University of Strathclyde

Department of Accounting and Finance

UK Closed-end Country Funds: Illiquidity, Sentiment and Segmentation

Mary H. Fletcher

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Abstract

In this thesis we investigate the relation between UK closed-end country fund pricing and measures of illiquidity, sentiment and segmentation. First, we examine whether the UK closed-end country fund premium is related to the illiquidity of the UK fund or the illiquidity of the country in which the fund invests. We also consider whether emerging market country funds behave differently in terms of their premium and illiquidity to developed market country funds, and in particular whether they offer more stability during the period of the recent financial crisis. Overall, we find country illiquidity plays a significant role in the premium of emerging market funds. However, in developed market funds country illiquidity is not significant. Fund illiquidity, in contrast, is significant for developed market funds but not for emerging market funds.

Second, we analyse the effect of sentiment on the pricing of UK closed-end country funds between 1992 and 2009. We find that country consumer sentiment is significantly negatively related to the share price and NAV (net asset value) return over different time horizons. We also find that UK consumer sentiment is significantly negatively related to the closed-end fund premium. The results suggest that both institutional investors and so called 'discount traders' influence country fund pricing.

Third, we examine the effect of time-varying direct investment barriers on the pricing of UK closed-end country funds in emerging markets. We focus on the post-liberalisation period (1993-2009) and analyse the relation between time varying measures of direct and indirect market segmentation. We find that the direct measures of capital market segmentation are significantly negatively related to both the share price return and the return on the NAV of UK closed-end country funds in emerging markets. We also find, however, that direct investment barriers have an insignificant effect on the premium.

Declaration

This thesis is the result of the author's original research. It has been composed by the author and has not been previously submitted for examination which has led to the award of a degree.

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1. Introduction

Closed-end country funds have provided a forum for constant debate between rational interpretations and those based on sentiment. The broad aim of this thesis is to draw from both sides of the debate and to examine three explanations for the pricing of closed-end country funds based on liquidity, sentiment and market segmentation.

Closed-end funds (known as investment trusts in the UK)[1] were one of the first specialist financial intermediaries set up in the UK over a hundred years ago with the aim of giving the small investor access to a managed diversified portfolio. Closed-end funds are like unit trusts, insurance and pension funds in that they pool investor cash and invest it, usually on a stock market in the UK or abroad. They are unlike unit trusts, insurance and pension funds in that they are public limited companies and are listed on one of the UK stock exchanges. They provide the investor with shares and the rights of a shareholder to participate in the governance of the company.

[1] In this thesis we usually use the widely used US term 'closed-end fund' instead of 'investment trust' unless the context requires 'investment trust'. UK investment trusts and US closed-end funds have many similarities both in structure and regulation. For example, in both the UK and the US, shareholders of closed-end funds must pay income taxes on the dividends and capital gains distributed to them. However, there are also differences between the two industries. In the UK investment trusts may retain up to 15% of their income from securities but cannot distribute the surplus from selling assets as a dividend. US closed-end funds in contrast must distribute substantially all of their income and capital gains to shareholders annually. Another difference is that there are very few bond funds in the UK whereas in the US most of the closed-end funds are domestic and international bond funds. (AIC, Directors' Handbook, 2010a) (Investment Company Institute, 2010).

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A particular feature of closed-end funds that distinguishes them from unit trusts is in the pricing structure. Unit trusts have a fairly simple pricing structure, as the price of units directly reflects the value of the unit trust's portfolio of assets. The price structure of closed-end funds, however, is more complex. The net asset value (NAV)[2] may differ from the share price at which the share trades on the stock market. As the share price is usually below the net asset value, this creates the characteristic closed-end fund discount or negative premium.[3] There has been much debate as to the causes and behavior of the premium, as it appears to violate the law of one price in which assets of the same value should trade for the same price. While a negative premium makes closed-end funds cheaper to buy as compared with buying the underlying assets, it can make them difficult to sell, and if it deepens, can put closed-end funds under the threat of a takeover or liquidation.

One advantage of closed-end funds over unit trusts however, at least for the fund manager, is that closed-end funds do not have to redeem or buy back shares when the investor wishes to sell them. Closed-end funds have a fixed number of shares, whereas the number of units in unit trusts expands or contracts according to investor demand. This gives closed-end fund managers greater freedom to take a long term view. They can tie up capital in less liquid assets without the disadvantage

[2] The Net Asset Value is the total value of the fund's assets. i.e. the value of the shares invested in by the fund, minus all of the fund's liabilities. See Section 1.1 for more detail on how the NAV is calculated.

[3] The premium is the difference between the fund share price and the NAV, divided by the NAV. This is usually expressed as a percentage. Following the practice of Bodurtha, Kim and Lee (1995) and Chan, Jain and Xia (2008), we use the term premium to refer to both the case where the share price is above the NAV and where it is lower than the NAV (a negative premium or discount). Where required by the context, for example when discussing the work of other authors, we also use the term discount.

of having to sell the underlying assets whenever investors wish to sell the UK shares, as is the case with unit trusts. This is important for some investors who are seeking a way to access the possible future growth offered by more illiquid emerging markets while avoiding the risks of direct investment.

In this thesis we focus on closed-end country funds. The AIC defines these as funds that invest over 80% of their assets in a single country. In the first empirical chapter we investigate whether the illiquidity of both the fund and the foreign market contribute to the premium of UK country funds, or whether the premium is chiefly influenced by factors suggested in other research. We also consider the behaviour of the country fund premium during the recent economic crisis, and in particular how emerging market funds survived the crisis as compared with developed market funds.

An alternative to the liquidity approach is the argument is that the premium is driven by the changes in investor sentiment. Following the recent economic crisis, the irrational side of the stock market has been emphasized, and in the second empirical chapter we consider whether changes in investor sentiment influence the pricing of UK country funds, as some have asserted. This also opens up the issue of institutional ownership and sentiment as most of the shares in UK closed-end funds are currently held by institutions, in contrast to the predominantly retail ownership of US closed-end funds.

Over the past two decades closed-end funds have expanded into emerging markets as these markets have become more open to foreign investment. In the third empirical chapter we examine the segmentation issue in relation to the UK premium

to see whether direct and indirect investment barriers affect closed-end country fund pricing.

This chapter is structured as follows. In Section 1 we outline our research objectives, summarize the main findings of the study and discuss the main contributions of the work. Section 2 provides a brief overview and history of the UK closed-end fund industry with a discussion of UK closed-end country funds.

The remainder of this thesis is organized as follows. Chapter 2 reviews the research into closed-end funds in the areas of sentiment, liquidity and segmentation, with a particular emphasis on country funds. Chapter 3 describes the data used in the study. Chapter 4 examines the role of country and fund liquidity play in the country fund premium. Chapter 5 focuses on the issues of sentiment in relation to country funds. Chapter 6 examines the impact of segmentation. Chapter 7 concludes and provides points for further research.

1.1 Research Objectives, Findings and Contribution

1.1.1 Research Objectives

The first empirical chapter studies the effect of changes in liquidity in the closed-end fund and the foreign country on the premium.

We divide the sample of closed-end funds into those of established and emerging markets. We adapt the Amihud (2002) illiquidity measure to estimate the illiquidity of both the closed-end fund and the market in which the trust invests. We also add in as control variables those factors, such as a proxy for investor sentiment,

which have been found to be influential in previous studies of the premium. Finally we look at liquidity and the premium over the recent economic crisis.

As we found that investor sentiment was a significant control variable in our study of illiquidity, in the second empirical chapter we consider the concept of investor sentiment more closely and examine whether UK and foreign country consumer sentiment influence pricing of UK closed-end country funds. We analyse the predictive ability of consumer sentiment indices in relation to the UK closed-end country fund share return and NAV return and premium. We also investigate the roles of institutional and individual investors in relation to the pricing of UK closed-end country funds. As there are two main groups of funds in the study, we include a separate examination of US and Japanese funds.

In our earlier study of illiquidity, we had found that market segmentation was a significant control variable affecting the premium of closed-end country funds, but that it was negatively related to the premium, rather than positively, as the previous literature would lead us to expect. The third empirical chapter therefore examines the impact of market segmentation on the pricing of closed-end country funds in emerging markets. We use the Edison Warnock (2003) time varying measure of availability of investment as a measure of a direct investment barrier. We also examine the role of indirect investment barriers such as illiquidity, inflation variability and economic freedom. In addition we use a rolling covariance measure as another measure of integration.

1.1.2 Research Findings

The main finding of the research described in Chapter 4 is that both country and fund illiquidity plays highly significant roles in the premium of UK country funds. When

we analyse the sample into emerging and developed market fund groups we find clear differences. In the sample of emerging market funds we find that country illiquidity is significantly positively related to the premium, even in the presence of control variables. Fund illiquidity is not a significant factor. Developed market country funds provide a completely different picture, however. In developed market funds we find that country illiquidity is not a significant factor, but fund illiquidity is a significantly negative factor. We examine the closed-end country fund premium in both groups of funds before and during the 2008 financial crisis. We find that the emerging market fund premium shows more stability whereas the premium of developed market funds falls steeply. During the crisis period itself all developed markets but one become significantly more illiquid, but only one of the emerging markets increases in illiquidity. We find a change in the role of country illiquidity in the fund premium during the crisis: during this period country illiquidity becomes negatively related to the premium of emerging market funds and significantly negatively related to the premium of developed market funds. We also investigate the relation between investor sentiment and fund illiquidity and find a significant negative relation, suggesting the UK investors respond negatively to fund illiquidity.

Having found that investor sentiment was a significant control variable in our study of illiquidity in Chapter 4, we advance the study of closed-end fund country fund pricing in Chapter 5 by examining the impact of sentiment in more detail. The main finding of the analysis is that foreign country consumer sentiment index levels are a significant negative predictor of the share price and NAV return of funds over horizons up to one year. UK consumer sentiment index levels, however, are not significantly related to the share price return. Our findings contrast with research on

US closed-end country funds by Bodurtha, Kim and Lee (1995) and Chang, Eun and Kolodny (1995) who find that the share price return of US country funds is more influenced by home (US) market sentiment than foreign market sentiment. They argue that US closed-end fund investors, who are predominantly retail investors in the US, are influenced more by sentiment in the home market. In the UK, however, UK closed-end fund investors are mostly institutional investors. Our findings therefore suggest that country consumer sentiment levels influence UK institutional investors, who form the largest investor group, more than UK consumer sentiment levels. Another implication of our findings is that UK closed-end funds are a good vehicle for diversification as their share prices reflect foreign market sentiment more than UK market sentiment. This result is consistent with that of Bekaert and Urias (1996), who find UK closed-end country funds are a better means of diversification than US country funds. We find clear differences between countries in relation to the predictive ability of the consumer sentiment indices.

Having found in our study of illiquidity in relation to closed-end funds (Chapter 4) that market segmentation was a significant factor in the pricing of closed-end funds, in Chapter 6 we look more closely at restrictions in the availability of investment over time in emerging markets. We find that even after the official liberalization of many emerging market countries in the late 1980s and early 1990s, when capital controls were relaxed, lack of investment availability continues to impact the pricing of closed-end country funds investing in these markets. Based on our analysis of UK data from the post-liberalization periods relating to a range of emerging markets from 1993 to 2009, we find that when investment availability decreased, this has been accompanied by a significant decrease in the share price

return of UK closed-end country funds. In addition to direct measures of restrictions on investment availability we examine the impact of indirect measures of market segmentation such as inflation variability, market illiquidity and lack of economic freedom.

We also examine the premium of UK closed-end emerging market funds. We find, contrasting to the results for the share price return, that the UK closed-end emerging market fund premium is not significantly related to measures of investment availability restriction or integration. In addition, it is not consistently significantly related to any indirect investment barriers. Instead we find that the UK closed-end country fund premium is much more influenced by UK factors such as the average premium of UK domestic closed-end funds, which was our previous proxy for investor sentiment in Chapter 4.

1.1.3 Research Contribution

Our findings contribute to several strands of financial research. In Chapter 4 our research adds to our understanding of the key role played by illiquidity in the pricing of UK closed-end country funds. In particular, it shows the different impacts that fund and country illiquidity have on the premium. In addition, the study contributes to the literature examining the effect of the impact of monetary shocks in one country on the financial variables in other countries. However, whereas other papers consider the impact of the home market of economic crises in the overseas investment market, we consider what happens to the premium and to fund illiquidity when a crisis affects the home market, and how these effects can differ in severity, depending on whether the fund invests in an emerging or developed market.

Chapter 4 also contributes to emerging market research in that it compares the illiquidity of a range of emerging markets at different time periods and considers the impact of changes in local market liquidity on the pricing of emerging market funds. We would go further than Bekaert, Harvey and Llundblad (2007) who find that 'local market liquidity is an important driver of expected returns in emerging markets' and argue that it is also an important driver of expected emerging market fund returns in developed markets. The research in Chapter 4 extends liquidity research in relation to closed-end funds in that we apply the Amihud (2002) measure of illiquidity to a UK context and to a wider range of funds over a longer period. The research adds to the emerging market literature in that we compare the behaviour of the developed and emerging market funds over a long time horizon which includes non-crisis periods as well as crisis periods. It contributes to our understanding of robustness of the closed-end fund structure when investing in less liquid markets as well as during crisis periods. Our analysis also challenges the traditional rational/irrational dichotomy as we consider the role of a range of factors: those associated with rationality as well as those associated with sentiment, and we find investor sentiment to be a significant factor influencing the pricing of closed-end country funds.

Extending the study of sentiment in Chapter 5, we contribute to two areas of research - investor sentiment and the closed-end fund premium, and investor sentiment and stock return prediction. Whereas other studies use the average domestic fund premium as a sentiment index, we use consumer sentiment indices in 13 countries between 1993 and 2009 as a measure of investor sentiment in both the home and foreign country and we compare the different impacts of sentiment in the

home and the country market and how these specifically affect the return on the share price and the premium of UK closed-end country funds. We know of only one study in this area based on one US fund investing in Australia. Furthermore, we analyse the predictive effects of consumer sentiment measures over different time horizons. We also add to the literature that examines the predictive effect of sentiment in aggregate markets by using closed-end funds instead of aggregate market returns, and also by including emerging market sentiment indices in our sample, whereas other studies use sentiment measures for developed markets. We also extend the concept of calibrating consumer confidence indices as in Baker, Wurgler and Yuan (2012) by using closed-end funds instead of twin companies and we offer insights into the different impacts of sentiment on the pricing of US and Japanese funds in particular, the two largest groups in the sample.

As our measure of restriction on investment availability was significant in our study of illiquidity in Chapter 4, in Chapter 6 we examine the impact of direct and indirect investment barriers on the pricing of closed-end funds in emerging markets. In contrast to most of the previous research, we examine them in a post-liberalization time frame which has been long enough to capture two major financial crises, the 1997 East Asian crisis and the 2008 financial crisis. We use UK emerging market single country closed-end funds which have not been specifically examined in the literature, apart from the paper by Bekaert and Urias (1996), and which have a completely different share ownership to US closed-end funds. We extend the work of Nishiotis (2004) by examining a new sample in a more recent time frame, by using a different time-varying measure of segmentation, and by analyzing the share price and NAV return as well as the premium.

General contribution

There are relatively few studies of UK closed-end funds as compared to the number of studies of US closed-end funds which is surprising, given their relatively larger role in the UK economy. As far as we are aware, there are no published studies of single UK closed-end country funds. In an unpublished paper Levis and Thomas (1999) find evidence to support the role of investor sentiment in the pricing and IPO timing of US and UK country funds. Bekaert and Urias (1996) investigate UK and US country funds but their focus is on the diversification benefit of emerging market funds and not single country funds per se.

A further contribution of this study is the unique data set on which it is based. This dataset was collected from many different sources, and some of the sources used in this thesis, such as historical expense ratios, are no longer publicly available. To the best of our knowledge of previous research our sample is the largest published sample of single country funds over the longest period. The sample size compares with the following studies of US country funds as follows:

Bonser-Neal et al. (1990)	14 country funds (1981-1989)
Bodurtha et al. (1995)	35 country funds (1986-1990)
Chan et al. (2008)	47 country funds (1987-2001)
Chandar & Patro (2000)	25 funds from countries experiencing crises (1988-1997)
Hardouvelis et al. (1994)	35 country funds (1985-1993)

The extensive literature review provides a further contribution in that there have been no substantial reviews of the closed-end fund literature since the survey of Dimson & Minio-Kozerski in 1999. We see the literature review as providing a complement to that of Cherkes (2012) who provides a recent update on the literature with a decided emphasis on rational, agency explanations of the discount. Our aim has been to set the review of literature within the ongoing rational/sentiment debate within finance.

Study Implications

Our study of illiquidity in Chapter 4 implies that investors in closed-end funds need to be aware that many of the funds, particularly smaller funds, can suffer from a lack of liquidity. This may mean that there will be larger spreads on the shares which may decrease any profit in selling the share. Fund illiquidity can also signal that the fund is struggling and this can result in a lower share price and lower premium. Markets may also have illiquidity issues and the implication of this for investors is that times of market illiquidity can accompany economic problems and that this is a feature, particularly of emerging markets. Lack of market liquidity can mean that the fund cannot easily change its portfolio and that it may be restricted to a small, more liquid sector of the foreign market.

The findings of Chapter 4 will also have implications for the growing number of fund managers investing in frontier markets, such as those in Africa, as illiquidity is likely to characterise these markets. Fund managers need to be aware of this. For example, Farrow comments that the third quarter of 2011 was very bad for the Chinese Special Situations fund, managed by Anthony Bolton: “Liquidity in the

Hong Kong market dried up and his portfolio, which was positioned for a bull market, had nowhere to run to. Several of Bolton's holdings plunged 10% overnight." (Farrow, 2012). To address fund liquidity problems, fund managers need to attract investment not only from large institutional investors but also from retail investors who can provide liquidity.

The finding that there is a negative relation between foreign market sentiment and the fund and NAV return has implications for investors. If they invest for periods up to a year when foreign market sentiment is high, they will find that future returns are likely to be lower. However, if they invest at a time of low foreign market sentiment, future returns are likely to be higher. In terms of market sentiment, country funds are best suited to longer term investors. If investors are hoping to profit from investing in funds with low premiums in the hope of profiting from a price rise, our research suggests that the premium is more affected by UK market sentiment.

Closed-end fund managers can profit from positive sentiment in relation to certain overseas markets, as evidenced by the number of emerging market funds launched in the mid 1990s. Fund managers are not necessarily immune to the sentiment themselves, however, and this may encourage a higher degree of leverage than is wise when market sentiment can change.

In Chapter 6 we found that market segmentation continues to impact asset pricing and that market liberalisation is not a once-for-all phenomenon, but that markets can become more restricted for various reasons. This may be beneficial as the investor can obtain diversification benefits from the difference in market

movement between the markets. However, increases in segmentation are often an indication of internal economic and political problems which can adversely affect the NAV and the share price. Investors should also be aware that reductions in investment availability reduce the area in which the fund can invest and therefore reduce the fund's investment opportunities.

Fund managers may find that investment barriers are an increasing issue as countries seek to protect their growth opportunities. There may be many indirect forms of barrier to effective investing, such as lack of local knowledge, knowledge of the language and cultural issues, as well as information barriers. On the other hand, many of the barriers may be direct, such as the need to obtain a licence to invest in the domestic Chinese A-shares market.

General Implications

From the perspective of managers, the size of the recent launch of the Special Situations Fund (£460m) shows what a huge impact the combination of positive market sentiment, a marketing campaign, fees paid to financial advisors and a well-established fund manager can have. The take-up from retail investors, who usually make up about 20% of the clientele of UK closed-end funds, was around 2 to 1, with no institutions holding more than 3%. After an initial climb, the subsequent performance of the fund has thus far failed to match expectations, however.

From the perspective of investors, retail investors need to be wary of being carried away by enthusiasm for new markets and to be aware that although long-term growth may be substantial, future returns may also be lower than they expect, particularly in the short term. Investors should also be aware that some closed-end

funds charge complex performance fees. Another factor for the investor to bear in mind is that closed-end country funds can suffer from illiquidity, and this can affect the spread when they come to sell the fund. As fund advisors may be recommending closed-end country funds under the new Retail Distribution Review which came into effect in December 2012, investors need to be aware that they are buying a more complex and volatile product than a unit trust, and a product which is more opaque in terms of its fee structure and leverage.

From the perspective of regulators, we would recommend the creation of an independent information source on all UK closed-end funds, and one that provides historical information. One of the difficulties in carrying out this research was to find accurate historical information, particularly on fund expenses. Until the advent of the AIC website, there used to be annual directories listing the fund sizes and expenses. The AIC web site only provides current expense ratios of AIC-registered funds. The other issue that is problematic for the retail investor is the complex performance fees that have been increasingly introduced by closed-end funds. Finally, we would recommend that Investment Advisors are fully aware of the differences between open and closed-end funds so that investors are aware that they are taking an additional risk in investing in a closed-end fund.

1.2 Profile of the UK Closed-end Fund Sector

1.2.1 Current Structure and Regulation

As the name suggests, closed-end funds have a closed structure. This means that closed-end fund issues a fixed number of shares at the outset of the company. This number does not usually change unless there is a major capital reorganization such as

a share buy-back. Because the number of shares is fixed, the price of the shares on the market will rise and fall according to the demand of investors. Closed-end funds also have a publicly disclosed net asset value (NAV). The NAV is calculated by adding together the value of the fund's investments - i.e. the portfolio of securities invested in by the fund, cash and other net current assets - and deducting all of its liabilities, including any preference capital that may have been issued. The total value of the assets is then divided by the number of shares, including the number of warrants, to give the Diluted Net Asset Value which we use in this thesis. The share price usually differs from the underlying NAV of the investment company. The share price is usually lower than the NAV giving rise to a discount (negative premium).[4]

Table 1.1 shows that there are 438 investment companies[5] listed in the markets of the London Stock Exchange with a market capitalization of £72,081m and assets of £93,433m (including Venture Capital Trusts or VCTs). Funds investing internationally have a market capitalization of £33,439m and total assets of £39,890m. Most of these invest in more than one country, but single country funds have a market capitalization of £4,000m and total assets of £4690m (AIC, 2010). As Chapter 2 shows, most of the research on closed-end funds is based on US closed-end funds, and so we include US fund data for comparison.

Table 1.1: Comparison of UK and US Closed-End Fund Markets

[4] The AIC Director's Handbook (AIC, 2010a) gives a detailed description of the operations of UK investment trusts (closed-end funds) and Section 1.1 is chiefly based on material from this document unless stated otherwise.

[5] The term 'investment company' refers to both UK domiciled closed-end funds and offshore closed-end funds. In this thesis I am referring to UK domiciled closed-end funds unless otherwise stated.

This table compares the number and value of equity and bond closed-end funds in the UK and US in 2010. Funds are categorized according to their investment objective.

Fund Type	Fund category	No. of Companies		Sector Value of Total Assets		
		UK	US	UK(£m)	US($m)	US(£m)
Equity Funds	Domestic	64	110	12,463	53,744	34,039
	International (excluding Single Country)	91	14	35,200	4,271	2,705
	Single Country	26	21	4,690	5,450	3,452
	Private Equity	18		10,880		
	Sector Specialist	41	36	7,936	3,087	1,955
	Hedge Funds	27		6,917	20,245	12,822
	All equity funds	**267**	**181**	**78,086**	**86,797**	**54,972**
Property Funds		26	14	8,652	3,087	1,955
Venture Capital Trusts		123		2,392		
Split Capital Trusts		22		4,303		
Bond Funds	Domestic Taxable		146		48,069	30,444
	Domestic Municipal		254		82,874	524,448
	International taxable		22		14,802	9,375
	Single Country					
	All bond funds	**0**	**422**		**145,745**	**92,307**
	Total	**438**	**617**	**93,433**	**235,629**	**149,235**

Sources: Keyfacts of the Investment Company Industry (AIC, 2010) for UK data and Closed-end Funds Association Website for US Data (CEFA, 2010).

Table 1.1 shows that the UK closed-end fund sector is clearly of comparable size to the US closed-end fund sector. Looking at equity funds we see the strength and maturity of the UK, not only in the value of the international sector but also in the single country sector. UK single country closed-end funds have over 35% more total asset value than US single country closed-end funds (Investment Company Institute, 2010). The UK also has more single country funds than the US, currently 26 as compared with 21 in the US and many of them have a much longer history. The oldest UK single country fund dates back to 1881 with the launch of the Fleming

American Investment Trust (now the JPMorgan American Investment Trust) whereas the earliest US single country closed-end fund, the Japan Fund, began in 1965. UK single country funds make up 5% of the total sector value of UK closed-end funds whereas US single country funds make up 2.3% of the total sector value of US closed-end funds, largely due to the dominance of bond funds.

The UK closed-end fund sector is also more important relative to the UK unit trust sector than the US closed-end fund sector is to the US mutual fund sector. The total asset sector value of UK closed-end funds is approximately 16.8% that of the total funds under management of UK unit trusts which amounted to £556,960m in September 2010 (IMA, 2010). In contrast, the US closed-end fund sector has a sector value of only just over 2% of US mutual funds, even when we include bond funds (Investment Company Institute, 2010). Another striking difference is that there are no bond funds in the UK whereas in the US most of the closed-end funds are bond funds and these include international bond funds.[6]

Regulation of UK Closed-end Funds

Investment companies - which include UK closed-end funds, offshore closed-end funds and venture capital closed-end funds - all have a company structure and are therefore regulated by company law. Investment companies domiciled in the UK are governed by the Companies Act 2006. A considerable number of closed-end funds have set up offshore in recent years, particularly in the Channel Islands and are governed by local legislation. Closed-end funds wanting to enlist on the main London Stock Exchange must adhere to the UK Listing Rules for all companies in

[6] As of 31 March 2013 there are now 10 UK debt funds (AIC, 2013)

these markets. Those wishing to enlist in the Alternative Investment Market, which has become an increasingly popular route since its establishment in 1995, must comply with the AIM Rules.

Capital structure

UK closed-end fund managers have developed many different ways of investing to appeal to different groups of investors. Conventional closed-end funds issue only one class of ordinary share. This thesis is based on the analysis of a sample of ordinary shares of conventional closed-end funds, as different classes of share can differ in volatility and cannot therefore be considered together. Shareholders of conventional closed-end funds receive both dividends and a capital return when the share is sold. Split capital closed-end funds issue more than one class of share. Split capital closed-end funds are usually launched with a wind-up date. On this date after the sale of the assets and settlement of debts, various types of shares will be paid off in the order established in the Articles of Association. This structure allows the company to suit the requirement for income or capital to various groups of investors. The first split capital closed-end fund (Dualvest) was launched in 1965 with two classes of share: income shares and capital shares. Holders of income shares received all of the dividend income of the trust, after expenses, but no capital gain. Holders of capital shares received the capital appreciation but no income. When the trust reached the end of its fixed life the portfolio was liquidated. Income shareholders obtained a fixed price for their shares and capital shareholders received the remainder of the assets.

Split trusts became popular, partly because investors could choose the form of investment that suited their tax requirements. They also were a way of introducing

gearing without having to borrow. They continued to be popular during the following decades but the launch of the Scottish National Trust with four classes of shares and warrants heralded the development of increasingly complex debt-laden structures. The risk of these structures was magnified by the amount of cross-holding between closed-end funds that took place in order to provide the promised returns to shareholders, who were often ill-informed about the risks they were running. This could be maintained in a bull market, but when the market took a downturn in 2000 and 2001, however, a crisis of confidence forced many splits to undergo liquidation. Shareholders lost hundreds of millions of pounds, and split capital trusts were required to provide compensation of just under £1billion. An investigation by the FSA and Treasury Select Committee resulted in changes to corporate governance, disclosure and regulation (Adams, 2004).

British closed-end funds often use gearing or leverage. A closed-end fund will choose to gear or borrow money if it expects that the return on its investment will outweigh the cost of borrowing. Borrowings are likely to be in the form of long or short term bank loans, long term debentures and floating rate notes e.g. set at a premium to LIBOR. Borrowing can also be in another currency which can act as a hedge for overseas investments. The effect of gearing is that it magnifies the performance of the fund. If the assets are growing, gearing will enhance the possible returns. However, in a falling market, the losses will also be increased. In January 2011 the AIC report that the overall average gearing for conventional UK closed-end funds was 9% (gross gearing) 6% (net gearing). The AIC distinguishes between the two as follows: gross gearing reflects the amount of prior charges drawn down by a company with no adjustment for amounts held in cash/cash equivalents, whereas the

net gearing reflects the amount of prior charges actively invested and not held in cash/cash equivalents (AIC, 2011). In January 2011 there was much more leverage in US funds than UK funds with the highest leverage being in bond funds, typically around 40%, but also in international funds with Clough Global equity with 41.95% of leveraged assets as a percentage of its total assets. Out of the 181 closed end funds, 53 had some degree of leverage. This contrasts with the findings of Dimson and Minio-Kozerski (1999) for US funds who found an aggregate debt ratio of less than 1%. In their survey of 167 equity funds only 11 had leveraged assets.

Increasing gearing is also one way in which a closed-end fund can expand. Other ways in which a closed-end fund can expand include issuing new shares, issuing warrants, issuing 'c' shares (similar to a rights issue without the dilution in value for existing shareholders); and taking over other closed-end funds. If a company wants to contract, it can offer to buy back shares. It may cancel the bought back shares immediately or keep them 'in treasury' for potential future new issues. If the company wishes to buy back 15% or more of the shares it must make a tender offer to buy shares for cash at a fixed or maximum price. Buying back shares, allowed since 1999, is also a way in which a closed-end fund can increase a premium as it increases the value of the shares by reducing the number of shares while the NAV is unaffected. This has become an increasingly popular way for companies to keep the level of the premium from becoming too negative. An, Gemmill and Thomas (2010) based on a study of UK closed-end funds between 1996 and 2004, distinguish between an immediate effect on the share price in which the fund share price jumps slightly, and a longer term effect over the next four years when the fund share price and NAV show evidence of outperformance. They argue that as the

repurchase reduces management fees, it serves as a means by which the directors can exert discipline over poorly performing managers.

If such disciplinary tactics fail and closed-end funds run into serious difficulties they may be taken over by another investment company or go into liquidation. As well as the simple cash for shares, there are various 'roll-over' options upon liquidating. The closed-end fund may choose to roll over into an already existing closed-end fund, perhaps located offshore, which then issues new shares. The fund may roll over into a newly created closed-end fund, or it may open-end and become a unit trust or OEIC.

Taxation

If the closed-end fund is domiciled outside the UK, it is usually located in a taxation system where the company is treated as tax exempt. There will be various conditions required to obtain this status which vary from place to place. UK domiciled closed-end funds do not pay tax on the dividends they obtain from UK companies and are not taxed on capital gains. This allows the management to change the portfolio without incurring capital gains tax on the transactions. They can be liable to pay 30% corporation tax on other forms of income. This 30% tax can be somewhat reduced by offsetting expenses against tax and by claiming double tax relief where income is taxed twice: once in the country where it arises and again in the UK. This tax status is why many closed-end funds have chosen an offshore base for their operations in recent years.

In order to be termed a UK closed-end fund and be exempt from capital gains tax a closed-end fund must:

- Not be a close company
- Reside in the UK for tax purposes
- Obtain its income wholly or mainly from shares and securities
- Not have any investments representing more than 15% by value of its investments
- Be listed on the London Stock Exchange
- Not distribute surpluses from selling investments as a dividend
- Not retain more than 15% of its income from shares and securities (Corporation Tax Act 2010, Section 1158).

Ownership

Whereas US closed-end funds are mainly held by individual investors, UK closed-end funds and investment companies are mainly held by institutions. There have been big changes in the ownership of UK closed-end funds since the 1960s. An early survey by Burton and Corner (1968) of the ownership of closed-end funds with a capital of £25 million or more showed that individuals owned an average of 75.2% of the shares with institutions owning 24.8%. By 1986, however, the situation had reversed. Institutions now owned an average of 77.7% of the share capital of the same trusts, with individuals owning only 22.3% (Draper, 1989). Draper argues that the reason for this change is that unit trusts were able to market themselves more effectively. Not being companies, they were allowed to advertise and provide commission to financial advisors. Individual investors changed to unit trusts. Insurance companies and pension funds were also growing and wanted to obtain investment expertise and diversification. These institutional investors therefore filled the ownership gap left by the small investor until they in turn developed their own in-

house expertise. It is clear, however, that many UK institutional investors still prefer to invest in closed-end funds rather than investing directly themselves as they continue to be the largest investors in UK closed-end funds.

Closed-end funds are interesting from an ownership perspective because their shareholders can exert more influence than is typical in other funds such as unit trusts. Shareholders can influence the level of directors' fees, dividends and can even change the board if they are unhappy.

1.2.2 Development of UK Closed-end Fund Sector

The very first UK closed-end fund is generally agreed to be the British Foreign and Colonial, which began in 1868.[7] It aimed to give 'the investor of moderate means the same advantage as the large capitalist, in diminishing the risk of investing in Foreign and Colonial Government Stocks, by spreading the investment over a number of different stocks.' Offering a return on foreign government securities which far exceeded the return on Bank of England Consols, the trust started slowly but rapidly gained in popularity. Others followed. Thus the UK closed-end fund industry had a foreign investment focus right from the start which has continued to this day. The first fund to focus on a single country was the Fleming American Investment Trust in 1881.[8] Soon trusts were reorganized as companies following an action declaring the Government and Guaranteed trust to be illegal in its present form. The boom years of the 1880s were followed by the Baring Crisis of the 1890s precipitating a lack of

[7] The account of the origins and development of closed-end funds in this section is based chiefly on the work of Newlands (1997), Burton and Corner (1968) and Masey (1988).

[8] This contrasts with the US where the earliest single country closed end fund, the Mexico Fund, began in 1981.

confidence in closed-end funds and concerns about conflicts of interest between the company management and shareholders. Most of the trusts recovered, however and by 1903 there were 84 trust companies in operation.

Between 1900 and 1914 the total assets of the UK closed-end fund industry had increased by £25 million to £90 million. During the First World War the UK closed-end funds generally survived well although the need for home investment and the dollar mobilization scheme, when companies were asked to sell dollars to provide the country with American munitions, saw overseas investment reduced. The postwar years saw closed-end funds gathering momentum again. The new Corporation Profits Tax of 1921 encouraged closed-end funds to move away from fixed interest securities into equities and also to take up gearing as expenses could be set against debenture interest and the tax reduced.

In the United States the closed-end fund did not become an important feature in the stock market until the 1920s although some trusts existed prior to this. US closed-end funds mushroomed in the 1920s. In a pattern which has become typical of US and UK closed-end funds, some funds did not take advantage of the boom and only charged moderate fees of up to 1%. Others, such as Lehman Brothers, imposed an initial sales charge of 4% and a staggering management fee of 12.5% of asset value. Some funds had little gearing while other ‘high leverage’ funds were investing in assets using substantial loans. When the crash came in October 1929, the highly geared closed-end funds were the most severely affected (Anderson & Born, p. 8).

In contrast to the US, UK closed-end funds survived the 1929 US stock market crash fairly well and no closed-end funds went into liquidation at that time.

They were affected by the ensuing economic depression, however which affected the entire economy. Newer closed-end funds with smaller reserves suffered more than established closed-end funds with larger reserves. Scandals continued to tarnish the reputation of closed-end funds and gave a boost to the new unit trusts which began in 1931 with the First British Fixed Trust. The image of closed-end funds improved when in 1932 the Association of Investment Trusts (now known as the Association of Investment Companies) was formed to give closed-end funds official representation.

During the Second World War trusts had to give up their American securities and Carlyle Gifford of Baillie Gifford sold these in the US, trying to get as many dollars as possible. The trusts were repaid in sterling which they then invested in UK equities. The immediate post-war years were difficult for closed-end funds and some did not welcome the new Companies Acts of 1947 and 1948, requiring the current market value of the investments to be revealed annually and for them to produce consolidated accounts.

By the 1950s large institutions were beginning to buy shares in the increasingly profitable closed-end funds. Private investors had traditionally held most of the shares in closed-end funds but competition from other forms of investment such as unit trusts, insurance, building societies and pension funds attracted them away from closed-end funds. In turn, these large institutions became awash with cash but lacked the investment expertise and became the biggest shareholders of closed-end funds.

The 1965 Finance Act had a big negative impact on closed-end funds. As well as imposing corporation and long-term capital gains tax on closed-end funds, the Act ended the relief from double taxation on overseas investment. In addition, closed-end funds wishing to change their overseas portfolios found that they had to pay 25% of the currency premium to the Bank of England. This again hampered overseas investment and led to the establishment of offshore funds and currency swaps to avoid the tax. By the mid 1970s closed-end funds were lacking in investors and were struggling at premiums of around -30%. Closed-end fund share prices fell to levels at which they were a target for takeovers. Other companies wished to buy the closed-end fund shares and then sell the underlying assets owned by the fund at their market value in what became known as a disguised rights issue. Some closed-end funds reacted by unitizing, or becoming a unit trust. Other closed-end funds specialized further into new markets, particularly Japan and the Far East. The first closed-end fund to particularly focus on Japan was the Anglo-Nippon Investment Trust which started life in 1961 and benefitted from Japan's subsequent expansion.

Closed-end funds fared better during the 1980s. The removal of exchange controls in 1979 encouraged closed-end funds to invest overseas and the abolition of the tax on capital gains within funds in 1980 allowed managers to alter portfolios more easily. Closed-end funds continued to consolidate in order to compete in the new technological arena as well as to protect themselves from predators. Unit trusts began to overtake closed-end funds, however, as they could advertise their shares and provide commission to sellers, as well as providing a simpler pricing structure.

Despite the improvements in the 1980s, closed-end funds continued to be targeted in takeovers. In 1990 The British Coal Pension Fund made a successful

hostile takeover bid for Globe, then the largest UK closed-end fund. This was followed by Robert Maxwell's takeover of First Tokyo. Issues of corporate governance were highlighted several times and in 1993 the Stock Exchange Listing Rules were changed to require closed-end fund boards to be independent of the investment managers.

