CITY/PERC
Political Economy Research Centre

CITYPERC Working Paper Series

Sizing the European Shadow Banking System:
A New Methodology

Judith Tyson and Mimoza Shabani

CITY
UNIVERSITY OF LONDON
— EST 1894 —

Sizing the European Shadow Banking System: A New Methodology

Judith Tyson[*] & Mimoza Shabani[**]

Abstract

One of the critical unanswered questions relating to the shadow-banking system has been to quantify its scale in an industry where entities, by design, are opaque and often outside of regulated and publically shared frameworks.

However almost all shadow banking entities, including hedge funds, private equity funds and special purpose vehicles ("SPVs"), interact with the financial markets via regulated investment banks. For example, many SPVs are in fact originated as part of investment banking business and hedge funds typically transact in financial markets exclusively via the "prime brokerage" division of investment banks.

This interface with the regulated banking environment combines with the typical practise by investment banks of equalizing compensation (Including bonus) ratios to revenues globally which then allows identification of the implied difference in revenues and hence assets that represents the shadow banking system.

The paper will present for critique the results of this methodology to estimate the UK shadow banking system including European business managed from the UK. The estimate will imply a larger scale of shadow banking than previous estimates at £548 billion which, when combined with hedge fund assets of £360 billion (FSA, 2011) gives total shadow banking assets of over £900 billion. It is proposed that the large gap between the estimates of this paper and other estimates reflects the huge, and previously unknown, scale of offshore activities of UK investment banks.

[*] Judith Tyson is a researcher at SOAS, University of London, specialising in financial markets and is a former member of the senior management of JPMorgan Asia. Current research includes the European Commission's "Financialization, Economy, Society and Sustainable Development" Programme under Prof. Jan Toporowski and research projects with Prof. S. Griffith-Jones of the "Initiative for Policy Dialogue", Columbia University, NYC.

[**] Mimosa Shabani is a researcher at SOAS, University of London. Current research includes the European Commission's "Financialization, Economy, Society and Sustainable Development" Programme under Prof. Jan Toporowski.

Introduction

From 2000 onwards the shadow banking industry grew in size and importance globally. In particular there was huge growth in the number and size of hedge funds, private equity funds and special purpose vehicles ("SPVs"). This was particalty true for the UK which became a global centre for hedge fund and private equity fund activities. In addition the UK became the global centre at many investment banks for managing the risk and operations of SPVs, related to structured financial transactions (Toporowski et al, 2013). In the paper the UK has been selected as the case study due to its importance to off-balance sheet activity globally. Such vehicles became important client segments for investments banks who acted both as principles for investments assets in such vehicles and as prime brokers for them. The key drivers for this growth were the fact that such vehicles were unregulated and, for investment banks, off balance sheet, thus ensuring their activities were opaque. The risks of these activities became apparent during the financial crisis when the lack of transparency and the unknown scale of activities and assets created panic amongst financial markets participants who were unable to assess counterparty or market risks (Independent Commission on banking, 2011). Given such events there have been calls for greater regulations and transparency of the activities of shadow banking, but in reality minimal regulation has been enacted.

Further the scale of the activities remains opaque and this reduces the influence of calls for regulation. Current estimates rely on trade bodies or regulators but both are highly likely to be substantially incomplete and understate the scale of shadow banking. For example, by definition, regulators lack access to accurate data on unregulated activities and trade bodies disclosures are typically voluntary and unaudited. In addition, and critical to this paper, all exclude any estimate of the level of assets in SPVs originated by, but off balance sheets of, investment banks.

This paper seeks to estimate the scale of this underestimation using a new methodology and using the UK as an example. The method uses the fact that bonus figures are globally consistent ratios of revenues and are publically disclosed in UK subsidiary financial statements on a basis that reflects true economic activity in the location. This contrasts with disclosed revenues and assets in such financial statements which are substantially distorted by accounting, tax and regulatory arbitrage. The bonus figure can then used to imply revenues and then assets using bonus: revenue and revenue: asset ratios from group financial statements. Comparison of the reported on-balance sheet assets and the implied assets estimates the off-balance sheet assets of investment banks.

