DATA REQUIREMENTS TO SUPPORT EARLY WARNING SYSTEMS AMELIORATING THE IMPACT OF ADVERSE VOLATILE CAPITAL FLOWS

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ABSTRACT

Efficient markets rely on timely and high quality data and other information to provide the price discovery and liquidity functions relied upon by market participants. International capital market data from official disclosures are examined and evaluated against the standards of timeliness, completeness, and adequacy in meeting market users' needs to anticipate problems and develop early-warning systems. Among the many efforts since the 1990's crises to improve capital flow data, the balance sheet approach offers the most promise. Hedge fund data from regulatory filings and private data sources are reviewed next, with the amount of proprietary hedge fund statistics on their activity presenting the best prospects for an analysis of their investment strategies that might threaten market stability. The availability of data on derivatives is described and evaluated. The final section of the paper contains a number of recommendations concerning the publication and use of data to increase the ability of regulators and policy-makers to anticipate and deal with possible problems to the smooth functioning of international capital markets.

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EXECUTIVE SUMMARY

Volatile capital flows are usually related to sudden changes in market sentiment coming from revisions in the assessment of future economic outcomes that can be the basis of speculative gains or losses or from profits or losses associated with routine business activities. Better information has economic value in terms of reducing risks of investments in an economy. Research has shown a reduction of one-half percent in the borrowing costs of emerging market economies with the best data dissemination systems. Adequate flows of information to market participants reduce the likelihood of surprises and abrupt revisions in expectations producing capital flow reversals and the possibility of financial crises. Information is essential to efficient market functioning where prices of assets reflect a meaningful balance of expectations concerning future risks and returns in the marketplace and liquidity can be provided to traders at reasonable cost. This paper focuses on the types of information needed by participants in international capital markets: official information on capital flows, cross-border investments, and the structure of economies; information on the activities of active international capital market traders like hedge funds; information on developments in derivative markets used for hedging, risk management, and speculation.

All market participants need data, and market participants always want more information than is available: data is only available at a cost. Date dissemination policies of governments and businesses are determined by weighing the advantages of informed trading market participants and the costs of collecting data and the disadvantages of revealing private or official strategies or possible policy options to the market. Available of information will never be sufficient to satisfy all market participants. This paper provides background material for ABAC members to form opinions on data needs and policy that advance their goal of efficient, integrated, and growing international capital markets.

The paper recommends that APEC economies take actions to address issues that limit the perception of reliability of official data releases. It is suggested that ABAC urge APEC statistical agencies to commit to a uniform code of conduct concerning the quality, completeness, and timeliness of data releases. A second recommendation is that ABAC consider urging economic officials to create investor relations units that would work with investors in an effort to provide them with the data they need to reduce their concerns about risks in the economy and the uncertainty concerning the key economic fundamental determinants of an economy's financial market performance.

Official data releases on international capital flows and the structure of economies in terms of sector balance sheets have been improved greatly since the financial crises of the 1990's. Some areas of improvement are more complete than others, as discussed in

the paper, and new developments in data collection promise development of more effective early warning systems than in the past. Data necessary for these efforts can be enhanced by additional effort in collecting balance sheet data. The paper recommends that ABAC endorse the further improvement in the quality and completeness of data collection conducted under the auspices of the International Monetary Fund (IMF) GDDS, SDDS, and balance sheet approach.

Hedge fund regulation and required reporting remain minimal. If hedge funds are considered a threat, despite the proliferation of hedge funds and shift away from exchange-rate speculative strategies by the industry in recent years, private and informal data sources will be required to develop intelligence concerning future speculative attacks or massive hedge-fund trading disruptive to markets. The paper suggests that ABAC members weigh the costs and benefits of developing hedge fund surveillance units and, if the costs are warranted, recommends the development of hedge fund expertise within the APEC community housed in individual economies or as a multilateral effort.

Derivative markets are mainly over-the-counter markets and data on activities in those markets is gathered infrequently. An aggressive effort of data collection and combining from various sources might be warranted as an effort to detect possible problems stemming from derivative trading. The paper recommends that these efforts, like hedge fund surveillance efforts, might be considered if they are judged to be worth the considerable costs.

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I. Financial Crises and Data: Introduction

Data and information are the grease to the many wheels and hubs in efficient capital markets. The term *efficient capital markets* in the finance literatures refers to the assumption that asset prices reflect relevant information concerning economic fundamentals available to investors and other market participants. Markets are important because they provide investors with *liquidity*, essential to most investors to ease entry to and exit from commitments of financial resources to asset holdings. An equally important role of markets is *price discovery*, that is that transactions initiated by informed investors operating in efficient financial markets establish values and rates of return on assets reflecting consensus views of fundamental economic conditions determining the future risks and returns on different assets. These values and expected rates of return are important in determining the most efficient business strategies and achieving an efficient allocation of real resources in both the public and private sectors. Liquidity and price discovery are valuable if not essential aspects of international financial markets that are built on reliable sources of economic and financial data.

Data on financial market activity are reported by participants in the market, including official institutions like governments and central banks, regulated private firms

like commercial banks and others, exchanges, trade associations, estimates of the activities of private individuals and firms, and so forth. Some financial market activities are reported partially or not at all. As will be discussed in the next section, the quality and timeliness of data on the financial-market activities of all classes of financial market participants are important in forming expectations of future market conditions and associated risks, trading strategies, and possible future opportunities or problems.

High quality, timely, and comprehensive data collection and dissemination is costly to provide. What benefits to market participants justify these costs to suppliers of data? Two answers reflect the *public good* and *private benefit* attributes of financial markets benefiting from the availability of good data. Both the public good and private benefits and their relation to data are described in the following discussion.

Liquidity and *price discovery* are public goods that benefit all market participants and policy makers since they contribute to good policy decisions and efficient allocation of resources. Reliable trades at prices meaningful in terms of underlying fundamentals assure private investors of fair returns on average for investment strategies entailing risk. Unreliable data force economic decision-makers to be cautious in their financial market activities, demanding lower prices and higher returns to account for the uncertainties and unreported unknowns inherent in an economic environment. New information may easily tip expectations based on partial or unreliable information towards expectations reversing or doubling the implications of financial market strategies, increasing the price reactions and hence risk of the market. The chances of herd behavior and accompanying "crowded trading" as many traders attempt to exit positions simultaneously in response to changes in expectations arising for unexpected data or rumors are reduced with high

quality data enabling analysts and research departments to sift through historical data and build statistically reliable predictive models.

The private benefits to financial markets with the availability of good data result from increased confidence and reduced uncertainty concerning the true state of an economy and financial markets. Increasing data quality can have real benefits to an economy by increasing confidence and reducing uncertainty concerning the ability of sovereign borrowers to fulfill debt obligations. For example, Cady and Pellechio (2006) provide convincing evidence that emerging-market sovereign borrowers adhering to higher IMF data standards (as described in the next section) have borrowing costs between 20 and 50 basis points lower than sovereign borrowers with lower quality data, with the larger interest-costs savings associated with the most complete data disclosures. Reduced yield risk spreads on debt instruments issued by emerging-market governments have clear benefits for residents of those economies. To achieve these important savings, emerging market officials in countries issuing securities must be committed to gathering and disseminating the best data possible.

Private-market analysts and investors aggressively seek more reliable international market data. Data distribution services have developed to ease the updating and expansion of available data series to financial market customers. Sophisticated market participants scrutinize critical data series as they are released to assess any implications requiring minor or major innovations in previously held expectations. Hypothesized relations between data series and important economic magnitudes are based on extensive statistical analysis and comparisons of theoretical models with market outcomes, as we discuss with early warning systems (EWS) in the next section. These

analyses require long historical series of comparable observations on important economic variables. Some officials and policy-markers may view this attention and scrutiny as bothersome, but it has a useful analogy in private debt and equity financial markets.