In the 1990s and beginning of the 21st century discounts narrowed (premiums became less negative) and closed-end funds enjoyed another boom period. Management groups launched more and more closed-end funds including new Venture Capital Trusts, benefitting from the fees they contributed. The split capital structure offered encouraged some companies to offer return that was over optimistic leading in turn to higher gearing and cross-holding in the income shares of other split companies. Concerns were raised in early 2001 about the complexity of the new products, the amount of cross-holding between closed-end funds and the implications of a change in market sentiment and later that year the change came about, resulting in many suspensions and liquidations the following year (Adams, 2004, p. 55). The Financial Services Authority responded to the crisis by issuing new safeguards into the Listing Rules with the aims of limiting cross-holdings; requiring clearer communication of risk and policy between management and shareholders; and ensuring increased board independence (Gardner & Wood, 2004, p. 125).

1.2.3 Closed-end Country Funds

Another feature of closed-end funds in the recent past has been the increasing specialization by industry and country. Traditionally closed-end funds have been pioneering in the wide geographical spread of the assets in which they invest. This diversification has benefitted the small investor, reducing risk and saving on the cost

and expertise required for direct investment overseas. Although some of the early closed-end funds began as specialist trusts, investing in US railroads for example, the real impetus to specialize came in the 1980s. Unit trusts had already been offering specialist overseas trusts and these were proving popular. Launching a unit trust, however, is easier than launching a closed-end fund due to the closed-end structure, and many of the UK country funds have wound up after only a few years. Most of the longest lasting UK country funds are those that invest in Japan and the US. Following the Anglo-Nippon Trust, one the first Japanese Trusts, GT Japan, began in 1972. It was phenomenally successful throughout the 1980s, lasting until 2001 when it was unitized. Crescent Japan was launched in the same year but struggled after the crash of autumn 1987 and was wound up in 1988. A series of other Japanese trusts were launched in the 1980s but few have survived to the present day. The larger, better funded trusts, such as Baillie Gifford, JPMorgan Japanese and Fidelity Japanese have been better able to survive the vicissitudes of the Japanese market than their smaller counterparts. UK closed-end funds have also been strong investors in the United States since their beginning. During the two world wars this investment emphasis was changed as the funds had to give up their American securities. Although most UK international funds in recent times tend to hold shares in US companies as part of a diversified portfolio, more funds specializing in US securities were launched following the drive towards specialization in the 1980s and 1990s. Like the Japanese funds, many US fund were wound up after only a short time, but some funds, in particular the Edinburgh US tracker fund, have performed well.

Closed-end funds expanded into emerging markets in the early 1990s as the capital controls in these markets began to be lifted. Emerging markets seemed to

offer the growth potential while the UK market was struggling at that time. Furthermore, the closed-end structure meant that funds could invest in less liquid and more volatile markets without having to redeem shares during troubled times. Between 1988 and 1994 UK funds were invested in Thailand, the Philippines, Indonesia, Turkey, Korea, India, China, South Africa, Taiwan, Sri Lanka and Russia. Investment analysts were confident, claiming "the industry has returned to its roots, as a vehicle for private investors and a suitable forum for those interested in the more exotic areas of world markets. Unlike the 1970s, the industry seems assured of a positive future" (Coggan, 1996). This optimism received a major blow during the Asian currency crisis in 1997-1998. Several funds investing in these areas, such as Taiwan Investment, JF Philippine and First Philippine had to be wound up as a result.

The main other investment sector has been Europe and in the early 1990s there were several closed-end funds investing in France and Germany in particular. The arrival of monetary union meant that they changed investment objective to a pan-European objective (as with Second Market) or were unitized (German Smaller Companies) or taken over (German Investment Trust).

To sum up, between 1993 and 2009 funds in both the emerging and developed market sectors have expanded and contracted, following market developments. The smaller funds have tended to be short-lived, while the large funds can cope with the volatility better. Market turbulence over the past 20 years has left the closed-end country fund sector dominated by the big funds, usually run by powerful fund managers including JPMorgan, Aberdeen, F&C, Fidelity, Schroder, Edinburgh and Baillie Gifford.

1.2.4 Current Concerns and Future Developments

Despite periodic resurgences of interest in closed-end funds they have fallen well behind unit trusts in market share. In 1965 they had around six times the assets of unit trusts, but by 1985 unit trusts had overtaken them and at present closed-end funds have less than 20% of the total asset value of unit trusts. Some of the reasons were due to legal and fiscal policies outlined above that hindered the expansion of closed-end funds relative to unit trusts.

It has been argued that the structure of the closed-end fund itself, however, is one of the biggest reasons for its unpopularity. It is not easy for the non-specialist investor to grasp the dual structure of closed-end funds. Even independent financial advisors are also slow to understand and promote closed-end funds to the public. A survey of independent financial advisors in 2010 found that 40% said that their knowledge of closed-end funds "needs refreshing", while around another 30% said that they did not recommend closed-end funds because they got no commission for doing so (Somerset Webb, 2010). As early as 1966, Pratt documents similar problems for US closed-end funds, and indeed attributes the discount itself to insufficient effort to sell closed-end funds and insufficient understanding of the funds by the public (Pratt, 1966).

The discount (negative premium) is another potential deterrent with only two funds, Personal Assets and Troy Income & Growth, having a zero discount policy. Other funds have sought to manage negative premiums by buying back shares periodically (An, Gemmill, & Thomas, 2010). In this area closed-end funds face a challenge from Exchange Traded Funds which have mushroomed in popularity over the last few years, as these funds trade at around net asset value. Those who blame

the unpopularity of closed-end funds on the fact that they could not pay commission to independent financial advisors are hoping to benefit from the implementation of the FSA's Retail Distribution Review (RDR) which took effect in December 2012. The RDR brings in two key changes that should benefit closed-end funds. Firstly, investment advisors will have to provide advice that is not biased or restricted, and so they will have to include closed-end funds. Secondly, and most significantly, investment advisors will no longer be paid commission by the providers of financial products, creating a level playing field between unit trusts and closed-end funds. Another issue that has given unit trusts an advantage over closed-end funds is that they can be offered via fund platforms, which allows the investor a wider choice of funds and investment managers. This should change with the new legislation, however (Elliot, 2010).

These changes may bring much needed growth to closed-end funds, but only if they provide clarity and good value to customers. This could be threatened by more complicated fee structures that some funds have introduced. It is already difficult for the retail investor to compare the fees of funds as a list of quarterly total expense ratios for all funds is no longer provided on the AIC web site. Although trusts argue that this is what customers want, others argue that it is in fact what managers want (Somerset Webb, 2010).

2. Survey of Closed-End Fund Literature

Closed-end funds have been a topic of lively debate for several decades. Not only has the existence of the discount been thoroughly argued over, but they have also been a means of examining other topics in asset pricing and corporate finance. This has resulted in a wide range of studies. In the first section of this chapter we begin with a brief chronological overview of the trends in research on closed-end funds. In the remaining sections we focus on studies relating to liquidity, sentiment and segmentation and, in particular, on studies that investigate closed-end country funds. We extend the previous survey by Dimson & Minio-Kozerski (1999) by including more recent contributions to the closed-end fund debate; we add to the survey by Bayoudh & Elgaied (2008); and by including more of a discussion of sentiment, segmentation and country funds we complement the recent survey by Cherkes (2012).

Most of the published research into closed-end funds has been carried out on US closed-end funds and our review reflects this emphasis. Studies of other funds include those of Doukas and Milonas (2004) into sentiment in relation to Greek closed-end funds. Hjelstrom (2007) examines the impact of ownership and portfolio concentration in Swedish and UK funds. Chen, Rui and Xu (2004) find evidence to support both rational and sentiment arguments from Chinese closed-end funds. Chen, Johnson and Lin (2009) examine the differences in sophistication between US and Taiwanese closed-end fund investors.

2.1 Chronological Overview of Research into Closed-end Funds

Research into closed-end funds should not be thought of in isolation from research into other areas of asset pricing and corporate finance. Closed-end fund studies

position themselves within a more extensive conceptual network which applies to other areas of finance. Theoretical models, with their attendant assumptions, have emerged within other subject areas, and these models have then been applied to closed-end fund research to see if they can help to resolve some of the anomalies associated with closed-end funds (i.e. the initial premium, the fall into a discount, the fluctuations in the discount and its disappearance at open-ending). This variety of approaches has meant that the research on closed-end funds does not generally constitute a cohesively developing body of literature. However, it is possible to identify key streams of thought in the literature and this is one of the main contributions of this chapter.

At a general level, a fundamental assumption underlying research in all areas of finance is that raw price data has an objective reality which can be formalised into models and then tested and interpreted in various ways in order to support or refute different hypotheses. The subsequent interpretations depend crucially on the initial assumptions made about market participants.

In one main stream of closed-end fund literature which comprises various models, the initial assumption is that market participants are rational and make utility maximising decisions which are then reflected in the share price and net asset value of closed-end funds. This research belongs within the conceptual framework which has prevailed in finance since the 1970s and which has the key assumption, usually implicit, that markets are generally efficient (Fama, 1970). This assumption provides the basis for interpretations that the discount can be accounted for by investors adjusting to market frictions such as taxation and illiquidity. It also extends to agency interpretations of the discount in which it is frequently accounted for with reference

to management fees and/or management performance. This stream of closed-end fund literature can be traced back two early papers, one by Malkiel (1977) and the other by Boudreaux (1973). Another important early paper in this context is that of Pratt (1966) who attributes the closed-end fund discount to the poor efforts by to sell closed-end funds and to the poor understanding of closed-end funds by the public.

In the other main stream, the assumption is that not all market participants make rational utility maximising decisions. Some market participants may be swayed by irrational sentiment. This analysis dates back to Zweig's distinction between professional and non-professional investors (Zweig, 1973). According to Zweig, the marketplace is occupied by two main types of investor, the informed or professional investor and the uninformed or retail investor, also termed 'noise trader'. The latter will tend to buy and sell without reference to the fundamental value of a share and hence bid up or down the share value with reference to its fundamental value. When it comes to closed-end funds, he argues, the difference between the share price and net asset value reveals the expectations of non-professionals. De Long et al. develop this view (1990) and argue that the discount reflects the risk posed by noise traders to the informed traders, who will not buy the closed-end fund share unless it is on sale at a discount to compensate them for noise-trader risk. A key assumption of this view, articulated most clearly by Lee, Shleifer and Thaler (1991) is that the clientele of the closed-end fund is different from the clientele investing in the underlying assets. Closed-end funds, they assume, have many more small or retail investors than do the underlying assets. The two papers by Lee, Shleifer and Thaler (1991) and of De Long et al. (1990) are among the most important contributions to the closed-end fund literature and have also had a major impact on other areas of asset pricing.

Related to the noise trading concept is the concept of limits to arbitrage. Pontiff (1996) argues that discounts exist because there are barriers preventing arbitrageurs from undertaking the actions which would eliminate the discount.

UK Studies

Despite the fact that the closed-end fund sector is of greater importance to the UK economy than the US closed-end fund sector is to the US economy, there have been relatively few articles published on UK closed-end funds.

Draper and Paudyal (1991) explore the possibilities of profiting from persistent discounts in the UK, following the study of Thompson (1978) in which he found significant performance by following a strategy of investing yearly in funds in proportion to the size of the discount. They do not find such a strategy to be successful in the UK in their sample from 1983-1986. They examine several possible contributory factors to the discount: investment objective, expenses, past performance, number of directors, ratio of individual to institutional shareholders and capital structure. They find some evidence to support a relation between the discount and managerial variables, such as past performance and investment objective, and also for the proportion of debt, but only mixed support for the number of directors (proxying for agency costs) and not for expenses. Gemmill and Thomas (2007) also find a relation between the discount and management variables, finding that discounts are wider when the management is more concentrated. In their sample for 1996 they also find that expenses are negatively related to the UK closed-end fund returns. Their results suggest that governance has an impact on UK closed-end fund pricing.

Cheng, Copeland and O'Hanlon (1994) revisit the possibility of exploiting the UK closed-end fund discount in a trading strategy that involves buying high discount shares and selling low discount shares and find that positive (negative) abnormal returns can be obtained by following this strategy. However, they note that short-selling constraints and transactions costs are likely to prevent this strategy from being profitable. In a more recent paper, Copeland (2007) returns to the issue of the UK discount and finds it to be mostly non-stationary with mean-reversion and suggests that this may be due to either the role of interest rates and market sentiment in the pricing of UK closed-end funds.

Gemmill and Thomas (2002) argue that the discount can arise for rational reasons, for example because it reflects the present value of long-term managerial expenses, and that the discount persists because it rarely reaches the level at which arbitrage would be profitable. A premium can also occur, but if it becomes too high, new issues of funds in the same investment sector will produce competition and this will reduce the premium. They suggest that the subsequent fluctuations in the discount, however, are due to small investor sentiment. The concept of arbitrage in closed-end funds continues to be debated with Flynn (2011) revisiting the research of Gemmill and Thomas (2002) and finding contrasting results for the US. Where Gemmill and Thomas (2002) found that UK closed-end fund premiums and discounts are constrained by the barriers to arbitrage, Flynn finds that US funds are not constrained by barriers to arbitrage. Instead he finds that noise trader risk consistently and significantly impacts the premiums and discounts of US funds.

Gemmill and Thomas (2011) examine the arbitrage issue with a more recent example of UK and US funds (1988-2007). They argue that the discount in both

markets persists because of arbitrage constraints, which are more severe in the UK, resulting from the possibility of new issues of closed-end funds in sectors where premiums occur. In addition to arbitrage constraints, they find that premiums and discounts are more influenced by rational factors (liquidity and management fees) in the UK and by investor sentiment factors (dividend payout and idiosyncratic risk) in the US. However, Agyei-Ampomah and Davies (2005) find patterns of excess volatility in UK closed-end funds, suggesting a role for investor sentiment.

Trends in studies from 2000 onwards

In general, much of the research into closed-end funds from 2000 onwards has sought rational explanations of the discount as opposed to sentiment-based explanations. Some studies apply the noise trader model of Lee, Shleifer and Thaler (1991) to other samples and question its explanatory power (Doukas & Milonas, 2004). Other studies propose different models, based on liquidity arguments and agency arguments (Cherkes, Sagi, & Stanton, 2009) (Berk & Stanton, 2007) (Bradley, Brav, Goldstein, & Jiang, 2010). 2011 also sees a revisiting of previous rational arguments as Day, Li and Xu (2011) conduct new tests for a previous tax timing argument (Malkiel, 1977).

However, recent years have also seen an increase in articles dealing with investor sentiment. This may be motivated firstly by the greater availability of measures of investor sentiment and greater computing power to amass and analyse a number of these proxies for investor sentiment. Secondly, recent market volatility has forced the issue of sentiment as a topic of debate further up the agenda. Many of these studies focus on open-end funds (Bailey, Kumar, & Ng, 2011) or on stocks at

an aggregate level, rather than examining the issue of sentiment in relation to closed-end funds. Several of these studies include the closed-end discount as one of the proxies for investor sentiment and compare changes in the discount to changes in other measures of investor sentiment (Brown & Cliff, 2004) (Baker & Wurgler, 2007) (Baker & Wurgler, 2006) (Lemmon & Portniaguina, 2006) (Baker, Wurgler, & Yuan, 2012).

Research into closed-end country funds is much smaller but can also be divided into two groups, one based on assumptions of investor sentiment and the other based on assumptions of investor rationality. Most of the country fund research favours the interpretation of investor sentiment (Hardouvelis, LaPorta, & Wizman, 1994) (Bodurtha, Kim, & Lee, 1995) (Kramer & Smith, 1998) but some have given a rational interpretation of closed-end country fund discounts and premiums, attributing them to market frictions such as illiquidity and informational asymmetries between markets (Frankel & Schmukler, 1996) (Chandar & Patro, 2000) (Chan, Jain, & Xia, 2008). Other country fund studies look at whether the discount is related to the degree of segmentation between the home and investment market (Choi & Lee, 1996) (Nishiotis G. P., 2004). Apart from the paper by Bekaert and Urias (1996) which focuses on emerging market funds, all of the published country fund studies deal with funds outside the UK. There are as yet no published studies dealing directly with UK closed-end country funds.[9]

In the following sections I look in more detail at closed-end fund research focusing on sentiment, liquidity and segmentation.

[9] Levis and Thomas (1999) write a working paper on UK and US country funds and find evidence of investor sentiment.

2.2 Sentiment-based Explanations

A considerable body of research has been devoted to the concept of investor sentiment and its possible role in closed-end fund pricing. As the concept of market efficiency, which had dominated since the 1970s, came under attack from behaviourists, one of the areas that seemed to show a clear anomaly and evidence of sentiment was the closed-end fund discount. The two key articles addressing this issue are those of De Long et al. (1990) and Lee, Shleifer and Thaler (1991). In the article by Lee, Shleifer and Thaler (1991) the authors build on both the concept of Zweig (1973) in which he distinguishes between the activities of professional and non-professional investors and the article by De Long et al. (1990) in which the concept of 'noise trader sentiment' is applied to closed-end funds. The argument of Lee, Shleifer and Thaler (1991) is based on the assumption that there are different clientele groups investing in closed-end fund shares: the informed and the uninformed investor. Uninformed investors have expectations that are not based on the fundamental value of the share. This means that they are influenced by 'noise' instead of news (Black, 1986). Uninformed investors are the dominant clientele group of the fund but not of the underlying assets. Their unpredictable optimism or pessimism affects the share price and poses a systematic risk to informed investors who will generally only invest in discounted funds to compensate for this risk. Lee, Shleifer and Thaler (1991) conduct several time series analyses in which they regress changes in the monthly closed-end fund discount on various factors. They regress changes in the discount with returns on in New York Stock exchange firms owned by retail or small investors and find support for the influence of small investor sentiment. They further argue that the concept of investor sentiment can explain why

trusts are launched at a premium which subsequently declines, why discounts fluctuate and why they disappear at open-ending. The closed-end fund debate seemed to be solved, despite the small size of the sample (9 closed-end funds) and the instability of their results over time.

The article by Lee, Shleifer and Thaler (1991) sparked a debate in the form of rejoinders from both sides of the argument in the Journal of Finance. Chen, Kan and Miller (1993) reject the argument made by Lee, Shleifer and Thaler (1991) that the closed-end fund reflects fluctuations in individual investor sentiment and that the same sentiment also influences the returns of stocks held by such investors. Chen, Kan and Miller questioned the economic significance of the results and found no strong relationship between small firm returns and the closed-end fund discount, regardless of the percentage of institutional ownership within the funds. This exchange polarised the closed-end fund debate into a rational versus sentiment debate, reflecting the wider on-going division in asset pricing, while the particular issues that had been raised were addressed in other studies that were carried out using the same sample as that of Lee, Shleifer and Thaler (1991). Brauer (1993) using another measure finds that only 7% of the variance in weekly discount changes is due to noise trader activity. Swaminathan (1996) also does research on same sample and also finds a common variation between the closed-end fund discount and small firm excess returns but finds that this relates to rational expectations about future expected return and inflation rather than to irrational investor sentiment. Elton, Gruber and Busse (1998) using a larger sample, also cast doubt on another of the predictions of Lee, Shleifer and Thaler (1991): the ability of discount changes to predict stock returns. However, there were also many studies supporting the findings

of Lee, Shleifer and Thaler (1991). Pontiff (1995) for example, finds support for both rational and investor sentiment theories in the ability of the premium to predict future share price returns. This feature had already been observed by Thompson (1978). Pontiff (1997) attributes most of the excess volatility he observes to irrational investor sentiment, as does Brown (1999) who finds support for a relation between investor sentiment and excess closed-end fund volatility. Neal and Wheatley (1998) find, supporting the findings of Lee, Shleifer and Thaler (1991) that the closed-end fund discount is a statistically significant factor in explaining small fund returns.

The UK provides a challenge to the individual investor sentiment hypothesis, however. In the UK closed-end funds are mainly held by institutions that are not supposed to be prone to irrational investor sentiment, but are supposed to make rational assessments based fundamental values and informed expectation. However, Agyei-Ampomah and Davies (2005) find that the prices of UK closed-end funds show excess volatility in relation to the net asset value. Gemmill and Thomas (2002) also argue that while investor sentiment does not cause the discount in the first place, changes in investor sentiment cause subsequent fluctuations in the discount.

The dominance of institutional investors in UK closed-end funds means that any study of UK closed-end funds needs to take account of research into the role of institutional investors in asset pricing, and in the pricing of closed-end funds in particular. Sias (1997) examines institutional versus individual trades in US closed-end funds between 1990 and 1991 and finds that institutional investors are much more active in the closed-end fund market as measured by their trades, than a simple ownership statistic would imply. He also finds no evidence that institutional investors face systematic noise trader risk or are offsetting the positions of individual

investors as argued in Lee, Shleifer and Thaler (1991). Nosfinger and Sias (1999) also examine the role of institutional trading in open-end funds and finds that changes in institutional ownership correlate positively with returns in open-end funds. They suggest this correlation implies either that institutional investors are engaging in more of what they call positive feedback trading, or that institutional herding has more of an impact than the herding of individual investors. A further study of the role of noise traders in the pricing of closed-end funds (Sias, Starks, & Tinic, 2001) finds no evidence to support the hypothesis of De Long et al. (1990) that the owners of closed-end funds earn superior returns to the owners of underlying assets as a compensation for bearing noise trader risk. A slightly different approach is taken by Grullon and Wang (2001) who develop a model to account for the discount based on an "informed ownership hypothesis" i.e. institutional ownership which they scale by the quality of private information. Their model predicts that the discount will be negatively related to the institutional ownership differential because institutional arbitrageurs will be attracted to high discount funds; the discount will be positively related to the quality of private information in the underlying assets, because institutional investors would prefer to invest in the underlying assets rather than paying a fee to fund managers and will only invest if the discount is sufficiently large. It also predicts that the discount will be positively related to the fund excess volatility, once the diversification benefit is taken into account. Their findings are consistent with the model. Hughen and McDonald (2005) also focus on the role of institutional investors, arguing that they are the noise traders, rather than individual investors, because their trades have the largest impact on pricing. They examine

daily trades between January and December 1999 and find evidence that discount changes are influenced by institutional trades rather than by individual trades.

After the 1990s the research on sentiment and closed-end funds tends be less intensive. Several papers are published that criticise of the finding by Lee, Shleifer and Thaler (1991) that the discount predicts returns on small stocks. Doukas and Milonas (2004) apply the same tests as Lee, Shleifer and Thaler (1991) on a sample of Greek closed-end funds between 1997 and 2002 and find support for the findings of Elton, Gruber and Busse (1998). They find that sentiment does not enter into the return generating process for small stocks.

In one of the first papers to set a trend for the ensuing years, Brown and Cliff (2005), developing the earlier work by Brown (1999) use survey measures of sentiment and investigate their ability to predict returns over longer horizons than previous research. Basing their analysis on the US stock market, they predict that excessive optimism will lead to times when stocks are over-valued and that this will be followed by low cumulative long run returns. A central element of their analysis is the sentiment variable which they construct from data in Investors Intelligence. This publication tracks market newsletters and rates them as bullish, bearish or neutral in terms of their market expectations. Their variable is the bull-bear spread i.e. the percentage of bullish newsletters minus the percentage of bearish newsletters. They also look at the relationship between sentiment and pricing errors in order to see whether sentiment explains pricing errors. Using pricing error variables from three models they find that the sentiment coefficient is significantly positive for all three variables, although the model has rather low explanatory power. As a robustness test they examine the ability of the closed-end fund discount to predict the returns on

small stocks but do not find evidence that the discount is related to the returns on small stocks.

Lemmon and Portniaguina (2006) take a rather similar approach, comparing various measures of sentiment and their ability to predict the returns on small stocks. Their paper is similar in spirit to the unpublished but frequently cited study by Qiu and Welch (2006) into measures of investor sentiment. Lemmon and Portniaguina use the University of Michegan Consumer Sentiment Index and the Conference Board Index of Consumer Sentiment as sentiment measures. They compare the sentiment component from the two sentiment indexes with the closed-end fund discount and with an aggregate sentiment measure from Baker and Wurgler (2006). Lemmon and Portniaguina find a generally high level of correlation between the various sentiment indexes but less so with the closed-end fund discount. They divide the sample into two sub-periods: before and after 1977 and find that the closed-end fund discount shows no forecasting power for small stocks after 1977 when they include the control for consumer confidence. They find evidence to support the theory that individual investor sentiment results in mispricing in that stocks with low institutional ownership give low returns following periods of high confidence and vice versa.

Baker and Wurgler advance the research into sentiment in two related papers (Baker & Wurgler, 2006) (Baker & Wurgler, 2007), looking further into ways of measuring sentiment in the stock market. Although published later, the 2007 paper gives the theory behind their approach to measuring market sentiment. In it they argue that ‘investor sentiment is not straightforward to measure but there is no fundamental reason why one cannot find imperfect proxies that remain useful over

time' (p135) One of the six components of their sentiment index is the closed-end fund discount. They then use this index in their 2006 paper to predict returns across a range of stock portfolios and find, confirming the noise trader hypothesis, that when sentiment is high according to their index, the future return on stocks attractive to optimists and speculators but not to arbitrageurs, tends to be low. In Baker, Wurgler and Yuan (2012) they expand their application of investor sentiment indices and apply them internationally, creating a global index and six local indices corresponding to six major markets. In this paper they use proxies based on volatility, IPO volume and first day returns and market turnover. In their empirical tests they find that global sentiment is a contrarian predictor of the cross-section of market returns.

Schmeling (2009) also looks at the impact of sentiment on aggregate stock market returns. Like Lemmon and Portniaguina (2006) he uses measures of consumer confidence and again funds that sentiment is a contrarian predictor of stock market returns on average across countries. Simpson and Ramchander (2002) also use measures of consumer confidence, focusing on Australia and the USA, to examine the relation between consumer confidence and the premium in the First Australia Fund, a US-based fund investing in Australia. They find that the more optimistic Australian consumers are in relation to US investors, the lower the premium; and the more optimistic US investors are in relation to Australian investors, the higher the premium on the fund. This study, though limited to one fund, gives valuable insights into the possible relationship between sentiment and closed-end funds.

Many of the studies discussed above do not examine closed-end funds directly but instead evaluate the discount as a predictor of future stock returns. Bringing the central focus back to closed-end funds, however, is a key paper by Cherkes, Sagi and Stanton (2009) in which they compare the explanations of sentiment and liquidity as explanations of the closed-end fund discount. Cherkes, Sagi and Stanton (2009) develop a sophisticated model in which the liquidity benefits, which they argue that closed-end funds provide to small investors, produce a premium in the absence of management fees. The resulting premiums and discounts reflect a trade-off between liquidity benefits and management fees. They also conduct an empirical analysis in which they advance the hypothesis that liquidity plays more of a role in the discount than sentiment. They use two measures of sentiment: the Michegan Sentiment Index and the S&P volatility index (VIX). They conduct a three stage regression and argue that there is more support for their liquidity hypothesis than for sentiment. However, taken in absolute terms, their results seem to show greater statistical significance for the sentiment indices than for the liquidity measure across both domestic and foreign equity funds.

Interest in the role of sentiment in the pricing of foreign equity funds has been a constant theme since the first appearance of US country funds in the 1980s and we turn to this in the following section.

Country funds and sentiment

The noise trader hypothesis from Lee, Shleifer and Thaler (1991) found an immediate application in research into closed-end country funds which was just beginning in the US. Bodurtha, Kim and Lee (1995) argue that closed-end country funds are excellent for testing the theory of investor sentiment because there are two

sets of investors: the local (foreign) investor and the international (US) investor. Thus, analysing the discount in country funds shows the influence of two sources of investor sentiment more clearly than by analysing the discount of US domestic funds, as the fund and the underlying assets of domestic funds may be influenced by similar investor sentiment. Bodurtha, Kim and Lee (1995) suggest that country fund premium fluctuations reflect the sentiment of small investors who are likely to be over-optimistic or over-pessimistic in their assessment of the fundamental share value, resulting in premiums or discounts. In this way the premium or discount captures the difference in sentiment between the US and foreign market. Basing their models on the earlier research of Lee, Shleifer and Thaler (1991) and De Long et al. (1990), Hardouvelis, LaPorta, and Wizman (1994) and Bodurtha, Kim and Lee (1995) find evidence to support this noise-trader model in relation to country funds. Frankel and Schmukler (1996) on the other hand, take a rational perspective, arguing that unexpectedly large premiums, particularly in the Mexican crisis of 1994, are due to information asymmetries between local and US investors causing them to value shares differently. This interpretation is developed further in Chandar and Patro (2000). Kramer and Smith (1998) disagree with Frankel and Schmukler (1996), suggesting instead that loss-averse US investors were hanging on to shares which had lost net asset value during the Mexican crisis and this created the large premiums.

Another way of looking at the influence of sentiment is to carry out event studies and to study price changes around the time of newsworthy events. Klibanoff et al. (1998) find a relationship between prominently featured news items and the pricing of closed-end funds, supporting the investor sentiment hypothesis. This kind

of event study was also carried out by Burch, Emery and Fuerst (2003) when they looked at the impact of the attack on the Twin Towers in 2001 on the US closed-end fund discount and find that discounts worsened immediately following the event, and then rose with the rest of the market, indicating that the pricing of closed-end funds reflects the sentiment of small investors. They make the point that research often relies on 'joint tests that discounts contain sentiment and that sentiment predicts security returns' (p527). They avoid this problem by looking at the impact of an unpredictable external event on the pricing of closed-end funds. A more recent study which also avoids the joint test problem is that of Hwang (2011) who constructs a country popularity score based on Gallup surveys of public opinion and finds evidence to relate the discount fluctuations of specific funds to particular events, such as German reunification and the Iraq war.

The table below summarises the findings of key papers on sentiment and closed-end funds.

Table 2.1: Sentiment Studies

Author	Published	Sample origin	Sample size	Sample period	Explanation examined	Findings confirmatory
Zweig	1973 J Fin	US	25 funds	1965-1971	Build-up of non-professional expectations will be followed by drop. Discount gives measure of changes in non-professional expectations	Yes
De Long, Shleifer, Summers & Waldemann	1990 J Polit Econ	Theoretical paper			Noise trader risk posed by small investors is systematic and means that sophisticated investors will only buy at discount. Arbitrage prevented because of short horizons (i.e. not holding until open-ending).	
Lee, Shleifer, Thaler	1991 J Fin	US	20 equity funds. Usually 10 in index	1956-1985	Application of model developed by De Long et al. Discount is driven by small investor sentiment. Discounts move together. Funds begin at times of positive investor sentiment. Discount changes relate to small stock returns.	To some extent. Small r-square and second period not significant
Chen, Kan & Miller	1993 J Fin				Rejoinder about statistical tests of Lee, Shleifer & Thaler 1991	
Chopra, Lee, Shleifer & Thaler	1993 J Fin				Rejoinder about statistical tests of Lee, Shleifer & Thaler 1991	
Chen, Kan & Miller	1993 J Fin				Rejoinder about statistical tests of Lee, Shleifer & Thaler 1991	
Brauer	1993 J Fin Services Res	US	Same sample as Lee et al. 1991		Noise trading only accounts for small percentage of discount when measured using French & Roll (1986) signal extraction technique. Noise trading occurs across all stocks, not just small stocks	Yes
Hardouvelis, LaPorta, Wizman	1994 Internationalization of Equity Markets	US	35 country funds	1985-1993	Sentiment moves the discount. Sentiment influences the IPO. Country restrictions influence premium	Yes, IPOs issued at premium which then mean-reverts. Discounts predict returns. No, country restrictions don't influence premium
Bodurtha, Kim & Lee	1995 Rev Fin Studs	US	35 country funds	1986-1990	Sentiment drives the premium. Premium changes correlate positively with those on small funds. Premiums move together. Fund premium index correlates to returns on small investor	Yes. Finds premium and share price move

					held stocks	with US market sentiment, not foreign market sentiment.
Prior	1995 App Fin Econ	UK	17 domestic equity funds	1986-1991	Discount is compensation for informed shareholders for extra risk from fees and from not holding portfolio directly.	Yes. When more private investors join, discount loses zero trend.
Swaminathan	1996 J Fin	US	Same closed-end funds as Lee, Shleifer & Thaler 1991. NYSE stock returns	1965-1990	Sentiment does not explain the discount. Discounts contain information about future expected earnings growth and inflation	Yes. Refutes Lee, Shleifer & Thaler 1991
Elton, Gruber & Busse	1998 J Bus	US	32 stock funds 38 bond funds. US stocks	1969-1994	Sentiment as measured by changes in discount is not important factor in generating stock returns. Discount is due to negative alpha.	Yes. Refutes Lee, Shleifer & Thaler 1991
Klibanoff, Lamont & Wizman	1998 J Fin	US	39 country funds	1986-1994	Relative prominence of news affects investor reaction and affects discount	Yes
Brown	1999 Fin Analysts Jnl	US	16 domestic diversified funds	1993-1994	Greater closed-end fund volatility is associated with increased levels of sentiment	Yes. Supports Lee, Shleifer & Thaler 1991
Levis & Thomas	1999 Working paper	UK/US	34 UK and 40 US country funds	1995-1997	Sentiment drives discount. Funds issued in hot issue periods. Mutual fund retail flows relate to discount changes. Higher institutional ownership is associated with lower discount.	Yes, but find higher institutional ownership associated with higher discount.
Grullon & Wang	2001 J Fin Intermed	US	34 US equity funds	1982-1998	Information differential between informed and uninformed investors drives the discount. Informed investors will only buy at a discount, otherwise they could buy underlying assets.	Yes. Find discount negatively related to institutional ownership and positively to underlying asset

						information and excess fund volatility
Gemmill & Thomas	J Fin 2002	UK	158 UK funds with matching open-end equivalents	1991-1997	Discounts are the result of noise-trader and arbitrageur interplay. Changes in discount are a function of noise trader demand. Arbitrage costs and expenses drive the level of the discount.	Yes. Mutual fund flows proxy for noise trader sentiment. Uses F&C to look at retail/institutional ownership.
Borenzenstein & Gelos	Em Mkts Rev 2003	US	231 closed and open emerging market funds.	1996-2000	In times of crisis open-end fund investors withdraw from emerging markets first and this causes closed-end funds to withdraw.	Yes. Not clear whether non-survivors are included.
Burch, Emery & Fuerst	Fin Rev 2003	US	393 closed-end funds	Sep 8 2000-Oct 31 2001	Discounts worsen severely following unpredictable "Nine-Eleven" reflecting small investor sentiment	Yes
Doukas & Milonas (2004)	Eur Fin Mgt 2004	Greece	16 closed-end funds	1997-2002	Discount is measure of investor sentiment and relates to small stock returns but not industrial factors	No
Brown & Cliff	Jnl of Fin Mkts	US	Range of market aggregates	1965-1998	Includes many market aggregates and measures of sentiment: closed-end discount and two surveys	No correspondence between discount and survey data. Finds stronger evidence for institutional sentiment than individual sentiment.
Hughen & McDonald	J Fin Res 2005	US	22 domestic closed-end funds.	Jan-Dec 1999. Daily trading data	Discount changes are influenced by institutional trades, not individual trades.	Yes.
Agyei-Ampomah & Davies	JBFA 2005	UK	210 funds with over 15 months data	1970-1998	Fund returns are less volatile than US fund returns because of predominance of institutional investors	No. Confirms US findings. Big funds and domestic funds

						especially volatile
Lemmon, Portiaguina	Rev Fin Studs 2006	US	Michegan sentiment index, Conference Board survey, closed-end discount	1956-1977 1978-2002	Sentiment predicts return on small stocks and stocks with low institutional ownership.	Yes, but only finds relationship after 1977. Suggests greater number of small investors is reason. No: discount does not correspond to sentiment measures
Baker& Wurgler	J Fin 2006	US	6 proxies for sentiment. All common stocks 1962-2001.	1962-2001	Investor sentiment index (includes closed-end fund discount) predicts returns.	Yes, when sentiment is high, future returns on common stocks will be low
Baker& Wurgler	Jnl Econ Pers 2007	US	2 indices – sentiment level & sentiment change. Stocks.	1962-2001 (as 2006 paper)	Investor sentiment affects stocks that are difficult to value & arbitrage. Indices include closed-end fund discount.	Yes. Indices correspond well to crises
Copeland	JBFA 2007	UK	133 closed-end funds.	1990-2004 Funds with over 500 weeks of data	Discount is mean-reverting	Yes
Cherkes, Sagi & Stanton	Rev Fin Studs 2008	US	658 funds includes bond and equity funds	1986-2006	Sentiment does not influence the discount. Liquidity does.	Partial. Finds more support for liquidity than sentiment.
Flynn	J Fin Mkts 2011	US	458 stock & bond funds	1985-2001	US closed-end funds more volatile than UK closed-end funds	Yes, but not clear whether this is because of institutional investors or nature of sample.

Gemmill & Thomas	Working paper 2011	UK	75 continuously traded UK equity funds 34 US equity funds	1988-2007	Arbitrage cap causes discount in UK and US. Modified by rational factors in the UK and behavioural factors in the US	Yes.
Hwang	JFE 2011	US	19 closed-end country funds from 15 countries	1993-2008	Sentiment is related to the discount of specific country funds. This can be estimated in various ways	Yes

2.3 Liquidity-based Explanations

Liquidity as a concept

Liquidity has been defined as 'a multi-dimensional attribute of an asset that includes the cost of a transaction, the ability to trade promptly, the ease with which large quantities can be traded, and the impact of trading on prices' (Chan, Jain, & Xia, 2008). The issue of liquidity is potentially relevant to the closed-end fund as the lack of a redemption option allows the management to invest in less liquid securities and in markets with lower levels of liquidity.