Detail of the Method

Investment banks disclose financial information through both consolidated group financial statements and in subsidiary financial statements, as required by regulatory or legal requirements. Such financial statements follow standard accounting principles and are typically audited. However in such statements there can be significant differences between the accounting statements and economic reality of investment banks activities. For example, and by design, they exclude off balance sheet assets, including those held or transferred to SPVs, assets transferred to regulatory arbitrage purposes and revenue transfers designed to reduce taxation.

These problems of financial statements failing to reflect economic reality is particular acute for subsidiaries as there is no correction, through group consolidation accounting, of inter-subsidiary transfers. In addition, for high tax jurisdictions, such as the UK, revenue transfers offshore are particularly prevalent[1]. This means that a subsidiary's financial statements are likely to be misleading, especially for revenues and assets, in representing true economic activities.

However, compensation figures for subsidiaries are not typically managed in this way as they are required to be accounted for in the subsidiary of the employees tax residency. Compensation is composed of both salary and bonuses. Bonuses are usually calculated based on percentages of revenues which are consistent across years and locations and use economically correct revenues which are known from internal management accounts. This reflects the common practise within investment banks of paying bonuses based on individuals performance, as measured by such internal management accounts, and the practise of equalising bonus allocations for all global locations. This means that compensation, unlike asset and revenues, as disclosed in publically disclosed subsidiary accounts is more fairly matched to the jurisdiction and reflects its true economic activity.

This method identified the bonus from UK subsidiary accounts. Subsidiaries were identified from the FSA register and from Company House registrations. Accounts are filed under limited company legislation at the UK Company House and are publically available. In some instances employment is managed through a number of subsidiaries including specialist "service" subsidiaries which are designed to manage employees and limit liability of investment banks in relation to employment rights. All such subsidiaries have been identified where possible. Then asset, revenues and bonuses from global accounts are used to calculate ratios and these are applied to the bonus figure for the UK alone to imply total UK assets. The implied assets is then compared to the disclosed on-balance sheet assets to give the off-balance sheet assets.

These figures are then summed across all the selected sample of banks to give an estimate of the UK banking off-balance sheet assets held in SPVs. For a given year this method gives the "flow" for the year represented by new trades due to the accounting for profits on a mark-to-market or mark-to-model basis. Using an estimated 5 year average deal maturity, stock of off balance sheet assets can then be calculated.

An Example: Goldman Sachs
Goldman Sachs is an important participant in UK financial markets and a global leader in structured products. The UK is also important to Goldman Sachs with a significant portion of global revenues being generated by the UK office and the European business managed from their London office. Goldman Sachs also follow the common business practise of equalising bonus ratios regionally, as assumed in the methodology. The annual report comments that, "The cost drivers of the firm taken as a whole —compensation, headcount

---

[1] The scale of the activity, in relation to tax, was revealed when new disclosure requirements were introduced by the Inland Revenue requiring disclosure of legal tax avoidance schemes of this type and, between 2004 and 2011, more than 2,000 different schemes and instruments were disclosed. In a particularly flagrant example, Barclays manipulated the buy-back of its own bonds and tax credits on interest to avoid over £500 million in UK corporate tax until this scheme was retrospectively stopped by the UK Inland revenue in 2012 (Toporowski et al, 2013).

and levels of business activity —are broadly similar in each of the firm's business segments."[2].

To illustrate the methodology, the figure 1 sets out the calculation for Goldman Sachs.

Figure 1: Example calculation for Goldman Sachs, 2010 & 2011.