In the United States and other developed markets, the analyst community, regulators, and sophisticated investors demand high-quality data from publicly traded firms. Poor or misleading data is often punished by the market in terms of valuations of firms reluctant to communicate candidly and frequently to the investor community. Recent accounting scandals and revelation of option-granting practices producing large share-price losses illustrate the importance of investor confidence in reported private-sector data and the consequences for assets values of a loss of confidence in data quality.

Most firms in the United States have *investor relations* departments. Top executives and investor relations staffs of the firm participate in presenting and analyzing financial and operating data through a variety of mediums like analyst meetings, phone conferences, and "road shows." Securities laws in the United States also assure investors that false disclosures are subject to criminal and civil legal sanctions. Gaining the confidence of current and future investors justifies the management time and direct costs of investors relations departments in terms of market access and valuation of claims on corporations. Losing the confidence of its investors is a major cost to firms that often must expend substantial resources to restore the reputation of the firms.

Sovereign borrowers of emerging market (or developed) economies entering international capital markets are in a situation similar to private corporate issuers in developed securities markets. The economic situation is however qualitatively different between sovereign and private issuers in one very important way. Governments and

other official issuers can influence economic fundamentals for an entire country through policy decisions. The market can lose confidence in official data disclosures due to lack of complete data reporting or the discovery or suspicion of manipulation of data. If officials offer unconvincing arguments in defense of policies accompanying data disclosures (as for example loss of reserves and continuing pledges to maintain a fixed exchange rate), this can and often does shake market confidence and increase assessments of risk. Inadequate, suspicious, unreliable data can increase the chances of sudden changes in market sentiment when new information becomes available to market participants.

Agencies responsible for official data, like central banks, statistical bureaus, and regulatory agencies, develop reputations among investors in part on the basis of their historical record of releasing and explaining data, no matter how bad or good the statistical releases appear. In the interest of smooth market functioning, it would be productive if official agencies were committed and held accountable on the record to highest possible standards in data publication. An important extension of this commitment would be if these agencies were actively helpful to data users and were perceived as trying to meet the data requirements of the international investor community, like the most successful investor relations departments of publicly traded firms. As Larry Summers wrote after the 1990's crises:

> Providing confidence to markets and investors that a credible path out of crisis exists and will be followed is essential. That requires transparency (providing all relevant information to markets so that risk-averse investors are not uncertain about how deep serious problems are), consistent and credible commitment to a coherent –policy-adjustment package (so that political and policy uncertainty does not undermine investors' confidence), and close consultation with creditors (so that sudden negative policy and information are minimized, and so that creditors are reassured that cooperative approaches to debt servicing difficulties will be pursued. (p. 11)

Clearly, data disclosures and other official communications can create confidence and may serve to avoid crises in the first place. Institutional investors' confidence and trust should be an objective of reporting agencies, in anticipation of the positive goals of reducing unnecessary risk assessments, smooth market functioning, and expanding the role of international financial markets in an economy's development. This report suggests some measures in support of increasing confidence in international financial market data based on this discussion in the final section.

II. Official Efforts to Improve International Capital Market Data*

Since the Financial Crises of the 1990s, most economies have attempted to improve financial market data released to the public under the guidance of multi-lateral organizations, most importantly by the International Monetary Fund (IMF). The effort to improve data has been a multi-pronged process with many task forces formed out of the many multi-national organizations (like the Bank for International Settlements (BIS), the World Bank, and the United Nations (UN)), as well as regional organizations and individual economies. It is enough for purposes of this policy background paper to provide a general summary describing this effort and provide an assessment of its successes to date. Providing a summary here should not be taken to diminish the importance of the details of this effort and the significance of its agenda for many working groups and task forces for the future. Paukula and Waller (2005) provide a good review of many of these data improvement initiatives: the following discussion can be seen as an update and expansion of the discussion in that paper. The most recent activities directed at improvements in international data are described in the IMF's Statistics Department newsletter (2005b) and in the many papers and reports of meetings posted on their website and those of other multinationals describing data improvements initiatives and reporting on their progress.

Improvements in Official International Capital Flow Data and Early Warning Systems

The IMF has played a key role in efforts to improve international capital market data in its General Data Dissemination System (GDDS) and the Special Data

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Dissemination Standard (SDDS), both initiated in the wake of the financial crises of the 1990's. The GDDS is a framework to develop a program of data collection and publication for less developed economies among IMF members. This GDDS program is often accompanied by assistance by the IMF and other multinational agencies and organizations. One goal of the GDDS program is to encourage and assist countries to develop data dissemination systems adequate to "graduate" to the SDDS. As of September 2004, 76 countries belonged to the GDDS program.

The SDDS was established to guide IMF members in developing data disclosures adequate to provide access to international capital markets. As of March 31, 2006, 62 countries participated in SDDS, or were "subscribers" to the system in IMF terminology. Subscription to SDDS requires data in four sectors: the real sector, fiscal sector, financial sector and external sector. An important component of these data disclosures are country disclosures of "metadata" consisting of information by subscribers about their data definitions and collection methods, as well as initiatives to improve future data releases, including actions taken under both the GDDS and SDDS and the Data Quality Program (IMF Statistics Department, 2005a).

Timely disclosures of data are important in the application of early warning systems (EWS). To illustrate the adequacy of existing data disclosures as well as the types of data requirements market participants have used to develop EWS, Table 1, "EWS Data Variables and Availability for Three Economies," lists all the variables used in representative EWS models of financial crises or sovereign debt defaults that have been published and reviewed for this study. As is demonstrated by the table for the selected economies, most required data is available and is published within a reasonable

timeframe. In terms of the data reporting by SDDS, most of the variables required by EWS are available from the system (all APEC economies except Brunei, Chinese Taipei, and New Zealand subscribe to SDDS). While data comparability and timeliness have improved since the 1990's with the development of the SDDS, this does not mean that there are no complaints from international capital market participants about quality or availability of comparable data series from each economy.

An informal survey of international financial market participants and a review of the literature identify two often-mentioned types of limitations to data available through SDDS. Addressing these limitations will form the basis of additional ABAC recommendations to APEC concerning international financial data presented in the final section of the paper. These data limitations are discussed below under the two headings, practical and theoretical limitations on SDDS data.

Practical International Financial Data Limitations

First, in terms of practical considerations, financial market data users continue to raise certain general criticisms of some data series, for example international reserves. While these data are reported monthly, Table 1 shows that they are often reported with a two-month lag, although the IMF explains that some delays are due to "technical problems." According to Maurine Haver, President of Haver Analytics, a data distribution firm widely used by institutional investors, one major concern to international financial market observers is that the definitions of international reserves are not consistent. Market observers feel they need more detail on the composition of reserve assets and currencies. The currency composition of reserves is likewise of interest (see Truman and Wong (2006)). While the IMF is focusing attention on the issue of

improving international reserves reporting (see IMF Statistics Department (2005b), p. 4), the concerns of the private financial market participants concerning the timeliness, comparability, and completeness of the reporting of reserves are voiced frequently.

Another set of practical concerns has to do with the terms at which necessary data are made available to researchers and analysts in the private sector. For example, some countries until recently charged substantial subscription fees for data to be distributed to financial market users. Other statistical offices continue to charge for historical series necessary for statistical analysis and model building. Some data are published that are difficult to users to interpret because English language annotations of tables are not easily used or are not available.

Finally, several international financial market participants have voiced concerns about the ethics of data publications by some statistical offices. For example, official data releases have been said to contain obvious errors, and that corrected data are provided to some users before an officially scheduled update of the release. Possession of corrections to released data that are not officially released could have significant market impact and present issues similar to those associated with inside information concerning private-sector issuers. Another complaint dating from the crisis period is that official data disclosures were not complete pictures of underlying financial exposures of government-related institutions.