Liquidity as one of several factors affecting the premium

Liquidity, or the lack of it, has featured from time to time in studies of closed-end funds. In one of the early studies of closed-end funds, Malkiel (1977) finds that lack of liquidity is one reason why shares in certain domestic closed-end funds may sell at a discount to the value of the underlying stock, or net asset value. He cites it as a potential issue for funds which invest in unregistered stock. Such stock can be purchased at a discount to the market price providing the fund guarantees that it will not sell it within a certain period. Malkiel suggests that funds with considerable levels of such stock may well sell at a discount because of the illiquidity of such stock. As the stock is not being bought and sold in the market, its value is difficult to determine. Malkiel finds a statistically significant effect in the variable measuring the amount of the portfolio invested in restricted stock, implying that investors were valuing the stock at only about half of its book value.

Malkiel (1977) also investigates potential liquidity issues in relation to closed-end funds holding foreign stocks. He suggests initially that restrictions on

direct foreign investment such as taxes and exchange controls could make foreign closed-end funds an attractive alternative route for foreign investing. He gives the examples of restrictions on nondomestic investment in foreign companies, or the existence of the US interest-equalization tax which operated over the sample period. Both of these could potentially prevent an investor from creating a duplicate of a foreign fund's portfolio. However, when he examines the foreign fund portfolios he finds that in general the investors could easily have duplicated the portfolio. From his regression results examining 24 companies between 1967 and 1974 and finding inconsistency in the coefficient for the 'foreign' dummy variable, he concludes that 'any premiums or discounts on funds invested in foreign securities resulted not from any market imperfections but rather from investor infatuation or disenchantment with foreign securities' (p851). It is not clear from the paper how many of the 24 funds invested in foreign securities, however, and not all companies were included each year because of missing data.

Lee, Shleifer and Thaler (1991) dismiss the idea of the illiquidity of restricted stock as a general explanation of the discount, observing that discounts also occur with many large funds that do not have restricted stock. However, in another study (1991a) they also find a small but significant correlation between the level of the discount and the amount of restricted stock held by the closed-end fund. They therefore argue in Lee, Shleifer and Thaler (1991) that this may show that investors do not believe that the stock has been sufficiently discounted and are therefore only prepared to buy the fund at a discount. This is similar to the Malkiel's reasoning discussed above (Malkiel, 1977).

Illiquidity as a factor in the cost of arbitrage

A related line of argument is that the discount exists because of mispricing which is due to market frictions. Arbitrageurs would normally make the appropriate investment decisions to reduce this mispricing. Thus, if a closed-end fund is selling at a discount to the market value of the underlying stock (NAV) the arbitrageurs could short sell the underlying stock and buy the share in the closed-end fund which in theory would force the two to equalise until there was very little difference between the two. There may be barriers that prevent this process, however, and in one of the early articles on arbitrage and closed end funds Pontiff (1996) writes that closed-end funds illustrate mispricing when arbitrageurs face costly barriers. These costly barriers to arbitrage may include the following: the security's unique risk may make it difficult to hedge; high interest rates may present a barrier as short sales may not provide arbitrageurs with full interest; various transaction costs such as commission and bid-ask spreads may be a barrier; and a low dividend income may be another barrier to arbitrage since dividends lower holding costs. In his multifactor model Pontiff relates these potential barriers to the size of the deviation of the stock price from the NAV. He does not investigate how these factors might cause a discount as opposed to a premium, and instead restricts himself to considering the absolute size of the deviation from the NAV.

Pontiff (1996) also identifies funds investing in foreign stocks or 'country funds' as an important group. He observes that country funds have more variable discounts than domestic funds and argues that this is because they are expensive to hedge. Arbitrage is more expensive for these funds than for funds investing in domestic securities because of the higher transaction costs when trading the foreign

securities required for hedging such funds. He does not explain why arbitrage issues could cause the premiums observed in foreign funds rather than the discount, or his observation that the Germany Fund was selling at a 13% premium while the Future Germany Fund was selling at an 11% discount, when the transaction costs presumably were similar as the stocks were in the same market.

Gemmill and Thomas (2002) following Pontiff (1996) argue that the discount persists as the costs of arbitrage are usually too high to make arbitrage profitable. They distinguish the origins of the discount from fluctuations in the discount, which they attribute to the activities of noise traders. In general, Gemmill and Thomas find that that funds which are small and not easy to replicate have higher discounts because they are more costly to arbitrage.

Gemmill and Thomas (2002) take issue the liquidity argument (the argument that the discount arises because of the uncertainty surrounding the value of the underlying assets) arguing that Draper and Paudyal (1991) did not find a significant effect in the UK.[10] Gemmill and Thomas also argue that because the share price rises to the net-asset value both in the UK and the US on open-ending, as found by Brauer (1984), (1988), Draper (1989) and Minio-Paluello (1998) the net-asset value is not overstated. Thus Gemmill and Thomas dismiss illiquid stock as a factor contributing to the discount. The concept of liquidity which underlies this thesis, however, is a broader concept, including not only the valuation of stock but also the cost of transactions and whether such stock can be traded readily.

Examining the discount on the Foreign and Colonial Investment Trust over time, Gemmill and Thomas (2002) find that times when there have been a large

[10] In their 1991 paper Draper and Paudyal conclude that it is not likely that valuation issues are very important.

number of small shareholders corresponds to times when there has been a low discount. It is possible, however, that the levels of investment by small investors corresponded to changes in fund liquidity over time. Thus the hypothesis of Gemmill and Thomas (2002) that the sentiment of retail investors causes movements in the discount, can also interpreted from a liquidity perspective as well as from a sentiment perspective.

Liquidity as a central issue

Papers which deal with liquidity as a key issue for closed-end funds include those by Deli and Varma (2002), Datar (2001), Cherkes, Sagi and Stanton (2009) and Manzler (2005). Deli and Varma (2002) focus on the advantages and disadvantages of the closed-end and open-end fund structure. They argue that firms choose the closed-end form because it offers liquidity advantages. If the firm wishes to invest in illiquid stock where the price is less established, it is more likely to choose the closed-end form. With the closed-end form the firm does not have to redeem shares, which is an advantage if it holds illiquid stock. Open-end firms will invest in stock with more liquid assets with transparent prices which are more readily redeemable if required. The closed-end form is therefore particularly suited to firms investing in foreign securities as they face various potential costs.

The first of these potential costs for are the higher transaction costs for foreign securities which are less frequently traded than domestic securities. In an open-end structure such a fund would potentially incur more transaction costs as the fund has to stand ready to redeem shares when required by investors. Following Lee, Shleifer and Thaler (1991) Deli and Varma (2002) also suggest that changes in

investor sentiment are more likely to affect funds that invest in foreign securities and that the closed-end form protects the firm from having to redeem shares when the area is no longer popular. Deli and Varma also argue that having to trade in the redemption of foreign shares is more costly where there is more possibility for firms to create value by discretionary trading. And finally they contend, following Malkiel (1977) and Lee, Shleifer and Thaler (1991) that the closed-end form is more suited for investment in foreign securities as they are difficult to value.

Cherkes, Sagi and Stanton (2009) make a substantial theoretical contribution to liquidity-based explanations of closed-end funds. Like Deli and Varma (2002) they suggest that there are specific advantages to the closed-end form. Cherkes, Sagi and Stanton further argue that closed-end funds offer small investors a liquidity benefit for which they are prepared to pay an IPO premium, which is then traded off against the fees charged by the fund managers. They argue that 'in the absence of fees, funds will trade at a premium, in the presence of fees it will trade at a discount or premium depending on the size of fees relative to the liquidity benefit' (Cherkes, Sagi, & Stanton, 2009) p258. This paper develops Cherkes' previous clientele argument (Cherkes, 2003) in which he argues that closed-end funds are aimed at distinct clientele groups. He identifies one such group as consisting of those who wish to invest overseas, in Thailand or Korea, for example, but lack the opportunities to invest in such countries.

In their 2009 paper, Cherkes, Sagi and Stanton develop a formal model of the tradeoff between liquidity and management fees which they calibrate using an extensive US dataset. They use two measures for the liquidity premium: the Roll trading cost measure and Pastor and Stambaugh's reversal measure. They argue that

their explanation is superior to the sentiment explanation of the closed-end fund puzzle advocated by others such as Zweig (1973), De Long et al. (1990) and Lee, Shleifer and Thaler (1991).

Their model is intuitively appealing. There are some issues which it does not address, however. One issue, from a UK perspective, is that it is based on the assumption that most of the investors in closed-end funds are small investors: closed-end funds 'can provide small investors with relatively liquid access to what otherwise would be illiquid assets' (Cherkes, Sagi, & Stanton, 2009) p264. In the UK, however, most of the investors in closed-end funds are institutional investors. It is not clear therefore why liquidity should be a sufficient motivator for an institution to be prepared to pay a premium to invest in a closed-end fund. Most institutional investors will have sufficient funds to make large investments and thereby to achieve less costly transactions than the individual investor.

Datar (2001) argues that closed-end fund discounts and premiums result from liquidity differences between the closed-end fund and the underlying assets. When the fund share is more liquid than the assets, a premium will result; when the underlying assets are more liquid, a discount will result. Datar's study lacks the spread of other studies as he restricts himself to analysing the weekly returns of 18 US domestic equity funds and 90 bond funds over a four year period from January 1988 to December 1991 (Datar, 2001). He uses both the ordinary least square (OLS) method but also uses the latent variable approach. This is because OLS is known to be biased when explanatory variables are measured with error and liquidity proxies are likely to measure liquidity with error. Several measurable variables such as size, volume of trade, dollar volume of trade and turnover rate (percentage of shares

traded in a week) are treated as error prone proxies for liquidity. These proxies are intended to capture the 'investor recognition' of the shares which relate to share liquidity (Merton, 1987).

As predicted, Datar (2001) finds that the premium increases (discounts decrease) as fund liquidity increases, as estimated by the above proxies. He finds discounts more likely to occur in stock than bond funds. He suggests that a basket (fund) is less sensitive to private information than its contents but also potentially increases transaction costs due to reduced trading, to the extent that informed traders do not trade the basket but only some of its contents. Whether there is a premium or a discount depends on which predominates. This concept is taken up by Hjelstrom (2007). Datar suggests that stock funds are more likely to have higher discounts than bond funds because of the higher underlying asymmetry of information in stock funds. Datar also finds that the slope on volatility is negative indicating that the more liquid a fund becomes, the less volatile it becomes.

In order to find more evidence that liquidity affects the price of closed-end fund shares, Datar (2001) looks at least traded stocks and closed-end funds to identify if they are driven by a common factor, following the analysis of Lee, Shleifer and Thaler (1991) who carry out a similar test with small stocks and find a sentiment effect. Datar finds that the lowest decile (comprising the least traded stocks) has the strongest relationship with excess returns realized by the closed-end industry.

Manzler (2005) examines the role of liquidity in the discount of 20 US domestic closed-end funds between 1995 and 2003. Manzler extends the work of Datar (2001) in that as well as looking at the liquidity effect, he also looks at

liquidity risk. He finds a significant relationship between the discount and the difference in liquidity between the fund share and the underlying assets: when the fund is less liquid than the assets, the discount increases. He also finds that when the liquidity risk of the closed-end fund becomes greater in relation to the underlying assets, the discount increases.

Manzler (2005) criticises the working paper of Jain, Xia and Wu (2004) – subsequently published under the authorship of Chan, Jain and Xia (2008) - for using aggregates of home market illiquidity to as a proxy for the illiquidity of the underlying assets. He argues that because they do not know the correlation between the liquidity of the underlying assets and that of the home market, they cannot ascertain the effect on the discount of the difference in liquidity between the fund and its underlying assets. This is because the exact composition of the portfolio of overseas closed-end funds required to calculate this is not readily available. For this reason, Manzler restricts his sample to US domestic funds and excludes closed-end funds with less than 95% US assets so that he can calculate both the liquidity and spread of the underlying fund portfolio. While Manzler gains in the depth of his analysis, he perhaps loses in the smallness of his sample of 20 funds over 8 years.

Chan, Jain and Xia (2008) explain the variation in the discount in closed-end country funds. In their paper entitled 'Market segmentation, liquidity spillover and closed-end country fund discounts' previously circulated under the title 'Illiquidity and closed-end country fund discounts' by Jain, Xia and Wu (2004). Chan, Jain and Xia (2008) suggest that relative market illiquidity explains part of the variation in closed-end country fund discount. If capital markets are segmented it follows that the closed-end country fund premium will be positively affected by the illiquidity of the

underlying assets but negatively affected by share price illiquidity. In other words, US investors will pay a higher share price to invest in less liquid markets, such as emerging markets, which they can't otherwise invest in. The study is based on data from 41 funds trading in 24 asset markets from 1987 to 2001.

This paper by Chan, Jain and Xia (2008) differs from those of Datar (2001) who considers the advantages of a closed-end structure in general and Manzler (2005) who examines the liquidity of domestic closed-end funds and excludes international funds. Furthermore, this study controls for other factors which have been shown to affect the closed end discount behaviour such as the expense ratio, dividend yield, size and age of the fund as well as a proxy for investor sentiment.

Like Manzler (2005) Chan, Jain and Xia (2008) use the Amihud (2002) illiquidity measure which is constructed using daily market returns and volume. This paper assumes that the liquidity of the underlying assets can be proxied by the liquidity of the foreign market as a whole - an assumption criticised by Manzler (2005) as discussed above. The control variables used are the following: expense ratio, size, age, dividend yield, institutional ownership, a measure of restriction on investment availability (Edison & Warnock, 2003), market risk factor in the share market, market risk factor in the asset market, foreign exchange appreciation rate and the average fund premium as a proxy for investor sentiment, following Bodurtha, Kim and Lee (1995). The main finding of the study is that the closed-end fund premium is significantly positively related to foreign market illiquidity, but significantly negatively related to fund illiquidity. In addition, they find that illiquidity alone accounts for around 36% of the variation in fund premiums. Market

illiquidity and the control variables together explain over 60% of the variation in fund premiums.

The table below summarises the findings of key articles on liquidity and closed-end funds.

Table 2.2: Liquidity Studies

Author	Published	Sample origin	Sample size	Sample period	Explanation examined	Findings confirmatory?
Datar	2001	US	18 domestic equity 90 bond funds	1988-1991	Discounts arise when underlying assets more liquid than shares. Also due to diversification disadvantage	Yes
Deli & Varma	Jnl Corp Finance 2002	US	472 funds including bond and equity funds	1997-1998	The liquidity and transparency of assets influences the choice of whether the fund is open or closed-end	Yes. Funds with less liquidity and transparency are more likely to be closed-end funds
Manzler	2005 Working paper	US	20 domestic funds	1995-2003	Discount increases when fund becomes less liquid and when liquidity risk increases	Yes
Cherkes Sagi Stanton	Rev Fin Studs 2009	US	658 funds including bond and equity funds	1986-2006	Discount and premiums arise from tradeoff between fees and liquidity benefit to small investors	Not strong empirical support
Chan, Jain & Xia	Jnl Fin Mkts 2008	US	41 country funds	1987-2001	relative market illiquidity explains part of the variation in CECF discount	Yes. Strong empirical support

2.4 Segmentation-based Explanations

A number of studies of closed-end country funds examine the role of market segmentation. They examine its influence in the pricing of closed-end funds and they examine whether closed-end country funds are an effective way of reducing risk by diversification.

In a key early paper on segmentation and the closed-end country fund discount, Bonser-Neal et al. (1990) argue that discounts and premiums on country funds are related to the investment restrictions operating in the foreign market. Their hypothesis is that when investment restrictions are loosened, the premium should fall because the closed-end country fund is no longer a unique vehicle for investment. If capital markets are already integrated, however, there should be no effect on the discount if restrictions are loosened. They follow Stultz (1981a) in their definition that capital markets are 'integrated internationally if assets of equal risk located in different countries yield equal expected returns in some common currency' (Bonser-Neal et al.,1990) p524. They also argue that closed-end country funds are good for testing segmentation because they avoid the joint hypothesis problem which arises when using an asset pricing model to test segmentation.

Bonser-Neal et al. (1990) compare the discount between 33 domestic and 14 country funds between May 1981 and January 1989 and find generally smaller discounts in country funds. Next they examine a smaller group of 5 closed-end country funds and relate investment restriction announcements to discount fluctuations. They find evidence consistent with their hypothesis that when an announcement is made about loosening investment restrictions in segmented markets, the discount of the closed-end fund investing in that market increases.

However, their sample of country funds is very small, comprising only the France, Japan, Korea, Mexico and Taiwan Funds. This means the sample is limited to three funds investing in segmented markets and the evidence from the Taiwan fund does not support the hypothesis. Despite these shortcomings, the paper makes a substantial theoretical contribution to the closed-end fund literature.

Choi and Lee (1996) take issue with the study of Bonser-Neal et al (1990) and point out that one fund that invests in a restricted market e.g. Brazil may trade at a discount whereas another fund investing in a restricted market e.g. Korea may trade at a premium. They suggest that this implies that there are also factors particular to each country, such as economic factors, that may influence discounts and premiums.

Choi and Lee (1996) examine closed-end country fund pricing and what determines the fund share price return in a partially segmented capital market. Their study is based on weekly fund returns of all 21 US closed-end country funds from their IPO date to December 1990. The earliest fund dates from 1978 but most funds have data for only one or two years. They regress weekly closed-end country fund returns against weekly US market returns in a 2 factor model where the factors are the local and US markets. They find that 15 out of the 21 funds show sensitivity at 5% to both factors and that 17 out of the 21 funds are sensitive to US market movements, but in an equilibrium model they find that only the local market is priced. They also estimate a 3 factor model including market segmentation dummy and find support for the influence of both market factors and segmentation. In addition, they estimate a cross-sectional model and find support for currency effect but not for growth rate, segmentation dummy or capitalization rate effect as factors affecting the premium. Their study contributes in that they look at funds cross-

sectionally as well as over time and they introduce three degrees of restriction instead of the tightening/loosening distinction of Bonser-Neal et al. (1990). However, they only have 2 emerging market funds whose returns are significantly related only to local market return, whereas the remaining 9 emerging market funds are significantly related to both US and local market returns (7) or none (2).

If markets are segmented and have low correlations with one another, this implies, following Solnik (1974) that a portfolio containing investments in countries with low correlations will be highly diversified and that risk will be reduced. Several papers that address market segmentation in closed-end country funds do so with the aim of determining whether closed-end funds offer a diversification benefit. Chang, Eun and Kolodny (1995) examine the integration, diversification potential and performance of 15 closed-end country funds between 1985 and 1990 with at least 2 years of trading history. They find evidence of segmentation in emerging markets in that the prices and NAVs of emerging market funds are not co-integrated, whereas the prices and NAVs of developed market funds are co-integrated. They also find that emerging market funds are heavily weighted in optimal closed-end country fund portfolios, showing the benefit that they can bring to US investors. However, when they examine the performance of the US closed-end country funds they find that only one of the 15 funds had a statistically significant Jensen's alpha when the world index (MSCI) was used as a benchmark. Bailey and Lim (1992) in a shorter study also examine the diversification benefits of closed-end country funds and conclude from their examination of correlations between the New York Index and various country funds, that they are indeed generally highly correlated and that to achieve diversification benefits ideally one should invest directly in the foreign stock market.

Bekaert and Urias (1996) also consider the benefits of diversification using emerging market closed-end country funds as compared with International Finance Corporation (IFC) Investable indices. They measure diversification benefits relative to a set of mature market benchmark returns. They study a sample of 43 US closed-end country funds, of which 23 are emerging market funds, and 37 UK closed-end funds, including both single country funds and funds investing in more than one country, of which 19 are emerging market funds. The sample period is 1986 to 1993. One original feature of the work is the mean-variance spanning tests which they use. Another interesting feature of the study is the comparison between US and UK funds. Their main finding is that UK emerging market funds provide diversification benefits that are statistically significant, but that US funds which are comparable do not provide such benefits. They suggest that this difference may be due more to differences in portfolio selection, but this is not investigated in the study. In the spirit of Bonser-Neal et al. (1990) they also examine the impact of liberalisations for Brazil, India, Korea and Taiwan using their spanning methodology. They find that only in the case of Taiwan did the opening of the market significantly reduce the diversification benefit it provided.

The study by Patro (2001) is similar in approach to that of Chang, Eun and Kolodny (1995) and that of Bekeart and Urias (1996) in that Patro looks at a sample of 45 US closed-end country funds from 1991-1997. He only includes funds with complete data and refers to Brown et al. (1992) for survivorship in studies of performance. He uses a range of performance measures, both conditional and unconditional. He uses the MSCI as a mean-variance efficient benchmark following Chang et al. (1995). Patro uses two multifactor models to test security selection

ability. Like other researchers, Patro (2001) compares the performance of closed-end country funds with the US market index, but does not find that the closed-end country funds outperformed the US index. He also compares the performance of 45 closed-end country funds with that of 35 national market indices and finds that, after adjusting for risk, the shares of the US-based closed-end country funds did not have superior performance as compared with their respective local market indices.

Some papers focus on crisis periods and the response of the closed-end country fund premium to a crisis in the country the fund invests in. Frankel and Schmukler (1996) analyse the Mexican crisis of 1994 and find large premiums in funds investing in Mexico. They argue that these large premiums are caused by information asymmetries which cause US and local investors to value shares differently. Levy-Yeyati and Ubide (2000) also find that closed-end country fund premiums increase dramatically during crises in the country the fund invests in. Decomposing the premium into movements in the NAV and share price, they find that the reason for the high premiums is that local investors react more quickly to the local crisis, causing the NAV to fall quickly, whereas US investors react more slowly, causing the share price to decrease less than the NAV which gives rise to premiums. They also argue that changes in world market conditions are more likely to affect the share price than the NAV and find a significant negative relation between changes in fund premiums and variations in the MSCI, and a significant positive relation between changes in fund premiums and local market indices.

This interpretation is developed further in Chandar and Patro (2000). They examine 25 currency crises between 1988 and 1997 and the changes in premium in 18 closed-end country funds, 12 of which invest in emerging markets. They show

that the premiums and the volatility of the premiums of emerging market funds (and also to a lesser extent of developed market funds) show a dramatic increase at times of currency crises and that these increases only correct themselves slowly over time. They argue that this is the result of the fact that the NAV and the share price of closed-end fund have different risk exposure with the NAV being more sensitive to changes in the local market index and the share price being more sensitive to movement in the global market. At a time of currency crisis, this difference causes the NAV to react quickly to the drop in value of the local market, while the share price reacts more slowly, due to its global sensitivity.

Errunza, Senbet and Hogan (1998) argue that several factors affect country fund premiums. Key amongst them are the level of access foreign investors have to the country; the extent to which the securities can be substituted by securities displaying similar characteristics in the home country; and the influence of the global market. Essentially this is a development of the concept from Bonser-Neal et al. (1990). They predict that if there are controls on capital inflows to countries and restrictions on international arbitrage there will be premiums on the corresponding country fund. If there are no restrictions there will be no premiums or discounts on the country fund. They construct a theoretical model based on this hypothesis and test the predictions of the model on both developed and emerging market funds. They find significant support for a global factor in the premium of both emerging and developed market funds. They also examine the extent to which the country fund price return is explained by the country (domestic) market factor, a US factor and a global country fund index which captures noise trading across all funds. They find that this global market factor correlates clearly with country fund returns even in the

presence of the US and local markets. This echoes the finding of Bodurtha, Kim and Lee (1995) who attribute this common movement in country fund premiums to investor sentiment, however. Errunza, Senbet and Hogan (1998) discuss the policy implications of their findings. They suggest that closed-end country funds should be invested in local assets which do not have substitutes in the home market, such as natural resources; they also argue that the introduction of country funds can improve pricing efficiency in emerging markets and that therefore international agencies may wish to introduce measures to stabilise country fund prices.

Somewhat similar in approach to Errunza, Senbet and Hogan (1998) is the theoretical paper by Eun, Janakiramanan and Senbet (2002). In this paper they use a framework of market equilibrium in international markets when there are investment barriers. They suggest that country fund premiums and discounts arise from differences in demand in the home and host countries for substitutable securities. If the fund has as many securities as are required by the difference in demand for substitutable securities between the home and foreign investor, then the fund will have neither a discount nor a premium.

Patro (2005) further extends the work of Errunza, Senbet and Hogan (1998) by empirically examining the implications of their paper in more detail on a new and larger set of country funds. He uses a sample of 34 emerging market funds from 18 countries between 1981 and 1999. He examines the effect of the market liberalisation announcements to premiums, prices and NAVs. He also examines the effect of the announcement of new funds has on the premium of existing funds in the same country. The key finding of the paper is that the country fund premiums decrease by over 8% when a new fund is announced, supporting the spanning argument of

Errunza, Senbet and Hogan (1998). Again, like Errunza et al (1998) he does not find support for the effect of loosening of investment restrictions on the premium, but finds support for a global fund factor in the price and premium of country funds. He argues that the reason liberalisation does not affect the premium is because it while the NAV increased significantly (at t10%) the share price also increased in response to the change in the NAV, causing no major impact on the premium.

While many papers focus on explaining the closed-end country fund premium, Lee and Hong (2002) examine the impact of the home and foreign market in explaining the returns on closed-end country funds. Although similar in spirit to the paper by Bodurtha, Kim and Lee (1995) the paper by Lee and Hong differs in that it uses a VAR framework to analyse the impact of US market returns, exchange rate returns, local market returns in the local currency and closed-end country fund returns. They find, unlike Bodurtha, Kim and Lee, that the returns of closed-end country funds are less influenced by US market returns than by the returns in the foreign market they invest in. This implies that the funds are providing a diversification benefit to investors.

Nishiotis (2004) revisits the hypothesis of Bonser-Neal et al. (1990) that the country fund discount is related to investment restrictions. In his study which focuses on 10 emerging market country funds in 9 countries between 1986 and 1994 Nishiotis argues that there are indirect barriers to investment as well as direct barriers, particularly in emerging markets and that these influence the pricing of closed-end funds. He suggests that this can explain why some emerging market country fund premiums drop when direct barriers are lifted but other emerging market country fund premiums do not drop. He proxies for these indirect barriers

using market turnover to estimate market liquidity and country credit ratings published by international banks to estimate political risk. He also includes the variability of monthly inflation to estimate macroeconomic stability. He finds evidence broadly consistent with the hypothesis that indirect investment barriers affect closed-end country fund premiums. He reruns the tests of Bonser-Neal et al. (1990) on his sample and finds conflicting evidence. He argues that the lack of relationship between the announcement and premium is due to the influence of political and macroeconomic events at the time i.e. indirect investment barriers. One issue with the paper is that there does not seem to be a robust direct barrier proxy as an alternative to the indirect barriers and so competing explanations are not explored in depth.

Returning to the theme of the closed-end country fund premium and investment barriers, Nishiotis (2006) looks at the relation between international capital flows from the US Treasury and the closed-end country fund premium. The aim of using international capital flows is to find a measure of segmentation that is not based on a specific asset pricing model. He argues that the degree to which markets are segmented by investment barriers will be reflected in the capital flows to these markets. He builds on his previous argument that direct investment barriers are associated with a premium and indirect barriers with a discount. If capital flows increase to countries where there is already a premium, this indicates that the barriers are lessening and will lead to a reduction in the premium as investors react negatively to a reduction in the diversification benefit. If capital flows increase to countries where the funds operate at a discount, it indicates that there is a reduction in indirect barriers and this will lead to a reduction in the discount as investors react

positively. He uses a co-integration analysis and finds a relation between international capital flows and the closed-end country fund premium in eight out of seventeen markets. He finds that while most developed countries are not segmented, most emerging countries are segmented with some becoming less segmented over time.

Somewhat similar in spirit is the paper by Chan et al. (2008) (discussed in 2.2 above) who argue that segmentation plays a role in the discount. They focus mainly on market and fund illiquidity as the source of part of the variation in the country fund premium. If capital markets are segmented, they argue, it follows that the country fund premium will be positively affected by asset illiquidity but negatively affected by share price illiquidity. Although their paper focuses on the illiquidity argument, they use the Edison Warnock (2003) measure of restriction on investment availability as one of their control variables. This measure is the ratio of the value of the market that is accessible to foreign investors to the global value of the market. They find that over their sample period (1987-2001) the Edison Warnock measure is significantly positively related to the premium, supporting the hypothesis of Bonser-Neal et al. (1990).

Jones and Stroup (2010) highlight a problem in previous studies that look at the relation between investment barriers and the closed-end country fund premium: the choice of barriers. They argue that 'the choice of barrier examined is highly subjective' and therefore they use the Economic Freedom Index measure which comprises both direct and indirect investment barriers. They argue that the level of economic freedom a country enjoys can partly explain whether closed-end funds investing in that country have discounts or premiums. They test the hypothesis that

the greater the economic freedom becomes, the more the discounts and premiums will reduce. This is because the market frictions leading to differences in price between the fund and the underlying assets are reduced as a result of greater market integration. The results of their regressions are significant in the quadratic model, although not in the linear model, providing evidence to support their hypothesis that greater economic freedom is associated with smaller discounts and premiums.

Kim and Song (2010) investigate again the role of direct and indirect barriers as they argue that previous studies show conflicting evidence: Chan et al. (2008) find a positive relation between the closed-end fund premium in emerging markets and country illiquidity, whereas Nishiotis (2004) finds a negative relation between indirect barriers and the fund premium. Furthermore, Kim and Song argue that the effect of the direct barriers on the premium should be weaker in the post-liberalisation period. They therefore examine the period 1995-2004, the post-liberalisation period, and find a that indirect barriers have a stronger impact on the closed-end fund premium, whereas direct barriers, proxied by the Standard and Poor's Investable Weight Factor, do not have a significant impact on the premium. The study is original in that it looks at a range of factors not previously addressed but because it uses annual data, it has less descriptive power than the other papers in this area.

The table below summarises the key articles on market segmentation and closed-end funds.

Table 2.3: Segmentation Studies

Author	Published	Sample origin	Sample size	Sample period	Explanation examined	Findings confirmatory?
Bonser-Neal et al	J Fin 1990	US	33 domestic & 14 country funds	1981-1989	Premiums arise when closed-end fund is unique investment vehicle into restricted country	Partially
Chang, Eun & Kolodny	J Bank & Fin 1995	US	15 country funds with 2 year trading history	1985-1990	Segmentation effect. Examine co-integration of prices and NAVs. Examine performance relative to MSCI and potential diversification benefit	Partially. Emerging fund prices and NAVs not co-integrated so potential diversification benefit. Find only one fund outperforms.
Choi & Lee	Rev Quant Fin & Acc 1996	US	21 country funds	1978-1990	Premiums reflect restrictions but also other factors	Partially
Bekaert & Urias	J Fin 1996	US/UK	43 US country funds & 37 UK funds (single country & diversified)	1986-1993	Closed-end country funds provide diversification benefits as compared with IFC investable indices. Effect of liberalisation on diversification benefit.	Yes for UK emerging market funds. Not for comparable US funds. Only 1 of 4 emerging market countries showed reduced diversification benefit after liberalisation.
Errunza, Senbet & Hogan	Int Jnl Theor & App Fin 1998	US	32 closed-end country funds.	1993-1994	Returns on funds are affected by global market, restrictions on capital flows and availability of substitutes. Lack of substitutes and capital restrictions increase the premium.	Find significant influence of access and global factor in emerging market funds. Global factor in developed market funds.
Frankel & Schmukler	NBER Working Paper 5714 2000	US	3 Mexican closed-end funds	1990-1996	Premiums during the Mexican crisis of 1994 were caused by Mexicans selling shares before international investors.	Yes. They find that NAVs fell more quickly than prices and that NAVs granger-cause the price movement.
Chandar & Patro	Pacific Basin Fin Jnl 2000	US	25 currency crises, 18 funds	1988-1997	Premiums during crises are caused by a differential in risk exposure between the NAV and the share price.	Yes. They find that NAVs are more sensitive to a local market drop in value, whereas the share price reacts less as it is more strongly related to global market

						movement.
Levy-Yeyati & Ubide	IMF Staff Papers 2000	US	24 single country funds	1994-1998	Premiums during country crises reflect information asymmetry between home and foreign investors.	Yes. Premiums in crisis countries increase, but decrease in other emerging market countries due to US investor risk aversion.
Patro	J Bank & Fin 2001	US	45 single country funds	1991-1997	Examines performance of funds using a range of measures compared to world market and local market indices	Neither share price nor NAV outperforms local market or world market indices.
Eun, Janakiramanan & Senbet	Jnl Int Money & Fin 2002				Theoretical paper. Argues that country fund premiums and discounts arise from differences in demand in the home and host countries for the underlying assets.	
Hong & Lee	Jnl Int Money & Fin 2002	US	33 single country funds	1995-1999	Argue that closed-end country funds provide an effective means of diversification as their returns are more related to the foreign market than the US market.	Use a VAR framework to analyse returns to closed-end country funds and find evidence for their hypothesis.
Nishiotis & Makris	2004	US	10 emerging market closed-end funds	1989-2001	Indirect barriers as well as direct barriers to investment play a role in emerging market fund premium.	Generally confirmatory. Find contradictory evidence when they rerun tests of Bonser-Neal et al. (1990)
Patro	2005 J Bus	US	All 34 emerging market country funds	1981-1999	Examines implications of Errunza, Senbet & Hogan applied to larger more recent sample.	Like Errunza et al (1998) does not find support for loosening of restrictions on premium but does on NAV at 10% and on share price at lesser effect. He finds support for sensitivity of premiums to announcements of new funds.
Nishiotis	2006 J Bus	US	17 closed-end country funds	1989-1996	Examines the relation between the closed-end fund premium and international capital flows.	Yes. Finds evidence of segmentation in most of the emerging markets with some becoming less segmented over time.
Jones & Stroup	2010 Applied Fin Economics	US	26 closed-end country funds	2000-2006	Hypothesis is that closed-end fund premiums and discounts reduce as economic freedom increases.	Yes. Finds that funds investing in countries with greater economic freedom have smaller discounts and premiums.
Kim & Song	2010 Int Rev of Econ &	US	55 closed-end country funds	1995-2004	Argues that indirect investment barriers are associated with	Yes. Finds that indirect investment barriers are associated with increased premiums and

	Fin				increased premiums.	after market liberalisation relation between premium and country risk increases.

2.5 Conclusion

Research into closed-end funds over the past has contributed substantially to our understanding of the complexity of the issue. Arguments have continued over the influence of investor sentiment in closed-end fund pricing and in asset pricing in general. The research has been dominated by US closed-end fund findings. As US closed-end funds are owned primarily by individual investors this is the reason for the continuing emphasis on the role of individual investor sentiment. Alternative explanations based on agency and liquidity issues and various forms of segmentation continue to be suggested as the various puzzles associated with closed-end funds continue to present a challenge and an opportunity for various explanations.

Two central papers in the closed-end fund debate are those of Lee, Shliefer and Thaler (1991) and De Long et al. (1990) and these papers have had a much wider influence on asset pricing in general. Despite the contested statistical significance of the results and the studies that found different results from the same data, the concept of individual investor sentiment has became widely accepted. As Cochrane (2001) observes, 'influential empirical work tells a story' (p302). He points out that the CAPM survived many statistical rejections, and we would argue that the noise trader model of Lee, Shleifer & Thaler (1991) or more generally the concept of investor sentiment was likewise accepted despite criticism of the empirical evidence because it also gives 'a coherent view of the world' (ibid).

3. Data Description

In order to build a sample of closed-end funds over several years we have used a range of resources in different locations. In this chapter we describe the data collection process, the contents of the sample and features of the data. We begin by describing all UK funds over the sample period to give an overview of the characteristics of the various closed-end fund investment groups. We then describe the features of closed-end country funds in detail. Section 1 describes the data sources used to form the whole sample and Section 2 describes the formation of the sample. Section 3 describes the whole sample over time, while Section 4 provides and analyses summary statistics of the main groups within the sample. Section 5 gives a description of closed-end country funds and Section 6 concludes.

3.1 Data Sources

Our aim was to collect as complete a sample as possible of conventional UK closed-end funds. The entire sample consists of 333 UK closed-end funds and runs from 31 December 1993 to 31 December 2009. This includes the 59 closed-end country funds which provide the basis of the analysis in Chapters 4 to 6. The reason for beginning in 1993 is that funds that end before 1993 often do not provide data on diluted Net Asset Value (NAV) but only on par NAV. If the fund had not issued warrants then the diluted NAV should be the same as the par NAV, but several of the funds had issued warrants and so the par NAV could potentially differ from diluted NAV.[11]

[11] The sample used in Chapter 4 begins in December 1992, as we were able to obtain diluted NAV for these funds.

1993-2009: From 1993 onwards the primary source of information used to identify the sample of UK closed-end funds is the monthly periodical 'Money Management'. The February edition is consulted for each year, or the edition for the month as close to February as possible to give a year-end list of investment trusts.

The following sources are also used:

1990-1995: *Investment fund index: investment trusts*, edited by Jane Green, and published by Centuar Communications, London. This was published in March and September each year and the March edition is used.

1996-2001: For this period the *Investment trust year book*, published by Credit Lyonnais is used. The 1997 edition is not available.

2000-2007: AITC Historic Total Expense Ratios. This is a list of UK closed-end funds each year with information on investment objectives and expenses.[12]

3.2 Sample Formation

The above sources were used to identify the list of closed-end funds alive in each year and their investment objectives. We exclude the following categories of closed-end fund: split capital, venture capital, private equity and specialist trusts such as those investing in biotechnology firms. The reason we exclude these funds is that the movement in their share prices or net asset values may be influenced by factors additional to those influencing conventional funds.

[12] Sent to the author by the Statistics Department of the AIC

This gave a total of 333 funds which were then subdivided into groups according to their investment objectives. We use the divisions currently used by the AIC on their website.

1. Global Closed-end Funds (66)
2. UK Closed-end Funds (124)
3. Europe (39)
4. North America (I have included the one Canada fund in this category) (13)
5. Emerging Markets (33)
6. Asia Pacific (58)

The fact that there is both wide spread of UK closed-end funds by investment objective but at the same time a common factor in the regulation and pricing structure of the funds allows us to make comparisons between funds and between countries as well as making comparisons over time.

