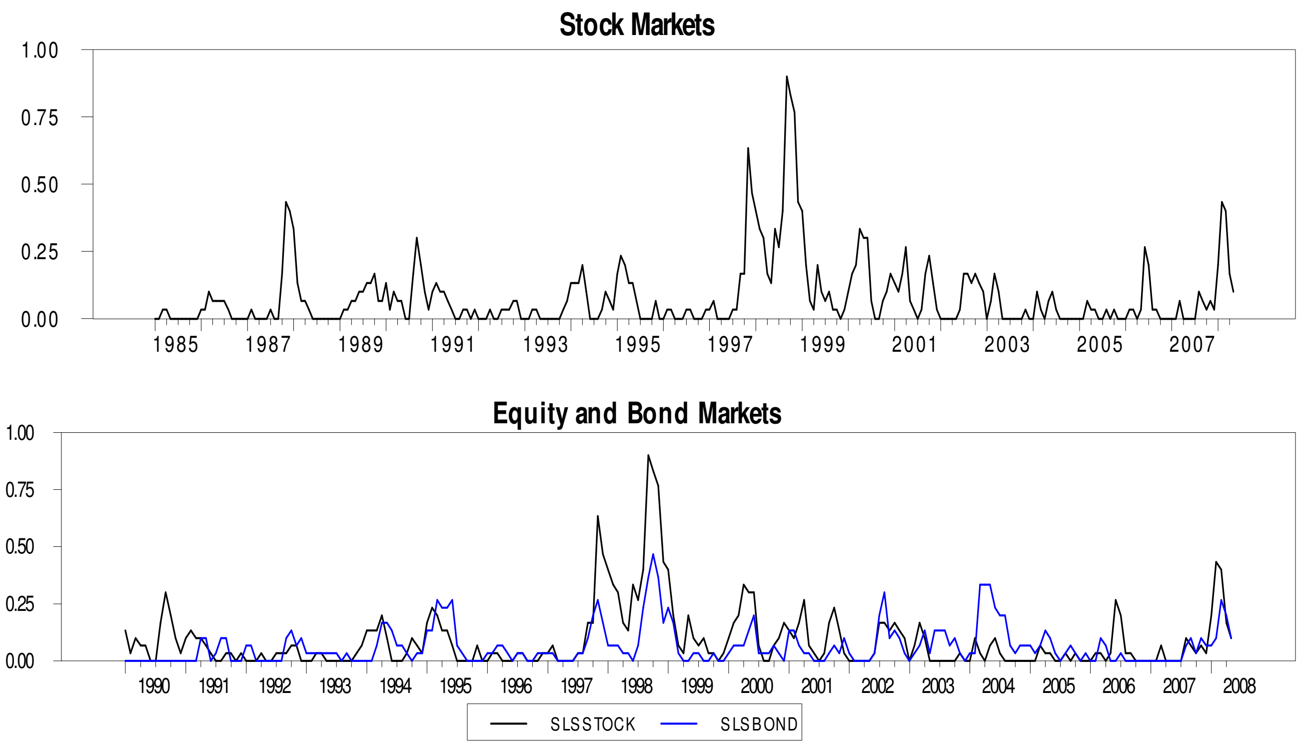


Table 3 : Bi-variate VAR of Global Equity and Bond Systemic Liquidity Shocks

Dependent Variable SLSSTOCK
Monthly Data From 1990:02 To 2008:05
Usable Observations 220 R Bar **2 0.653030

Variable	Coeff	Std Error	T-Stat	Signif
1. Constant	0.017615241	0.006004648	2.93360	0.00335055
2. SLSSTOCK{1}	**0.817907057**	**0.056953104**	**14.36106**	**0.00000000**
3. SLSBOND{1}	**-0.023394647**	**0.085119761**	**-0.27484**	**0.78343617**

Dependent Variable SLSBOND
Monthly Data From 1990:02 To 2008:05
Usable Observations 220 RBar **2 0.575203

Variable	Coeff	Std Error	T-Stat	Signif
1. Constant	0.0134723950	0.0043240702	3.11567	0.00183525
2. SLSSTOCK{1}	**0.1072488464**	**0.0496684975**	**2.15929**	**0.03082743**
3. SLSBOND{1}	**0.6447746989**	**0.0713702570**	**9.03422**	**0.00000000**