Theoretical Issues

Theoretical issues raised by practitioners with respect to international financial data have to do with the fact that most of the published data under SDDS is flow data, based on balance of payments and national account or similar statistics. National income

Table 1: EWS Data Variables and Availability for Three Economies (Korea, Thailand, Chinese Taipei)

(Last updates as of May 2006)

Variables	Korea		Thailand		Chinese Taipei	
	Availability	**Last Update (Frequency)**	**Availability**	**Last Update (Frequency)**	**Availability**	**Last Update (Frequency)**
External Sector Variables						
Overvaluation *(Exchange rate)*	**Yes**	**28-Apr-06 (D)**	**Yes**	**23-May-06 (D)**	**Yes**	**Apr-06 (M)**
Terms of trade	**No**		**No**		**No**	
Current account	**Yes**	Mar-06 (Q)	**Yes**	**Q4-05 (Q)**	**Yes**	**Q1-06 (Q)**
Current account balance/GDP	**Yes**	Q1-06 (Q)	**Yes**	**Q4-05 (Q)**	**No(GDP)**	
Current account balance/investment	**No (investment)**		**No (investment)**		**No(investment)**	
Reserves growth	**Yes**	Apr-06 (M)	**Yes**	**May-06 (M)**	**Yes**	**Apr-06 (M)**
Reserve losses	**Yes**	Apr-06 (M)	**Yes**	**May-06 (M)**	**Yes**	**Apr-06 (M)**
Reserves/M2 (level)	**Yes**	**Mar-06 (M)**	**Yes**	**Mar-06 (M)**	**Yes**	**Mar-06 (M)**
Reserves/M2 (growth)	**Yes**	**Mar-06 (M)**	**Yes**	**Mar-06 (M)**	**Yes**	**Mar-06 (M)**
Reserves/Imports (level)[1]	**Yes**	**Mar-06 (Q)**	Yes	Q4-05 (Q)	**Yes**	**Q1-06 (Q)**
Openness (Exports+Imports/GDP)	**Yes**	**Mar-06 (Q)**	Yes	Q4-05 (Q)	**No(GDP)**	
Export growth[2]	**Yes**	**Mar-06 (Q)**	**Yes**	**Q4-05 (Q)**	**Yes**	**Q1-06 (Q)**
Import growth	**Yes**	**Mar-06 (Q)**	**Yes**	**Q4-05 (Q)**	**Yes**	**Q1-06 (Q)**
Total external debt/GDP	**Yes**	**Q4-05 (Q)**	**Yes**	**Q4-05 (Q)**	**No(debt, GDP)**	
Debt/Export	**Yes**	**Q4-05 (Q)**	**Yes**	**Q4-05 (Q)**	**No(debt)**	
Short-term external debt (original maturity basis)/reserves	**Yes**	**Q4-05 (Q)**	**Yes**	**Q4-05 (Q)**	**No(external debt)**	
Short-term external debt (remaining maturity basis)/reserves	**No**		**No**		**No**	
ST Debt/Reserves	**Yes**	**Q4-05 (Q)**	**Yes**	**Q4-05 (Q)**	**No(debt)**	
Interest on short-term external debt/ GDP	**No(interest)**		**No(interest)**		**No(interest, GDP)**	
Debt service on short-term external Debt/reserves	**No (debt service)**		**No(debt service)**		**No(debt service)**	
Financing requirement/reserves	**Yes**	**2004 (Y)**	**Yes**	**Mar-05 (Q)**	**No(financing)**	
FDI/GDP	**Yes**	**2004 (Y)**	**Yes**	**2004 (Y)**	**No(FDI, GDP)**	

[1] Import of goods and services is available quarterly but merchandise import is available monthly.
[2] Export of goods and services is available quarterly but merchandise export is available monthly.

Table 1 (continued): EWS Data Variables and Availability for Three Economies (Korea, Thailand, Chinese Taipei)

Variables	Korea		Thailand		Chinese Taipei	
Oil prices	No		No		No	
LIBOR	Yes		Yes		Yes	
U.S. Treasury bill rate	Yes		Yes		Yes	
Monetary/Fiscal Policy Variables						
Bank Deposits	No		No		No	
Domestic credit growth[3]	Yes	Mar-06 (M)	Yes	Mar-06 (M)	Yes	Mar-06 (M)
Domestic credit/GDP growth	Yes	Q4-05 (Q)	Yes	Q4-05 (Q)	No (credit, GDP)	
Growth of credit to pvt. Sector	Yes	Mar-06 (M)	Yes	Mar-06 (M)	Yes	Mar-06 (M)
Financing requirement *(Govt)*	Yes	Mar-06 (M)	Yes	Mar-06 (M)	No (financing)	
Domestic real interest rate[4]	Yes	Mar-06 (M)	Yes	Apr-06(M)	No (inflation)	
Real interest rate on deposits	Yes	Apr-06 (M)	Yes	Apr-06(M)	No (inflation)	
Ratio of lending interest rate to deposit interest rate	Yes	Apr-06 (M)	Yes	Apr-06(M)	No (inflation)	
Domestic Foreign real interest Rate differential	Yes	Apr-06 (M)	Yes	Apr-06(M)	No (inflation)	
Inflation (year-on-year, in percent)	Yes	May-06 (M)	Yes	Apr-06(M)	No	
Short Term Debt	Yes	Q4-05 (Q)	Yes	Q4-05 (Q)	No	
Debt coming due	No		No		No	
Total Debt	Yes	Q4-05 (Q)	Yes	Q4-05 (Q)	No	
Commercial Share	No		No		No	
Concessional Share	No		No		No	
Multilateral Share	No		No		No	
Primary balance in percent of GDP	No (net interest payment/receipt)		No (net interest payment/receipt)		No (net interest payment/receipt)	
General government consumption as % of GDP	No (govt cons)		No (govt cons)		No (govt cons, GDP)	
Real Sector Variables						
GDP growth	Yes	Q1-06 (Q)	Yes	Q4-05 (Q)	No	

[3] Domestic credit is not given in case of Taiwan. However, one can obtain it by adding claims on public and private sector.
[4] Can calculate using nominal interest rate and inflation on which data is available. Though interest rate data is available daily price data is available only monthly. For Taiwan, inflation data is not available.

Table 1 (continued): EWS Data Variables and Availability for Three Economies (Korea, Thailand, Chinese Taipei)						
Variables	**Korea**		**Thailand**		**Chinese Taipei**	
Industrial production	**Yes**	**Mar-06 (M)**	**Yes**	**Mar-06 (M)**	**No**	
Stock Market Variables						
Stock market	**Yes**	**28-Apr-06 (D)**	**Yes**	**23-May-06 (D)**	**Yes**	**23-May-06 (D)**
Stock price growth	**Yes**	**28-Apr-06 (D)**	**Yes**	**23-May-06 (D)**	**Yes**	**23-May-06 (D)**
Contagion Variables						
Global liquidity contagion	These model specific derived variables, i.e. the authors have used various variables to construct these measures and the exact methodology and data requirements are not known for these variables. Most of these variables are used in EWS models used in industry.					
Regional Contagion						
Devaluation contagion						
Market pressure contagion						
Interest rate 'event'[5]	**Yes**	**Mar-06 (D)**	**Yes**	**23-May-06 (D)**	**Yes**	**Mar-06 (M)**
Other Variables						
Political event	**No**		**No**		**No**	
Regional dummies	**No**		**No**		**No**	
Moody's sovereign credit ratings	**No**		**No**		**No**	
Institutional investor sovereign credit ratings	**No**		**No**		**No**	
Presidential Elections	**No**		**No**		**No**	
Index of Freedom Status	**No**		**No**		**No**	

Sources for EWS Model Variables: Berg, Borensztein, and Pattillo (2004), Detraigiache and Spilimbergo (2001), Manasse. Roubini, and Schimmelpfennig (2003), and Pakula and Waller (2005)

[5] Depending on the definition of "event" it can be calculated from the data. Although Korea is supposed to report interest rate data daily it reports it when there is a change in the interest rate on aggregate credit ceiling loans.

account and balance of payments data like GDP or exports are *flow* statistics rather than the total accumulation of *stocks* of assets or liabilities on balance sheets of decision-making entities in an economy. Stock data on debt levels necessary to estimate debt-service obligations are often not available (see Table 1). While the IMF has expanded its SDDS requirements for external debt in 2003, the quality and coverage of stocks of assets and liabilities are limited in most countries. The historical lack of balance sheet data forced analysts to construct analytical approaches and models that were compromised by data availability, as noted in Table 1, under several asset and liability classifications.