The chart below (Figure 3.1) shows the composition according to the objectives of the funds. Clearly the UK is the largest single investment area, but taken overall, most of the sample represents funds invested abroad, either in single countries or across more than one country.

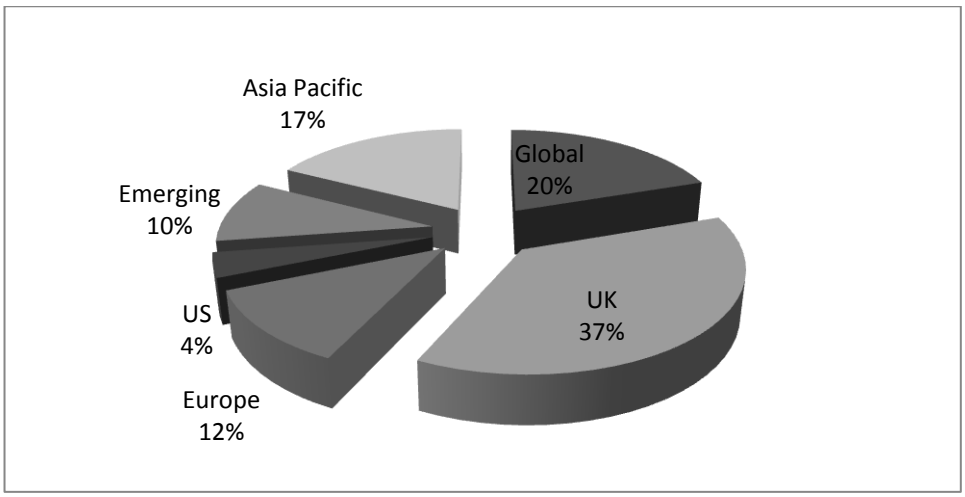


Figure 3.1 Fund Investment Areas: Each of these groups is made up of smaller groups of closed-end funds. We use the current names for each group (in italics). Two previous naming systems for the groups were introduced by the AIC in 1990 and 2001 and these are referred to in brackets.

1. Global Closed-end Funds

This group is made up of the following sub-groups:

Global Growth (Formerly International: Capital Growth and International: General)

Global Growth and Income (Formerly International: Income Growth)

Global Smaller Companies (Formerly Smaller Companies: International)

2. UK Closed-end Funds

This group is made up of the following sub-groups:

UK Growth (Formerly UK: General and UK: Capital Growth)

UK Growth and Income (Formerly UK: Income Growth

UK High Income (Formerly High Income)

UK Smaller Companies (Formerly Smaller Companies: UK)

3. Europe

This group is made up of the following sub-groups:

Country Specialists: Europe (Formerly Europe: Single Country)

Europe (Formerly Europe, Pan Europe and Continental Europe)

European Smaller Companies (New grouping)

4. North America

This group is made up of the following sub-groups and was unchanged:

North America (Unchanged)

North American Smaller Companies (New grouping)

5. Emerging Markets

This group is made up of the following sub-groups:

Country Specialists: Latin America (New grouping)

European Emerging Markets (New grouping)

Global Emerging Markets (Formerly Emerging Markets)

Latin America (New grouping)

The former category: Emerging Markets: Single Country was redistributed among various groups.

6. Asia Pacific

This group is made up of the following sub-groups:

Asia Pacific – Excluding Japan (Formerly Far East: Excluding Japan)

Asia Pacific – Including Japan (Formerly Far East: Including Japan)

Country Specialists: Asia Pacific (Formerly Far East: Single Country and Emerging Markets: Single Country)

Japan (Unchanged)

Japanese Smaller Companies (New grouping)

Databases

Once the fund sample had been identified from the resources above, the history of each fund was collected from the London Share Price Database (LSPD) using the Names file for 2010. This database gives details of each company which has issued shares on the London Stock Exchange since 1955. Because the database begins in 1955 it gives 1955 as the listing date to all of the closed-end funds in existence at that time, although many UK closed-end funds date back much further. LSPD assigns a number to each company which remains the same throughout the history of the fund, even if the fund changes name. It also gives the reason why the fund may have changed name. This is particularly important for UK closed-end funds as over one third of the funds in the sample had changed name at least once and many had changed name more than once. This LSPD database was used to gather the history of each trust. However, LSPD does not provide the net asset value of closed-end funds and so it could not be used to gather all of the data. Thompson Datastream was therefore was used to collect the raw data on each fund. The disadvantage of Datastream, however, is that it does not provide a history of each company. As a result, a closed-end fund with several name changes throughout its history, such as JPMorgan European Investment Growth (formerly JPMorgan Fleming Continental

European, Fleming Continental European and Fleming Universal) can appear to be four different closed-end funds covering consecutive time periods. For this reason, then, both databases were used: LSPD to track the fund history and Datastream to collect the raw data.

We collect the following data on the sample of closed-end funds from December 1993 to December 2009. Chapters 4 to 6 include descriptions of additional data required for the analysis carried out in the particular chapter.

Price

The closing price is used which is a volume-weighted average of all automated trades in the last 10 minutes of trading.

Net Asset Value

The net asset value is the total value of the fund's assets i.e. the value of the shares invested in by the fund, minus all of the fund's liabilities. The total value of the assets is then divided by the number of shares.

The value of the underlying assets is estimated as follows. At the end of every year closed-end funds disclose the portfolio of securities invested in by the fund. At this point Datastream creates this portfolio and tracks the value of the portfolio until an officially published Net Asset Value is provided, which then rebases the valuation of the portfolio.

UK closed-end funds can issue warrants which may be exercised by shareholders into ordinary shares at a date in the future. If warrant holders exercise their right into the ordinary there will be more shareholders to share in the assets and

the net asset value is termed diluted (instead of net asset value at par). Datastream provides Diluted Net Asset Value as the default Net Asset Value. When we use the term NAV in this thesis we are using the Diluted Net Asset Value.

Premium

Following Chan et al. (2008) we use the natural log of the difference between the share price and the diluted Net Asset Value (NAVD) to minimise the problems posed by outlying values.

$$PREM \equiv lnShare\ price - lnNAVD$$

Return index

The return index shows the monthly theoretical growth in value of the fund share price, assuming that dividends are re-invested to purchase extra shares at the closing price on the ex-dividend date. Returns are then created as follows:

Return= ((RI_2/RI_1) -1)

where RI_2 = Return Index in month 2

RI_1 = Return Index in month 1

Diluted net asset value total return

The diluted net asset value total return index shows a monthly theoretical growth in the value of the underlying investments of the fund and is based on diluted net asset values (see above). It is assumed that dividends are re-invested to purchase extra shares at the closing price on the ex-dividend date. Returns are then created from the index as follows:

Return= $((NAVDRI_2/NAVDRI_1) -1)$

where $NAVDRI_2$ = Net Asset Value (Diluted) Return Index in month 2

$NAVDRI_1$ = Net Asset Value (Diluted) Return in month 1

Turnover by volume

This shows the number of shares traded for a stock. The figure is always expressed in thousands.

Dividend yield

The dividend yield expresses the dividend per share as a percentage of the share price. The underlying dividend is based on an anticipated annual dividend and excludes special or once-off dividends. Dividend yield for UK shares is calculated on gross dividends (including tax credits).

Market value

This is the share price multiplied by the number of ordinary shares in issue. This figure is updated whenever there is a new share issue or after capital changes. It is expressed in millions of pounds sterling. In regressions the natural log of market value is used as there is a considerable difference in fund size.

Age

Age is calculated as years since IPO with each month being 1/12 or 0.083. In regressions the natural log of age is used as there are some very long-lived funds, such as JPMorgan American Investment Trust which was launched in 1881.

Expense Ratio

The UK Association of Investment Companies (AIC) produces an annual list of expense ratios for each closed-end fund that is based on the total annual expense divided by the NAV, known as the Total Expense Ratio (TER). Expenses include management fees and operational expenses of the trust, but do not include performance fees. Our data is taken from the AIC yearbooks, the AIC website and annual reports. We also used the AITC Historic Total Expense Ratios. This is a list of UK closed-end funds each year with information on investment objectives and expenses.[13]

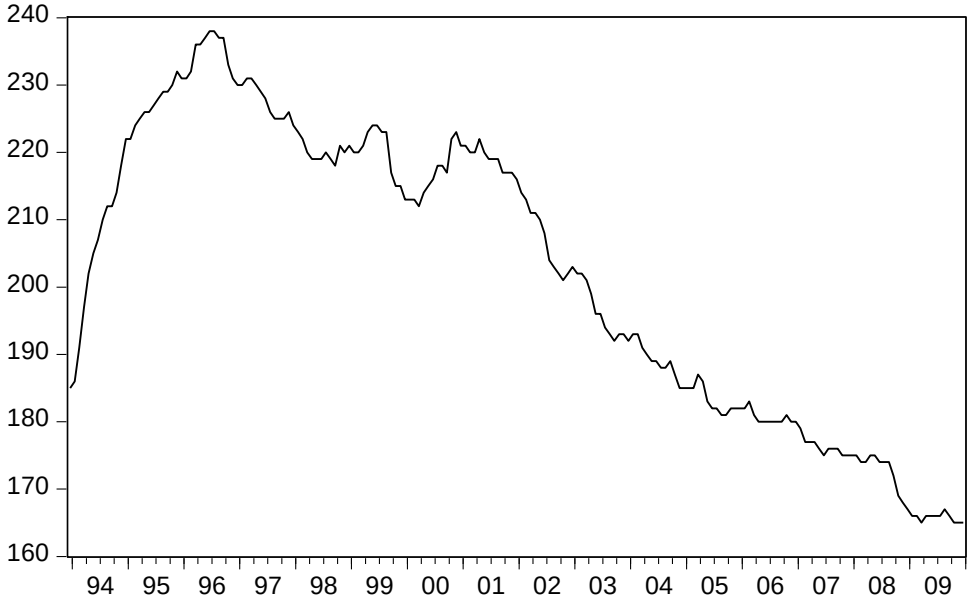
3.3 Whole Sample Description

3.3.1 Number of Funds

Figure 3.2 shows that the number of UK closed-end funds increased rapidly in the late 1990s when there was a bull market to a maximum of 238 in 1996 but has been declining steadily since then. In the sample there is an average of 202 funds per year.

[13] Sent to the author by the Statistics Department of the AIC

Figure 3.2: Number of Closed-end Funds per Month (1993-2009)

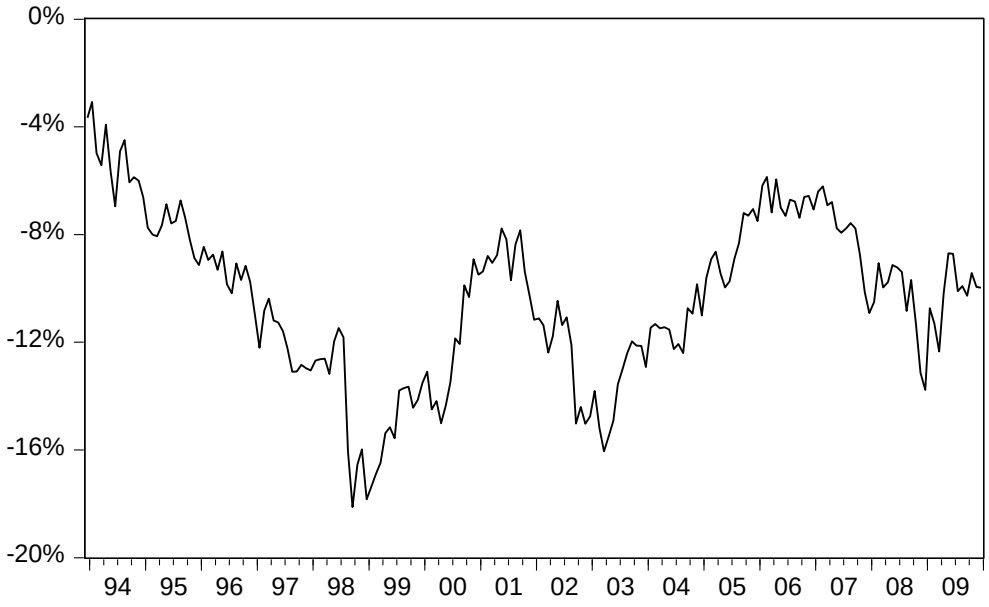


3.3.2 Premium

Figure 3.3 shows the average monthly premium across all closed-end funds throughout the sample period. It is comparable with the graph in Dimson and Paluello (2002), although they do not include emerging market funds in their sample. The mean of the average premium is -10.37%. The maximum premium was 152.56% achieved by the short-lived Quilter Global Enhanced Income Fund just before it was liquidated. The price was 42p and the NAV had dropped to 16p. This shows how extremes of positive and negative premium are usually caused by troubled and often short-lived funds: either the share price or the NAV completely drops away, giving rise to these extreme values. The lowest premium of -82.46% was achieved by the again short-lived Langley Park investment trust at the outset of its career: the price had fallen from the usual initial 100p to 15p four months later while the NAV had only fallen from 100p to 85.5p.

We include in our sample all of the data provided on Datastream from the initial listing date until the company ends. Where the price or NAV was less than 10p we have recorded a missing value as this tends to result in extremes of NAV and premium. Many of the funds began well before Datastream or LSPD began and we record the IPO date for such funds.

Figure 3.3: UK Closed-end Fund Premium 1993-2009



3.3.3 Return

The average monthly share price return across the funds over the sample period was 0.59%, whereas the average monthly return on the FTSE All-share Index was 0.34%. Of course not all funds are included each month as funds begin and end during the sample period. Figure 3.4 shows how the average monthly return on UK closed-end funds is similar to the average monthly return on the stock market as a whole, reflecting the fact that a large number of UK funds are in fact invested in UK companies.

Figure 3.4: Closed-end Fund Return and UK Market Return 1993-2009

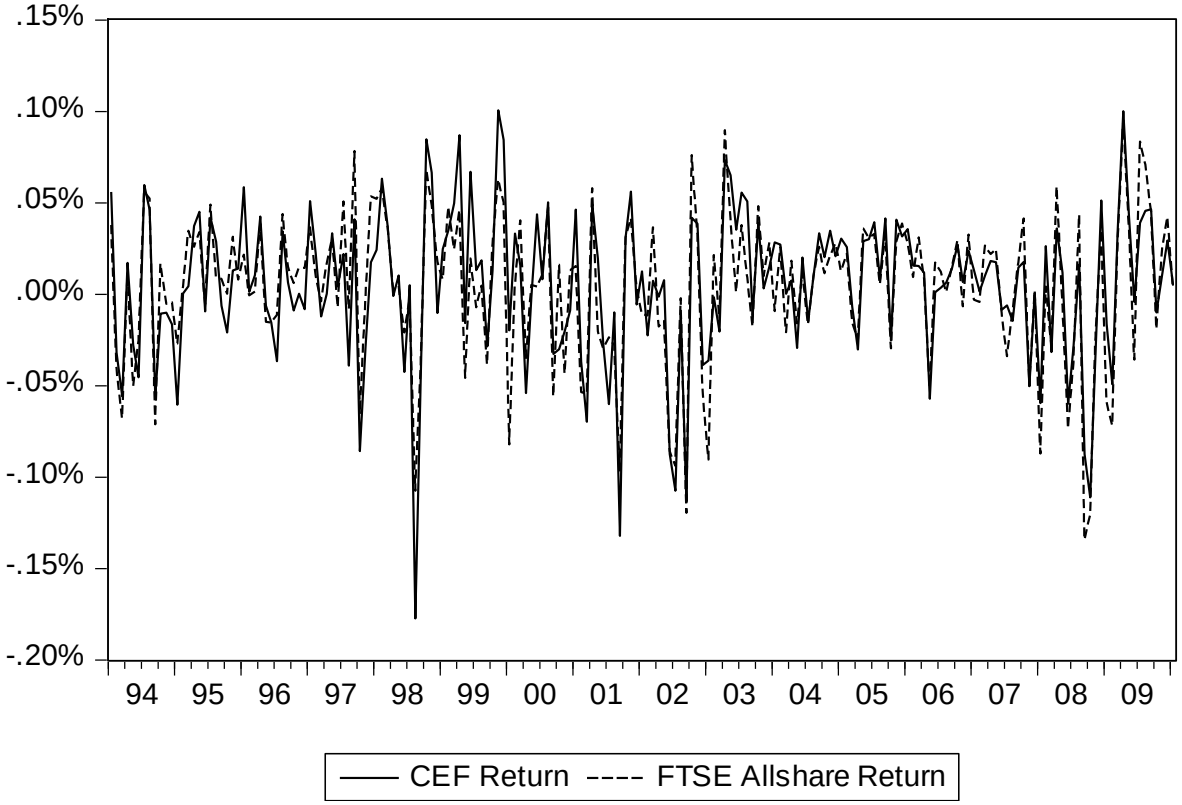
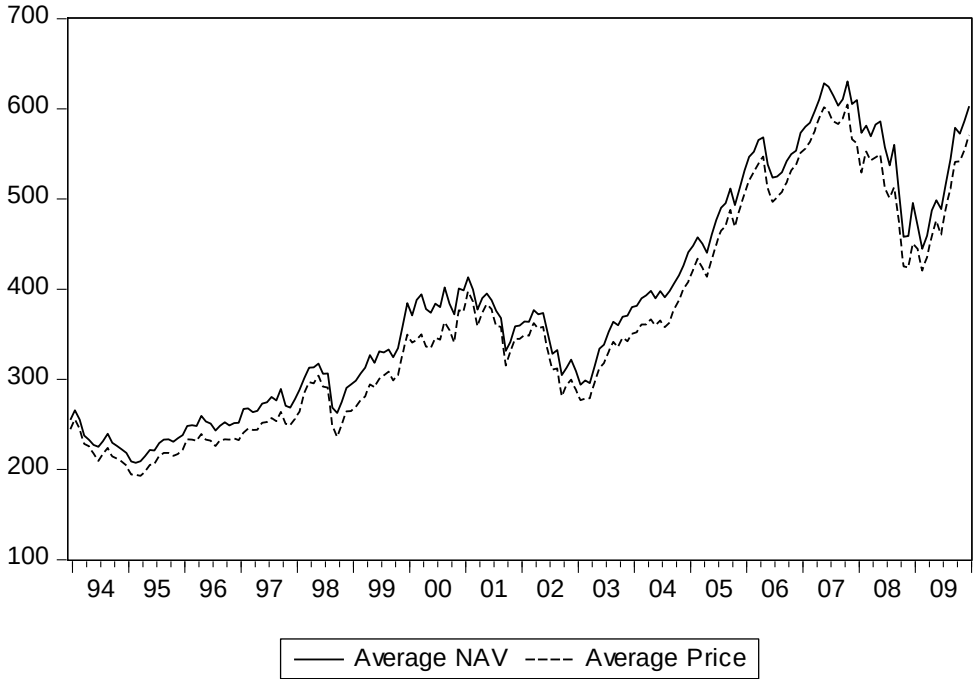


Figure 3.5 shows the close relation between the average UK closed-end fund price and NAV over the sample period. The average NAV is consistently above the average price, creating the characteristic negative premium (discount).

Figure 3.5: Average Fund Price (pence) and Net Asset Value (pence) 1993-2009



3.4 Sector Analysis

As referred to in section 3.1 above, the 333 UK closed-end funds were assigned to six groups, according to the six main divisions currently used by the AIC. These are:

1. Global Closed-end Funds
2. UK Closed-end Funds
3. Europe
4. North America (I have included Canada in this category)
5. Emerging Markets
6. Asia Pacific

This meant assigning funds to groups according to their investment objectives. The grouping of funds according to investment objective was according to the information in the Investment Trust yearbooks, the AIC website and the periodical

'Money Management' (see section 3.1 above). Usually the investment objective corresponds to the name of the fund but in some cases the name and the investment objective do not correspond. This happens with the Advance UK Fund and British Assets, British Investment Trust, Scottish American and Scottish Eastern. Despite their names, the funds have an international investment objective and so they are assigned to the Global Closed-end Funds group. Some funds seem to cross the boundaries between two groupings, such as the Eastern European Trust, which occupies the sub-category: European Emerging Markets. In this case the fund is assigned to Emerging Markets, rather than to Europe, as it seems to have more in common with other emerging markets than with other European markets.

The other issue that arises occasionally is that some funds change objective during the sample period. This may not necessarily affect the grouping as, for example, a fund may change objective from Global Growth to Global Growth and Income or Global Smaller Companies and still remain within the first general grouping of Global Closed-end Funds. Where other funds have changed objective we assigned them to the group appropriate to the investment objective which they held for most of their history.

Figure 3.6: Number of Funds According to Investment Objective 1993-2009

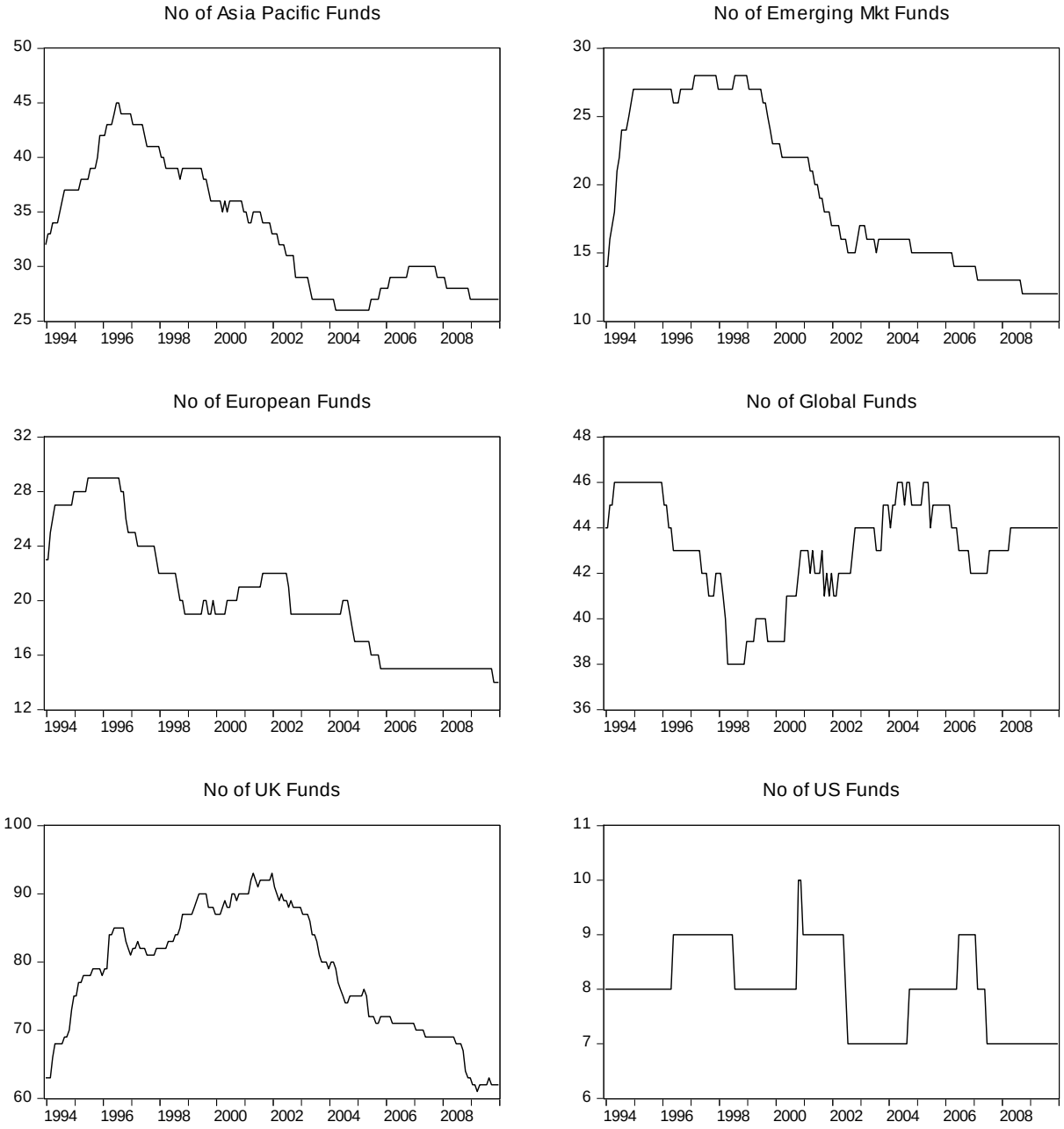


Figure 3.6 shows clear differences in the number of funds being launched and disappearing, depending on their investment area. Asia Pacific, European and Emerging Market funds both show a similar pattern of declining numbers after an

initial increase in the mid 1990s. UK funds show a longer increase in number but are also followed by a decrease from early 2000s onwards. Global funds on the other hand show an almost exact opposite pattern. Despite dropping in number in the late 1990s they have continued to increase. The few US funds also continue steadily.

In the section below (Figure 3.7 and Tables 3.1 to 3.9) we analyse the monthly time series average premium, price, net asset value (NAV), share price return, NAV return, age, market value, turnover and dividend yield for each sector.

3.4.1 Average Group Premium

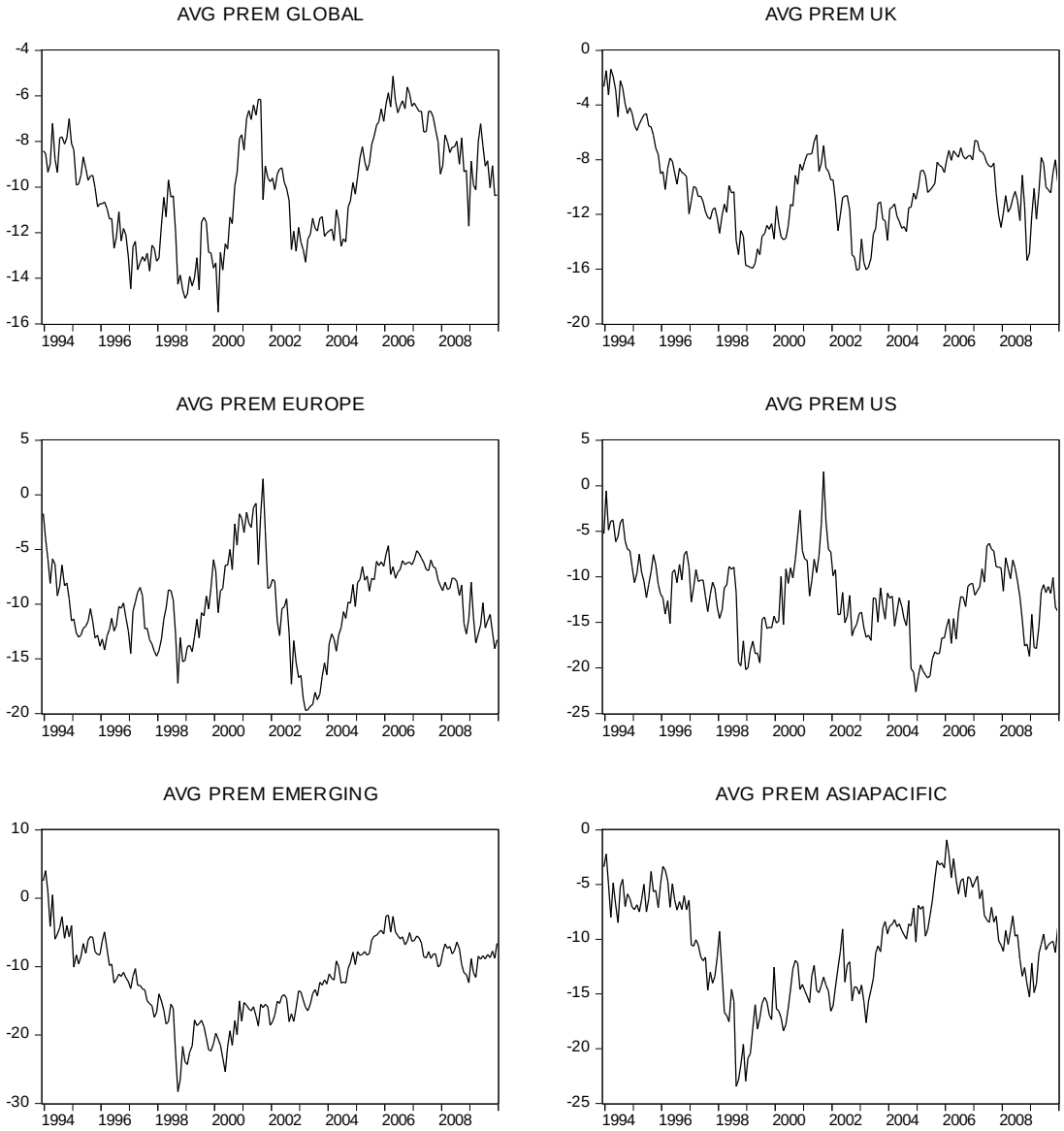


Figure 3.7: Average Group Premium

Figure 3.7 above shows some features in common between the different groups but also some differences. Global funds, as might be expected, show the least volatility

in terms of the average premium whereas emerging market funds show the greatest volatility. They have both the lowest and the highest premium. This is shown in Table 3.1, which provides summary statistics of the monthly cross-sectional average premium across each sector.

Table 3.1: Average Monthly Premium

	Global Funds	UK Funds	European Funds	US Funds	Emerging Mkt Funds	Asia Pacific Funds
Mean	-10.05	-10.04	-9.92	-12.15	-11.74	-10.55
Standard Error	0.17	0.23	0.29	0.32	0.42	0.34
Median	-9.90	-10.22	-9.87	-11.90	-11.10	-10.18
Standard Deviation	2.42	3.23	4.05	4.39	5.89	4.72
Sample Variance	5.86	10.43	16.44	19.30	34.64	22.28
Kurtosis	-0.99	-0.06	-0.03	-0.07	-0.21	-0.47
Skewness	-0.05	0.34	-0.04	0.03	-0.29	-0.33
Range	10.35	14.69	21.19	24.19	32.33	22.53
Minimum	-15.48	-16.07	-19.72	-22.64	-28.29	-23.44
Maximum	-5.13	-1.39	1.47	1.55	4.04	-0.91
Sum	-1940.60	-1937.90	-1915.32	-2344.23	-2266.63	-2036.82

3.4.2 Average Group Price

Table 3.2 shows the large difference in average price between the different groups. The high price of global funds may be partly due to the age of some of these funds, several of which are over a hundred years old as well as the closed-end structure of the funds. There is also a wide variation in the prices of global funds as seen in the high standard deviation, driven by a few funds such as the Personal Assets Trust which ended 2009 with a share price of £280.75. The average monthly prices of all the other groups of funds are more comparable.

Table 3.2: Average Monthly Price (pence)

	Global Funds	UK Funds	European Funds	US Funds	Emerging Mkt Funds	Asia Pacific Funds
Mean	916.55	220.41	264.62	354.89	144.50	135.14
Standard Error	20.82	4.23	8.36	6.77	5.92	3.13
Median	923.21	208.60	231.93	362.50	107.23	131.83
Standard Deviation	289.27	58.83	116.11	93.99	82.23	43.53
Sample Variance	83679.74	3460.85	13481.55	8834.59	6762.39	1894.60
Kurtosis	-0.88	-0.32	-0.64	-0.69	0.18	-1.04
Skewness	-0.26	0.70	0.74	0.10	1.19	0.00
Range	1045.22	241.24	418.53	396.51	305.62	177.59
Minimum	385.08	133.52	123.87	187.56	56.28	45.82
Maximum	1430.30	374.76	542.40	584.07	361.90	223.41
Sum	176894.13	42538.75	51071.89	68493.08	27889.05	26082.27

3.4.3 Average Net Asset Value

The average net asset values are what we would expect from Figure 3.5 above which shows average net asset values consistently above the share price. Global funds show a huge variation in the net asset value as well as the largest difference between average net asset value and average price.

Table 3.3: Average Monthly Net Asset Value

	Global Funds	UK Funds	European Funds	US Funds	Emerging Mkt Funds	Asia Pacific Funds
Mean	946.48	243.05	290.62	400.85	160.45	149.53
Standard Error	20.98	4.60	8.75	7.56	6.14	3.16
Median	970.24	234.81	261.41	415.33	121.17	150.03
Standard Deviation	291.52	63.86	121.60	105.09	85.35	43.96
Sample Variance	84982.49	4077.52	14785.73	11044.71	7284.42	1932.07
Kurtosis	-0.90	-0.49	-0.63	-0.75	0.44	-0.97
Skewness	-0.28	0.55	0.73	-0.11	1.28	-0.01
Range	1041.56	257.50	436.45	421.98	322.66	182.76
Minimum	413.84	146.40	138.69	208.61	70.04	59.49
Maximum	1455.40	403.91	575.14	630.60	392.71	242.25
Sum	182670.16	46909.52	56090.60	77363.18	30966.56	28860.25

3.4.4 Average Monthly Share Price Return

Table 3.4 shows that the average monthly share price return is highest for emerging market funds. If we annualize the returns we see that emerging market funds have achieved a yearly average return of 10.8%, but again the volatility of the emerging market return is the highest. The Asia pacific funds have the lowest average monthly return and also a high volatility.

Table 3.4: Average Monthly Share Price Return

	Global Funds	UK Funds	European Funds	US Funds	Emerging Mkt Funds	Asia Pacific Funds
Mean	0.007	0.006	0.007	0.004	0.009	0.004
Standard Error	0.003	0.003	0.004	0.004	0.005	0.005
Median	0.014	0.011	0.015	0.005	0.014	0.006
Standard Deviation	0.045	0.048	0.059	0.052	0.073	0.067
Sample Variance	0.002	0.002	0.004	0.003	0.005	0.005
Kurtosis	1.971	2.373	2.381	1.249	2.470	0.800
Skewness	-0.960	-0.790	-0.867	-0.670	-0.806	-0.111
Range	0.295	0.341	0.366	0.333	0.510	0.425
Minimum	-0.162	-0.170	-0.204	-0.190	-0.330	-0.208
Maximum	0.133	0.171	0.163	0.143	0.181	0.217
Sum	1.275	1.235	1.274	0.812	1.806	0.724

3.4.5 Average Monthly Diluted NAV Return

Table 3.5 shows that the average monthly diluted net asset value return is again highest for emerging market funds but again the volatility of the emerging market return is the highest. The Asia pacific funds again have the lowest average monthly net asset value return.

Table 3.5: Average Monthly Return on Net Asset Value

	Global Funds	UK Funds	European Funds	US Funds	Emerging Mkt Funds	Asia Pacific Funds
Mean	0.006	0.006	0.007	0.004	0.009	0.003
Standard Error	0.003	0.003	0.004	0.003	0.005	0.004
Median	0.012	0.012	0.014	0.007	0.017	0.009
Standard Deviation	0.043	0.045	0.055	0.046	0.068	0.060
Sample Variance	0.002	0.002	0.003	0.002	0.005	0.004
Kurtosis	1.245	2.449	2.427	1.100	1.820	0.836
Skewness	-0.862	-0.924	-0.818	-0.678	-0.805	-0.107
Range	0.250	0.307	0.380	0.260	0.437	0.387
Minimum	-0.148	-0.171	-0.206	-0.167	-0.280	-0.186
Maximum	0.103	0.136	0.174	0.093	0.157	0.201
Sum	1.167	1.227	1.299	0.780	1.661	0.563

3.4.6 Average Age

Table 3.6 shows that the average age of the funds existing each month varies considerably between the groups. The widely diversified global funds are the longest survivors. Emerging market funds are the youngest funds reflecting the more recent access to these markets. Age is calculated in terms of years with each month being 1/12 or 0.083.

Table 3.6: Average Monthly Age of Funds

	Global Funds	UK Funds	European Funds	US Funds	Emerging Mkt Funds	Asia Pacific Funds
Mean	47.11	22.78	15.15	28.59	8.52	17.85
Standard Error	0.11	0.20	0.21	0.09	0.30	0.21
Median	46.85	21.51	14.33	28.56	8.64	17.16
Standard Deviation	1.53	2.73	2.85	1.23	4.21	2.85
Sample Variance	2.34	7.43	8.13	1.51	17.76	8.13

Kurtosis	-1.01	-0.44	-0.75	-0.46	-1.20	-1.14
Skewness	0.37	0.84	0.42	0.05	0.08	0.34
Range	5.80	9.77	10.59	5.63	14.09	10.15
Minimum	44.84	19.79	10.56	25.80	1.97	13.46
Maximum	50.64	29.55	21.15	31.44	16.06	23.61
Sum	9092.86	4396.68	2924.19	5518.06	1644.50	3444.15

3.4.7 Average Monthly Market Value

Table 3.7 shows that the average market value of the funds existing each month again varies considerably between the groups. The widely diversified global funds are by far the largest in terms of market value. Emerging market funds are not the smallest funds, as one might expect, being on average the youngest group of funds, but are the second largest by market value. UK funds are perhaps surprisingly the second smallest group by average market value. The large market value of the closed-end funds in general is related to the closed-end fund structure which requires a large initial capital outlay. Closed-end fund launches are sometimes abandoned if they fail to attract at least £50m. This contrasts with open-end funds which can be launched with less capital and expanded as the capital flows into the fund.

Table 3.7: Average Monthly Market Value (£m)

	Global Funds	UK Funds	European Funds	US Funds	Em. Mkt Funds	Asia Pacific Funds
Mean	334.94	121.32	152.87	127.47	159.04	98.91
Standard Error	4.57	1.93	3.67	2.09	8.67	2.00
Median	333.17	116.58	139.50	125.65	93.42	101.50
Standard Deviation	63.54	26.76	51.04	29.02	120.50	27.73
Sample Variance	4037.05	716.19	2605.19	842.42	14519.79	768.89
Kurtosis	-1.19	-0.37	-1.00	-0.58	0.18	-0.95
Skewness	0.06	0.44	0.36	0.26	1.26	-0.20
Range	246.40	120.89	198.25	132.20	442.14	115.28
Minimum	216.21	70.29	61.45	74.59	43.70	37.94
Maximum	462.61	191.18	259.70	206.79	485.84	153.22
Sum	64643.70	23414.82	29504.59	24601.46	30694.18	19089.71

3.4.8 Average Monthly Dividend Yield

Table 3.8 shows a clear difference in the dividend yield between the fund groups. UK funds are those with by far the largest average dividend yield. This reflects their emphasis on income rather than on growth, in contrast to emerging market funds which have the lowest dividend yield.