Table 4. Government Bond Spreads and Liquidity: Advanced Economies

The dependent variable is the first difference of the spread between a long term yield and a short term interest rate on government bonds. Equations (1) and (2) are fixed effects panel regressions, with standard errors clustered by country. Equations (3)-(11) are OLS regressions. Robust p-values are reported in brackets. *, ** and *** denote significance at 10%, 5% and 1% levels respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	all	all	US	Canada	Germany	France	Italy	UK	Japan	Australia	New Zealand
COEFFICIENT											
L.spread	-0.0801***	-0.0773***	-0.0665***	-0.145***	-0.0488**	-0.216***	-0.0770*	-0.203***	-0.0639*	-0.0756	-0.0271
	[0.00275]	[0.00875]	[0.00184]	[0.000198]	[0.0252]	[0.00569]	[0.0652]	[0.000100]	[0.0639]	[0.118]	[0.321]
Bond Liqudity	-0.157	-0.269	6.539***	-0.21	-0.0772	-2.620*	0.0797	1.202	0.164	0.003	-0.169
	[0.616]	[0.330]	[0.000336]	[0.741]	[0.770]	[0.0528]	[0.922]	[0.203]	[0.333]	[0.993]	[0.640]
Stock Liquidty	-0.205	-0.226	-0.364*	-1.359***	-0.267	-0.197	-0.149	-0.444	0.000325	-0.139	0.808**
	[0.149]	[0.203]	[0.0511]	[0.00264]	[0.162]	[0.823]	[0.650]	[0.428]	[0.997]	[0.696]	[0.0296]
Money Market Liquidity	-0.0165	-0.0714	103.8	-89.29	-279.8**	-113.8**	7.649**	-563.1**	0.00352	-1747**	135.5
	[0.926]	[0.558]	[0.678]	[0.386]	[0.0231]	[0.0397]	[0.0465]	[0.0228]	[0.973]	[0.0117]	[0.731]
US Bond Liqudity		4.301***		4.413**	4.689***	13.77***	5.558**	7.705**	0.930*	2.008	5.379***
		[0.000570]		[0.0301]	[0.0000145]	[0.00456]	[0.0188]	[0.0439]	[0.0949]	[0.219]	[0.00149]
US Stock Liquidty		-231.1**		-689.6	-204.3	-73.06	-335.1	339.3	-123.1	-213.6	22.98
		[0.0327]		[0.139]	[0.329]	[0.935]	[0.377]	[0.520]	[0.338]	[0.542]	[0.946]
US Money Market Liquidity		-0.187*		0.257	-0.273	-0.741	-0.171	-0.772	-0.240***	-0.168	-0.639***
		[0.0912]		[0.468]	[0.139]	[0.475]	[0.577]	[0.117]	[0.00409]	[0.527]	[0.00507]
US Spread		0.256**		0.272**	0.120**	0.231	-0.0635	0.333**	0.0201	0.230***	0.296***
		[0.0205]		[0.0272]	[0.0120]	[0.234]	[0.490]	[0.0211]	[0.492]	[0.00244]	[0.0000849]
Constant	0.133*	0.101*	-0.0516	0.487***	0.133**	0.512**	-0.00819	0.0602	0.0865	0.291***	-0.132
	[0.0584]	[0.0971]	[0.328]	[0.000362]	[0.0102]	[0.0400]	[0.931]	[0.660]	[0.187]	[0.00571]	[0.308]
Observations	1483	1479	208	208	208	99	173	205	149	115	114
R-squared	0.045	0.132	0.12	0.222	0.273	0.326	0.157	0.161	0.088	0.276	0.367

Table 5. EMBI Spreads and Liquidity: Emerging Economies

The dependent variable is the first difference of the natural logarithm of the EMBI spread. Estimation is by fixed effects panel regressions, with standard errors clustered by country. Robust p-values are reported in brackets. *, ** and *** denote significance at 10%, 5% and 1% levels respectively.

	(1)	(2)	(3)	(4)
	all	Latin America	Asia	Europe
COEFFICIENT				
L.dlembi	0.126*	0.132	0.109**	0.107
	[0.0847]	[0.233]	[0.0118]	[0.214]
Stock Liquidity	0.0357*	0.0539*	0.0620*	-0.0345
	[0.0567]	[0.0936]	[0.0524]	[0.344]
US Bond Liquidity	-1.044**	-1.781	-0.564**	-0.552
	[0.0249]	[0.135]	[0.0180]	[0.219]
US Stock Liquidity	0.176***	0.243**	0.133**	0.139
	[0.000800]	[0.0151]	[0.0233]	[0.154]
US Money Market Liquidity	-62.2	-58.81	-63.79	-57.95
	[0.126]	[0.582]	[0.108]	[0.449]
Constant	-0.0142	-0.0112	-0.0321***	0.0203
	[0.175]	[0.583]	[0.00532]	[0.514]
Observations	1028	394	416	218
# of countries	16	6	6	4
R-squared	0.055	0.078	0.047	0.03

Table 6. Price-Earnings (PE) Ratios and Liquidity

The dependent variable is the first difference of price-earning (PE) ratio. Estimation is by fixed effects panel regressions, with standard errors clustered by country. Robust p-values are reported in brackets. *, ** and *** denote significance at 10%, 5% and 1% levels respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
COEFFICIENT	All	G-7 countries	All Developed	Emerging Countries	Emerging Latin America	Emerging Asia	Emerging Europe
L.pe	-0.296***	-0.0472***	-0.0537***	-0.334***	-0.363***	-0.128***	-0.109**
	[0.0000188]	[0.000914]	[0.000393]	[5.38e-08]	[0.0000593]	[0.000127]	[0.0242]
World PE ratio	0.168***	0.0724**	0.0692***	-0.0493	-0.156	0.0553*	0.0259
	[0.00441]	[0.0141]	[0.000114]	[0.452]	[0.238]	[0.0656]	[0.564]
Stock Market Liquidity	1.242	-0.866*	-0.797***	3.946	12.55	-0.0692	-0.117
	[0.518]	[0.0545]	[0.00364]	[0.245]	[0.239]	[0.894]	[0.804]
US Stock Market Liquidity	-3.624**	-1.411***	-1.421***	-5.204**	-7.579*	-2.831**	-0.856*
	[0.0248]	[0.00250]	[0.000225]	[0.0177]	[0.0812]	[0.0129]	[0.0984]
Constant	2.180*	0.17	0.253	5.855***	6.726**	1.542**	1.38
	[0.0639]	[0.612]	[0.361]	[0.0000163]	[0.0283]	[0.0161]	[0.125]
Observations	6931	2241	3715	3216	1060	1384	772
# of countries	30	7	12	18	6	7	5
R-squared	0.175	0.064	0.062	0.196	0.212	0.077	0.058