In evaluating the data available for EWS development, one must keep in mind that most of these models were developed and conditioned on data availability, not necessarily the suitability of data. In other words, the coverage of the current data required by SDDS, even if available and of sound quality, does not satisfy the theoretically desirable and most useful variables to use developing in EWS models. Previously reported EWS research reflects data compromises forced on analysts concerning measurements of vulnerabilities in asset and liability accumulations or stocks, and should not be used as a standard for the ideal data to have available. These points are relevant to the following discussion on the recent efforts to improve data useful in diagnosing financial market vulnerability to crisis.

Asset and Liability Data and the Balance Sheet Approach

Voluminous research reported by academic and central bank researchers, private analysts, and by the multilateral institutions since the financial crises of the 1990's, has focused on balance-sheet mismatches (maturity and currency) for important economic entities as an important cause of these crises. Sector balance-sheet mismatches can result

in liquidity crises when income or other flows are inadequate to cover required debt service (see Chang and Velasco (1998)). The distributed effects of liquidity crises are transmitted from one sector of the economy to other sectors: for other examples of transmission, see Counterparty Risk Management Policy Group II (2005) report discussed in the next section. These accumulating liquidity and often solvency issues are responsible for increased volatility in asset values and required rates of return in international financial markets in the face of liquidity difficulties. These issues are emphasized by Pettis (2001) among others.

In recognition of the importance of balance sheet mismatches and the way economic shocks are transmitted through balance sheets of sectors in an economy, in 2002 the IMF increased its efforts to develop a *balance sheet approach* (BSA) to presenting sector sheets. The goal is to be able to assess each sector's financial market exposures to currency and maturity mismatches (see Mathisen and Pellechio (2006)). In the following discussion, we discuss both the implications of the BSA for data reporting and quality improvement and the significance of IMF surveillance effort to reducing the probability of an unexpected financial market disturbance (crisis).

The BSA is based on the presentation of aggregate balance sheets for seven sectors of an economy:

(1) Central bank;
(2) General government;
(3) Other depository institutions;
(4) Other financial corporations;
(5) Non-financial corporations;
(6) Other resident sectors;
(7) Rest of the world.

This breakdown of an economy into sectors with balance sheets is comparable to the venerable Federal Reserve Board's *Flow of Funds* accounts, published since the end of the Second World War. In addition to the sectors, data gathering is aimed on a classification of important asset and liability classes, that is the required entries in the balance sheets. The major difference in the IMF BSA initiative and data reported by the Federal Reserve is the emphasis by the IMF on maturity and currency classifications of individual asset and liability classes. Of course, these classifications are of central interest in developing assessments of likely international financial market disturbances stemming from volatile capital flows.

Accurate and timely data disclosures under the BSA initiative would meet many practical and theoretical concerns raised in developing EWS. Unfortunately, data on balance sheets of most sectors in most economies are not yet reported with enough reliability to give a complete view of non-financial sector vulnerabilities and aggregations of balance sheet items can obscure significant omissions in data on specific types of transactions. Tables 2 and 3 below from Mathisen and Pellichio (2006) show an assessment of the relative reliability of difference sectors' balance sheets source data and specific asset and liability entries, and they report:

> Data reliability can vary significantly by sector (Table 2). In general, central bank data are most reliable, followed by data from commercial banks and other financial institutions, international investment position data, and government debt data. Secondary trading in government debt can substantially affect the ability to determine sectoral holdings of government securities. Data on households and nonfinancial corporations are typically very scarce in emerging markets and in many cases are nonexistent. … Sectoral data reliability can vary by methodology. In general, the most reliable data are those that follow … [IMF guidelines]…. Data on nonfinancial corporations' positions vis-à-vis household and nonprofit organizations are generally less reliable. The uncertainty of these data are exacerbated if derived on a residual basis. [p. 30]

Households and businesses account for most bank and non-bank borrowing. Much of the data on foreign obligations and asset claims are estimated and the above quote may

overstate the reliability of these assets and liabilities. Most of these data are based on comparisons between domestic reporting and foreign creditor and investment surveys. A BIS report (2002), while somewhat outdated, discussed the differences between national and creditor estimates: these can be substantial and important.

While in most economies central bank and regulated financial institutions balance sheet data are routinely generated in great detail and with sanctions against misrepresentation (see Table 2), many of the other non-bank data items are estimated using survey data. Surveys are expensive and hence data are collected less frequently than would be desirable to analyze growing sector maturity or currency mismatches. The Bank of Thailand (2006) provides a detailed example of survey procedures for estimating external debt for the non-bank sector, illustrating the effort and adjustments required by the survey approach to estimates. Several commentators have noted problems with trade credit in particular, an important variable not only from the point of view of short-term non-financial liabilities, but also often used to hide transactions that are essentially speculative short-term capital flows. A focus on trade credit availability during crises is usual because credits reflect changes in trade volumes in and out and may be essential to support exports with their foreign exchange earnings potential.

Bilateral Surveillance and the Balance Sheet Approach

Research reported by the IMF (for example IMF (2004a)) and others provides several examples of the benefits of using the BSA to diagnose the vulnerability of emerging market economies to financial crises. The IMF has embraced the balance sheet approach in its surveillance program based on the value the BSA has in identifying financial

Table 2: Data Reliability (by Sector)

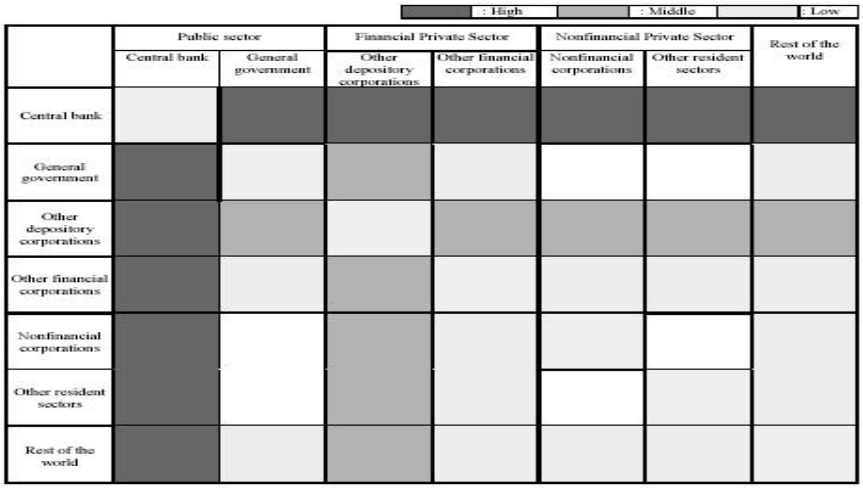
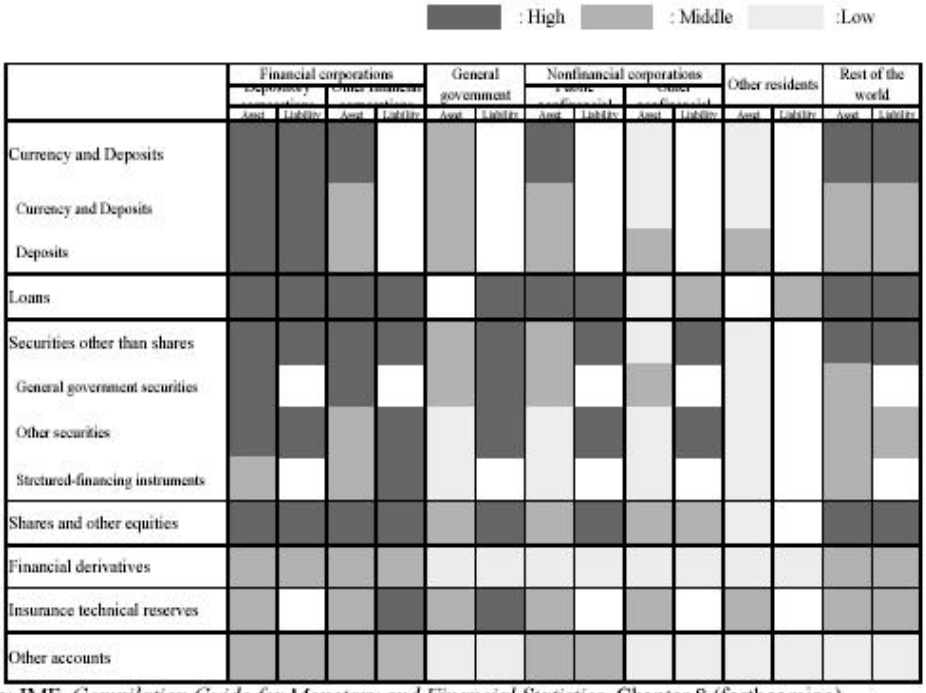