Table 3.8: Average Monthly Dividend Yield

	Global Funds	UK Funds	European Funds	US Funds	Emerging Mkt Funds	Asia Pacific Funds
Mean	2.20	3.51	2.07	1.31	0.68	1.12
Standard Error	0.04	0.07	0.12	0.14	0.03	0.05
Median	2.21	3.26	1.64	0.57	0.55	1.04
Standard Deviation	0.50	0.94	1.66	1.96	0.39	0.63
Sample Variance	0.25	0.88	2.76	3.82	0.15	0.40
Kurtosis	-0.97	0.53	6.61	20.36	1.74	1.55
Skewness	0.08	0.98	2.36	3.99	1.38	1.25
Range	2.05	4.12	9.94	15.29	1.83	3.12
Minimum	1.31	2.14	0.43	0.26	0.23	0.31
Maximum	3.35	6.27	10.38	15.55	2.06	3.43
Sum	425.43	677.41	398.64	253.49	130.90	217.02

3.4.9 Average Monthly Turnover

Table 3.9 shows that although global funds are the largest by market value, the greatest amount of monthly trading on average takes place in emerging market funds where on average nearly 5 million shares are traded per month.

Table 3.9: Average Monthly Turnover (thousands of shares)

	Global Funds	UK Funds	European Funds	US Funds	Emerging Mkt Funds	Asia Pacific Funds
Mean	4487.97	2318.47	4053.71	2363.43	4878.76	4394.74
Standard Error	148.38	66.87	174.09	118.51	132.55	163.26
Median	4025.03	2161.45	3439.36	1936.00	4683.57	3959.17
Standard Deviation	2061.37	929.06	2418.59	1646.38	1841.41	2268.15
Sample Variance	4249237.91	863144.46	5849569.74	2710559.64	3390780.41	5144494.61
Kurtosis	8.37	5.12	2.00	2.76	1.07	5.25
Skewness	1.95	1.49	1.14	1.50	0.84	1.76
Range	16160.35	6910.32	13566.54	8503.75	10490.68	15618.81
Minimum	1713.62	697.68	753.45	336.67	1180.68	1190.33
Maximum	17873.96	7608.00	14319.99	8840.42	11671.35	16809.14
Sum	866178.91	447464.98	782365.61	456141.84	941600.53	848184.72

3.5 Closed-end Country Funds

Within the European, US, Emerging Market and Asia Pacific funds there are funds focusing on specific countries, called closed-end country funds. These are funds that invest more than 80% of their assets in one particular country. In the chapters that follow we analyse issues relating to these funds in depth.

Table 3.10: Country Fund Summary Statistics

Table 3.10 reports summary statistics of UK closed-end country funds from December 1993 to December 2009. The column labelled Obs gives the number of monthly observations. The columns labeled Mean, Std. Dev. Min and Max report the average monthly premium, standard deviation, minimum and maximum values. Status is taken from LSPD records and Datastream. The column labelled Status indicates whether the fund is alive (active), has changed investment objective, has become a unit trust (unitised) or has ceased trading.

	Emerging Market Funds	IPO Date	Sample start	Closing Date	Obs	Mean	Std. Dev.	Min	Max	Status
1	Aberdeen New Thai	Dec 1989	31/12/1993	31/12/2009	193	-11.90	8.95	-31.62	8.71	Active
2	Edinburgh Java	May 1990	31/12/1993	31/05/2002	101	-9.91	12.39	-27.00	27.00	Voluntary liquidation
3	First Philippine	Dec 1989	31/12/1993	30/05/1997	41	-18.64	4.28	-27.50	-4.86	Unitised
4	Siam Selective Growth	Mar 1990	31/12/1993	31/05/2000	77	-22.19	7.63	-44.18	-1.87	Voluntary liquidation
5	Turkey Trust	Dec 1988	31/12/1993	30/06/1998	54	-12.12	12.57	-34.47	35.25	Unitised
6	INVESCO Korea	Dec 1991	31/12/1993	30/04/1999	64	-9.31	8.73	-27.21	10.75	Unitised
7	New India Inv Tst	Feb 1994	31/12/1993	31/12/2009	61	-7.86	6.35	-19.86	4.06	Active
8	China Investment	Apr 1993	31/12/1993	31/08/1998	56	-19.49	5.53	-33.27	-8.56	Unitised
9	JPMorgan Chinese Inv Tst	Sept 1993	31/12/1993	31/12/2009	190	-8.97	10.21	-34.44	8.40	Active
10	JPMF Indian	Mar 1994	31/03/1994	31/12/2009	184	-10.84	11.69	-38.24	9.96	Active
11	Old Mutual South Africa	Jun 1994	30/06/1994	28/02/2007	146	-15.75	6.33	-33.91	0.33	Voluntary liquidation
12	Taiwan Investment	Jan 1994	31/01/1994	30/07/1999	60	-18.29	9.24	-35.90	1.76	Unitised
13	Laxey IT	Jan 1997	31/01/1997	30/09/2008	134	-30.27	18.52	-69.94	4.09	Acquisition/Takeover/ Merger
14	JPM Russian Secs	Dec 2002	15/12/2002	31/12/2009	85	-9.03	3.53	-16.29	0.74	Active
15	Korea Europe Fund	Jun 1989	23/06/1989	10/04/2003	112	-9.56	12.72	-44.35	23.36	Dead
16	Korea Liberalisation	Dec 1992	31/12/1992	21/01/1997	37	-3.77	14.03	-28.05	40.88	Suspended
17	JF Philippine	1977	28/06/1994	30/06/1997	37	-21.85	7.89	-41.98	-11.96	Dead
18	Brazilian IT	1973	31/12/1992	28/01/1999	61	-13.74	8.83	-42.90	8.42	Delisted
19	Israel Fund	Feb 1994	02/10/1994	18/10/1999	68	-16.12	6.82	-31.95	5.11	Delisted
	Cross-Fund Emerging Mkt Mean Premium					-14.19	9.28	-34.90	8.50	

Table 3.10 - *Continued*

	Developed Market Funds	IPO Date	Sample start	Closing Date	Obs	Mean	Std. Dev.	Min	Max	Status
1	Edinburgh US Tracker Trust	1902	31/12/1993	31/12/2009	193	-6.19	4.82	-22.32	2.73	Active
2	Baillie Gifford Japan	Aug 1981	31/12/1993	31/12/2009	193	-9.46	6.14	-24.01	8.20	Active
3	JPMorgan American IT	1881	31/12/1993	31/12/2009	193	-9.72	6.85	-34.44	3.98	Active
4	JPMorgan Japanese	1927	31/12/1993	31/12/2009	193	-10.75	6.96	-27.11	6.90	Active
5	GT Japan	May 1972	31/12/1993	30/11/2001	95	-9.06	7.20	-24.47	11.86	Unitised
6	Baillie Gifford Shin Nippon	Jul 1985	31/12/1993	31/12/2009	193	-13.10	9.11	-35.56	20.81	Active
7	Paribas French	Jan 1987	31/12/1993	29/08/1997	44	-12.68	5.90	-21.70	2.40	Unitised
8	New Zealand	Oct 1988	31/12/1993	29/01/2008	170	-9.25	6.58	-25.42	10.49	Voluntary liquidation
9	Second Market	Oct 1984	31/12/1993	30/04/1998	52	-14.51	7.35	-30.79	-1.06	Investment objective change
10	Australian Opportunities	Aug 1987	31/12/1993	30/09/2002	76	-17.72	9.37	-45.38	1.25	Investment objective change
11	American Opportunity	Aug 1989	31/12/1993	31012007	157	-13.57	9.19	-45.88	5.75	Acquisition/ Takeover/ Merger
12	Fidelity Japanese Values	Feb 1994	31/12/1993	31/12/2009	185	-12.81	7.08	-33.52	5.39	Active
13	For & Col Germany	1910	31/12/1993	29/05/1998	53	-18.02	3.81	-24.95	-5.48	Unitised
14	German Investment Trust	Feb 1990	31/12/1993	30/05/1997	41	-15.69	3.90	-20.59	-4.84	Acquisition/Takeover/ Merger
15	German Smaller Cos	Feb 1985	31/12/1993	29/10/1999	70	-18.50	5.47	-27.83	-5.84	Unitised
16	US Smaller Cos Inv Tst	July 1991	31/12/1993	30/11/2000	83	-11.99	5.29	-23.94	6.76	Voluntary liquidation
17	Govett American Smaller Cos	May 1992	31/12/1993	31/07/1998	55	-12.74	6.25	-22.73	3.87	Acquisition/Takeover/ Merger
18	Edinburgh Japan	Jun 1992	31/12/1993	31/01/2000	73	-9.16	8.66	-29.99	7.72	Acquisition/Takeover/ Merger
19	Dunedin Japan	Jun 1993	31/12/1993	30/08/1996	32	-2.33	3.91	-10.41	9.46	Acquisition/Takeover/ Merger
20	Perpetual Japanese	Jun 1993	31/12/1993	31/12/2008	180	-10.86	7.97	-31.50	13.76	Unitised
21	F & C US Smaller Cos	Dec 1992	31/12/1993	31/12/2009	193	-10.37	5.21	-24.18	6.59	Active
22	North Atlantic Smaller Cos	Jan 1973	31/12/1993	31/12/2009	193	-16.35	10.97	-74.18	-1.26	Active
23	NM Smaller Australian Cos	Nov 1993	31/12/1993	30/01/1996	18	-10.82	7.31	-19.70	5.04	Acquisition/ takeover/ merger

Table 3.10 - *Continued*

Developed Market Funds

		IPO Date	Sample start	Closing Date	Obs	Mean	Std. Dev.	Min	Max	Status
24	Henderson Japanese Sml Cos	Sept 1993	31/12/1993	31/08/2001	89	-12.05	10.27	-32.62	3.77	Unitised
25	INVESCO Japan Discovery	Jun 1994	30/06/1994	31/10/2007	154	-12.27	7.82	-35.47	6.99	Unitised
26	Schroder Japan Growth	Jun 1994	30/06/1994	31/12/2009	181	-9.57	6.56	-25.45	7.57	Active
27	INVESCO Tokyo	Jun 1995	30/06/1995	31/10/2002	82	-15.53	6.86	-28.29	0.27	Acquisition/ takeover/ merger
28	Martin Currie Japan	Oct 1995	31/10/1995	30/12/2005	116	-11.26	6.03	-26.36	2.82	Unitised
29	Gartmore Select Japanese	Jun 1996	30/05/1996	30/05/2003	78	-18.11	5.92	-31.21	-3.29	Voluntary liquidation
30	Renaissance US Growth	Apr 1996	30/04/1996	31/12/2009	159	-16.46	10.59	-40.00	17.47	Active
31	JPM US Discovery	Jun 1982	30/04/1998	31/12/2009	141	-15.77	5.67	-32.23	-3.19	Active
32	Murray Japan Grth & Inc	Dec 1999	15/12/1999	15/04/2003	32	-8.44	21.72	-62.06	19.89	Voluntary liquidation
33	JPMF Japan Smllr Cos	Aug 1927	31/12/1993	31/12/2009	193	-13.31	8.03	-38.86	6.92	Active
34	LeggMason Investors American	Aug 2000	31/08/2000	31/05/2002	15	-1.73	21.45	-36.69	49.17	Voluntary liquidation
35	East German	Feb 1991	28/02/2001	28/09/2001	7	-80.27	8.70	-92.54	-71.18	Investment objective change
36	American Inv Tst	Aug 2000	31/08/2000	31/03/2005	17	-19.96	21.92	-65.41	4.08	Voluntary liquidation
37	Morant Wright Japan Income	Oct 2005	31/10/2005	31/12/2009	45	-9.48	12.77	-51.54	11.28	Active
38	Melchior Japan Inv Tst	Feb 2006	28/02/2006	31/12/2009	41	-13.42	11.12	-37.70	2.45	Active
39	Middlefield Canadian Inc	Jun 2006	30/06/2006	31/12/2009	37	-7.35	9.42	-30.75	8.74	Active
40	Gartmore Irish Growth	May 1995	31/05/1995	31/12/2009	170	-12.66	6.74	-28.18	9.60	Active
	Cross-Fund Developed Mkt Mean Premium					-13.83	8.42	-34.40	4.70	

Table 3.10 gives summary statistics for the closed-end fund monthly premium of each of the 19 emerging market country funds and also of a complete sample of 40 developed market country funds for comparison. The table reports the fund IPO date, the date the fund entered the sample and the date that the fund ceased trading, the number of monthly observations, the mean and standard deviation of the premium, the maximum and minimum premiums and the status of the fund, whether active or inactive.

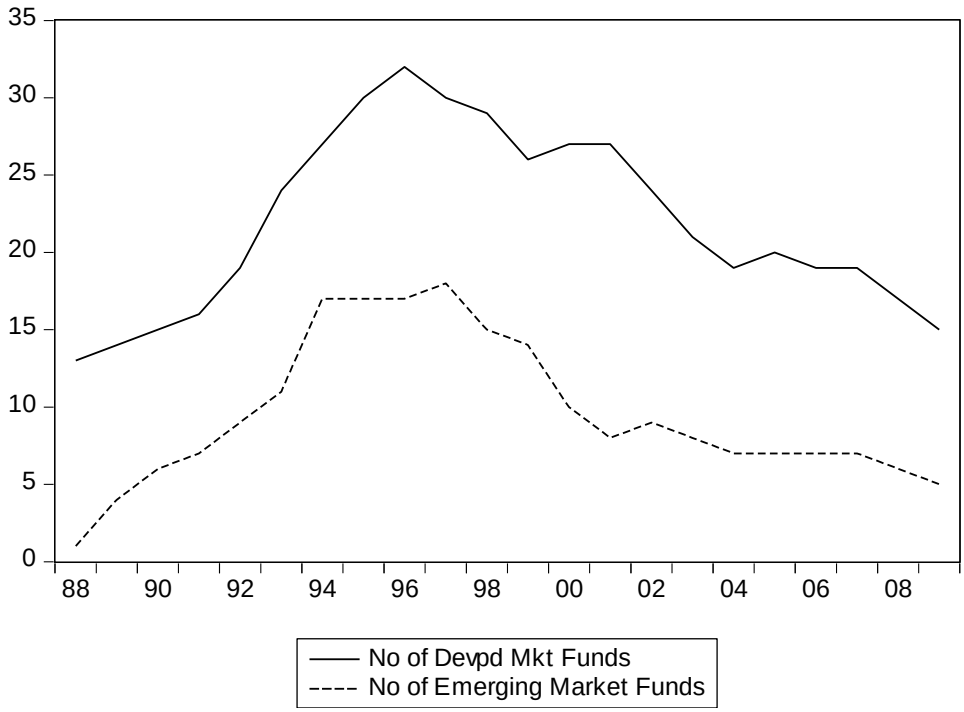
The first point of interest from Table 3.10 is that the average UK emerging market fund premium is so low. At -14.19% it is lower than the average developed market fund premium which is -13.83%. This contrasts with the findings for US emerging market funds. Nishiotis (2004) finds that the premium of US emerging market funds from 1981-1996 is -0.12%, while the premium of developed market funds is -9.07%. Chan et al. (2008) also find the US average emerging market fund premium from 1987-2001 is still considerably higher at -3.7%, compared with -11.01% for developed markets. Kim and Song, in a more recent sample (1995-2004) continue to find a difference with the average developed market premium at -12.86% and the average emerging market premium at -8.59%.

Table 3.10 also shows that many funds struggle to survive for more than a few years. Out of the 59 country funds that exist over the sample period, only 21 are still active. The funds with the longest life span have usually been funds from big fund managers such as Baillie Gifford, JPMorgan, Perpetual, Schroder and Fidelity.

Figure 3.8 shows that the number of both developed and emerging market closed-end funds increased considerably during the early 1990s. Both groups drop

considerably around the time of the 1997 Asian crisis and the numbers fail to recover. A large number of funds cease trading around the time of the 2008 financial crisis.

Figure 3.8 Number of Developed and Emerging Market Funds Per Year (1988-2009)



Emerging market funds increase rapidly in the 1990s. They reach a peak before the time of the Asian crisis and then decline. The number of developed market funds also declines after the Asian crisis to where it was in the late eighties. If we compare Figure 3.8 with Figure 3.2 we see that the trend of an expansion followed by a contraction in the UK closed-end fund industry as a whole is mirrored in both emerging and developed market country funds.

Table 3.11 presents summary statistics of the complete sample of 59 closed-end country funds in two separate groups as these are the key groups examined in the following chapters. Table 3.11 shows that the time series mean premium of emerging market funds (-13.9%) is lower than the time series mean premium of developed market funds (-12.2%). As the standard deviation of the premium is higher for emerging market funds we might expect that they are more of a risk to investors. There are some extreme examples of high and low premiums in both sectors, usually associated with the funds in difficulty when either the NAV or share price suddenly decreases, causing a temporary extreme negative premium (discount) or high premium. The distributions of the premium in both sectors are negatively skewed, particularly in developed market funds. The higher kurtosis for developed market funds in particular shows that the distribution of the premium is influenced by extreme values.

The return on the NAV and share price shows a clear and consistent difference between the two sectors. Whereas the mean NAV return on developed market funds is 0.0024 (annualised: 2.8%), the mean NAV return on emerging market funds is higher at 0.0033 (annualised: 3.96%). Likewise the share price return on developed market funds is 0.0025 (annualised at 3%) whereas the share price return on single country emerging market funds is 0.0037 (annualised at 4.44%). At the same time the greater volatility of emerging markets over the period is seen in the higher volatility of both the NAV and share price return in emerging markets as compared with those of developed markets.

Table 3.11: Summary Statistics of Developed and Emerging Market Funds

This table reports monthly summary statistics of UK closed-end country funds from December 1993 to December 2009. The variables examined are Prem (Premium), Navdri (Diluted NAV Return), SPret (Share Price Return), Expratio (Expense Ratio), Market Value (Mval), Age (Age) and Divyld (Dividend Yield). For each variable the table reports the Number of monthly observations (Obs), the time series average (Mean) the standard deviation (Std. Dev.), the minimum and maximum observations (Min and Max) and measures of the normality of the distribution (Skewness and Kurtosis).

	Devpd Mkt Funds	Emerg Mkt Funds	Devpd Mkt Funds	Emerg Mkt Funds	Devpd Mkt Funds	Emerg Mkt Funds	Devpd Mkt Funds	Emerg Mkt Funds	Devpd Mkt Funds	Emerg Mkt Funds	Devpd Mkt Funds	Emerg Mkt Funds	Devpd Mkt Funds	Emerg Mkt Funds
Variable	Prem	Prem	Navdri	Navdri	SPret	SPret	Expratio	Expratio	Mval	Mval	Age	Age	Divyld	Divyld
Obs	4292	1761	4460	1913	4461	1930	3386	1142	4488	1901	6821	3495	4488	1901
Mean	-0.122	-0.139	0.0024	0.0033	0.0025	0.0037	1.40	1.94	93.93	58.47	17.89	9.33	0.85	0.53
Std. Dev.	0.09	0.12	0.07	0.09	0.08	0.10	0.67	1.02	119.39	68.05	25.77	5.03	3.46	0.87
Min	-0.93	-0.70	-0.56	-0.44	-0.54	-0.46	0.23	0.40	4.85	2.53	0.08	0.08	0.00	0.00
Max	0.49	0.41	0.51	0.69	0.73	0.77	5.2	7.00	875.93	464.78	128.00	22.75	72.80	7.30
Skewness	-1.06	-0.51	0.21	0.30	0.40	0.28	1.00	2.26	2.56	3.01	2.90	0.12	10.71	2.75
Kurtosis	10.89	5.04	7.22	6.76	7.84	6.60	6.14	10.06	9.69	13.35	10.60	2.14	152.07	14.42

When we turn to the other fund characteristics of the two groups: the expense ratio, size (market value), age and dividend yield, we again see clear differences between the two investment sectors. The mean annual expense ratio for emerging market funds of 2.07% is much higher than the mean expense ratio of developed market funds (1.54%). As the expense ratio is expressed in relation to total assets the higher charge may be due to the smaller size of emerging market funds. If we compare the market value of emerging market and developed market funds we see that emerging market funds on average have just over half the market value (£58.47m) of developed market funds (£98.93m). This may partly explain the higher attrition rate of emerging market closed-end funds. Although the shorter average age is partly due to the fact that emerging market closed-end funds only began as emerging markets began to be liberalised in the late 1980s and early 1990s.

The dividend yield shows a difference between the two sectors with emerging market funds being lower dividend payers in relation to the share price than developed market funds. Extreme values of dividend yield can occur when the fund share price falls dramatically so that the dividend is nearly the same in value as the share price. The value of 72.8 occurred when the Legg Mason Fund share price fell to 12p.

3.6 Conclusion

The data shows clear differences between the funds when grouped according to their investment objectives. When we subdivide the sample into single country funds and consider the differences between developed and emerging country funds we find that

emerging market funds that are generally younger, smaller, have smaller dividend yields and a less stable premium, but they have a higher share price return. For investors looking for growth instead of income, and prepared for volatility, closed-end emerging market country funds have rewarded their confidence over the sample period. However, investors looking for higher dividend yields would have been better off with developed market country funds.

4. The Role of Illiquidity in Explaining UK Closed-end Country Fund Pricing

4.1 Introduction

Naes, Skjeltorp and Odegaard (2011) et al. state that 'investor participation is related to market liquidity.' (p139). In this chapter we argue that investor participation is also related to market *illiquidity*. The aims of this chapter are as follows. Firstly, we ask whether the UK closed-end country fund premium is affected by the illiquidity of the UK fund, the illiquidity of the foreign market, or other factors. Secondly, we compare emerging and developed market closed-end funds to examine whether country and fund illiquidity have a different influence on the premium between the two groups. Thirdly, we consider how the recent financial crisis affected the UK country fund premium, fund and country illiquidity.

Our research adds to our understanding of the key role played by illiquidity in the pricing of UK closed-end country funds. In particular, it shows the different impacts that fund and country illiquidity have on the premium. It considers how the roles played by fund and country illiquidity change, depending on whether the fund invests in an emerging or developed market.[14] We also add to the literature examining the impact of monetary shocks and analyse what happens to the premium and fund illiquidity when a crisis affects the home market, and how these effects may

[14] In this study we examine 55 UK funds. 14 of these invest in emerging markets (Thailand, Indonesia, the Philippines, India, China, Russia, Taiwan, South Africa, Turkey and South Korea). The remaining funds invest in Japan (18) and the US (12), in Germany, France, Ireland, New Zealand, Australia or Canada.

differ in severity, depending on whether the fund invests in an emerging or developed market.

Despite the fact that UK closed-end funds form a very important part of the financial sector[15], there are no published studies of UK closed-end country funds, in contrast to the larger number of studies of US closed-end country funds. In studying UK funds there are institutional differences between US and UK closed-end funds that could give rise to different findings. One major difference is that of share ownership: between 1998 and 2008 private individuals held less than 20% on average of UK closed-end fund shares (Office for National Statistics, 2009) whereas Hardouvelis et al. (1994) find that over 80% of investors in US closed-end funds are private individuals. This implies that there is potentially less noise trading in UK trading and therefore less volatility. A further reason for focusing on the UK is that the UK closed-end fund sector is much more important relative to the UK economy than the US closed-end fund sector is to the US economy.

The main finding presented in this chapter is that both country and fund illiquidity play highly significant roles in the UK closed-end country fund premium. We also find that the role played by illiquidity in the premium alters during the crisis. In emerging market funds, country illiquidity is significantly positively related to the premium. This suggests that UK investors are willing to pay more for access to less liquid emerging markets because of their growth potential. In developed market funds however, fund illiquidity is significantly negatively related to the premium,

[15] The total asset sector value of UK closed-end funds is approximately 16.8% that of the total funds under management of UK unit trusts (IMA, 2010). In contrast, the US closed-end fund sector has a sector value of only just over 2% of US mutual funds, even when we include bond funds (Investment Company Institute, 2010). The UK also has a relatively large number of funds: there are currently 26 single closed-end country funds in the UK as compared with 21 in the US.

showing that investors are strongly deterred by fund illiquidity in developed market funds. In addition we find that the average domestic fund premium, frequently associated with investor sentiment, is a highly significant factor in both the developed and emerging market fund premium. However, we also find a strong and significant relationship between the average premium of the funds in the sample and average fund illiquidity, suggesting that the common movement in the premium may be related to fund illiquidity. Over the financial crisis period, developed market fund premium drops steeply, but emerging market funds show more stability. This suggests that investors had more confidence in these markets, despite the research showing that all markets were affected by the crisis (Bartram & Bodnar, 2009). The illiquidity of all developed markets (but one) increases significantly, but emerging markets are affected more gradually: only one of the emerging markets shows an increase in illiquidity over the period under study. During the crisis country illiquidity becomes significantly negatively associated with the premium, suggesting that investors are unwilling to pay for access to illiquid markets when these are developed markets.

Surveys of research into closed-end funds show that there is little agreement as to the nature and causes of the closed-end fund premium.[16] One strand of research principally associated with Lee, Shleifer and Thaler (1991) suggests that irrational noise trader sentiment is the cause, while another strand identifies rational factors. Bodurtha, Kim and Lee (1995) find evidence to support the noise-trader sentiment model in relation to country funds. They argue that the premium captures the difference in sentiment between the US and foreign market investors. Pontiff (1996)

[16] Chapter 2 provides a comprehensive literature review.

takes a rational limited arbitrage approach and argues that deviations from pricing equilibrium can particularly affect US country funds which are more difficult to arbitrage. Gemmill and Thomas (2002) suggest that the premium of UK funds also arises because of limitations to arbitrage, but that premium fluctuations are due to noise-trader sentiment. In a similar study, Flynn (2012) finds contrasting results for US funds. He points to the possibility of greater irrationality in US pricing due to the greater proportion of retail investors in the US. Results from Gemmill and Thomas (2011) further confirm this apparent difference between investor groups in the two countries.

Another line of research argues that liquidity, rather than sentiment, plays a role in the closed-end fund premium. Datar (2001) argues that closed-end fund premiums result from liquidity differences between the closed-end fund and the underlying assets. When the fund share is more liquid than the assets, a premium will result; when the underlying assets are more liquid, a negative premium (discount) will result. Cherkes, Sagi and Stanton (2009) argue that US closed-end funds offer small investors a liquidity benefit for which they are prepared to pay a premium at the time of the IPO. This liquidity benefit is then traded off against the fees charged by the fund managers, resulting in a negative premium. They find that liquidity, rather than sentiment, provides the explanation for the closed-end fund premium. In their analysis of US country funds, Chan et al. (2008) suggest that relative market illiquidity explains part of the variation in closed-end country fund premium. If capital markets are segmented, it follows that the closed-end country fund premium will be positively affected by asset illiquidity but negatively affected by share price illiquidity. In other words, investors will pay more for a share that invests in a less

liquid market which they cannot otherwise invest in (increasing the premium) but less if the share itself becomes illiquid (reducing the premium).

Our analysis differs from that of Cherkes, Sagi and Stanton (2009) in that it uses a different liquidity measure and compares emerging and developed market funds. This study is in the spirit of Chan et al. (2008) but deals with UK funds over a longer and more recent period. We also examine the behaviour of developed and emerging country funds during a crisis affecting developed markets and carry out additional robustness tests to examine the impact of volatility and exchange rate fluctuations during the crisis.

The remainder of this paper is organised as follows. Section 2 describes the data and introduces the research method. Section 3 provides the empirical results and section 4 examines the funds during the recent financial crisis. Section 5 concludes.

4.2 Data and Research Method

We collect data on UK closed-end funds that invest in single foreign countries from a range of sources. Datastream, the London Share Price Database, Investment Trust Yearbooks and the periodical 'Money Management' provide return data and information on fund investment objectives. These sources provide us with a complete sample of 55 single country funds[17] from 31 December 1992 to 31 December 2009. We include funds that ceased trading between these dates as well as funds that were active during the whole sample period to avoid survivorship bias. 14 of these funds invest in 10 emerging markets (Thailand, Indonesia, the Philippines,

[17] The sample consists of conventional funds. Split capital funds are excluded as their shares may behave differently.

India, China, Russia, Taiwan, South Africa, Turkey and South Korea). The remaining 41 funds invest in 8 developed markets. Most funds invest in Japan (18) and the US (12), and the others invest in Germany, France, Ireland, New Zealand, Australia or Canada.

We collect monthly data from Datastream on the sample of 55 UK traded closed-end country funds from 31 December 1992 to 31 December 2009. Data includes the monthly closing price from the last trade and the monthly diluted net asset value (NAV) of each fund. The difference between the natural log of the share price and natural log of the NAV is the premium (PREM):

$$PREM \equiv lnShare\ price - lnNAV \quad (1)$$

To calculate fund illiquidity we collect the daily return on each fund from the return index and aggregate this to give the absolute monthly return on the fund. We collect monthly turnover from the London Share Price Database. To calculate country illiquidity we collect the daily return on each country index to which the funds correspond and aggregate this to give the absolute monthly return for the index. We also collect monthly turnover for each country index.

Studies have shown that closed-end funds typically begin at a premium to the NAV and within a few months fall into a negative premium (see Weiss Hanley, Lee and Seguin (1996) for US funds and Levis and Thomas (1995) for UK funds). We therefore exclude the first six months from the fund IPO. If the fund merely changes objective and becomes a single country fund, the first six months are not excluded as the fund has already been through the IPO process. We also exclude the month before the fund is liquidated, open-ends or changes objective. In most cases the birth

month of the fund corresponds to the date on which both the price and NAV of the fund are provided on Datastream.[18]

4.2.1 Measuring Liquidity

As liquidity and illiquidity cannot be directly measured, studies use a range of measures as estimates. Well known measures include those of Amihud and Mendelson (1986) and Brennan and Subrahmanyam (1996). Other well-known measures include those of Pastor and Stambaugh (2003) and Amihud (2002) who constructs a Kyle (1985) type illiquidity measure from daily market returns and volume.[19] Amihud (2002) defines the illiquidity of a stock *i* in market *c* at time *t* as 'the average return ratio of the daily absolute return to the (dollar) trading volume on that day'. Following Chan et al. (2008) we adapt Amihud's annual measure to the following monthly calculation and apply it to the closed-end fund:

$$FILLIQ_{f,,t} = \sum_{d=1}^{Dt} \left|R_{f,d}\right| / VOL_{f,d} \qquad (2)$$

where $FILLIQ_{f,t}$ is the illiquidity of fund *f* at time *t*, D_t is the number of trading days, taken to be 21 in month *t*. The daily absolute return and daily sterling volume of fund *f* on day *d* are given by $R_{f,d}$ and $VOL_{f,d}$. We calculate the sterling volume of trading by multiplying the number of shares traded, reported in thousands, by the price in sterling using the sterling exchange rate for that day. These daily figures are

[18] There are seven cases in which the NAV is not published until the following month and so the first entry of the fund is taken to be when both price and NAV are available.

[19] Hasbrouck (2009) and Avramov et al. (2006) have found similarity between the results obtained with the Amihud (2002) measure and other measures of illiquidity (Chan et al. 2008).

aggregated to give the monthly absolute return which is divided by the monthly volume of trading. This figure is then scaled by multiplying it by 10^3.[20]

We use a similar method to calculate the illiquidity of the foreign market:

$$CILLIQ_{c,t} = \sum_{d=1}^{Dt} |R_{c,d}| / VOL_{c,d} \qquad (3)$$

where $CILLIQ_{c,t}$ is the illiquidity of market c at time t, D_t is the number of trading days, taken to be 21 in month t. The daily absolute return and daily sterling volume of country index c on day d are given by $R_{c,d}$ and $VOL_{c,d}$. We calculate the sterling volume of trading by multiplying the number of shares traded, reported in thousands, by the price in sterling using the sterling exchange rate for that day. These daily figures are then aggregated to give the monthly absolute return which is divided by the monthly volume of trading and scaled by 10^3.

We use total return indices for the return on each market and for the turnover. We are interested in whether this measure of illiquidity will give similar results to those found by Chan et al. (2008) as they compile an equity index for each country. They use the daily return and daily dollar volume of each qualifying stock[21] on the stock exchange of each of the asset markets.

4.2.2 Fund Premium and Illiquidity

Table 4.1 shows that the funds have an average premium of -14%. The average premium of UK funds investing in emerging markets (-14.11%) is comparable to that

[20] Some very illiquid funds have a turnover of 0 as less than 500 shares are traded in the month. Some funds may have a return of zero if the price remains static. The illiquidity measure is then zero, but the fund is highly illiquid. In such cases (3.26%) we record a missing value. Also, where the total market return is clearly erroneous we record a missing value (0.036%).

[21] Qualifying stocks have to have a) trades of 1000+ shares and data on returns for at least 14/21 monthly days and b) if the estimated illiquidity is in the highest or lowest 5% of those in a) they are excluded.

of funds investing in developed markets (-13.82%). This UK sample finding differs from that of Chan et al. (2008). They find a higher (less negative) premium of -6.37% across all funds. They also find a higher (less negative) premium (-3.7%) for US funds investing in segmented (emerging) markets than for funds investing in integrated (developed) markets (-11.01%). This may reflect a difference in time period as the study of Chan et al. (2008) is from 1987 to 2001, whereas our study extends from 1992 to 2009. It may also indicate a greater role of individual investor sentiment in the US, causing US investors to pay more for country fund shares, especially in emerging markets.

Table 4.1:Summary Statistics

This table reports the average fund premium, illiquidity and control variables firstly for all 55 UK closed-end funds investing in a single non-UK country and secondly for those investing in developed markets (41 funds) and emerging markets (14 funds) between 31/12/1992 and 31/12/2009.

Variables	All Funds	Developed Market Funds	Emerging Market Funds
Premium (%) (Prem)	-14.04	-13.82	-14.11
Foreign Country Illiquidity (Cilliq)	0.001	0.000	0.005
Fund Illiquidity (Filliq)	3.373	3.038	3.407
Controls			
Dividend Yield (%)	3.170	4.092	0.468
Foreign Exchange Appreciation (%)	0.120	-0.000	0.005
Average Premium (%)	-0.126	-0.126	-0.126
Expense Ratio (%)	1.861	1.492	2.814
Segmentation	0.108	0.000	0.419
Log of Age (years)	4.251	4.327	4.010
Log of Size (£m)	3.674	3.782	3.380
UK Market Return (%/month)	0.68	0.68	0.68
Foreign Market Return (%/month)	0.79	0.35	2.22

Table 4.1 shows that the average illiquidity measure of the funds was 3.37, and varies little between developed markets (3.04) and emerging markets (3.4). Chan et al. (2008) find similar results, but more illiquidity for developed market funds: -2.43 for developed market funds and -2.08 for emerging market funds (taking logs). The average country illiquidity is 0.001 but shows a clear difference between the low illiquidity of developed markets (0.000) and that of emerging markets (0.005). As expected, the illiquidity of the UK emerging market fund countries is much higher than that of developed markets. This contrasts with the finding of Chan et al. (2008) who find rather surprisingly that the log value of developed market illiquidity was higher (10.05) than that of emerging markets (8.79). This may be due to the fact that they exclude the most illiquid stocks from their index.

4.2.3 Control Variables

We include additional variables that have been shown to influence the premium. Table 4.1 provides summary statistics on these variables.

Dividend yield (DIVYLD): This expresses the dividend per share as a percentage of the share price. The underlying dividend is based on the annual dividend and excludes special or one-off dividends. Pontiff (1996) and Johnson et al. (2006) find that dividend yield is positively related to the premium: funds with higher premiums tend to pay a higher dividend relative to the share price. Table 4.1 shows that there is a clear difference between the dividend yield of both groups, with developed market funds paying a much higher dividend relative to the share price. Chan et al. (2008) also find this difference between emerging and developed markets which may reflect the fact that emerging market investors are hoping for future growth rather than present income.

Foreign Exchange Appreciation (FXCHG)*:* A change in exchange rates could affect the fund premium. This could be particularly relevant for emerging markets where exchange rates can be volatile. Swanson and Tsai (2005) find that premiums are significantly affected by the volatility of exchange rate returns. Here the monthly rate of exchange between sterling and the foreign market currencies is measured as units of foreign currency per UK pound. The difference between each month is then expressed as a percentage change. Table 4.1 shows a very slight depreciation of sterling against developed market currencies over the period and a small appreciation of sterling against emerging market currencies.

Expense Ratio (EXPRATIO): We include the expense ratio as previous studies find a negative relationship between expenses and the premium (Kumar & Noronha, 1992). Berk and Stanton (2007) propose a trade-off theory where a high initial premium representing managerial ability is traded off against increasing expenses. The UK Association of Investment Companies (AIC) has produced a list of expense ratios for each closed-end fund that is based on the total annual expense divided by the NAV, known as the Total Expense Ratio (TER). Expenses include management fees and operational expenses of the trust, but do not include performance fees. Our data is taken from the AIC yearbooks, the AIC website and annual reports. Table 4.1 shows that the average expense ratio of emerging market funds (2.81%) is almost double that of developed market funds (1.49%). Although it could be argued that this is because emerging market funds are smaller so the ratio of expenses to NAV is higher, this is not always the case.