GOLDMAN SACHS	2010	2011	Average
Global Consolidated Group Financial Statements			
USD millions			
Gross Assets	911,332	923,225	917,279
Total Revenues	39,161	28,811	33,986
Compensation & benefits	15,376	12,223	13,800
Compensation: Revenue ratio	39.3%	42.4%	40.8%
Revenues: Assets ratio	4.3%	3.1%	3.7%
Goldman Sachs International Bank (UK FSA Regulated Subsidiary)			
STG millions			
Revenues	7,373	5,131	6,252
Gross Assets	750,727	942,126	846,427
Compensation & benefits	3,969	2,821	3,395
Compensation: Revenue ratio	53.8%	55.0%	54.4%
Estimate of undocumentated assets			
STG millions			
Compensation difference %	14.6%	12.6%	13.6%
Implied UK revenues	1,074	644	859
Implied UK off balance sheet assets (Flow)	24,996	20,642	22,819
Implied UK off balance sheet assets (Stock)			**114,095**
% of UK On-balance sheet assets			**13%**

Source: Goldman Sachs and Goldman Sachs International Bank Financial Statements for 2010 and 2011, http://www.goldmansachs.com/investor-relations/financials/

As illustrated, global compensation: revenue ratios for 2010 and 2011 average 40.8% globally but for the UK average 54.4%. Global revenue: asset ratio is 3.7%. When applying these global ratios to the UK compensation this implies additional economic revenues of £0.8 billion and additional assets of £22 billion annually. Assuming an average maturity for a structured product of 5 years, off-balance sheet assets are calculated as £114 billion or 13% of on-balance sheet assets.

Results for the UK

---

[2] Extract from Goldman Sachs 2011 Annual report, page 180

This methodology was then repeated for the sample selected. The sample was the banks with a top 10 UK or EMEA market shares in structured financing[3]. They are Barclays, Morgan Stanley, Goldman Sachs, Citibank, Deutsche Bank, Credit Suisse and JP Morgan[4]. Subsidiaries are detailed in the appendix for each bank. In some instances the UK subsidiaries used also operate all European businesses. Results are shown in figure 2 below.

Figure 2: Estimated Off-balance Sheet Assets of Selected UK Based Investment Banking Subsidiaries.

STG millions	Off Balance Sheet UK/EMEA Assets				
	2010	2011	Average (Flow)	Average (Stock)	% of On BS UK Assets
Barclays	19,154	48,835	33,994	169,972	15%
Morgan Stanley	12,898	8,855	10,876	54,382	38%
Goldman Sachs	24,996	20,642	22,819	114,095	13%
Citibank	1,770	96	933	4,666	26%
Deutsche Bank	20,915	4,350	12,633	63,165	10%
Credit Suisse	14,971	20,378	17,674	88,372	51%
JP Morgan	15,719	5,114	10,417	52,083	27%
	110,424	**108,270**	**109,347**	**546,735**	**26%**

Source: Annual financial statements of global groups and UK/EMEA subsidiaries, 2010 & 2011. (See appendix for details).

As can be seen the result give an annual asset flow for 2010 and 2011 using the methodology outlines. Applying an estimated five-year average maturity, level of off-balance sheet assets in the UK financial system in £546 billion, or 26% of on-balance sheet assets.

Also notable is the range of estimates between individual investment banks from 10% to 51% and from a maximum of £169 billion to a minimum of £4.6 billion. Such differences may reflect differences in business activities. For example, Barclays are highly active in tax arbitrage and structured products whereas Citibank are more concentrated in vanilla, non-structured transactions. However it may also be due to issues in the data and this is discussed further below.

---

[3] As disclosed in industry league tables
[4] UBS also has a large market share but does not make required disclosures.

Critique of the Methodology

There are a number of important considerations to be made in assessing the accuracy of this method.

Firstly, there are important assumptions, including a stable, globally consistent bonus to revenue and revenue to asset ratio, and the firmness of these assumptions vary. The bonus: revenue ratios is reasonably established as this is standard practise in investment banking, as indicated by both explicit disclosures (Such as Goldman Sachs), stable actual ratios and known internal practises. However revenue: asset ratios can vary considerable over time.