Table 3: Data Reliability (by Financial Instrument[1])



Source: IMF, *Compilation Guide for Monetary and Financial Statistics*, Chapter 8 (forthcoming).

1/ The darker areas indicate where the compiler placed a relatively "high" degree of reliability. The moderately shaded areas indicate series where estimates are judged to be less reliable, but still where source data are available on a sample basis or on a basis where the frequency is less than quarterly or annually. The lightly shaded areas are for series where there is virtually no source data; estimates for series in the non shaded area are based largely on residual calculation.

system vulnerabilities. The IMF's review of its surveillance activities under its Article IV (IMF (2004b)) describes the value of the BSA as follows:

> Vulnerability assessments are benefiting from initiatives to enhance coverage of balance sheet issues, including implementation of the strengthened framework for debt sustainability assessments. Balance sheet issues have received substantial attention in surveillance of both advanced and emerging market economies. In advanced economies, the focus has been on private balance sheet vulnerabilities, particularly in connection with risks stemming from risking real estate prices and mortgage lending. In emerging market countries, staff reports have focused on the potential transmission of shocks across domestic sectors under crisis conditions, key factors contributing to resilience under such conditions, and ensuing policy advice. Nevertheless, limited data availability remains an obstacle to detailed balance sheet analysis in many instances. [p. 13]

The IMF Annual Report of 2005 states as follows:

> During FY2005, such balance sheet analysis was increasingly integrated into the Fund's operations, with a particular focus on the role of public debt. Analyses of balance sheet vulnerabilities are increasingly being incorporated into Article IV consultations and other surveillance exercises. [p. 2]

Data on short-term foreign currency assets and liabilities, for example, are balance-sheet series directly relevant to assessing potential international payments problems. Improvements in the quality, reliability, and timeliness of balance sheet data, both in support of the IMF surveillance program and to supply private-sector analysts with useful statistics, is an obvious position for ABAC to support to the APEC economics ministers, as will be presented in the final section.

IMF Surveillance and Public Information Notices

Transparency is necessary for market participants to assess policy and performance in economies as effectively as possible. Economic conditions are always changing and there are always risks of unexpected events or developments. A major part of effective financial market assessments of values and risks underlying international investment strategies in economies and regions is to consider likely future outcomes contingent on future policy changes and the resilience and adaptability of governments and institutions to unexpected changes. An open dialogue or debate between various

market participants can help analysts assess the range of reactions official and private market participants might consider in the face of unexpected events.

The IMF surveillance effort produces biannual detailed reviews of IMF member economies. Official and private international financial market participants have differing views about the effectiveness of past IMF policy prescriptions and the ultimate value of the IMF and other multilateral organizations in dealing with past and future crises. However, open debate of these issues, including the assessments resulting from IMF surveillance efforts, contributes to an understanding of the range of possible future policy responses to unexpected financial market disturbances and can reveal the considerations relevant to determining the impact of policy changes on financial market performance. In other words, active discussion of current economic conditions and possible future problems reveals information about the understanding, motives, and likely responses of major market participants in the event of shocks to the system. Because this non-data based information is relevant to assessing risks and develops an understanding of alternative theories and objectives and decisions by major participants in financial markets, this debate should be encouraged to stimulate broader transparency going beyond disclosure of data in international financial markets.

For example, as part of the IMF surveillance process, individual countries have the option of publishing or not publishing the IMF staff report covering the assessment of its economy. Countries may release only the IMF executive board's assessment contained in the Public Information Notice (PIN). In 2005, 130 countries were reviewed of which 12 are ABAC economies. Of the 12 ABAC members, seven either did not publish the full IMF staff report or published it with a lag of one month or greater (as

tabled in IMF *2005 Annual Report*). While many reasons could be advanced to justify non-publication of the IMF staff report, non-publications limits the ability of market observers to debate the merits of the assessment and the concerns raised by IMF staff. We believe that timely airing of all the positions concerning the likely future status of an economy and financial markets is a healthy contribution to a broader notion of market transparency and will be the subject of a proposed recommendation in the final section of this paper.

III. Hedge Fund Regulation, Reporting, and Data

Hedge funds have come to play an almost mythic role in international financial markets. They were alleged to have played a major role in the speculative attacks on currencies in the 1990's financial crises. Funds under the control of hedge-fund managers are said to grown to over $1.3 trillion in the last few years. They operate without disclosing their operations and strategies publicly and are therefore often considered suspicious and possibly dangerous. This section reviews the current status of the data available to follow the hedge-fund industry. The discussion first makes some general observations about the hedge-fund industry and then reviews the concerns of regulators related to hedge funds and the state of regulation and official reporting. The section concludes with a discussion of non-official sources of data and some possible recommendations that could be made with regard to the hedge-fund industry.

General Observations on the Hedge-Fund Industry

The hedge-fund industry in terms of hedge-fund managers has spread to many money-market centers but management of the industry is still dominated by the United States (estimated 70% of assets under management in world) and in Europe by London (15 to 20% under management) (Waters, 2005). In addition to Europe, Asian centers like Hong Kong and Singapore have become important centers of hedge-fund management. While the location of hedge-fund management may be the most important attribute of the hedge-funds strategic regional orientation, other functions required by a hedge-fund, like brokerage, custody, marketing (capital introduction), accounting, and so forth, have also spread widely to locations like Ireland, the Channel Islands, and off-shore tax havens like the British Virgin Islands. The hedge-fund industry is very mobile,

despite its reliance on sophisticated financial market talent. Most host economies are reluctant to lose the jobs, prestige, and related business associated with the location of services required by hedge funds. The politics of hedge-fund regulation is clearly influenced by the mobility of the industry in a world of increasingly integrated capital markets and cheap international communication.

Traditional hedge-fund managers invest money on behalf of sophisticated investors, where sophisticated is interpreted as institutional investors (insurance companies, endowments, pension funds, other corporations) or wealthy individuals. In the United States, the capital by investors is paid into a partnership where investors are limited partners and the manager is a general partner. Off-shore funds are usually corporations (SEC (2003)). The typical hedge manager charges investors asset-management fees (say one percent of invested capital) and demands incentives payments when the fund exceeds benchmark performance (for example, 20 percent of profits above the benchmark will be paid to the fund managers). Historically, the client of the investment advisor or hedge-fund manager is a fund (a limited partnership), and managers can have several funds to manage.