Segmentation (SEG): Following Chan et al. (2008)we use the Edison Warnock measure of restriction on investment availability (Edison & Warnock,

2003). This is a measure of the level of liberalization in the capital account of a country. The scale ranges from 0 for an open market with no capital restrictions and 1 for a completely closed market (this is because in an open market the investable market will equal the global market). The measure comes from two indices published by Standard and Poors: a Global Index (IFCG) which aims to represent the market and an investible index (IFCI). The calculation is as follows:

$$SEG_{i,t} = 1 - \frac{MC_{i,t}^{IFCI}}{MC_{i,t}^{IFCG}} \quad (4)$$

$SEG_{i,t}$ is a measure of a country *i*'s restrictions on foreign ownership at time *t* which relates the total market capitalisation of the global market of that country (IFCG) to the capitalisation of that market that is accessible to foreign investors (IFCI).

It has been suggested that investors will pay more for the access to segmented markets. Bonser-Neal et al. (1990) find that when investment restrictions are loosened, premiums decrease because the closed-end fund is no longer a unique vehicle for investment. In our sample almost all of the markets show a decreasing level of segmentation over time, although in some markets (Russia in particular) there has not been a steady decrease. China has the highest segmentation measure (0.951) showing a trend of increasing segmentation since a low of 0.254 in 2006.

Age (LNAGE): The age of each fund is given by the number of months since its listing date.[22] The natural log of the age is used in our study[23]. Gemmill and Thomas (2002) find age and size are closely related to the size of the premium and to

[22] A few funds began before they were listed in Datastream, such as JPMorgan American which began in 1881. We run the same tests using the log of the age since IPO date and the results are similar to those using the listing date.

[23] The sample of funds shows a range in age from the well-established and substantial funds such as Edinburgh US Tracker which exists throughout the whole sample period, to the short-lived East German Investment Trust which only lasted for 6 months after changing from a venture capital trust.

the expense ratio, consistent with Rowe and Davidson (2000) in the US. Table 4.1 shows that the average age of developed market funds is slightly greater than the average age of emerging market funds.

Size (LNCAP): This is measured by the market capitalization of the fund (in millions of pounds sterling). The natural log of this variable is used. Table 4.1 shows that UK emerging market funds are smaller than developed market funds, in contrast to the finding of Chan et al. (2008) for US funds. This difference may reflect the greater maturity of the UK developed market fund sector or point to more US small investor sentiment in favour of emerging markets.

UK Market Return (UKMKT): This measures the percentage return on the FTSE All Share Index over the period for which each trust was active. This measure is included as a movement in the trust premium may be influenced by a general movement in the UK market.

Foreign Market Return (FMKT): This measures the percentage return on the country Market Index over the period for which each trust was active. A movement in the trust premium may be partially accounted for by a movement in the foreign market, rather than the UK market.[24] Table 4.1 shows that return from emerging markets was higher than that of developed markets, consistent with Chan et al. (2008).

Average Domestic Premium (AVGDOMPREM): Earlier research suggests that there is a common movement in the premium across funds and that this reflects noise trader sentiment (Lee, Shleifer and Thaler, 1991). However, Qiu and

[24] One example of this is the Turkey Trust in 1994 during the Turkish financial crisis where a temporary high premium resulted from a sudden drop in net asset value.

Welch (2006) find no significant correlation between the US closed-end fund premium and the UBS/Gallup survey of consumer sentiment. Some UK research supports the role of sentiment in relation to the UK closed-end fund premium. Gemmill and Thomas (2002) suggest that sentiment, proxied by retail flows to open-end funds, while not causing the premium in the first place does influence the UK fund premium. Agyei-Ampomah and Davies (2005) also find evidence associated with sentiment in the excess volatility of the UK closed-end fund share price relative to the NAV. More recently, however, Gemmill and Thomas (2011) find more evidence that the UK premium on domestic closed-end funds is influenced by rational factors (management fees and liquidity, proxied by bid-ask spread).

Due to the difficulties in measuring sentiment various proxies have been used. Chan et al. (2008) use the arithmetic average premium as a proxy for sentiment, taking the monthly arithmetic average premium of all the funds in the sample. Other studies, such as those of Bodurtha, Kim and Lee (1995) and Nishiotis (2004) use the average domestic fund premium as a proxy for sentiment. We analysed the correlations between the average monthly premium of funds in the sample against the UK Consumer Confidence Index and total UK retail flows to open-end funds which are alternative measures of investor sentiment. We repeated this using the average domestic UK fund premium instead of the average premium of funds in the sample. We do not find significant correlations between the average monthly premium of funds in the sample and the alternative measures of sentiment. However, we do find significant, though negative, correlations between the average domestic UK fund premium and the alternative measures of sentiment and we therefore use the average domestic UK fund premium as a proxy for sentiment.

4.3 Empirical Analysis

We test for a relation between the premium of a fund and the illiquidity of the fund and the illiquidity of the foreign market as shown below:

$$PREM_{f,c,t} = \alpha_f + \beta_1 FILLIQ_{f,t} + \beta_2 CILLIQ_{c,t} + \beta_3 EXPRATIO_{f,t} + \beta_4 LNCAP_{f,t} + \beta_5 LNAGE_{f,t} + \beta_6 DIVYLD_{f,t} + \beta_7 SEG_{c,t} + \beta_8 UKMKT_t + \beta_9 FMKT_{c,t} + \beta_{10} FXCHG_{c,t} + \beta_{11} AVGDOMDISC_t + u_{f,c,t} \quad (5)$$

where $PREM_{f,c,t}$ is the premium of fund *f* from market *c* at time *t*, α_f is the fixed effects parameter, *FILLIQ* is the fund illiquidity measure from (2) above and *CILLIQ* is the country illiquidity measure from (3) above, *EXPRATIO* is the expense ratio, *LNCAP* is the natural log of the market value, *LNAGE* is the natural log of fund age since listing date, *DIVYLD* is the dividend yield, *SEG* is the Edison Warnock measure of restriction on investment availability from 4.2.3 above, *UKMKT* is the UK market return, *FMKT* is the monthly market return of the foreign markets corresponding to each fund, *FXCHG* is the foreign exchange appreciation rate and *AVGDOMPREM* is the arithmetic average of the premium of UK funds investing in the UK.

We use a fixed effects technique where each fund is allowed to have a fixed constant (α_f) to take account of the heterogeneity in the funds. One example of the difference between funds could be the size as some funds have a large fixed size over the period and some have a small fixed size. We allow for the intercepts to be different for each fund but constant over the sample period. We also adjust for correlation within each cross-section following Petersen (2009).

Table 4.2 reports the time series correlations of the average values of the variables. As expected, the premium (PREM) is negatively correlated with the illiquidity of the fund (FILLIQ) and positively correlated with the illiquidity of the country (CILLIQ). The premium is negatively correlated with the average domestic fund premium (AVGDOMPREM) showing that UK country fund premiums tend to move together with the premiums of UK domestic funds. The premium is positively correlated with the size (LNCAP) of the fund (-0.31) indicating that larger funds have higher premiums. A decrease in fund size may indicate that a fund is struggling, resulting in a lower premium. The premium is negatively correlated with the expense ratio (0.14) indicating that higher expenses correlate to a lower premium as we might intuitively expect, consistent with Kumar and Noronha (1992). The positive correlation between country illiquidity and segmentation (0.34) indicates that countries in segmented markets are less liquid.

Table 4.2: Correlation of Premium with Illiquidity and Control Variables

This table reports the correlations between the premium, fund illiquidity (Filliq) and country illiquidity (Cilliq) and control variables: expense ratio (Expratio), size (Lncap), age (Lnage), Dividend yield (Divyld), segmentation (Seg), UK market return (UKmkt), foreign market return (Fmkt), foreign exchange appreciation (Fxchg) and average domestic fund premium (Avgdomprem). The sample period is 31/21/1992 to 31/12/2009 and the sample includes all 55 UK country closed-end funds investing in a single non-UK country.

	Filliq	Cilliq	Expratio	Lncap	Lnage	Divyld	Seg	UKmkt	Fmkt	Fxchg	Avg domprem
Prem	-0.07	0.10	-0.14	0.31	0.07	0.004	-0.07	0.04	0.003	0.09	0.29
Filliq		0.07	0.09	-0.18	0.004	0.06	0.05	-0.02	-0.02	-0.02	-0.07
Cilliq			0.12	-0.26	-0.21	0.14	0.34	-0.01	-0.01	0.02	0.13
Expratio				-0.13	-0.02	0.19	-0.04	0.00	0.02	-0.10	-0.12
Lncap					0.56	-0.03	-0.20	0.02	0.01	-0.02	0.01
Lnage						-0.01	-0.32	-0.03	-0.03	-0.01	-0.11
Divyld							-0.02	-0.02	0.01	-0.01	0.03
Seg								0.02	0.02	0.02	0.04
UKmkt									0.51	-0.12	0.01
Fmkt										0.04	0.04
Fxchg											0.08

In specification (1) of Table 4.3 we regress the fund premium against fund and foreign market illiquidity. The premium is significantly and negatively associated with fund illiquidity (FILLIQ) suggesting that as funds become illiquid, the premium decreases. An increase in fund illiquidity can be a sign of a fund getting into difficulties and so we might expect this association. The premium is positively and significantly associated with country illiquidity (CILLIQ) supporting the argument that investors are prepared to pay a higher share price for access to markets which may be more illiquid but offer more growth potential.

Table 4.3: Panel Regression of Fund Premium

This table reports coefficient estimates from regressions of closed-end fund premium on measures of fund illiquidity, foreign market illiquidity and various control variables following equation (5). In specification (1) we exclude all control variables, in specification (2) we include all control variables except the average domestic premium (AVGDOMPREM) and in specification (3) we include all control variables. The sample period is 31/21/1992 to 31/12/2009 and the sample includes all 55 UK country closed-end funds investing in a single non-UK country. In order to take account of heterogeneity between the funds, we use country closed-end fund fixed effects. Within each cross-section the White standard errors are adjusted for correlation of the residuals (Petersen, 2009). The corresponding t-statistics are reported in parentheses. The symbol * denotes significance at the 5% level and ** denotes significance at the 1% level.

Indep Vars	(1)	(2)	(3)
FILLIQ	-0.0002	-0.000009	0.0001
	(-2.74)**	-(0.09)	(0.92)
CILLIQ	28.82	66.58	65.50
	(3.59)**	(5.15)**	(5.02)**
EXPRATIO		-0.002	-0.001
		-(3.13)**	(-1.88)
LNCAP		0.08	0.07
		(13.91)**	(15.24)**
LNAGE		-0.04	-0.02
		-(8.49)**	(-4.32)**
DIVYLD		0.0004	0.001
		(0.18)	(0.56)
SEG		-0.17	-0.16
		(-7.71)**	(-7.71)**
UKMKT		0.001	0.001
		(1.55)	(2.47)**
FMKT		-0.04	-0.05
		-(1.36)	(-1.56)
FXCHG		0.21	0.17
		(3.04)**	(2.6)**
AVGDOMPREM			0.006
			(11.05)**

Adj R^2	21.48	40.77	46.66
No. of obs	5648	4080	4080

In specification (2) of Table 4.3 we include all of the control variables except AVGDOMPREM and find that fund illiquidity (FILLIQ) is no longer significantly associated with the fund premium, but foreign market illiquidity (CILLIQ) is still significantly positively associated with the premium. The first of the control variables, the expense ratio (EXPRATIO) is significantly negatively associated with the premium. This confirms the findings of Gemmill and Thomas (2002) for UK funds in general and those of Kumar and Noronha (1992) for US funds, but contrasts with finding of Chan et al. (2008) who find, perhaps surprisingly, that US funds with higher expenses tend to have higher premiums. We find that larger market capitalisation (LNCAP) is associated with a higher premium, whereas age (LNAGE) is negatively associated with the premium. This supports earlier findings that as funds age, the premium falls. Weiss Hanley et al. (1996) find this effect in US funds as do Levis and Thomas (1995) for UK funds. However, Table 4.2 shows that age and size are strongly positively correlated (0.56) which makes us cautious about this interpretation. In contrast to Chan et al. (2008) who find that the dividend yield (DIVYLD) is significantly positively associated with the premium, we find no significant association. However, this is because UK emerging and developed market funds are significantly associated with opposite signs as we discuss below. We would expect to find market segmentation (SEG) positively associated with the premium, supporting earlier studies such as those of Bonser-Neal et al. (1990) and Chan et al. (2008) implying that investors are willing to pay more for access to segmented markets, but we find the opposite. We find a strong negative association between the

segmentation measure and the premium. However the relation between segmentation and the premium may not be straightforward. Internal political and economic problems can cause indirect investment barriers which could in turn deter UK investors, causing the premium to become increasingly negative. This is consistent with the findings of Nishiotis (2004).

The change in the foreign exchange rate (FXCHG) is significantly positively associated with the premium. Swanson and Tsai (2005) also find this effect for five of the ten funds in their country fund study. As the exchange rate increases (the foreign currency weakens), the price of the fund on the home market increases more than the NAV increases and this raises the premium. They suggest that this may reflect home investors anticipating better future performance from the foreign country.

In specification (3) of Table 4.3 we include the average domestic premium (AVGDOMPREM). It is significant and indicates that there is a common movement in the premium in both domestic and country funds. This may lend support to the argument that investor sentiment may be driving the premium, as suggested by Bodurtha, Kim and Lee (1995) for US country funds. Gemmill and Thomas (2002) also find evidence that noise-trader sentiment leads to fluctuations in the UK domestic equity fund premium. In a more recent study, however, Gemmill and Thomas find evidence that the UK closed-end fund premium is influenced by the rational factors (management fees and liquidity), whereas the US premium is more influenced by behavioural factors (idiosyncratic risk and payout ratio) (Gemmill & Thomas, 2011).

Even in the presence of the average domestic fund premium, Table 4.3 shows that foreign market illiquidity remains strongly positively associated with the premium. Expenses are no longer significant in the presence of the average premium, but age, size and segmentation remain significantly associated with the premium, with the same signs as before.

Our evidence clearly indicates that the country fund premium is influenced by the illiquidity of the country in which the fund is invested, suggesting that investors are prepared to pay more for access to illiquid markets. This remains the case even in the presence of the control variables. Fund illiquidity, on the other hand, is no longer significant when we include the control variables, however this may be due to the role played by the average domestic premium which may be an indication of sentiment, either rational or irrational.

Following the rational line of argument we investigate whether the common movement we observe in the UK fund premium may be related to fund illiquidity, in other words, if it might proxy for a rational aversion to fund illiquidity. We regress the average fund premium of the 55 sample funds against average fund illiquidity over the sample period. Table 4.4 shows a highly significant negative association between average fund illiquidity over the sample period and the average premium. This suggests that UK investors are less willing to pay more for illiquid funds, despite the fact that the overwhelming majority of closed-end fund investors in the UK are institutions and not the small investors who, according to Cherkes, Sagi and Stanton (2009), are particularly influenced by liquidity issues. UK institutional investors may be deterred from investing in less liquid funds for several reasons. Firstly, illiquidity may be an indication that the fund is struggling and that future

returns are likely to be less attractive. Secondly, institutional investors such as open-end funds invest in UK closed-end funds and they may require more liquid assets in case they are required to redeem units. Thirdly, many other institutional investors require liquid assets as they change portfolios regularly, requiring them to buy and sell shares at regular intervals.

Table 4.4: Regression of Average Fund Premium and Average Fund Illiquidity
This table reports the results coefficient estimates from a time series regression of the closed-end fund premium on average fund illiquidity using White heteroskedasticity-consistent standard errors and covariance. The sample period is 1992-2009 and includes all 55 UK country closed-end funds investing in a single non-UK country. The t-statistics are reported in parentheses. The symbol * denotes significance at the 5% level and ** denotes significance at the 1% level.

Independent Variables	
AV FILLIQ	-0.004 (-6.069)**
Adj R^2	15.36
No. of obs	205

Table 4.5 follows the same format as Table 4.3 but shows how different factors affect the premiums of emerging market and developed market funds when analysed separately. The analysis used in Table 4.3 is repeated, that is, specifications (1) and (4) corresponds to equation (4) without the control variables; specifications (2) and (5) correspond to equation (4) with all of the control variables except AVGDOMPREM; and specifications (3) and (6) include all of the control variables in equation (4). Fund illiquidity (FILLIQ) is only significant for developed market funds in the absence of the control variables. Foreign market illiquidity (CILLIQ) on the other hand, is highly significant for emerging market funds and is strongly positively associated with the premium, even in the presence of control variables. Our illiquidity results are similar to those of Chan et al. (2008) but our results show a

clearer contrast between developed and emerging market funds, confirming the suggestion that the UK investor will pay a higher share price for illiquid emerging markets, which may have growth potential, but not for illiquid developed markets. The expense ratio (EXPRATIO) also gives a quite different result: a higher expense ratio is strongly negatively associated with the premium for UK developed market funds, which again would support a rational interpretation, whereas Chan et al. find that a higher expense ratio is strongly positively associated with the premium of US funds

Table 4.5: Panel Regression of Fund Premium for Emerging and Developed Markets

This table reports coefficient estimates from regressions of closed-end fund premium on measures of fund illiquidity, foreign market illiquidity and various control variables following equation (5). In specifications (1) and (4) we exclude all control variables, in specifications (2) and (5) we include all control variables except the average domestic premium (AVGDOMPREM) and in specifications (3) and (6) we include all control variables..The sample period is 31/12/1992-31/12/2009 and includes all 55 UK country closed-end funds investing in a single non-UK country. The same tests are carried out separately on 14 emerging market funds and 41 developed market funds. In order to take account of heterogeneity between the funds, we use country closed-end fund fixed effects. Within each cross-section the White standard errors are adjusted for correlation of the residuals (Petersen, 2009). The corresponding t-statistics are reported in parentheses. The symbol * denotes significance at the 5% level and ** denotes significance at the 1% level.

Independent Variables	Emerging Market Funds			Developed Market Funds		
	(1)	(2)	(3)	(4)	(5)	(6)
FILLIQ	-0.000	0.000	0.000	-0.000	-0.000	0.000
	(-0.75)	(0.89)	(1.05)	(-3.05)**	(-1.31)	(0.45)
CILLIQ	29.19	70.89	69.84	15.17	9.13	38.08
	(3.74)**	(4.99)**	(5.03)**	(0.62)	(0.39)	(1.91)
EXPRATIO		-0.002	0.001		-0.001	0.001
		(-0.67)	(0.58)		(-2.59)**	(0.13)
LNCAP		0.070	0.05		0.08	0.08
		(9.46)**	(7.14)		(12.16)**	(15.59)**
LNAGE		-0.009	0.01		-0.044	-0.03
		(-1.09)	(1.28)		(-10.33)	(-7.29)**
DIVYLD		0.012	0.016		-0.004	-0.005
		(2.46)**	(3.18)**		(-2.21)*	(-2.82)**
SEG		(-0.105)	-0.10			
		(-4.17)**	(-3.93)**			
UKMKT		0.003	0.003		0.000	-0.000
		(2.98)**	(3.77)*		(0.45)	(-0.59)
FMKT		-0.07	-0.08		-0.005	0.02
		(-2.24)*	(-2.76)*		(-0.08)	(0.41)
FXCHG		0.236	0.21		0.21	0.12
		(2.24)*	(2.09)		(2.51)*	(1.76)
AVGDOMDPREM			0.006			0.007
			(5.49)**			(12.26)**
Adj R^2	26.32	48.95	52.56	17.04	35.90	47.79
No. of obs	1449	821	821	4199	3259	3259

The dividend yield (DIVYLD) shows another interesting contrast between emerging and developed markets funds. In emerging market funds the dividend yield is strongly positively associated with the premium, consistent with Chan et al. (2008). This supports the findings of Pontiff (1996) and Johnson et al. (2006)

discussed above who find that dividend yield is positively related to closed-end fund premium. Table 4.1 shows that emerging market funds have a much lower average dividend yield (0.47%) than developed market funds (4.09%). An increase in the dividend yield in emerging markets could signal confidence in future growth and result in a higher premium. In developed market funds, however, we find the opposite: as the dividend yield increases, the premium decreases. An increasing dividend yield could be caused by a decrease in price relative to the dividend and we would expect this to be accompanied by a fall in the premium.

We see another clear difference between emerging and developed market funds in the influence of the UK market. Whereas Chan et al. (2008) find no significant relation between the US and foreign market returns and the premium, Table 4.5 shows that the return on the UK market (UKMKT) is significantly positively related to the premium, indicating that as prices rise in the UK market, investors are buying shares in emerging market funds, causing fund prices to rise and the premium to increase correspondingly. This indicates that the UK emerging market fund investor may be influenced by movement in the UK market as well as by movement in the emerging market. This is confirmed when we look at the role of the foreign market return (FMKT) in the emerging fund premium. The premium is significantly negatively related to the foreign market return, indicating that when the return on the foreign market increases the premium does not increase as we might expect if discerning UK institutional investors buy as the net asset value increases. This may reflect market segmentation between the UK and emerging markets. We find that the average domestic fund premium (AVGDOMPREM) is significant for both developed and emerging market funds but much more so for developed market

funds. This suggests that there is a greater degree of common price movement in price between domestic and developed market funds than between domestic and emerging market funds, which is consistent with the greater degree of segmentation.

4.4 Financial Crisis and Country Funds

In this section we examine the behaviour of UK country funds and their underlying asset markets during the 2008 financial crisis. We follow Bartram and Bodnar (2009) and consider the key crisis period as beginning in September 2008 with the bankruptcy of Lehman, followed by the collapse of the Dow Jones and FTSE All Share Index. We examine the developing crisis until September 2009. 21 UK funds investing in 8 countries span the crisis period.

To ascertain whether the UK country fund premium decreases during the recent developed market crisis we conduct tests to compare the mean premium for 13 months to August 2008, the pre-crisis build-up, and 13 months from September 2008 onwards, the key crisis period (see Table 4.6).

Table 4.6: Response of Closed-end Country Fund Premiums to Developed Market Financial Crisis

The table reports descriptive statistics for the mean and standard deviations of the UK closed-end country fund premiums before and during the crisis. The sample includes all of the closed-end country funds investing in a single non-UK country that were active during the sample period: 16 developed market funds and 5 emerging market funds. The *t*-statistic is from regressions of the fund premium on a constant and a dummy variable which is zero for the 13 months before the crisis (31/08/07-29/08/08) and 1 for the 13 months when the crisis was most acute (30/09/08-30/09/09). The *t*-statistics are corrected for heteroskedasticity and autocorrelation of unknown form using Newey-West HAC coefficient covariance estimator (Newey & West, 1987b). A significantly negative coefficient on the dummy variable implies that premiums are significantly larger on average compared to the premiums before the crisis. The symbol * denotes significance at the 5% level and ** denotes significance at the 1% level.

Panel A: Developed Market Funds

Fund	Premium before crisis		Premium during crisis		*t*-statistic for difference of means
	Mean (%)	Std (%)	Mean (%)	Std (%)	
Edinburgh US Tracker	-3.54%	1.38%	-3.37%	2.79%	0.16
Baillie Gifford Japan	-10.48%	2.58%	-16.89%	2.61%	-5.34**
JPMorgan American	-9.19%	2.13%	-3.67%	4.58%	0.84
JPMorgan Japan	-13.09%	2.17%	-18.83%	4.39%	-3.39**
Baillie Gifford Shin Nippon	-11.19%	3.23%	-17.38%	7.37%	-2.28*
Fidelity Japanese Values	-13.40%	2.86%	-19.20%	7.06%	-2.04
F&C US Smaller Cos	-10.90%	2.27%	-15.26%	3.75%	-3.93**
North Atlantic Smaller Cos	-15.46%	7.54%	-41.22%	15.40%	-3.92**
Schroder Japan Growth	-12.43%	2.90%	-18.11%	3.24%	-4.10**
Gartmore Irish Growth	-11.59%	2.00%	-14.52%	4.29%	-2.09*
Renaissance US Growth	-15.82%	4.06%	-25.43%	9.56%	-2.44*
JPMorgan US Discovery	-9.73%	2.15%	-11.78%	1.81%	-3.17**
JPMF Japanese Smaller Cos	-11.57%	2.35%	-15.91%	4.97%	-2.10*
Morant Wright Japan	-10.17%	3.45%	-9.48%	14.28%	-2.30*
Melchior Japan	-10.01%	7.26%	-25.52%	1.67%	-3.94
Middlefield Canadian	-4.12%	4.19%	-16.71%	8.23%	-3.53**
T-test for group mean before and after crisis					-4.96**

Panel B: Emerging Market Funds

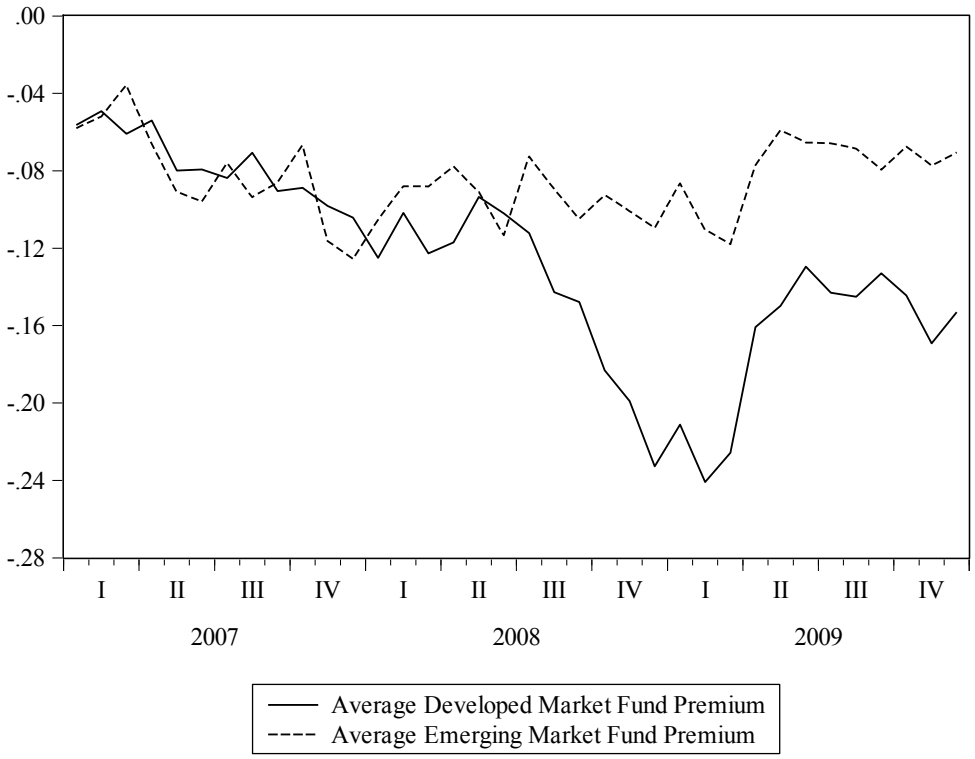
Fund	Premium before crisis		Premium during crisis		*t*-statistic for difference of means before and after crisis
	Mean (%)	Std (%)	Mean (%)	Std (%)	
New India	-14.12%	2.49%	-12.52%	4.18%	0.84
JPMorgan Chinese	-8.39%	2.64%	-4.24%	5.58%	1.80
JPMorgan India	-5.83%	5.10%	-5.46%	3.55%	0.15

JPMorgan Russian	-7.70%	2.05%	-6.83%	2.98%	0.80*
Aberdeen New Thai	-6.98%	6.70%	-14.72%	3.18%	-3.18**
T-test for group mean before and after crisis					-0.161

Panel A of Table 4.6 shows that the premium decreases significantly during the crisis for the overwhelming majority of developed market funds (*t*-ratio -4.96, p-value 0.00). However, Panel B shows that emerging market funds all have a generally insignificant increase in premium during the crisis, apart from Thailand, which had its own political crisis in 2008. These results contrast with those of Chandar and Patro (2000) who find that in almost all cases crises are accompanied by high country fund premiums in both emerging and developed markets. Chan et al. (2008) also examine the Asian and Russian financial crises of 1997-8 and also find that the fund premium increases dramatically during the crisis. We argue, however, that the developed market fund premium decreases significantly because both the shares and the assets belong to the same integrated market. As the financial crisis spreads from the US and UK to the remaining developed markets, UK shareholders are quickly selling their shares in developed market funds, causing the share price to drop and the premium to fall.

Figure 4.1 below confirms the results of Table 4.6 and clearly shows the difference between the average fund premium of developed and emerging markets during the crisis. The developed market fund premium plunges in the third quarter of 2008 and struggles to recover, but the emerging market fund premium continues to be much more stable.

Figure 4.1: Average Fund Premium for Emerging and Developed Market Funds 2007-2009



We find supporting evidence for the positive influence of illiquidity on the fund premium when we examine the relationship between the fund premium and country illiquidity during the crisis. We rerun the regressions of the closed-end fund premium on measures of market and fund illiquidity but restrict the time period to September 2008-September 2009, the main crisis period. Previously we found that in general country illiquidity is significantly positively related to the fund premium. However, Table 4.7 shows that during the crisis period country illiquidity in developed markets becomes significantly negatively related to the developed market fund premium (*t*-stat: -2.96). This supports our argument that country illiquidity is a disadvantage when it affects normally liquid markets.

Table 4.7: Panel Regression of Fund Premiums in Developed Market Financial Crisis
This table reports coefficient estimates from regressions of the closed-end fund premium on measures of fund and foreign market illiquidity between September 2008 and September 2009. The sample includes all of the closed-end country funds investing in a single non-UK country that were active during the sample period: 16 developed market funds and 5 emerging market funds. In order to take account of heterogeneity between the funds, we use fixed effects. Within each cross-section the White standard errors are adjusted for correlation of the residuals (Petersen, 2009). The t-statistics are reported in parentheses. The symbol * denotes significance at the 5% level and ** denotes significance at the 1% level.

Independent Variables	Developed Market Funds	Emerging Market Funds	All Funds
FILLIQ	-0.01	0.001	-0.004
	(-0.86)	(0.32)	(-0.59)
CILLIQ	-0.000	-59.63	-27.57
	(-2.96)**	(-0.33)	(-0.21)

When we look further into the illiquidity of individual markets, we find, consistent with our argument, that during the crisis period the illiquidity of developed markets increases significantly. Table 4.8 shows changes in the mean illiquidity in the eight countries that UK closed-end country funds invested in during the crisis period. All of the developed markets, except Japan, show a significant increase in illiquidity. None of the emerging markets, apart from Russia, shows a significant increase in illiquidity. This indicates that these emerging markets were less affected by illiquidity over this time period.

Table 4.8: Market Illiquidity Changes in Developed Market Financial Crisis

This table reports the mean market illiquidity of the countries invested in by UK closed-end country funds investing in a single non-UK country before and during the crisis period. The sample includes 5 developed markets and 4 emerging markets. The *t*-statistic is from regressions of the fund premium on a constant and a dummy variable which is zero for the 13 months before the crisis (31/08/07-29/08/08) and 1 for the 13 months when the crisis was most acute (30/09/08-30/09/09). The *t*-statistics are corrected for heteroskedasticity and autocorrelation of unknown form using Newey-West HAC coefficient covariance estimator (Newey & West, 1987b). A significantly positive coefficient on the dummy variable implies that premiums are significantly higher on average compared to the premiums before the crisis. The symbol * denotes significance at the 5% level and ** denotes significance at the 1% level.

Panel A: Developed Markets			
Country	Mean Illiquidity before crisis	Mean Illiquidity after crisis	t-statistic
Canada	2.88	6.86	3.81**
US	0.12	0.23	2.48*
Japan	1.15	1.61	1.58
Ireland	80.03	197.64	4.16**
Panel B: Emerging Markets			
China	3.75	2.78	-0.90
India	39.02	50.41	1.25
Thailand	70.21	92.32	1.07
Russia	12.90	44.88	2.38*

All of the country funds are located within the UK market that is suffering the crisis, and we find that they all become more illiquid. The paired *t*-test in Table 4.8 shows a significant increase in the illiquidity of funds investing in developed markets whereas illiquidity of funds investing in emerging markets shows an increase that is less significant. As our illiquidity measure consists of absolute return divided by turnover it could be argued that the increase in fund illiquidity is simply a function of more volatility in returns over the crisis period. However, is not just that fund volatility increases, as shown in Table 4.5, the paired *t*-test in Table 4.9 shows that mean fund turnover decreases more significantly in developed markets as well.

Table 4.9: Changes to Fund Illiquidity and Turnover in Developed Market Financial Crisis

This table reports the means of developed and emerging market fund illiquidity and turnover before and during the crisis period. The sample included all of the closed-end country funds investing in a single non-UK country that were active during the sample period: 16 developed market funds and 5 emerging market funds. The *t*-statistic is from regressions of the fund premium on a constant and a dummy variable which is zero for the 13 months before the crisis (31/08/07-29/08/08) and 1 for the 13 months when the crisis was most acute (30/09/08-30/09/09). The *t*-statistics are corrected for heteroskedasticity and autocorrelation of unknown form using Newey-West HAC coefficient covariance estimator (Newey & West, 1987b). A significantly positive coefficient on the dummy variable implies that premiums are significantly higher on average compared to the premiums before the crisis. The symbol * denotes significance at the 5% level and ** denotes significance at the 1% level.

Funds	Feature	Mean Before Crisis	Mean After Crisis	*t*-statistic
Developed Market	Illiquidity	149	334	5.03**
Emerging Market	Illiquidity	216	590	2.18*
Developed Market	Turnover/month £000	3234	1917	-3.31**
Emerging Market	Turnover/month £000	8033	4872	-2.24*

It could also be argued that exchange rate fluctuations are responsible for changes to the premium. Swanson and Tsai (2005) find that closed-end country fund premiums are significantly affected by the volatility of exchange rate returns. To test for the contribution of foreign exchange fluctuations to the premiums, as opposed to country or fund illiquidity, we regress the premium against country and fund illiquidity and include the foreign exchange rate over the crisis period. We find still find that country illiquidity is the overwhelming influence on the premium.

4.5 Conclusion

In this chapter we examine whether UK country fund premiums relate to the liquidity of the UK fund or the liquidity of the country the fund invests in. We also

consider whether emerging market country funds behave differently to developed market country funds during a crisis period. We find that both country and fund illiquidity plays highly significant roles in the premium of UK country funds. In emerging market funds country illiquidity is significantly positively related to the premium even in the presence of control variables, whereas fund illiquidity is not a significant factor. This suggests that investors in UK emerging market funds are prepared to pay more for access to illiquid markets with growth potential and are not so concerned about the illiquidity of the fund itself. For developed market funds the opposite is true: country illiquidity is not a significant factor but fund illiquidity is significant. The finding that country fund premiums move together with domestic fund premiums may indicate the presence of a rational or irrational investor sentiment. We explore this in more detail in Chapter 5. Consistent with a rational interpretation, we find that the average fund premium is highly significantly related to average fund illiquidity in regression, suggesting that decreases in the average fund premium may indicate a rational institutional aversion to fund illiquidity.

The recent financial crisis has a marked effect particularly on the premium and illiquidity of developed market funds. The premiums of funds investing in developed markets drops steeply during the crisis but those of emerging market funds show greater stability. During the crisis country illiquidity, previously insignificant in the developed market premium, now plays a significant negative role as developed country illiquidity increases markedly. Despite the volatility of emerging markets in general, investors are willing to pay more for emerging market funds relative to their assets during the crisis than for developed market funds.

Investing in a closed-end country fund offers the investor advantages in that it gives access to markets with growth potential which would otherwise be difficult to access, especially for the retail investor. The benefit of investing in a closed-end fund is that it offers investors more liquidity in the buying and selling of funds which invest in less liquid markets. However, the downside of foreign market illiquidity may mean that the fund is restricted to investing in the most liquid stocks of a less liquid market, which reduces the diversification benefits. Investors in UK closed-end single country funds should also be aware that these funds can suffer from liquidity problems, particularly when the home market is facing a downturn. This means they can be more difficult to sell and that spreads could widen considerably.

5. Sentiment as a Predictor of UK Closed-end Country Fund Pricing

5.1 Introduction

This chapter examines whether UK and foreign country consumer sentiment influence pricing of UK closed-end country funds. Specifically, it analyses the predictive ability of consumer sentiment indices in relation to the UK closed-end country fund share return and NAV (net asset value) return and premium. In addition, it investigates whether such investor sentiment is related to the roles of institutional and individual investors in the pricing of UK closed-end country funds.

Identification of the influence of investor sentiment on closed-end fund premium is chiefly associated with the work of Lee, Shleifer and Thaler (1991) who analyse domestic US closed-end funds. Bodurtha, Kim and Lee (1995) extend the analysis internationally by examining US closed-end country funds that invest in single foreign countries. They argue that the country fund premium captures the difference in sentiment between US investors and those in other countries - what we might call a relative sentiment hypothesis. Thus, the premium increases (decreases) when home investors are more optimistic (pessimistic) relative to investors in other countries and bid up (down) the closed-end fund share prices relative to their Net Asset Value (NAV).

A related strand of research investigates the relation between investor sentiment and stock returns across the entire stock market. Several papers find a significant negative relation between sentiment and future stock returns in the US market (Brown & Cliff, 2005) (Baker & Wurgler, 2006) (Lemmon & Portniaguina, 2006). This suggests that times of investor optimism when sentiment is high are consistently

followed by lower stock market returns. Some papers extend this analysis to international stock markets and find consistent results (Schmeling, 2009) (Baker, Wurgler, & Yuan, 2012). In this chapter we extend this analysis further, asking whether there is a predictive relation between consumer sentiment and the pricing of closed-end country funds.

We contribute to both of these areas of research - investor sentiment and the closed-end fund premium, and investor sentiment and stock returns – by combining insights from both in our analysis. We extend the literature on sentiment and closed-end funds by comparing consumer sentiment indices in 13 countries between 1992 and 2009 as a measure of investor sentiment in both the home and foreign country.[25] In addition, we analyse the predictive effects of consumer sentiment measures over different time periods. Our research takes a similar approach to that of Schmeling (2009). While he analyses the impact of sentiment on aggregate stock markets, we focus on the different impacts of sentiment in the home and the country market and how these specifically affect the return on the share price and the premium of UK closed-end country funds.