Secondly, such the data used in this paper requires further refinement. For example, UK and EMEA financial statements are not fully isolated in some instances and it would require further clarification to ensure inclusion of all major subsidiaries. In addition financial data require normalisation across years. For example, 2011 data has been impacted by large provisions relating to Euro zone credit exposures or 2010 by UK bank levy's and ideally these would be excluded to give normalised revenue and compensation trends. Such lack of normalization, in particular, impacts the granular results for different investment banks and years materially.

Nevertheless, as an estimate of the industry level of off-balance sheet assets, it is considered that the method produces a broadly correct result, although it would benefit from further development.

Conclusion

The results estimate UK-based off-balance sheet assets of £546 billion or 26% of on-balance sheet assets. The method requires further development and refinement but nevertheless represents an reasonable estimate of a previously unknown and yet very important figure.

When combined with FSA estimates of UK hedge fund assets of £360 billion, this given an estimated assets of the UK shadow banking system of over £900 billion. Such a huge asset base of unregulated and opaque assets underpins calls for greater regulation and disclosure.

Bibliography

Buckle, M & Thompson, J. 2004. The UK Financial System: Theory and Practise. Manchester: Manchester University Press.

Davies, R. Et al., 2010. Evolution of the UK Banking Sector, s.l.: http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/qb100407.pdf.

Financial Services Authority, 2006. Private Equity: A Discussion of Risk and Regulatory Engagement, s.l.: http://www.fsa.gov.uk/pubs/discussion/dp06_06.pdf. London: Financial Services Authority.

Financial Services Authority, 2009. The Turner Review: A regulatory response to the Global Banking Crisis, London: Financial Services Authority.

Financial Services Authority, 2011. Assessing the possible sources of systemic risk from hedge funds, London: Financial Services Authority.

Financial Stability Board, 2011. Shadow Banking: Strengthening Oversight and Regulation, s.l.: http://www.financialstabilityboard.org/publications/r_111027a.pdf.

HM Treasury, 2011. A New Approach to Financial Regulation: A Blueprint for Reform, s.l.: http://www.hm-treasury.gov.uk/d/consult_finreg__new_approach_blueprint.pdf.

Independent Commission on Banking, 2011. Final Report: Recommendations, s.l.: http://bankingcommission.s3.amazonaws.com/wp-content/uploads/2010/07/ICB-Final-Report.pdf.

Toporowski, J., 2005. Theories of Financial Disturbance. Cheltenham: Edward Elgar.

Toporowski, J., 2010. Why the World Economy Needs a Financial Crash and Other Critical Essays on Finance and Financial Economics. London: Anthem Press.

Toporowski, J. Shabani, M & Tyson, J., 2013, UK Country Study, European Commission Framework Programme Seven Research Project "Financialisation, Economy, Society and Sustainable Development". Unpublished.

Appendix

Sample of UK investment banks used

Head office		Sample (See note)	UK Legal Entities (Selected from FSA Register & Annual reports)
UK	1	Barclays	Barclays Bank plc
	2	HSBC	HSBC Bank plc
	n/a	Royal Bank of Scotland Group	Mergered with Natwest (Not material in SB)
	n/a	Lloyds	Not material in SB
Non -UK	3	Morgan Stanley	Morgan Stanley Bank International Ltd
			Morgan Stanley Securities Ltd
	4	Goldman Sachs	Goldman Sachs International
			Goldman Sachs International Bank
	5	Citibank	Citibank International Plc
	6	Deutsche Bank	DBOI Global Services
			DB Group Services
	7	Credit Suisse	Credit Suisse AG
			Credit Suisse UK Ltd
	8	UBS	UBS AG
	9	JP Morgan	J.P. Morgan Securities Ltd