Because hedge funds are not sold to the general public but only large, sophisticated investors, they are exempt from regulation under United States law. Mutual funds, on the other hand, are marketed to individuals so mutual funds are regulated. Regulation of mutual fund companies in the United States consists of required registration of their investment advisors and periodic examination under the Investment Advisors Act (1940). Mutual funds have required periodic filing of reports to the Securities and Exchange Commission (SEC) and to their current or potential investors.

Separation of mutual fund advisory functions and asset custodial functions is mandated under the Investment Company Act (1940). Advisors and mutual funds and separate accounts of corporate pension funds are also subject to U.S. securities laws and codes of conduct and regulations of exchanges.

Many hedge fund managers have avoided registration and regulation by limiting their marketing to sophisticated investors, so-call *qualified purchasers* of hedge-fund partnership shares (SEC (2003), p. 11-12). This treatment is widely followed around the world, as for example in the United Kingdom (see FSA (2002)) and elsewhere (see PriceWaterhouseCoopers (2006)). The attraction of hedge funds for sophisticated investors is that they can employ investment strategies that are not possible for regulated investment vehicles and that they are not required to report to regulatory authorities like the SEC or FSA. Another class of institutional money managers using investment strategies called global tactical asset allocations (GTAA) and employing derivatives to trade foreign exchange are exempt from registration requirements.

As discussed below, hedge funds are not totally exempt from regulation by government agencies like the SEC or self-regulatory organizations like the exchanges. A recent SEC initiative attempted to bring hedge fund advisors under regulations similar to those for mutual fund advisors by arguing that individual investors in hedge funds partnerships were the advisors' clients. The SEC reasoned that an exemption from registration requirements for advisors with fewer than 15 clients was not a valid basis for exemption from registration of hedge-fund advisors with more than 15 investors, an argument that was contested in court. In June 2006, the Supreme Court of the United States ruled that the SEC had exceeded its authority in requiring the registration of hedge

fund advisers. Regulation of hedge-fund advisors was thus determined to be an unauthorized extension of SEC authority. Regulation of hedge funds in the United States is currently under intense discussion.

Market observers classify the investment strategies of hedge-fund managers into several categories. Three broad categories are *market trend* or *directional strategies*, *event-driven strategies*, and *arbitrage strategies* (SEC (2003), p. 34). Under the first broad category are two subcategories: *macro* and *long-short strategies*. Currency speculation falls under the subcategory of a macro strategy. While no official data on hedge-fund portfolio composition is available, industry sources (as discussed below) indicate that total hedge-fund assets managed on the basis of all possible macro strategies are estimated to have fallen from around 71% in 1990 to under 10% of off-shore funds currently (presentations to ABAC by Macquarie Bank (2005) and Russell (2006)). Hedge funds currently seem to be much less engaged in currency speculation than in the 1990's.

Unregulated hedge funds, unlike mutual funds, can employ borrowed funds (often margin account lending) to leverage their speculative positions. They also can sell stocks short (that is, sell borrowed shares with the intention of returning the shares later with purchases at lower prices.) Both margin-account borrowing and short selling require the services of large brokers that offer those services to large accounts. Brokers providing these services to hedge funds, as well as handling clearing and settlement for transactions handled with other brokers, are called *prime brokers*.

Hedge funds require custodial, accounting, and marketing services, as mentioned above. Firms outside of the residency of the fund manager often provide these services,

sometimes for tax reasons. For example, Ireland has developed a substantial presence as a service center for hedge funds. Hedge funds, with their large investment pools of money and frequent trading, are desirable residents in cities attempting to retain or develop active securities markets services and the employment and incomes associated with those activities.

Hedge Fund Regulation and Disclosures

Hedge funds are not regulated much, as discussed above. Nonetheless, an active debate is underway by potential regulators like the SEC and FSA and others about why (or why not) hedge funds should be regulated. Essential to understanding this debate concerning regulation is an appreciation of regulators' major concerns. Major issues and concerns related to hedge-fund activities raised in the debate concerning hedge-fund regulation (see SEC (2003) and FSA (2004)) are:

(1) Protection of retail investors;
(2) Concerns about market stresses because of concentrated trading in similar instruments;
(3) Liquidity problems caused by leverage used by hedge funds;
(4) Corporate control issues from large share positions;
(5) Valuation of assets in hedge-fund portfolios;
(6) Incentive issues concerning investment advisors and different classes of investors.

Each of these concerns can be related to developments in the industry, as discussed below. To illustrate the general tenor of the discussion concerning policy issues raised by hedge funds, the European Central Bank *Financial Stability Review (2006)* summarizes its concerns about hedge funds as follows:

> The possibility of tighter global liquidity conditions in the period ahead has raised investor redemption risk for hedge funds managers, particularly as the share of less liquid assets has reportedly been increasing. The correlation of returns within some hedge fund investment strategies and among strategies have remained high or have even increased, raising the risk of disorderly synchronous exits from similar trades. [p. 133]

Market liquidity and smooth functioning of markets are main focus of regulators' concerns.

Concerns regarding hedge funds and retail investors are mainly due to the development and marketing of hedge funds investing exclusively in other hedge funds forming so-called "funds of funds," intended to provide hedge funds returns as well as diversification in smaller investment amounts to the retail market. Marketing of hedge fund related products to the retail market is controversial because securities market regulators want to be assured that small savers not be exposed to excessive risks or risks they do not understand. Funds of funds, however, can be regulated without regulating the underlying hedge funds since they are a type of mutual fund.

Hedge fund concerns not related to the retail market have a number of bases. Concentrated simultaneous trading of assets that are the focus of hedge funds pursuing similar strategies that require quick entry and exit into positions to realize profits or limit losses. Liquidity issues associated with many traders unwinding strategies involving the same or similar assets have moved to the forefront of regulatory concerns following the Long Term Capital Management (LTCM) hedge-fund collapse in September 1998. Corporate control issues associated with accumulations of large equity positions have always played a role in securities regulation in the United States. Hedge funds are not exempted for reporting investment positions that could be considered an attempt to gain control of a private firm. Valuation issues are an issue because of the complexity of many hedge-fund assets and the requirement to report performance to investors. Finally, since funds are limited partnerships, different classes of partners (defined by so-called "side letters") may be disadvantaged relative to other partners and managers may be able to exploit these differences to advantage (for example, by differentiated disclosures to classes of partners or priority calls on capital ahead of other investors).

None of the issues of concern to potential hedge-fund regulators in the above list is related to concerns about issuers of securities or derivative contracts suffering unwarranted attacks on their values unless the usual securities trading rules are violated. For example, hedge funds might fraudulently manipulate a market in order to profit from a "short squeeze," whereby funds could extort high prices for assets deliverable against contracts (like shares of stock or commodities) that they have accumulated secretly with undisclosed trading through affiliated parties. Market manipulation of securities' values is prohibited in most securities markets. Outside of the impact of illegal trading practices and fraudulent disclosures, regulators currently are not concerned about the effects of hedge fund trading on issuer security values.

Two of the concerns from the above list, market stress and leverage, are being addressed in the hedge-fund industry, but not through regulatory intervention. In the case of large concentrations of assets (item (2) on the list), for example, the FSA is planning on developing intelligence on potential problems through the improvement of communication with the hedge-fund industry based on voluntary relations with FSA "hedge-fund supervisory teams" (FSA 2005). These teams would become familiar with the hedge-fund industry and its managers and focus on the possible adverse effects on securities markets of "high impact" funds with large concentrations of less liquid assets. The existence of these team could possibly increase investor confidence in hedge funds.