Furthermore, by comparing sentiment in the home and foreign countries we extend the concept of calibrating consumer confidence indices as in Baker et al. (2012). They use three pairs of dual-listed UK-US companies and find that differences in investor sentiment levels between the US and UK are significantly related to differences in pricing between the dual-listed companies. Instead of using

[25] Datastream provides the consumer confidence index levels from Conference Board surveys. These are consumer responses to standardised questions concerning business, employment and family income expectations – see Appendix A.

three pairs of UK-US listed companies, we use 44 closed-end country funds investing in the following countries: Japan, US, Germany, Australia, China, Thailand, France, New Zealand, Turkey, Russia, Canada and Ireland. As the UK closed-end fund and the underlying portfolio are both claims to the same assets, this gives us a good basis to compare investor sentiment in the UK with that in different countries.

An additional motivation for this research is that UK closed-end funds, unlike those in the US, are primarily held by institutional owners. Between 1998 and 2008 private individuals held less than 20% on average of UK closed-end fund shares (Office for National Statistics, 2009) whereas Hardouvelis et al. (1994) find that over 80% of investors in US closed-end funds are private individuals. This implies that there is potentially less noise trading impact in the pricing of UK closed-end funds. Recent studies of closed-end funds also point to the possibility of a greater impact of sentiment in US pricing as opposed to the UK due to the greater proportion of retail investors in the US (Flynn, 2012). Gemmill and Thomas (2011) also find evidence to confirm the impact of greater noise trading in the US on closed-end fund prices as compared with the UK.

Data from the Nominus Database,[26] which lists share ownership in a sample of UK Investment trusts from 1999-2005, confirms that in general the largest investors in UK closed-end country funds are institutional investors. In addition it shows that institutional investors are generally investing for longer periods than individual

[26] The author has data from 1999 – 2005 sent by Thomas Hjelstrom. The database is no longer in operation.

investors.[27] Following previous studies (Lee, Shleifer, & Thaler, 1991) we assume that these institutional investors are informed about the trends in market sentiment in the countries in which they invest, since they are advised by professional asset managers. Thus, when consumer sentiment is rising in the country market, informed UK institutional investors buy shares in the corresponding UK closed-end country fund. Over time country consumer sentiment gradually declines, but share prices are slow to react, partly due to the lack of liquidity in the UK closed-end fund market, as evidenced from previous studies (Davies, Fletcher, & Marshall, 2012). This gives rise to a negative predictive relation between country consumer sentiment and the closed-end fund share price return.

There is also a much smaller group of active individual UK investors, some of whom follow what is known as a 'discount trading' strategy. These investors buy funds at low premiums (high discounts to the value of the underlying assets) at times of increasing UK consumer sentiment. They anticipate that the premium will increase as UK market conditions improve, increasing the price relative to the NAV. Over time UK sentiment will correct itself and decrease, but prices will be slow to react, causing a negative predictive relation between UK consumer sentiment and the UK closed-end fund premium. The activity of discount traders is not restricted to particular sectors, such as country funds but is an across the board strategy. This suggestion is supported by our data from the Nominus database from 1999-2005 showing that individual investors hold shares in closed-end funds for shorter periods than institutional investors. Furthermore, the practitioner literature regularly advises investors to follow such a strategy. A recent article in Investment Week cites a

[27] The sample includes over 22% of the funds in the present study.

broker who has compiled a ten strong list of investment trusts trading on discounts which are 'too attractive to ignore' (Investment Week, 2012). During the sample period (1992-2009) this strategy was also recommended in the Financial Times: 'One [strategy] that appears to have succeeded, not only this year but during the bear market years of 2000-02, is that of closed-end fund arbitrage. It involves going long on closed-end funds that are trading at a severe discount to their net asset value, and possibly hedging by going short on the components of the closed-end fund. Hedge funds have used this strategy for some time and it can work for sophisticated retail investors too.' (Altucher, 2004). Gemmill and Thomas (2002 & 2011) also find evidence that the UK premium is constrained by arbitrage bounds.

The main finding of our study is that foreign country consumer sentiment index levels are a significant negative predictor of the share price and NAV return of funds over horizons up to one year but that UK consumer sentiment index levels are not significantly related to the share price return. This suggests that country consumer sentiment levels influence UK institutional investors, who form the largest investor group, more than UK consumer sentiment levels. One implication of our findings is that UK closed-end funds are a good vehicle for diversification as their share prices reflect foreign market sentiment more than UK market sentiment. This finding contrasts with earlier US findings as Bodurtha, Kim and Lee (1995) and Chang, Eun and Kolodny (1995) find that the share price return of US country funds is more influenced by home (US) market sentiment than foreign market sentiment. And our results are consistent with those of Bekaert and Urias (1996), who find UK closed-end country funds are a better means of diversification than US country funds. Our results are also consistent with more recent US research by Lee and Hong (2002)

who find that US country fund returns move more closely with foreign market returns.

Our second main finding is that country (UK) consumer sentiment index is not (is) a significant negative predictor of the closed-end country fund premium across all horizons. This indicates that the closed-end country fund premium is much more influenced by UK consumer sentiment than by sentiment in the countries in which the investment takes place. We argue that premium levels are influenced by the trading activity of retail investors who buy shares in funds in all sectors at low premiums in bear markets, expecting that the premium will rise closer to the NAV.

Taken together, our findings suggest that country consumer sentiment indices can contribute to predicting the long term future share price return of country funds. If investors are more concerned with the level of the premium however, our results suggest that the UK consumer sentiment index is more relevant.

The rest of this chapter is structured as follows. The next section briefly reviews a selection of the literature on sentiment in relation to the stock markets and closed-end funds, concluding with testable hypotheses. Section 3 describes the data on sentiment indices and closed-end funds. Section 4 provides the results of the sentiment based regressions. Section 5 compares groups of country funds and Section 6 concludes.

5.2 Literature and Testable Hypotheses

The areas of closed-end funds and sentiment have both given rise to an extensive literature.[28] Here we focus on key contributions from the two strands of research that inform our study: investor sentiment and closed end funds, and investor sentiment and aggregate market returns.

Regarding research on investor sentiment and closed-end funds, De Long et al. (1990) argue that the closed-end fund premium reflects a risk posed by noise traders to the informed traders. A key assumption underpinning this view, articulated most clearly by Lee, Shleifer and Thaler (1991) in their analysis based on a sample consisting almost exclusively of US domestic closed-end funds, is that there are different clientele groups investing in closed-end fund shares: informed and uninformed investors. Uninformed investors have expectations that are not based on fundamental values and are influenced by 'noise' instead of news (Black, 1986). They further argue that uninformed investors are the dominant clientele group of the fund but not of the underlying assets. Their unpredictable optimism or pessimism therefore affects the share price of the fund but not the price of the underlying assets.

A criticism of the paper by Lee, Shleifer and Thaler (1991) is that it is based on the assumption that investors in closed-end funds differ from investors in the underlying assets. We agree with Bodurtha, Kim and Lee (1995) who suggest that country funds are a richer research setting than the domestic funds used by Lee, Shleifer and Thaler (1991) for testing the theory of investor sentiment because

[28] Chapter 2 provides a comprehensive literature review.

country funds provide two distinguishable sets of investors - the foreign country investor and the US investor – and therefore two potential sources of sentiment. Bodurtha, Kim and Lee argue that the country fund premium captures the difference in sentiment between the US and foreign market. This is because the premium reflects the sentiment of US retail investors who are likely to be over-optimistic or over-pessimistic in their assessment of the fundamental share value. If retail investors are over-optimistic (over-pessimistic) they will bid up (down) the share price in relation to the net asset value, increasing (decreasing) the premium. Basing their models on the earlier research of Lee, Shleifer and Thaler (1991) and De Long et al. (1990), Hardouvelis (1994) and Bodurtha, Kim and Lee (1995) find evidence to support this noise-trader model in relation to country funds. Others disagree however, suggesting that information asymmetries between markets are the primary cause of fluctuations in the country-fund premium, particularly the dramatic fluctuations seen during times of financial crisis (Frankel & Schmukler, 1996) (Chandar & Patro, 2000).[29]

Turning to the second strand of relevant research, that of individual investor sentiment and stock market returns, Brown and Cliff (2005) use survey measures of sentiment and investigate their ability to predict returns over longer horizons than previous research. Basing their analysis on the US stock market, they predict that excessive optimism will lead to times when stocks are over-valued and that this will be followed by low cumulative long run returns. Lemmon and Portniaguina (2006) compare various measures of US sentiment, including the Conference Board Survey,

[29] Dimson and Minio Kozerski (1999) provide a comprehensive review. See Cherkes (2012) for a more recent one.

the Baker and Wurgler indices (2006) and the closed-end fund discount. Lemmon and Portniaguina compare their ability to predict the returns on small stocks and find a predictive negative relationship between consumer sentiment and the returns on small stocks and on stocks with low institutional ownership. They suggest this relation shows that individual investors are more likely to make errors in stock pricing due to the influence of sentiment. Baker and Wurgler advance the research into sentiment in two related papers (Baker & Wurgler, 2006) (Baker & Wurgler, 2007), looking further into ways of measuring sentiment in the stock market. They create a sentiment index from six market-based measures which they then use to predict returns across a range of stock portfolios and find, confirming the noise trader hypothesis, that when sentiment is high according to their index, the future return on stocks attractive to optimists and speculators (but not to arbitrageurs) tends to be low. In Baker, Wurgler and Yuan (2012) they expand their application of investor sentiment indices and apply them internationally, creating a global index and six local indices corresponding to six major markets. In their empirical tests they find that global sentiment is a contrarian predictor of the cross-section of market returns.

Schmeling (2009) also looks at the impact of sentiment on stock market returns in 18 developed market countries. Like Lemmon and Portniaguina (2006) he uses survey measures of consumer confidence and finds that sentiment is a contrarian predictor of aggregate stock market returns on average across these countries. The predictive ability of sentiment varies considerably between countries, and in the case of the UK, he does not find that consumer sentiment predicts aggregate market return.

This finding is of particular relevance to our study. It could be argued that the reason Schmeling (2009) finds that sentiment indices vary in their predictive ability is due to differences in the stock markets themselves. Baker, Wurgler and Yuan (2012) recognise this version of the joint hypothesis problem in their analysis of the impact of sentiment across countries and address it by analysing the impact of their market-based sentiment indices on the returns of three pairs of dual listed companies, listed in the US and the UK. Our study provides an extension of the analysis of Baker, Wurgler and Yuan (2012) as we compare the impact of UK and 12 foreign country consumer sentiment indices on the pricing of 44 UK country funds. As the UK share price and the NAV both represent the same assets and are comparable to dual-listed companies, it provides an opportunity to compare the difference in the impact of sentiment on pricing of the same assets over time.

We formalise our investigation of the impact of consumer sentiment on the pricing of UK closed-end country funds in the following hypotheses:

Hypothesis 1. Foreign country consumer sentiment negatively predicts the NAV return.

Studies have shown that measures of foreign country consumer sentiment negatively predict the aggregate stock market return in those countries over different time horizons (Schmeling, 2009). UK closed-end funds are required by law to invest in a diversified portfolio and so we hypothesise that the diversified portfolio of underlying assets invested in by the fund is representative of the foreign stock market and that a similar negative predictive relation will exist across different time horizons. This is because optimistic (pessimistic) investors in the foreign country

will bid up (down) country market share prices but the prices eventually revert to their true values over longer intervals.

Whereas we expect that the NAV return will be influenced by country consumer sentiment, we would expect the UK closed-end fund share price return to be influenced by UK sentiment, leading to our second hypothesis:

Hypothesis 2. UK consumer sentiment negatively predicts the share price return.

Consistent with the findings of Bodurtha, Kim and Lee (1995) we expect to find that the share price return of closed-end country funds will be influenced by UK sentiment. If sentiment, as proxied by consumer sentiment surveys, affects the UK market, then as the closed-end fund share is traded in the UK market we would expect to see the influence of sentiment on the return of the closed-end fund share price. We would expect optimistic (pessimistic) UK investors to bid up (down) the price of the share which will revert to its true value over time.

The fluctuations in closed-end fund premiums offer sophisticated retail investors in all sectors of the UK closed-end fund market the opportunity to buy closed-end fund shares operating at low premiums (large discounts to net asset value) and sell them later when the price has risen to the net asset value. Gemmill and Thomas (2002) (2011) find evidence for the activities of arbitrageurs in constraining the bounds the UK closed-end fund premium, and also find evidence of investor sentiment in the fluctuations of the premium. We explore the role of sentiment in our third hypothesis:

Hypothesis 3. UK consumer sentiment negatively predicts the premium.

Bodurtha, Kim and Lee (1995) argue that the premium corresponds to difference in sentiment between the home and country market investor. If this applies in the UK, we would expect the premium to rise (fall) when optimistic (pessimistic) UK investors pay higher (lower) share prices relative to the NAV but for the premiums to revert back over the longer term, giving rise to a negative relation between the premium and UK sentiment.

5.3 Data and Descriptive Statistics

5.3.1. Data Issues and Descriptive Statistics

Sentiment Indices

We choose to measure sentiment using consumer confidence indices.[30] As these surveys are available for many countries, although measured slightly differently, they offer a largely consistent way of comparing consumer sentiment across different countries that is not based on trading data. We collect data on the 13 country consumer sentiment indices and on UK closed-end country funds from Datastream between December 1992 and December 2009. As some consumer confidence indices did not overlap with the fund period, the number of funds in the sample had to be reduced from 48 to 44. For 3 countries the consumer confidence index is only available quarterly and so we use the most recent measure for months without values as in Baker and Wurgler (2006). This only applies to 3 out of the sample of 44 funds. Datastream usually only provides either a seasonally-adjusted or

[30] Sentiment cannot be directly measured but can be estimated in various ways. One method is to construct an index of sentiment as in Baker et al (2012) using market data. An alternative approach followed by Lemmon and Portniaguina (2006), Schmeling (2009) and Zouaoui (2011) is to use survey data on consumer sentiment.

non seasonally-adjusted index, but not both. Where a seasonally adjusted index (SADJ) was available we have used it. We include more information on the indices used in Appendix A.

Table 5.1: Descriptive Statistics of Sentiment Indices

This table presents the mean (μ), the mean standardised to begin at 100 (μ(standardised)), the standard deviation (σ), first order autocorrelation ($\rho(1)$) and number of observations of the country consumer sentiment indices from December 1993 to December 2009. We have included all of the observations available over the sample period although in some cases the life of the fund is shorter than the timespan of the sentiment index.

	Sentiment Index	μ	μ(standardised)	σ	$P(1)$	Observations
1	Turkey	97.38	96.88	13.15	0.92	193
2	China	110.48	91.38	4.23	0.93	193
3	Russia	-15.53	142.47	14.04	0.94	135
4	Canada	82.68	111.68	8.06	0.89	102
5	US (SADJ)	101.03	121.23	25.98	0.96	193
6	Thailand	78.16	107.86	11.38	0.97	126
7	Japan (SADJ)	40.9	104.5	5.16	0.95	193
8	Germany (SADJ)	-9.76	115.84	9.26	0.95	193
9	Ireland (SADJ)	-0.6	87.13	10.59	0.98	173
10	UK (SADJ)	-6.47	112.23	7.38	0.93	193
11	New Zealand	115.23	90.73	9.82	0.91	193
12	Australia (SADJ)	108.01	101.37	7.12	0.81	150
13	France (SADJ)	100.93	105.33	10.51	0.98	193

Table 5.1 presents the mean, standard deviation and number of monthly observations of the consumer confidence indices for Turkey, China, Russia, Canada, the US, Thailand, Japan, Germany, Ireland, the UK, New Zealand, Australia and France. To make it easier to compare the indices we have standardised them all to a value of 100 at the beginning of their respective sample periods. The US confidence index shows one of the highest mean levels of confidence and the highest standard deviation. The UK, in contrast, shows a lower mean level of confidence and lower standard deviation. This confirms the findings of greater volatility in the US market as compared to the UK market in the studies of Flynn (2012) and Gemmill and

Thomas (2011). It is clear that the consumer confidence indices show a high level of first order autocorrelation.

To check that the confidence indices are not too highly correlated with each another and that we are not essentially dealing with one confidence index, we compute pairwise correlations of the consumer confidence indices, reported in Table 5.2.

Table 5.2: Correlations Between Sentiment Indices

This table presents the pairwise correlations between the country consumer sentiment indices from December 1993 to December 2009.

	Turkey	China	Russia	Canada	US	Thai.	Japan	Germ	UK	New Zeal.	Irel.	Austral.
China	0.30											
Russia	0.55	0.52										
Canada	0.71	0.22	0.18									
US	0.17	0.22	-0.24	0.60								
Thailand	0.43	0.03	0.22	0.42	0.05							
Japan	0.50	0.35	0.33	0.61	0.37	0.26						
Germany	0.04	0.19	0.02	0.19	0.52	-0.30	0.20					
UK	0.47	0.20	0.12	0.78	0.71	0.38	0.45	0.22				
New Zealand	0.11	0.35	0.01	0.59	0.04	0.50	0.41	-0.19	0.16			
Ireland	0.05	0.19	-0.40	0.56	0.94	0.08	0.38	0.34	0.69	0.12		
Australia	0.24	0.03	0.00	0.73	0.19	0.40	0.42	0.00	0.33	0.58	0.20	
France	-0.10	0.17	-0.33	0.52	0.73	-0.03	0.08	0.58	0.45	0.18	0.66	0.19

Table 5.2 shows that although there is certainly a high correlation between the indices, as we might expect, such as that between the UK and the US and Canada, the correlation between the indices is generally not too strong. The difference between the indices is further confirmed in Figure 5.1 below which illustrates the different country consumer confidence indices over time.

Figure 5.1: Country Consumer Sentiment Indices

Figure 5.1 illustrates the time series of the country sentiment indices from December 1993 to December 2009, standardised to begin at 100.

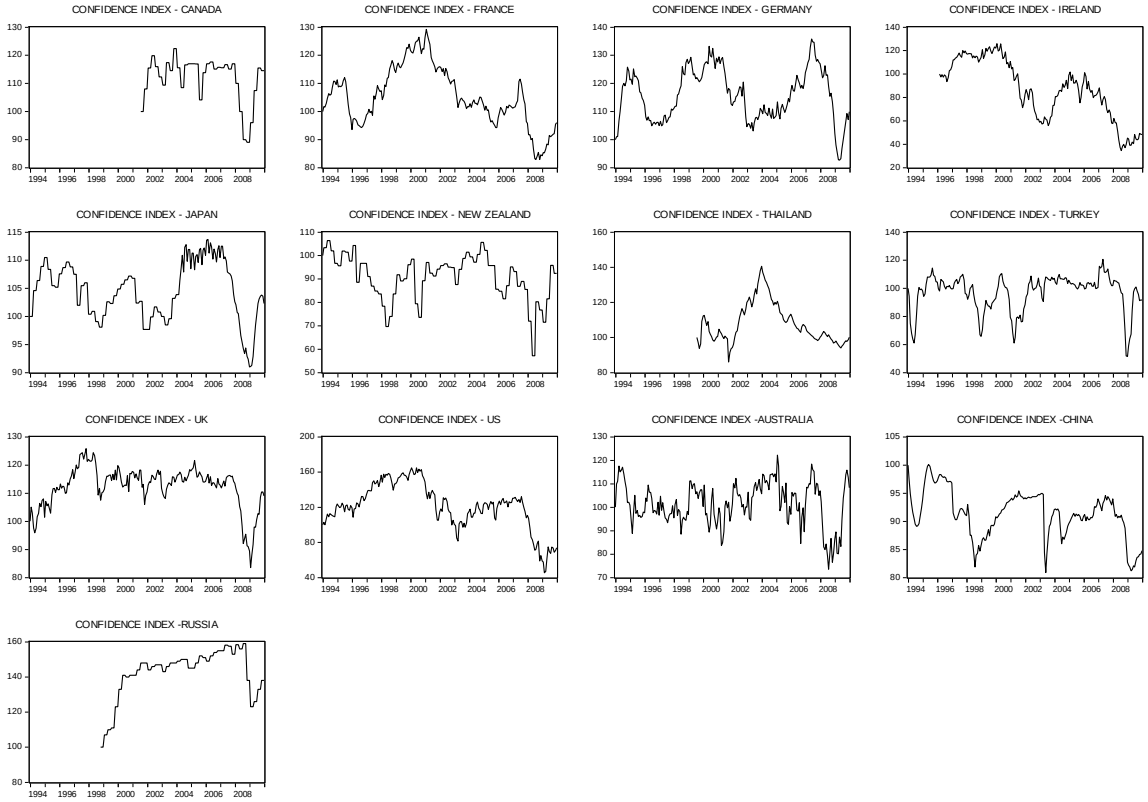


Figure 1 shows both similarities and differences in the consumer confidence indices of 13 countries over time. The impact of the financial crisis in 2008 is immediately apparent in the steep drop of consumer confidence at that time across all of the indices. Some of the indices, particularly in emerging markets, however, (China, Russia, Thailand and Turkey) reflect trends in consumer confidence that seem quite different to those in developed markets which resemble each other more closely.

Closed-End Fund Data

We collect data on UK closed-end country funds from Datastream, the London Share Price Database, Investment Trust Yearbooks and the periodical 'Money Management'. We exclude split capital funds and those that do not provide NAV information and those without corresponding consumer sentiment indices over the sample period.

We include all funds that existed at any point during the sample period, even if they ceased trading during the sample period to avoid survivorship bias, giving us a final sample of funds investing in the following countries: Japan (17), US (11), Germany (4), Australia (2), China (2), Thailand (2), France (1), New Zealand (1), Turkey (1), Russia (1), Canada (1), and Ireland (1) between Dec 1993 and Dec 2009.

The data we collect include the monthly closing price and the monthly diluted net asset value (NAVD) of each fund. From these we construct the Share Price Return (SPRET) and the premium (PREM). Studies have shown that closed-end

funds typically begin at a premium to the NAV and within a few months fall into a discount (see Weiss Hanley et al. (1996) for US funds and Levis and Thomas (1995) for UK funds). We therefore exclude the first six months from the fund IPO. If the fund merely changes objective and becomes a single country fund, the first six months are not excluded as the fund has already been through the IPO process. We also exclude the month before the fund is liquidated, open-ends or changes objective. In most cases the birth month of the fund corresponds to the date on which both the price and NAV of the fund are provided on Datastream.

We also collect data on additional variables which have been shown to influence the premium in previous studies: foreign country market return (CMKT), UK market return (UKMKT), dividend yield (DIVYLD, foreign exchange appreciation (FXCHG), expense ratio (EXPRATIO), age (LNAGE) and size (LNMVAL). These control variables are defined in Section 4.2.3. Table 5.3 provides summary statistics of these variables.

Table 5.3: Fund and Confidence Index Descriptive Statistics
This table reports the average country and UK consumer sentiment index levels, the average fund share price return and premium, and control variables, the standard deviation, minimum and maximum for all 44 UK closed-end funds investing in single foreign countries between 31/12/1993 and 31/12/2009.

Variable	Mean	Std. Dev.	Min	Max
CSENT	64.40	41.84	-58.00	144.70
UKSENT	-6.47	7.36	-35.20	7.10
SPRET	0.0029	0.09	-0.54	0.73
PREM	-0.1233	0.10	-1.24	0.49
NAVDRI	0.0026	0.07	-0.56	0.51
CMKT	0.0071	0.06	-0.36	0.65
UKMKT	0.3847	4.14	-13.42	9.52
DIVYLD	0.77	2.87	0.00	72.80
EXPRATIO	1.62	1.35	0.23	13.54
FXCHG	0.0008	0.03	-0.18	0.63
LNAGE	2.24	1.09	-2.48	4.85
LNMVAL	3.93	1.02	1.58	6.78

Country Consumer Sentiment (CSENT) and **UK Consumer Sentiment (UKSENT):** These are the consumer sentiment index levels for all of the country funds and for the UK. We have standardised these so that all begin at 100 at the beginning of the sample period.

Share Price Return (SPRET): This is the monthly return on the share price of the fund and is expressed as a decimal. In common with previous research we find that the volatility of the share price return is higher than the volatility of the underlying assets (Agyei-Ampomah & Davies, 2005).

Diluted NAV Return (NAVDRI): This is the monthly reported return on the Net Asset Value (NAV) of the fund. (The NAV is calculated by adding together the value of the company's investments, cash and other net current assets and deducting all of its liabilities, including any preference capital that may have been issued).

Premium (PREM): As in Chapter 4.2, (Equation 1) we define the premium is the difference between the natural log of the share price and natural log of the NAV, following Chan et al (2008).

The remaining control variables are defined in Section 4.2.3. Table 5.4 shows the pairwise correlations of independent and control variables.

Table 5.4: Correlation of Premium, Sentiment and Control Variables

This table reports the correlations between country consumer sentiment (CSENT), UK consumer sentiment (UKSENT), the NAV return (NAVDRI), the share price return (SPRET) the premium (PREM) and control variables. The control variables are the expense ratio (EXPRATIO), size (LNCAP), age (LNAGE), Dividend yield (DIVYLD), UK market return (UKMKT), country market return (CMKT), foreign exchange appreciation (FXCHG). The sample period is 31/21/1993 to 31/12/2009 and the sample includes all 44 UK country closed-end funds investing in a single non-UK country.

	Csent	Uksent	Navdri	SPret	Prem	Cmkt	Ukmkt	Fxchg	Expratio	Lnage	Lnmval
Uksent	0.17										
Navdri	0.02	0.03									
SPret	0.02	0.04	0.80								
Prem	0.12	-0.03	-0.07	0.09							
Cmkt	0.03	0.09	0.67	0.61	0.02						
Ukmkt	0.02	0.14	0.48	0.48	0.03	0.53					
Fxchg	0.02	0.14	-0.31	-0.20	0.09	0.04	-0.11				
Expratio	0.06	0.07	-0.03	-0.02	-0.09	0.00	-0.03	0.01			
Lnage	0.06	-0.04	0.04	0.05	-0.04	0.00	-0.02	-0.05	-0.24		
Lnmval	-0.04	-0.02	0.05	0.06	0.29	0.01	0.01	-0.02	-0.24	0.46	
Divyld	0.14	-0.05	-0.12	-0.12	-0.02	-0.02	-0.03	-0.01	0.03	-0.10	-0.06

Table 5.4 shows that the return on the share price (SPRET) and the NAV return (NAVDRI) have the strongest correlation as we would expect. Again as we expect, the NAV return is negatively correlated with the premium and the share price return is positively correlated with the premium. We see a strong positive relationship between the NAV return and the return on the country market (CMKT) as we would expect. We also see a strong relation between the fund share price return (SPRET) and the return on the country market (CMKT). The premium, however, does not have strong correlation with anything apart from size (LNMVAL). The correlations between country consumer sentiment and the share price return and UK consumer sentiment and the UK premium are not strong. However, in this study we focus on the ability of consumer sentiment to *predict* the share price return and premium and would not expect a strong result from contemporaneous correlations.

5.3.2 Preliminary Tests

It is possible that the confidence indices show an upward or downward trend over time. Accordingly, we conduct panel unit-root tests for individual unit roots for the 13 consumer confidence series as shown in Table 5.5.

Table 5.5: Panel Unit Root Tests for Country Confidence Indices

This table presents panel unit-root tests for the consumer confidence indices across all funds. The null hypothesis of the tests is that each series has an individual root process. Tests are repeated at various lag lengths and the average of the test statistics is given. (* denotes significance at 5% and ** denotes significance at 1%).

		Avg Test Statistic	*Avg p*-value	Avg No of periods
Country Confidence	Im, Pesaran and Shin	-4.94	0.00**	187.37
	Fisher	163.82	0.00**	187.37
UK Confidence	Im, Pesaran and Shin	-8.08	0.00**	187.37
	Fisher	175.37	0.00**	187.37

The results of these tests confirm that the confidence indices are stationary, although they are highly autocorrelated, consistent with the finding of Schmeling (2009) for industrialised country confidence indices.

5.4 Predictive Consumer Sentiment Regressions

This section presents the results of the consumer confidence regressions. In section 4.1 we present the methodology and in section 4.2 we present the results of regressions on all of the country funds and section 4.3 we present the results from the largest country groups.

5.4.1 Research Methodology

We use panel regressions to test for a significant relation between consumer confidence and return on the share price and the premium. To take account of the heterogeneity in the funds we use a fixed effects technique where each fund is allowed to have a fixed constant (α_f). One example of the difference between funds could be the size of the trust, in the sense that some trusts have a large fixed size over the period and some have a small fixed size. We allow for the intercepts to be different for each fund but constant over the sample period.

We estimate panel regressions of the form:

$$NAVDRI_{f,c,t} = \alpha_f + \beta_1 CSENT_{c,t} + \beta_2 UKSENT_t + \beta_3 EXPRATIO_{f,t} + \beta_4 LNMVAL_{f,t} + \beta_5 LNAGE_{f,t} + \beta_6 DIVYLD_{f,t} + \beta_7 UKMKT_t + \beta_8 CMKT_{c,t} + \beta_9 FXCHG_{c,t} \quad (2)$$

$$SPRET_{f,c,t} = \alpha_f + \beta_1 CSENT_{c,t} + \beta_2 UKSENT_t + \beta_3 EXPRATIO_{f,t} + \beta_4 LNMVAL_{f,t} + \beta_5 LNAGE_{f,t} + \beta_6 DIVYLD_{f,t} + \beta_7 UKMKT_t + \beta_8 CMKT_{c,t} + \beta_9 FXCHG_{c,t} \quad (3)$$

$$PREM_{f,c,t} = \alpha_f + \beta_1 CSENT_{c,t} + \beta_2 UKSENT_t + \beta_3 EXPRATIO_{f,t} + \beta_4 LNMVAL_{f,t} + \beta_5 LNAGE_{f,t} + \beta_6 DIVYLD_{f,t} + \beta_7 UKMKT_t + \beta_8 CMKT_{c,t} + \beta_9 FXCHG_{c,t} \quad (4)$$

Where *NAVDRI* is the return on the underlying assets (NAV) of fund *f* from country *c* at time *t. CSENT* is the level of consumer sentiment of country *c* at time *t* and so on. In equation (2) we are testing our first hypothesis that foreign country consumer sentiment negatively predicts the NAV return. In equation (3) we test the second hypothesis that UK consumer sentiment negatively predicts the share price return (SPRET) and in equation (4) we test the third hypothesis that the UK consumer sentiment negatively predicts the premium.

As we are interested in whether consumer confidence indices predict changes in the share price and the premium, we introduce lags in the consumer confidence indices of the various countries and the UK confidence measures simultaneously of 1, 6, 12 and 24 months and repeat the regressions.

5.4.2 Regression Results

We start with the results from the regressions of the NAV return on UK and country consumer confidence indices and control variables which are shown in Table 5.6. The table shows regression equation (2) with the confidence variables (UKSENT) and (CSENT) lagged at periods of 1, 6, 12 and 24 months. The aim of this is to investigate whether confidence measures may be predicting the return on the NAV at varying time horizons.

Table 5.6: Panel Regression of Diluted NAV Return (All Funds)

This table reports the results of panel regressions of the monthly UK closed-end country fund diluted NAV return on the UK consumer confidence index (UKCONF), country consumer confidence index (CONF), country market return (CMKT), UK market return (UKMKT), age (LNAGE), market value (LNMVAL), expense ratio (EXPRATIO), dividend yield (DIVYLD) and foreign exchange appreciation rate (FXCHG). The regression is repeated with the lagged confidence indices. The results are shown for the sample of all funds from December 1993 to December 2009. Robust standard error adjustment is used. (* denotes significance at 5% and ** denotes significance at 1%).

	Forecast Horizon							
	1 month		6 months		12 months		24 months	
Indep. Vars.	Coef.	t	Coef.	t	Coef.	t	Coef.	t
UKCONF	0.0004	2.59*	-0.0001	-1.43	0.0001	0.71	0.000	1.01
CONF	-0.0002	-4.08**	-0.0002	-3.29**	-0.0001	-1.54	0.000	1.25
CMKT	0.8351	6.84**						
UKMKT	0.0018	1.5						
LNAGE	-0.0039	-1.84						
LNMVAL	0.0034	1.15						
EXP RATIO	-0.0007	-1.33						
DIVYLD	0.0005	0.42						
FXCHG	-0.7993	-7.93**						
R-sq	63.45							

Table 5.6 shows that measures of country consumer confidence (CSENT) are highly significantly negative predictors of the NAV return. However, they are significant only for time horizons up to 6 months. We find support for Hypothesis 1, that the foreign consumer sentiment index will predict the NAV return and that

sentiment will be negatively and significantly related to the NAV return in the presence of controlling factors. Our findings give support to our argument that consumers in the country market become confident and are prepared to buy shares, causing the value of the fund's underlying assets to increase and increasing the NAV return. However, over longer intervals the effect disappears as the sentiment becomes mean-reverting. This is consistent with prior research which shows that developed market sentiment measures are negative predictors of stock returns but that this predictive effect washes out over longer horizons (Schmeling, 2009). The high R-sq measure (63.45) indicates that the model fits the data well. We rerun the tests using an AR-1 correction for serial correlation in the residuals, but find that generally the T-stats are more conservative when using robust standard errors.

Although country consumer sentiment clearly has a strong relation with the return on the we find that the NAV return is more influenced by the return on the country market the fund invests in (CMKT) and changes in the exchange rate (FXCHG). As the return on the country market (CMKT) increases, the NAV return increases, as we might expect, assuming that the underlying assets invested in by the fund are representative of the market as a whole. The strongest relation is that between the foreign exchange appreciation rate (FXCHG) and the NAV return. As sterling depreciates and the foreign currency becomes stronger, the NAV return increases. We might expect an increasing market return to be accompanied by an increase in the strength of the currency. This finding agrees with the study of Bodurtha, Kim, and Lee, (1995). They also find that the country market return and exchange rate changes have a more significant impact on the NAV than the home market return.

We do not see a significant relation between UK the consumer confidence measure (UKSENT) on the NAV return or between the UK market return (UKMKT) and the NAV return. This suggests a degree of segmentation between the markets and a relative difference in the confidence of consumers in the UK and elsewhere.

The regression of the fund share price return on country sentiment, UK sentiment and the control variables is shown in Table 5.7.

Table 5.7: Panel Regression of Share Price Return

This table reports the results of panel regressions of the monthly UK closed-end country fund share price return on the UK consumer sentiment index (UKSENT), country consumer sentiment index (CSENT), country market return (CMKT), UK market return (UKMKT), age (LNAGE), market value (LNMVAL), expense ratio (EXPRATIO), dividend yield (DIVYLD) and foreign exchange appreciation rate (FXCHG). The regression is repeated with the lagged confidence indices. The results are shown for the sample of all funds from December 1993 to December 2009. Robust standard error adjustment is used. (* denotes significance at 5% and ** denotes significance at 1%).

	Forecast Horizon							
	1 month		6 months		12 months		24 months	
Indep. Vars.	Coef.	t	Coef.	t	Coef.	t	Coef.	t
UKSENT	0.0002	1.22	-0.0001	-0.68	0.0002	1.48	0.0006	2.16*
CSENT	-0.0002	-2.80**	-0.0002	-2.96**	-0.0001	-1.23	0.0001	1.83
CMKT	0.8451	6.73**	0.8793	7.18**	0.8904	7.18**	0.890	6.67**
UKMKT	0.0034	2.61*	0.0031	2.50*	0.0030	2.42*	0.003	2.27*
LNAGE	-0.0023	-1.06						
LNMVAL	0.0131	4.93**						
EXP RATIO	-0.0002	-0.38						
DIVYLD	0.0009	1.00						
FXCHG	-0.6589	-7.67**						
R-sq	52.47							
No of obs	3398							

Table 5.7 shows that there is a generally insignificant relation between the UK consumer confidence measure and the share price return. We do not therefore find support for our second hypothesis, that UK consumer sentiment negatively predicts

the share price return. Table 5.7 shows instead that country consumer sentiment (CSENT) is significantly negatively related to the share price return over horizons up to 6 months. We suggest that the difference between our results and those of Bodurtha, Kim and Lee (1995) may be due to the larger proportion of institutional investors in the UK as compared to the US.[31] We argue that these UK institutional investors are informed and are influenced by market expectations of the countries in which they invest. When foreign market consumer sentiment is high, anticipating future growth in the foreign market, UK investors will invest in the closed-end fund that invests in the optimistic foreign market, causing the share price to rise. Eventually over time the effect will reverse, causing a negative predictive relation over different time horizons between the country consumer confidence index and the share price. The results suggest that UK investors in closed-end country funds, who are primarily professional institutional investors, are more influenced by sentiment in the foreign market than the UK market and that if we wish to find out what will happen to the share price return of the UK country fund we should pay more attention to foreign market sentiment than UK sentiment. The foreign exchange appreciation rate (FXCHG) is also strongly related to the share price, showing that as the foreign currency strengthens against the pound, the share price return increases. Again this would imply that UK investors are alert to growth in the foreign markets in which closed-end funds invest.

Table 5.7 shows the importance of the country market return (CMKT) on the share price. We expect to see the influence of the UK market return (UKMKT) on

[31] Most of the UK investors in closed-end funds are institutional investors. Between 1998 and 2008 institutions held over 80% on average of UK closed-end fund shares (Office for National Statistics, 2009).

the share price return, but it is much smaller than the influence of the country market return. This finding contrasts with those of Bodurtha, Kim and Lee (1995) whose results show that both the home and foreign market return are significantly related to the closed-end fund share price return, but that the home market (US) return is more significant. Again, this is consistent with our interpretation that informed UK investors are pricing funds in relation to what is happening in the country market.

The high R-sq measure in Table 5.7 (52.44), although slightly lower than in Table 5.6, shows that the share price return regression provides a good explanation of the variation in country fund returns. The strong positive relation between the share price return and the market value of the fund (LNMVAL) is what we might expect, given that the funds are closed-ended and therefore do not as a rule issue more shares. An increase in the market value would therefore imply an increase in the share price return.

