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A framework for tracking changes in the intensity of investment funds' systemic risk[☆]

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ABSTRACT

This study applies to investment funds a novel framework which combines marginal probabilities of distress estimated from a structural credit risk model with the consistent information multivariate density optimization (CIMDO) methodology and the generalized dynamic factor model (GDFM). The framework models investment funds' distress dependence explicitly and captures the time-varying non-linearities and feedback effects typical of financial markets. It measures investment funds' systemic credit risk in three forms: (1) credit risk common to all funds within each of the seven categories the Eurosystem reports to the ECB; (2) credit risk in each category of investment fund conditional on distress on another category of investment fund and; (3) the buildup of investment funds' vulnerabilities over time which may unravel disorderly. In addition, the estimates of the common components of the investment funds' distress measures contain early warning features, and the identification of their drivers is useful for macroprudential policy. The ranking of drivers of those common components in terms of importance differs from the ranking of the drivers of the common components of marginal measures of distress. This framework contributes to the formulation of macroprudential policy.

> "*Before we can hope to manage the risks of financial crises effectively, we must be able to define and measure those risks explicitly.*"[1]
> [*Lo, 2008*]

1. Introduction and motivation

The world investment fund industry was managing about 22 trillion euro of assets at the end of 2012 (Table 1).[2] This includes only investment funds organized as the Undertakings for Collective Investment in Transferable Securities (UCITS), i.e., publicly offered

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[1] Testimony prepared for the U.S. House of Representatives Committee on Oversight and Government Reform, November 13, 2008.
[2] Sources of statistics on investment funds are: BCL, EFAMA (2013), Investment Company Institute (2013), and TheCityUK (2013).

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Table 1
Total assets of the world investment fund industry.
(billion euro, end-2012).

	UCITS[a]		Non-UCITS[b]	Overall
	Assets	Share	Assets	Assets
United States	10,863	49.0	1187	12050
Luxembourg	2002	9.0	381	2384
France	1116	5.0	389	1506
Ireland	968	4.4	260	1227
United Kingdom	759	3.4	211	970
Germany	248	1.1	1037	1285
Switzerland	235	1.1	62	297
Sweden	168	0.8	4	172
Italy	138	0.6	53	190
Denmark	79	0.4	86	164
Rest of Europe	582	2.6	165	747
Rest of the World	5011	22.6	n.a.	n.a.
TOTAL	22,170		3836	26006

Sources: BCL, European Fund and Asset Management Association, Investment Company Institute, and TheCityUK.
[a] Includes funds-of-funds assets.
[b] For the U.S., it only includes hedge funds' assets.

open-end investment funds regulated by the European Economic Community UCITS IV directive of 2009[3] in Europe and the Investment Company Act of 1940 in the U.S. European investment funds organized as non-UCITS were managing over 2.6 trillion euro at end-2012.[4] In the U.S., Hedge Funds only managed nearly 1.2 trillion euro at end-2012.[5] In the EU, therefore, total assets managed by all categories of investment funds at end-2012 represented over 3/4 of its GDP.

After the U.S., the Grand Duchy of Luxembourg is the second largest domicile of UCITS in the world and the third domicile of non-UCITS after Germany and France. Luxembourg-domiciled investment funds managed almost 2.4 trillion euro of assets at end-2012. Worldwide, Equity, Bond and Mixed Investment Funds were the main business lines (Fig. 1). In Luxembourg, Bond Investment Funds represented 38% of total assets, followed by Equity Investment Funds and Mixed Investment Funds, with shares of 27% and 22%, respectively (Fig. 2). The evolution of the total number of compartments of the industry during the 2000s followed the macroeconomic cycle (Fig. 3).

In Luxembourg, UCITS and non-UCITS are regulated by a set of national laws that have implemented the European Commission's UCITS IV Directive, the Sicar Law (Luxembourg, 2004), the Specialized Investment Funds Law (Luxembourg, 2007, 2010), and the 2013 Law that implemented the European Commission's Alternative Investment Fund Managers Directive (AIFMD). This regulatory framework is a complex set of rules regarding the type of investors who can access different types of investment funds, the eligible investments, investment restrictions, the asset valuation approach and its frequency, funds' permitted leverage and exposure (Table 2). Fig. 4 shows the evolution of leverage per type of investment fund.

Not only highly-leveraged hedge funds have been blamed for magnifying the crisis, as it was exemplified by Investment bank Bear Stearns which liquidated two Hedge Funds that had invested in risky securities backed by subprime mortgage loans, but also Money Market Funds have been at the center stage. For example, just one day after Lehman Brothers declared bankruptcy in September 2008, the Reserve Primary Fund's share price fell below the value of one US dollar because the fund's holdings of Lehman-issued commercial paper became worthless. Investors swamped the fund with redemption requests, causing the fund to be closed and eventually liquidated. Withdrawal from funds grew to 144.5 bn US dollar during one week, compared to 7.1 bn US dollar the prior week. According to analysts at the Boston Fed, at least 20 other funds would have “broken the buck” in the U.S. if not for direct support from fund sponsors during the financial crisis. The U.S. Treasury also stepped in, setting up a guarantee program for Money Market Funds’ investors to stem redemptions at other prime money funds and shore up the industry. In the euro area, at the height of the crisis, some investment funds approached the Eurosystem asking, without avail, for liquidity support. Sponsors stepped in.

The sheer size of the world investment fund industry had prompted a large volume of research preceding the crisis. With the obvious importance of the industry heightened by the crisis, the literature has grown. However, the investment fund literature has been relatively concerned with modeling and estimating distress in two categories of investment funds, i.e., Money Market Funds and Hedge Funds. Data used have often been publicly available returns and, with some exceptions, have tended to cover U.S. domiciled investment funds.

[3] The UCITS I directive dates back to December 1985 (European Economic Community, 1985).
[4] While non-UCITS are nationally regulated investment funds for which a classification in terms of market exposure is not possible, the European Commission's Directive on Alternative Investment Fund Managers (AIFMD) that entered into force in July 2011—Member States had time until July 2013 to transpose the Directive—creates a comprehensive regulatory an supervisory framework for non-UCITS with requirements regarding safekeeping of assets, leverage, liquidity management, management and pricing.
[5] The Dodd-Frank Wall Street Reform and Consumer Protection Act that entered into effect in July 2011 (United State Congress, 2010), requires private pools of capital exceeding $100 million to register with the Securities and Exchange Commission as investment advisers ($150 million if they work with private funds only). For pools of capital below the threshold, registration with the state of domicile of the advisers is compulsory. Since October 2011, advisers must also report information necessary for monitoring systemic financial risk.