The Counerparty Risk Management Policy Group (CRMPG), chaired by a former president of the Federal Reserve Bank of New York, E. Gerald Corrigan, has concentrated on averting the systemic risks associated with the liquidity and credit-risk problems associated with the LTCM collapse. This effort has had the effect of increasing

the credit-risk standards applied to hedge fund customers of prime brokers and other service providers of hedge funds. Most observers believe that impact of improved risk-management by hedge-fund creditors has been to reduce average hedge-fund leverage and to reduced systemic risk. The latest CPRMG report (2005) summarizes:

> In approaching its task, the Policy Group shared a broad consensus that the already low statistical probabilities of the occurrence of truly systemic financial shocks had further declined over time. The belief that the risk of systemic financial shocks had fallen was based on a number of considerations, including: (1) the strength of the key financial institutions at the core of the financial system; (2) improved risk management techniques; (3) improved official supervision; (4) more effective disclosures and greater transparency; (5) strengthened financial infrastructure; and (6) more effective techniques to hedge and widely distribute financial risks. [CRMPG (2005), p. 1]

The report focuses on risk-management of large exposures and makes the following recommendation:

> CRMPG II recommends that the private sector, in close collaboration with the official sector, convene a high level discussion group to further consider the feasibility, costs and desirability of creating an effective framework of large-exposure reporting at regulated financial intermediaries that would extend – directly or indirectly – to hedge funds. Using the indirect method, regulators would collect and aggregate large exposure data from traditionally regulated institutions and, through those institutions, collect data on hedge fund activity. Under the direct approach, hedge funds would, on a voluntary basis, provide a large exposure data directly to the appropriate regulator. [p. 40]

This position is very similar to that advocated by the FSA (2005, p. 16).

Regulators are primarily concerned about market liquidity and solvency risks of major securities market participants like investment banks serving as prime brokers to the hedge-fund industry. They are also mindful of the huge supply of liquidity hedge funds supply as part of their routine trading activities. For example, the *Wall Street Journal* (July 27, 2006, p.1) reports that the hedge fund industry accounts for up to half the daily trading volume on the New York and London stock exchanges. Interference with routine hedge-fund activity would reduce liquidity (and price discovery) benefits from major money-center exchanges. Important officials like Ben S. Bernanke, Chairman of the

Federal Reserve System, and his predecessor Alan Greenspan, are skep0tical about the merits of more required hedge fund reporting (Bernanke (2006)).

Hedge funds do not escape all regula tion or regulatory reporting requirements (see SEC (2003), pp. 23–32). Hedge fund managers that have registered with the SEC as investment advisors because they also manage pension funds and mutual funds are subject to examination and audit. Large hedge funds managers with over $100 million in assets under management must file quarterly portfolio reports detailing asset long positions in equity holdings over 10,000 shares or $200 thousand on a form 13-F to the SEC. Assets include U.S. stocks, some equity options and warrants, shares in closed-end investment companies, and convertible debt securities. Hedge funds report to investors as agreed in partnership arrangements and provides information to prospective investors in private placement memorandums. Under certain circumstances, hedge funds trading commodity contracts are considered to be "commodity pools," subject to reporting requirements by the Commodity Futures Trading Commission (CFTC). The United States Treasury Department may require reporting large positions in Treasury securities or large foreign currency positions (over $50 billion) to the Federal Reserve Bank of New York. They may be subject to reporting requirements if they manage pension fund assets due to the Employee Retirement Income Security Act (ERISA), and they are subject to National Association of Securities Dealers (NASD) regulation on the suitability of hedge fund investments for individual investors. Most of this reporting is not available in public data sources.

It seems likely that neither in the United States nor other centers of hedge-fund management will increase the regulation of hedge-fund activity in the near future. If

there is increased regulation, this regulation will most likely focus on sales of hedge-fund related investments to the retail market or will focus on position concentrations and/or leverage in an effort to reduce systemic risk. The alleged role of hedge funds as a cause of the crises of the 1990's, even if valid, would not be addressed by regulatory initiatives in these two directions.

Short of internationally enforceable and enforced rules preventing hedge-fund investments in assets whose values are linked to exchange rates, any foreign currency denominated assets, or even broader capital controls preventing cross-border payments and settlements, it is hard to imagine any future regulation of hedge funds reducing their ability to speculate on exchange rates. Officials of economies concerned about the role of hedge funds in speculative attacks should consider improving the assessment of accumulations of undesired speculative positions through surveillance of the private data sources that are available and are discussed next.

Data From Hedge-Fund Information Services

Interest in the returns to hedge funds following different investment strategies and by hedge-fund service providers in developments in the hedge-fund business have lead to a robust industry in collecting and disseminating information on hedge fund returns, assets under management, and strategies. Hedge fund managers themselves are also interested in what other managers are doing: hedge funds are among the most active subscribers to hedge fund information providers. Most of this data is proprietary, with subscription fees for access to data reports and the ability to screen or analyze data at varying levels are high. For example, annual access fees for Morningstar Direct, an information provider for all-types of managed assets using a variety of proprietary

databases are between $7 to $15 thousand per year, depending on the kinds of data included in the subscription. A variety of services allow limited search capabilities and the ability to extract data from different hedge-fund databases for around $1 thousand per year.

There are several competing hedge-fund database services. For example, many academic studies have used the Lipper-Tremont TASS database (see Malkiel and Saha (2005) for an example) that contains 3,900 hedge funds and over 300 commodity trading advisor programs as of July 2006. Hedge Fund Research (HFR) with over 5,000 funds and Center for International Securities and Derivatives Markets (CISDM) with over 3,000 funds at the end of 2004 are competing databases (see Fung and Hsieh (2006)). Data analysis and software services have also developed to enable users to search and analyze these data. Other databases are also maintained by Morgan Stanley Capital International and Eureka Hedge of Singapore. Many other firms and publications involved in hedge fund management or services develop data bases or provide research on hedge fund activity and strategies.

Proprietary databases on hedge fund activity rely on voluntary disclosures of data to collection and dissemination services, since most hedge funds are not subject to mandatory regulatory filings. Most of the attention on hedge-fund databases is focused on comparing performance of alternative funds and strategies. Poorly performing funds often stop providing data on their operations, meaning that performance statistics based on the usual hedge-fund databases are biased towards higher performance than actual averages.

Some databases contain combined data for large hedge fund advisors' 13-F quarterly filings (as discussed above) enabling and analysis of portfolio composition and trading activity data for the aggregate funds managed by advisors with large sums of money under management (see for example Brunnermeister and Nagel (2002)). Morningstar offers clients the ability to merge data from the 13-F filings for asset managers with hedge fund performance and strategies, allowing estimates of net quarterly trading in reported positions. Large hedge fund managers meeting the 13-F reporting standard accounted for only 71 investment advisors in 1998 in the Brunnermeister and Nagel study. For comparison, only 4 of the 49 hedge funds located in Singapore had assets under management of that magnitude. Morningstar's new database linking hedge-fund advisors with return data has 600 advisors accounting for around $600 billion assets under management, although not all of these assets are hedge funds since 13-F filings include pension fund and mutual fund assets managed by hedge-fund advisors as well. Thus detailed portfolio strategies for hedge funds on a quarterly basis would provide incomplete coverage in terms of the number of funds included in the sample[**].

It is very possible that a dedicated staff of financial market experts could track hedge fund trading and strategies with some accuracy as part of an effort to identify threats to international capital market functioning. Such a staff would require expertise in analyzing data, access to proprietary data bases and public filings from a number of sources, and appropriate analytical resources. Putting together a reasonable assessment of recent trends using quarterly data (and higher frequency data on some derivatives as discussed in the next section) seems possible some private sector analysts do that now. Staff members with institutional investing experience with and contacts in the hedge-fund

industry, its service providers including especially prime brokers, data dissemination firms, trade publications, and so forth, as well as access to regulators, banks and brokers, and exchanges, could develop a pretty good sense of current or even fast-breaking changes in hedge fund trading strategies. This is in fact what the FSA is proposing and the CPRMG II has suggested. However, such a surveillance unit would not be cheap to staff and maintain.

The opinions of many experts like Federal Reserve Chairman Bernanke (2006) as well as his predecessor Alan Greenspan or academic experts like Barry Eichengreen *et al* (1998) are that hedge funds do not pose a serious problem for international financial markets. If hedge funds, despite these experts' opinions, are felt to be a threat to global financial market stability, a recommendation could be made to form a hedge fund surveillance effort. Such an effort could be housed in a multinational institution like the Asian Development Bank or in another regional institution, possibly with funding and cooperation in operations with other member central banks. Of course, there could be several efforts in different APEC economies. The real question is to weigh the costs of such an effort against the threat poised by hedge funds. We summarize these tradeoffs in the recommendation to consider the establishment of a hedge fund surveillance unit in the final section of this paper.

IV. Data on Derivative Markets Activities

Speculative activity in international financial markets can be implemented, often more cheaply and in more liquid markets, using derivatives. As described in Garber (1998), all speculative strategies using assets or liabilities can be replicated with derivatives, avoiding disclosures to authorities of "on-balance" items. However, for private firms, audited disclosures do contain information on "off-balance sheet" derivative positions. This section explores the availability of data concerning the use of derivatives for speculation and hedging. The goal is to identify the availability or lack of availability of data useful in identifying speculative attacks on asset values, specifically those of importance to international capital movements, primarily exchange rates.

Aggregate trading activity of OTC derivatives is reported on a semi-annual basis by the Bank for International Settlements (BIS). These data reflect OTC derivative trading in the G-10 countries plus Switzerland. The data are classified by forwards, swaps, and options and by foreign exchange, interest-rate and equity-linked contracts. The data are released with a three-month lag. While aggregate trading by type of contract may signal some aspects of derivate market developments, the data are obviously not of high enough resolution in terms of timeliness of reporting or specifics of contracts to assess speculative surges in particular currencies. The BIS supplements these data with more complete surveys every three years.

Data on derivative activity in the United States are available from four different sources: (1) corporate use of derivative contracts are reported in footnotes of audited statements filed with the SEC; (2) the Comptroller of the Currency (OCC), the regulator

of nationally chartered U.S. banks, publishes quarterly summaries of derivative activity by U.S. chartered commercial banks; (3) the CFTC requires registration of commodity pool operators and futures commission agents (commodity brokers) and publishes aggregate reports on their capital and assets; and finally, (4) commodity futures and options exchanges are required to provide daily commitments of traders (COT) reports trades and positions for contracts by traders classified as "commercial" (presumably used for hedging) and "non-commercial" (large traders including speculators), and "non-reportable" (small traders), a residual category. Each classification is discussed briefly below.

Some of the above listed data enable an examination of aggregate derivative activity by individual firms. Academic research, for example Covitz and Sharpe (2005), has used 10-K SEC filings for an examination of corporate hedging activity. The article cited examines different corporations' use of derivatives for hedging interest-rate risk. These data are annual. The OCC data on bank derivative positions are published quarterly and some individual bank data, for example large banks, are published allowing some assessment of the activity of individual banks measured by total notional amounts in different classes of derivatives. For example, J. P. Morgan Chase had $53 trillion notional amount of total derivatives, of which $280 billion is spot foreign exchange, on March 31, 2006 (OCC (2006), Table 1). Since the derivative data is aggregated into categories, actual positions, as for example a net exposure to a given currency, are impossible to infer. Finally, the CFTC provides individual commodity brokers capital and assets quarterly, but does not report details of derivative positions.

The COT reports do not report by individual firms but does provide weekly data on aggregate positions and trading activity by individual contract. These data can be used to track aggregate investor activity in individual contracts. For example, Wall (2006) presents an example of using COT reports to assess the direction of the market by analyzing commercial, large trader, and residual trades in a stock-equity index contract. While some efficient market economists might question the assumptions underlying the analysis (small traders are slow to react to changes in expectations), the level of detail and frequency of these data do enable close analysis of linkages between trading patterns and future market events as would be necessary in an EWS.

The COT data are limited to contracts traded on exchanges. As is well known, a substantial share of the growth of derivative markets has taken place in the over-the-counter (OTC) markets. In the case of the most innovative contracts, like swaps and credit derivatives, nearly all the trading by sophisticated investors is done in OTC markets, with commercial and investment banks playing a major role. OTC reporting, beyond that reflected in the SEC and OCC filings discussed above, does not exist on a frequent basis.

Prime brokers and major commercial and investment bank counterparties normally know the identities of individual traders with large exposures to derivative contracts. This information is proprietary and in many cases is subject to non-disclosure agreements with traders. Trade data are and not reported in official statistics, but hints and clues about major concentrations may be possible to obtain through detective work. As with hedge fund activities discussed in the previous section, sophisticated market observers with access to major traders, including hedge funds, can often develop a sense

of market sentiment using bits of data and tips from contacts. Obtaining information on critical market moves, like an attack on a specific currency, may be possible given skilled intelligence gathering. These moves are never going to be obvious since speculators and other traders will not want to dilute their ability to profit from market swings by signaling their intentions, so detecting them will require the full resources of experienced market observers. If speculative or other disruptive trading is of concern to policy makers and measurement of potentially adverse activity is desirable, as with hedge funds, intelligence or surveillance units could justify their costs. We include this observation in our recommendations in the next section.

V. Summary and Possible Recommendations to APEC Ministers

The previous three sections of this report describe data issues concerning official reporting of international capital flows and related economic statistics, the data available on hedge funds and their activity, and finally data available on traded derivatives. In line with that discussion and to further the goal of the ABAC Finance Working Group to promote growth and development of integrated international capital markets, actions by APEC economy officials to improve the supply of good information desirable for markets to function smoothly and efficiently are identified. The following suggestions for policy advocacy and recommendations are made:

A. Statistical offices and official agencies in APEC are urged to recognize that participants in active international capital markets require the best information possible if those markets are to perform effectively and grow. Rather than viewing demands for information disclosure as a bothersome chore, these offices and agencies should:

- Commit to a uniform code of conduct concerning the reliability and care taken in assuring the quality and unbiased nature of information releases, to be governed by fairness in the timing and nature of releases, and in general, to make it easy to obtain, interpret, and use data for market participants.
- Form units within their economies that take as their objective to play a role similar to investor relations units in private firms in anticipating and meeting data requirements and other information needed by current and future investors in the economy, explaining official policy, and strategy and being open to queries and discussion.

B. APEC officials should support the IMF actively in improving data disclosures and specifically should:

- Commit to the highest SDDS data quality standards and work with other APEC members to assure the maximum comparability of data on economic activity
- Urge APEC statistical bureaus and related agencies to commit to improving data disclosures under SDDS and other reporting efforts necessary to further develop the balance sheet approach, with particular attention to improving data on non-financial sectors of the economy.

C. APEC policymakers would contribute to the quality of economic policy debates and understanding of financial market participants of the principles guiding decision-making by timely publishing of the complete IMF surveillance staff reports and engage in an active discussion and providing official explanations of the points raised in the reports.

D. Concerns about hedge funds should be assessed carefully against the likelihood of problems to financial markets caused by their trading activities and, if these concerns are felt to be important, to develop hedge fund market surveillance teams to develop intelligence on hedge fund actions and their trading intentions. This effort could be conducted by individual economies, or housed and operated in an appropriate multilateral organization funded by several economies, or could be contracted to a private institution. In any case, if such an intelligence effort is judged to be worthwhile, sponsors must recognize the need for such an activity to have adequate funding, resources, and access to policymakers.

E. If derivative trading is also felt to be a problem, an intelligence unit solution similar that discussed in D. above should be considered, perhaps in conjunction with that effort.

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