The closed-end fund premium expresses the relation between the share price and the NAV. We regress the fund premium with country confidence, UK confidence and the control variables as shown in Table 5.8.

Table 5.8: Panel Regression of Fund Premium

This table reports the results of panel regressions of the monthly UK closed-end country fund diluted NAV return on the UK consumer confidence index (UKSENT), country consumer sentiment index (CSENT), country market return (CMKT), UK market return (UKMKT), age (LNAGE), market value (LNMVAL), expense ratio (EXPRATIO), dividend yield (DIVYLD) and foreign exchange appreciation rate (FXCHG). The regression is repeated with the lagged confidence indices. The results are shown for the sample of all funds from December 1993 to December 2009. Robust standard error adjustment is used. (* denotes significance at 5% and ** denotes significance at 1%).

	Forecast Horizon							
	1 month		6 months		12 months		24 months	
Indep. Vars.	Coef.	t	Coef.	t	Coef.	t	Coef.	T
UKSENT	-0.0015	-3.36**	-0.0016	-4.31**	-0.0021	-4.35**	-0.004	-5.34**
CSENT	-0.0004	-1.14	-0.0002	-0.54	0.0000	0.07	0.000	1.17
CMKT	-0.0413	-1.6	-0.0545	-1.96	-0.0472	-1.89	-0.011	-0.41
UKMKT	0.0005	1.77	0.0007	1.73	0.0004	1.1	0.001	2.02
LNAGE	-0.0371	-4.44**						
LNMVAL	0.0972	10.4**						
EXP RATIO	-0.0022	-0.83						
DIVYLD	-0.0097	-3.17**						
FXCHG	0.2557	7.32**						
R-sq	24.10							
No of obs	3398							

Table 5.8 shows that the UK consumer sentiment index is significantly negatively related to the premium across all horizons up to 24 months. We therefore find support for Hypothesis 2, that there is a negative predictive relation between sentiment and the premium. The results imply that a rise in positive UK sentiment is followed by a decrease in the premium. This effect is similar to the effect of country consumer confidence index changes upon the share price return in Tables 6 and 7. This finding also gives support to our argument that the UK closed-end fund premium in country funds, as in other funds, is partly influenced by the activities of 'discount traders' who buy funds at high discounts (low premiums) across all sectors when consumer confidence is high, indicating optimism for future economic

conditions and giving rise to a negative predictive relation between the premium and UK sentiment.

Table 5.8 also shows that factors other than sentiment have a greater impact on the country fund premium. We also find, similarly to Bodurtha, Kim and Lee (1995), that the UK market return (UKMKT) exerts a much more significant effect on the premium than the country market return (CMKT). The size of the fund (LNMVAL) is the most important factor influencing the premium. As the market value of the fund increases, the premium increases. We might expect this as an increase in market value implies an increase in the share price which will result in an increase in the premium if the NAV does not increase at the same rate. We also see that as funds age the premium decreases (LNAGE). This is in line with previous research (Weiss, 1989).

The second most important factor influencing the premium is the foreign exchange appreciation (FXCHG). As the pound weakens relative to the foreign currency, the UK price has to increasing relative to the NAV giving an increase in the premium. However, age, size, the dividend yield and foreign exchange appreciation (LNAGE, LNMVAL, DIVYLD and FXCHG) remain significantly related to the premium when the regressions are run with lagged confidence indices. The lower R-sq measure in Table 5.8 (24.24), as compared with those in Tables 5 and 6, shows that the model explains less of the variation in the UK closed-end country fund premium than it does of the variation in the or share price return.

5.4.3. Comparison of Fund Groups: Japanese and US Funds

As there are two large single country groups in the sample - Japan and the US with 17 and 11 funds respectively - it could be suggested that the results from these two groups, if similar, could be driving the results for the sample as a whole. To find out if this is the case we run the regressions on these two groups of funds. When these are analysed separately we see clear differences between the two groups with regard to confidence indices (see Tables 9 and 10). This confirms indicates that country consumer confidence indices to predict NAV returns, share price returns and premiums will vary between countries.

Table 5.9: JAPANESE FUNDS: Panel Regression of Diluted NAV Return, Share Price Return and Premium

This table reports the results of panel regressions of the UK closed-end Japanese funds monthly diluted NAV return, share price return and premium on the UK consumer confidence index (UKSENT), country consumer confidence index for Japan (CSENT), country market return for Japan (CMKT), UK market return (UKMKT), age (LNAGE), market value (LNMVAL), expense ratio (EXPRATIO), dividend yield (DIVYLD) and foreign exchange appreciation rate (FXCHG). The results are shown for the sample of all funds from December 1993 to December 2009. Robust standard error adjustment is used. (* denotes significance at 5% and ** denotes significance at 1%).

	NAV Return regression		Share Price Return Regression		Premium Regression	
Indep. Vars.	Coeff	t	Coeff	t	Coeff	t
UKCONF	0.0006	3.26**	0.0007	2.35*	-0.0034	-4.28**
CONF	-0.0012	-4.42**	-0.0021	-4.17**	0.0073	7.84**
CMKT	1.2359	20.44**	1.3744	23.74**	0.1820	3.30**
UKMKT	-0.0007	-2.76*	0.0008	1.94	-0.0004	-0.80
LNAGE	-0.0039	-2.00	-0.0015	-0.56	-0.0315	-3.22**
LNMVAL	0.0011	0.49	0.0134	3.77**	0.0475	3.13**
EXPRATIO	-0.0013	-1.79	-0.0009	-0.92	-0.0035	-0.97
DIVYLD	0.0002	0.06	0.0009	0.27	-0.0101	-0.69
FXCHG	-0.9530	-18.4**	-0.8591	17.4**	0.1279	2.87*
R-sq	74.17		65.69		43.66	

Table 5.9 shows that there are four key variables that significantly account for the variation in the NAV return, the share price return and the premium of UK funds investing in Japan. These variables are the country consumer confidence index (CONF), the UK consumer confidence index (UKCONF), the country market return (CMKT) and the foreign exchange rate (FXCHG). Furthermore, when we repeat the regressions with lagged CONF and UKCONF at 1, 6, 12 and 24 months (not reported) we find that the country confidence variable is significant at all time periods, but this is not the same for the UK confidence variable. Japanese consumer confidence, then, plays an important part in explaining the NAV return, share price return and premium, but the most important influence is that of the Japanese market return (CMKT) and the foreign exchange appreciation rate (FXCHG). Our finding concerning the impact of consumer sentiment in Japan is supported by studies of retail flows into Japanese 'bull' and 'bear' funds which suggest that Japanese investors are anticipating future market direction. (Brown, Goetzmann, Hiraki, Shiraishi, & Watanabe, 2005).

Table 5.10: US FUNDS: Panel Regression of Diluted NAV Return, Share Price Return and Premium

This table reports the results of panel regressions of the UK closed-end US funds monthly diluted NAV return, share price return and premium on the UK consumer confidence index (UKCONF), country consumer confidence index for the US (CONF), country market return for the US (CMKT), UK market return (UKMKT), age (LNAGE), market value (LNMVAL), expense ratio (EXPRATIO), dividend yield (DIVYLD) and foreign exchange appreciation rate (FXCHG). The results are shown for the sample of all funds from December 1993 to December 2009. Robust standard error adjustment is used. (* denotes significance at 5% and ** denotes significance at 1%).

	NAV Return regression		Share Price Return Regression		Premium Regression	
Indep. Vars.	Coeff	t	Coeff	t	Coeff	t
UKCONF	-0.0001	-0.26	-0.0003	-1.19	-0.0011	-0.95
CONF	0.000	-1.19	-0.0001	-1.11	-0.0010	-2.64
CMKT	0.7141	5.62**	0.4863	8.59**	-0.3232	-4.80**
UKMKT	0.0019	3.83**	0.0049	8.51**	0.0019	2.47
LNAGE	-0.0040	-2.16	-0.0112	-2.65*	-0.0724	-3.32*
LNMVAL	0.0078	1.55	0.0334	4.98**	0.1228	3.40*
EXPRATIO	0.0003	0.88	-0.0009	-0.98	-0.0076	-1.37
DIVYLD	0.0032	1.31	0.0078	2.21	-0.0006	-0.07
FXCHG	-0.8316	-11.00**	-0.5687	-6.48**	0.3661	3.82**
R-sq	56.94		39.17		23.62	
No of obs	940		940		940	

In contrast to the results for Japanese funds in Table 5.9, Table 5.10 shows that consumer confidence indices are insignificant when it comes to explaining the variation in US fund NAV return, share price return and premium. When we repeat the regressions with lagged CONF and UKCONF at 1, 6, 12 and 24 months (not reported) we find that the country confidence variable is only significant at 5% at 1 and 6 months, while the UK confidence variable is never significant. The most significant explanatory variables are the return on the US market (CMKT) and the

foreign exchange appreciation rate (FXCHG) and, to a lesser extent, the return on the UK market (UKMKT). The results of the research of Brown et al. (2005) also point to a difference in the influence of sentiment in the US and Japanese stock markets.

5.5 Conclusion

Consistent with earlier studies for aggregate markets, our findings give support to the investor sentiment hypothesis in relation to UK closed-end country funds. Our findings provide evidence of the impact of two sources of investor sentiment, both domestic and foreign, on UK closed-end country fund pricing. We find that country sentiment, as proxied by foreign country consumer sentiment surveys, significantly predicts the NAV return and the share price return. A further finding is that the UK consumer sentiment index significantly predicts the premium, showing the influence of UK sentiment on the pricing of closed-end funds. Our findings are consistent with the existence of different groups of investors in the UK. Firstly, the largest group of informed institutional investors, who buy closed-end country funds when foreign consumer sentiment is rising and impact the share price return of closed-end funds. Secondly, our findings suggest that a much smaller group of retail investors or 'discount traders' can exert an influence on the closed-end fund premium by buying funds across all sectors when premiums are low in the expectation of improving market conditions as indicated by rising consumer confidence. The negative predictive relation may be attributed to less excessive optimism. Equally it may be attributed to other factors, such as the illiquidity of the UK closed-end fund sector as a whole, which may cause a slow reaction in pricing.

One implication of our findings is that slow-moving variables, such as country consumer sentiment, can predict future returns of the share price and NAV return for periods up to one year. When country consumer sentiment is high, it is not a good time to invest in the closed-end fund corresponding to that country, as future returns are likely to be low over periods of up to one year. A second implication of our findings for investors is that UK closed-end country funds are a good vehicle for diversification as their share prices reflect country consumer sentiment and the return in the country market more than UK consumer sentiment and the UK market return. This finding contrasts with research on US funds, which finds that the share price return of US country funds is more influenced by the US market than the country (Bodurtha, Kim, & Lee, 1995) (Chang, Eun, & Kolodny, 1995). Our results also provide an explanation for the finding by Bekaert and Urias (1996), that UK closed-end country funds a better means of diversification than US country funds.

6. The Role of Time-varying Investment Barriers in Explaining UK Closed-end Country Fund Pricing

6.1 Introduction

What happens to a closed-end country funds when the foreign market it invests in begins to close? Emerging markets in particular can suddenly become less accessible due to internal political and economic tensions which result in a sudden restriction in investment availability.[32]

In this chapter we find that direct investment barriers continue to impact the pricing of closed-end country funds even after the countries have officially liberalised. We analyse UK data from the post-liberalisation periods relating to a range of emerging markets from 1993 to 2009, and find that an increase in the restriction of investment availability is consistently accompanied by a significant decrease in the share price return of UK closed-end country funds. We also find that the share price return on closed-end emerging market funds is significantly related to indirect measures of segmentation such as inflation variability and illiquidity.

In contrast, we find that the UK closed-end emerging market fund premium is not significantly related to measures of restrictions on investment availability or integration. Furthermore, it is not consistently significantly related to any indirect

[32] The Financial Times reported in 1998: "Sharp market declines are not the main cause of complaint for emerging markets fund managers .... Of greater concern are the rapidly changing rules in markets such as Russia and Malaysia which prevent foreign investors from withdrawing funds in hard currency. "We are now getting back to an era of expropriation of funds," says Mr Mobius. [manager of Templeton Emerging Markets closed-end fund] "This is the worst nightmare you can imagine for any investor."" (Martinson, 1998).

investment barriers. It is much more influenced by UK factors such as the average premium of UK domestic closed-end funds.

We argue that the reason that the premium is not significantly affected when restrictions on investment availability are increased in countries that have liberalised is because both the share price and the value of the assets the fund has invested in (NAV) are significantly negatively related to increases in the level of segmentation. As the premium expresses the ratio between the share price and the NAV, the ratio does not change significantly as both the numerator and denominator are affected to a similar degree. There may be a temporary increase in the premium, until the price adjusts to the fall in NAV, as found by Chandar and Patro (2000), but this is only a short-term effect.

Studies of closed-end country funds and market segmentation have generally argued, however, that direct investment barriers have in fact been beneficial and have raised the premiums of closed-end funds investing in segmented markets. (Bonser-Neal et al., 1990) (Errunza, Senbet, & Hogan, 1998) (Chan, Jain, & Xia, 2008). These studies argue that investors have been willing to pay a higher share price to achieve the diversification benefit of access to markets that are difficult to invest in directly. When capital controls are loosened following market liberalisation it follows that the premium should fall as the diversification benefit disappears. Other studies disagree, finding that liberalisation has no significant effect on the premium (Patro, 2005).

As well as direct investment barriers, there can be strong indirect investment barriers that can deter investors and can potentially affect closed-end fund pricing.

Indirect investment barriers may be in the form of market illiquidity, inflation or other deterrents to investing such as the political and economic stability of a country (2004).

In this chapter we combine research into market integration with research into closed-end fund pricing. We examine them in a new post-liberalisation time frame which has been long enough to capture two major financial crises: the 1997 East Asian crisis and the 2008 financial crisis. We use UK emerging market closed-end funds which have not been examined in the literature,[33] and which have a completely different share ownership to US closed-end funds. We extend the work of Nishiotis (2004) by examining a new sample in a new post-liberalisation time frame, using a different time-varying measure of segmentation[34], and analysing the share price and NAV return as well as the premium. In addition we point towards a different understanding of the closed-end fund premium puzzle.

The remainder of this chapter is organised as follows. Section 2 discusses closed-end fund facts and related literature. Section 3 gives more detailed analysis of the data and presents testable hypotheses. Section 4 presents the empirical tests and results and Section 5 concludes.

[33] The paper by Bekaert and Urias (1996) compares the diversification benefits of UK and US emerging market funds, including both regional and single country funds.

[34] We use the Edison Warnock (2003) measure of market capitalisation as well as the world market covariance used by Nishiotis and we use the Economic Freedom of the World Index (Gwartney & Lawson, 2013) as a proxy for indirect barriers to economic freedom.

6.2 Literature and Hypotheses

Several papers examine the role that market segmentation plays in the pricing of US closed-end country funds.[35] There are two main reasons why researchers have been interested in examining segmentation in the context of closed-end funds. Firstly, as the fund and the underlying assets are both claims to the same assets, they allow discrepancies in pricing to be examined without being based on a specific asset pricing model. Secondly, US closed-end country funds have tended to have higher premiums than developed market funds, prompting investigations into whether the higher premium is related to market segmentation. The key early paper arguing for a relation between the premium and capital market controls is that of Bonser-Neal et al. (1990). In this paper they argue that US closed-end country fund premiums are due to the diversification benefits provided by closed-end funds investing in otherwise inaccessible markets. When capital control restrictions are loosened and the markets become accessible, it follows that the premium will drop. One issue with the paper is that they base their main conclusions a sample of just five closed-end country funds (France, Japan, Korea, Mexico and Taiwan), only three of which are in segmented markets. Furthermore, in their analysis they find that the premiums of only the Korean and Mexican funds are related to changes in investment restrictions, but not that of the Taiwan fund.

Errunza, Senbet and Hogan (1998) argue that several factors affect country fund premiums. Key amongst them are the level of access foreign investors have to the country; the extent to which the securities can be substituted by securities

[35] Chapter 2 provides a comprehensive literature review.

displaying similar characteristics in the home country; and the influence of the global market. They predict that if there are controls on capital inflows to countries and restrictions on international arbitrage there will be premiums on the corresponding country fund. If there are no restrictions there will be no premiums or discounts on the country fund. In their analysis they find only marginally significant support at 10% and 5% for an access (capital control) factor in 10 out of 19 cases, 8 of which have the correct sign. They do significant support, however, in the premium of both emerging and developed market funds. Patro (2005) extending the work of Errunza, Senbet and Hogan (1998) and Bonser-Neal et al. (1990) examine the effect of the market liberalisation announcements to premiums, prices and NAVs. He also looks at the impact of listing new emerging market closed-end funds in the US. He finds that when new country funds are listed, the premiums of existing country funds decrease by 8.8% over the following 4 months. He finds that the loosening of investment restrictions has a positive effect on the closed-end fund net asset value, but no significant effect on the closed-end premium.

Other studies look at the role of indirect barriers in the pricing of closed-end country funds. Such barriers may include the illiquidity of the market in which the fund invests, economic instability and political risk. From this group, the key papers are those of Nishiotis (2004) and Chan et al. (2008). Nishiotis revisits the analysis of Bonser-Neal et al. (1990) and argues that closed-end funds in segmented markets may not have premiums, as Bonser-Neal et al. suggested, because the diversification benefit they provide is offset by indirect barriers such as illiquidity, lack of economic freedom and political risk. Furthermore, when the markets are liberalised and the direct investment barriers are removed, emerging market closed-end funds will have

differing premiums due to the role of various indirect barriers in their pricing. Chan et al. (2008) also argue that market segmentation plays a role in the closed-end country fund premium. Focusing on illiquidity, they find that foreign market illiquidity is significantly positively related to the closed-end country fund premium, whereas Nishiotis argues that such indirect barriers have a negative impact on the premium. Davies, Fletcher and Marshall (2012) extend their analysis to UK closed-end country funds over the period of the financial crisis and also find that country illiquidity is significantly positively related to the closed-end country fund premium. In addition they examine the 2008 financial crisis and find that developed market country illiquidity becomes significantly negatively related to the country fund premium as investors are deterred by foreign market illiquidity in developed markets.

Two recent papers, one by Jones and Stroup (2010) and another by Kim and Song (2010) re-examine the roles of direct and indirect barriers on the closed-end country fund premium in the post-liberalisation period. Jones and Stroup analyse 26 US developed and emerging market funds between 2000 and 2006. They examine the impact on country fund premiums of economic freedom, as estimated in the Fraser Institute Economic Freedom Index. They argue that the greater the level of integration, the more the positive and negative premium should converge to zero as market frictions which lead to pricing discrepancies are reduced. They find some evidence to support this hypothesis in a quadratic, but not in a linear regression model. Their paper differs from ours in that they do not use a specific direct measure of restriction on investment availability as the Economic Freedom measure is an aggregate measure comprised mainly of indirect investment barriers. In addition,

they use annual average data for their analysis, whereas we use monthly data as we are interested primarily in the time series nature of investment barriers.

Kim and Song examine the role of direct and indirect investment barriers on the US closed-end country fund premium in a sample of 37 emerging market funds and 18 developed market funds between 1995 and 2004. Like Jones and Stroup (2010) they use annual measures of segmentation. The problem with this is that when averaged over a year, this measure is not sensitive to increases in segmentation which may correct themselves in the course of a year. The key difference between our paper and theirs is that we use a monthly time-varying measure of direct segmentation, and that as well as examining the impact of investment barriers on the closed-end fund premium, we examine the impact on both the share price and net asset value as well.

In this paper we argue, similar to Bekeart and Harvey (1995) that market liberalisation is not a once-for-all occurrence but that market segmentation varies over time and that markets can become more segmented once they have liberalised, often as a result of internal financial or political uncertainty. Such periods of uncertainty are often followed by increasing market segmentation as countries react by 'changing the rules', as in the quotation above, to avoid capital flight. This has a negative effect on the pricing of closed-end country funds. It affects the pricing in two ways. First, the value of the underlying assets decreases as the country market contracts. This results in a drop in the NAV. For a brief period there can be very high premiums - a phenomenon is commented on by both Chandar and Patro (2000) and Frankel and Schmukler (2000) - until the share price adjusts downwards as domestic

investors react to the loss in value of the underlying assets. Once the share price has adjusted downwards, however, the premium will revert to a previous level and so there will only be a temporary impact on the premium.

The key issue that we argue in this paper is that when both share price and NAV are affected to a similar degree by direct investment barriers, this does not impact the premium which expresses the ratio between share price and NAV. This leads us to our hypotheses:

1. That direct investment barriers are negatively related to the closed-end fund share price return.
2. That direct investment barriers are negatively related to the closed-end fund NAV return.
3. That the closed-end fund premium is not significantly related to direct or indirect investment barriers.

6.3 Data

To test these hypotheses we collect monthly data from Datastream on the complete sample of 19 UK traded closed-end country funds investing in single emerging markets from 31 December 1993 to 31 December 2009. In addition we collect monthly data on a complete sample of 40 developed market funds for the same period. Data include the monthly closing price from the last trade and the monthly diluted net asset value (NAV) of each fund. We define the closed-end fund premium, following Chan et al. (2008) as the difference between the natural log of the fund share price and natural log of the net asset value (NAV). (See Chapter 4.2, Equation 1).

Table 6.1 gives summary statistics for the closed-end fund premium of each of the emerging market country funds and also of a complete sample of 40 developed market country funds for comparison. The table reports the fund IPO date, the date the fund entered the sample and the date that the fund ceased trading, the number of monthly observations, the mean and standard deviation of the premium, the test statistic that the average premium is zero and the maximum and minimum premiums. Following Chan et al. (2008) we exclude the first six months after the IPO date and the last month before delisting to exclude the price distortions associated with these events.

The first point of interest from Table 6.1 is that the mean UK emerging market fund premium is so low. At -14.19% it is even lower than the mean developed market fund premium which is -13.83%. This contrasts with the findings of Nishiotis (2004). He finds that the premium of emerging market funds is very close to zero. A further thing to note is that none of our funds has a positive premium. This contrasts with the findings of Nishiotis who has some funds with extraordinarily high premiums, such as a premium of 221.19% for the Mexico fund. Our average minimum premium is also much more negative than those in his sample for both emerging and developed markets and the average maximum premium is also much lower. One partial explanation for these differences could be that our period includes the Asian Crisis, whereas his period covers a relatively booming period, 1981-1996. However, in a later period including the Asian Crisis (1987-2001), Chan et al. find the average emerging market fund premium is still considerably higher at -3.7%, compared with -11.01% for developed markets.

Table 6.1: Summary Statistics for Emerging Market Closed-end Fund Premiums

This table reports summary statistics of the premium (100 * (lnSP- lnNAV)) of UK closed-end emerging market country funds from December 1993 to December 2009. The column labelled No. of Obs. gives the number of monthly observations. The column labelled *t*-stat reports the test statistic from the test of the null hypothesis that the average premium is zero. The Cross-Fund Mean Premium reports the average premium, standard deviation, minimum and maximum values. The symbol * denotes significance at 5% and the symbol ** denotes significance at 1%.

Fund	IPO	Sample start	Closing Date	Obs	Mean	Std. Dev.	t-stat	Min	Max
Aberdeen New Thai	Dec 1989	31/12/1993	31122009	193	-11.90	8.95	-18.46	-31.62	8.71
Edinburgh Java	May 1990	31/12/1993	31/05/2002	101	-9.91	12.39	-8.04	-27.00	27.00
First Philippine	Dec 1989	31/12/1993	30/05/1997	41	-18.64	4.28	-27.87	-27.50	-4.86
Siam Selective Growth	Mar 1990	31/12/1993	31/05/2000	77	-22.19	7.63	-25.53	-44.18	-1.87
Turkey Trust	Dec 1988	31/12/1993	30/06/1998	54	-12.12	12.57	-7.09	-34.47	35.25
INVESCO Korea	Dec 1991	31/12/1993	30/04/1999	64	-9.31	8.73	-8.53	-27.21	10.75
New India	Feb 1994	31/12/1993	31/12/2009	61	-7.86	6.35	-9.67	-19.86	4.06
China Investment	Apr 1993	31/12/1993	31/08/1998	56	-19.49	5.53	-26.37	-33.27	-8.56
JP Morgan Chinese	Sept 1993	31/12/1993	31/12/2009	190	-8.97	10.21	-12.10	-34.44	8.40
JPMF Indian	Mar 1994	31/03/1994	31/12/2009	184	-10.84	11.69	-12.58	-38.24	9.96
Old Mutual South Africa	Jun 1994	30/06/1994	28/02/2007	146	-15.75	6.33	-30.05	-33.91	0.33
Taiwan Investment	Jan 1994	31/01/1994	30/07/1999	60	-18.29	9.24	-15.33	-35.90	1.76
Laxey	Jan 1997	31/01/1997	30/09/2008	134	-30.27	18.52	-18.92	-69.94	4.09
JPM Russian Secs	Dec 2002	15/12/2002	31/12/2009	85	-9.03	3.53	-23.56	-16.29	0.74
Korea Europe Fund	Jun 1989	31/12/1992	10/04/2003	112	-9.56	12.72	-7.95	-44.35	23.36
Korea Liberalisation	Dec 1992	31/12/1992	21/01/1997	37	-3.77	14.03	-1.63	-28.05	40.88
JF Philippine	1977	28/06/1994	30/06/1997	37	-21.85	7.89	-16.84	-41.98	-11.96
Brazilian IT	1973	31/12/1992	28/01/1999	61	-13.74	8.83	-12.15	-42.90	8.42
Israel Fund	Feb 1994	02/10/1994	18/10/1999	68	-16.12	6.82	-19.49	-31.95	5.11
Cross-Fund Emerging Mkt Mean Premium					-14.19	9.28		-34.90	8.50

Liberalisation generally signifies the date when restrictions on capital flows into the country were officially lifted. Liberalisation dates across our sample, following Bekaert, Harvey and Lundblad (2003), can be summarised as follows: 1987 – Thailand (September); 1989 - Turkey and Indonesia (June and September); 1990 – Sri Lanka (October); 1991 – Taiwan and the Philippines (January and June); 1992 – Korea and India (January and November); and 1996 – South Africa. For most emerging markets the introduction of the first UK closed-end country fund occurs after the official liberalisation date. Only in the cases of Korea, the Philippines and South Africa was there a closed-end fund trading before the liberalisation date.

6.3.1 Direct Investment Barriers

The hypothesis of Bonser-Neal et al. (1990) is that restrictions on capital flows increase the premium of closed-end country funds. This is because the funds provide a means of international diversification which is not otherwise available to international investors. They are therefore willing to pay more for access to such funds, increasing the premium or decreasing the discount.

Research on closed-end country funds and segmentation is therefore usually carried out in a regression framework using a dummy variable for open/closed using various announcements of market liberalisation (Bonser-Neal et al., 1990) (Choi & Lee, 1996). Instead we employ data on restrictions on investment availability on a time series basis, reflecting a belief that market integration is a gradual process rather than a once for all event. Furthermore, countries may become more segmented over time due to various crises. This time-varying approach is consistent with that of Bekaert and Harvey (1995).

We use the Edison Warnock measure (Edison & Warnock, 2003) to represent the level of restriction on investment availability exercised by a country. This measure indicates the proportion of the stock market that is accessible to foreign investors. The measure comes from two indices published by Standard and Poors: (a) a Global Index (IFCG) which represents the global country market value and (b) an investible index which represents the proportion of the market that is accessible to foreigners (IFCI). The measure is defined as follows:

$$EW_{i,t} = 1 - \frac{MC_{i,t}^{IFCI}}{MC_{i,t}^{IFCG}} \quad (1)$$

$EW_{i,t}$ is the Edison Warnock (EW) measure of a country *i*'s restrictions on foreign ownership at time *t* which relates the total market capitalisation of the global market of that country (IFCG) to the capitalisation of that market that is accessible to foreign investors (IFCI). The scale for the EW measure ranges between 0 for an open market with no capital restrictions and 1 for a completely closed market (this is because in an open market the investable market will equal the global market).[36]

6.3.2 Indirect Investment Barriers

As well as direct investment barriers, there are indirect investment barriers. Such barriers include the illiquidity of the market, inflation uncertainty and lack of economic freedom. Nishiotis (2004) finds that direct barriers positively influence the premium whereas indirect barriers are negatively related to the premium. Kim and

[36] In November 2008 the S&P IFCG indices were continued as the new S&P Global BMI series and the S&P IFCI indices tightened their criteria to include only the most liquid stocks (those with a float-adjusted market capitalization of at least US$ 200m with a minimum value traded of $100m in the previous year, up from the required market capitalization of US$100m and minimum value traded of $50m since 1994).

Song (2010) however, find that indirect barriers are positively related to the premium. We therefore also examine these measures.

Illiquidity

We adapt the well-known Amihud (2002) illiquidity measure to proxy the illiquidity of the foreign market:

$$CILLIQ_{c,t} = \sum_{d=1}^{Dt} |R_{c,d}| / VOL_{c,d} \quad (2)$$

where $CILLIQ_{c,t}$ is the illiquidity of market c at time t, D_t is the number of trading days, taken to be 21 in month t.. The daily absolute return and daily sterling volume of country index c on day d are given by $R_{c,d}$ and $VOL_{c,d}$. We calculate the sterling volume of trading by multiplying the number of shares traded, reported in thousands, by the price in sterling.

Inflation variability

Following Nishiotis (2004) we proxy inflation variability (VINFL) by the standard deviation of the monthly inflation rate from the IMF International Financial Statistics using a 3 year rolling period ending in month t (International Monetary Fund, 2012).

Country risk

We use the Economic Freedom of the World Index (Gwartney & Lawson, 2013) (Fraser Institute) measure to proxy for indirect barriers to economic freedom. This index, which is produced by James Gwartney and Robert Lawson, is an annual composite rating of 5 areas affecting economic freedom: the size of government, the legal structure, access to sound money, freedom to trade internationally and the regulation of credit, labour and business (see Appendix B). The index provides a

rating out of 10 for the economic freedom and we then subtract it from 10 to give a measure of the lack of economic freedom, or the economic freedom barrier (EFB). This measure has been used in a range of economic studies showing the impact of economic freedom (Hovakiminian, Kane, & Laeven, 2003). Nishiotis (2004) uses country risk from the Institutional Investor's semi-annual monthly ratings. This is primarily a country credit rating, whereas the Economic Freedom measure is a more broad ranging aggregate, taking into account the legal structure, security of property and business and labour market regulation of each country.

Table 6.2 provides summary statistics for the measures of direct and indirect investment barriers.[37] We include data from developed markets for comparison. The measure of restriction on investment availability is not included for developed markets as they are completely accessible over the sample time period. The first point to emerge from Table 6.2 is that there are clear differences in both the mean and the standard deviation of the indirect investment barriers, with emerging markets showing levels of indirect investment barriers that are not only higher but also much more variable than those in developed markets. The second point of interest is the difference between the levels of direct and indirect investment barriers. Countries with high direct barriers can have low indirect barriers, such as Taiwan, and to a lesser extent, Korea. Turkey, South Africa, Indonesia and Russia, on the other hand, have relatively much higher indirect barriers than direct barriers, as compared with other countries. Nishiotis (2004) finds that countries with lower levels of indirect barrier trade at the highest premiums. In our sample there are no funds that trade at a premium above zero. We find some evidence to support this in the case of Korea,

[37] Data for calculating the inflation variability of Taiwan was not available.

where the Korea Liberalisation Fund has the highest average premium of -3.77. However, the fourth highest average premium is that of the JPM Russian Securities fund (-9.03), but Russia has very high levels of indirect investment barriers.

Table 6.2: Summary Statistics for Measures of Direct and Indirect Barriers

Table 6.2 reports summary statistics of one direct and three indirect investment barriers between 31/12/1993 and 31/12/2009. The Edison Warnock measure is the ratio of the S&P Investable Index to the S&P Global Index for the country market. Illiquidity is measured as the absolute monthly return of the country market divided by the sterling volume of trading over the same period. Inflation variability is calculated using a three-year rolling period. Economic freedom is calculated using the measures from the Economic Freedom of the World (Fraser Institute).

	Direct Measures		Indirect Measures					
	EW Measure		Country Illiquidity		Inflation Variability		Economic Barrier	Freedom
Country	Mean	Σ	Mean	σ	Mean	σ	Mean	σ
China	0.66	0.21	0.0002238	0.0006448	5.12	6.12	4.05	0.48
India	0.57	0.19	0.0001124	0.0002511	6.85	2.36	3.77	0.42
Indonesia	0.19	0.18	0.0005645	0.0005566	12.62	7.14	3.74	0.25
Korea, South	0.28	0.35	0.0000440	0.0000663	3.96	1.17	2.99	0.41
Philippines	0.47	0.07	0.0008312	0.0006383	5.98	2.10	3.22	0.35
Russia	0.27	0.15	0.0654643	0.5199539	134.96	221.34	4.34	0.95
South Africa	0.01	0.01	0.0000784	0.0000684	7.01	2.25	3.29	0.43
Sri Lanka	0.65	0.11	0.0001124	0.0002511	10.28	2.27	3.99	0.30
Taiwan	0.45	0.29	0.0000161	0.0000109			2.60	0.18
Thailand	0.49	0.13	0.0003242	0.0004198	3.66	1.59	3.24	0.23
Turkey	0.02	0.02	0.0002484	0.0004435	52.63	30.78	4.02	0.57
Mean (Emerging)	***0.37***	***0.16***	***0.0061836***	***0.0475731***	***24.31***	***27.71***	***3.57***	***0.42***

6.3.3 Control variables

We include control variables that have been found to influence the premium in previous studies. The control variables are described in Section 4.2.3. In Table 6.3 we report the correlations between the fund premium (prem), fund return (pret), Edison Warnock restriction on investment availability (ew), rolling covariance (rcov), country illiquidity (cilliq), inflation variability (vinfl), economic freedom barrier (efb) log of market value (lnmval), log of age (lnage), UK market return

(UKmkt), average domestic fund premium (UKprem), expense ratio (expratio), foreign exchange appreciation rate (fxchg) and country market return (cmkt).

Table 6.3: Correlation of NAV Return, Premium and Fund Return with Investment Barrier Measures and Control Variables

This table reports the correlations between the NAV return (Navdri), fund premium (Prem), fund return (Pret), Edison Warnock measure (EW), rolling covariance (Rcov), country illiquidity (cilliq), inflation variability (Vinfl), economic freedom barrier (Efb) log of market value (Lnmval), log of age (Lnage), UK market return (UKmkt), average domestic fund premium (UKprem), expense ratio (Expratio), foreign exchange appreciation rate (Fxchg) and country market return (Cmkt).

	Navdri	Prem	Pret	Ew	Rcov	Cilliq	Vinfl	Efb	Lnmval	Lnage	Ukmkt	Ukprem	Expratio	Fxchg	Cmkt
Navdri	1														
Prem	-0.0837*	1													
Pret	0.8304*	0.0542*	1												
Ew	-0.0978*	-0.0743*	-0.0996*	1											
Rcov	0.0754*	0.0485	0.0749*	-0.4082*	1										
Cilliq	-0.0217	-0.0397	-0.0267	-0.0096	0.0754*	1									
Vinfl	0.0046	0.0536*	0.0011	-0.0219	0.0702*	0.0670*	1								
Efb	-0.0271	-0.0112	-0.0368	0.2166*	-0.0939*	0.0985*	0.4085*	1							
Lnmval	0.0839*	0.4494*	0.0923*	-0.2253*	0.0945*	0.0684*	0.0398	-0.0600*	1						
Lnage	0.0450*	0.0979*	0.0680*	-0.5190*	0.2896*	-0.2442*	-0.1257*	-0.4233*	-0.0071	1					
Ukmkt	0.4515*	0.0363	0.4785*	0.0226	-0.0137	-0.0003	0.0155	0.0163	0.0287	-0.0357*	1				
Ukprem	-0.0662*	0.2276*	-0.0784*	0.2033*	-0.3199*	-0.0335*	0.1631*	0.1412*	0.1800*	-0.3204*	-0.0406*	1			
Expratio	-0.0212	-0.2037*	-0.0299	0.1885*	0.0533	-0.0021	-0.005	0.1668*	-0.3043*	-0.1601*	0.007	-0.1237*	1		
Fxchg	-0.3638	0.0842*	-0.2748*	0.0358*	-0.0561*	0.2145*	0.1477*	0.1240*	-0.0424	-0.0884*	-0.1573*	0.0692*	0.0091	1	
Cmkt	0.7428*	-0.0265	0.6681*	-0.0809*	0.0277	0.0459*	0.011	0.0437*	0.0275	0.0366	0.4350*	-0.0332	-0.0322	-0.1036*	1

Table 6.3 shows that the closed-end fund premium is negatively correlated with the EW measure. There is a positive correlation between inflation variability and the premium. The strongest correlations with the premium, however, are those of the UK average domestic fund premium (UKprem) and the fund size. The fund return is also negatively correlated with the EW measure. There are also significant correlations between fund return and the return on the UK market, the foreign exchange appreciation rate and the country market return.

Looking at the correlations between the investment barriers, they are significantly positive between the indirect investment barriers. The economic freedom barrier is also significantly positively correlated with the EW measure.

6.4 Empirical analysis

We begin by testing for a relation between the components of fund premium, i.e. the share price and net asset value (NAV), and the direct and indirect restrictions on investment availability as shown below:

$$SPRET_{f,t} = \alpha_f + \beta_1 EW_{c,t} + \beta_2 CILLIQ_{c,t} + \beta_3 EFB_{c,t} + \beta_4 VINFL_{c,t} + \beta_5 UKMKT_t + \beta_6 UKPREM_t + \beta_7 DIVYLD_{f,t} + \beta_8 EXPRATIO_{f,t} + \beta_9 FXCHG_{c,t} + \beta_{10} CMKT_t + \beta_{11} LNMVAL_{f,t} + \beta_{12} LNAGE_{f,t} + u_{f,c,t} \quad (3)$$

where $SPRET_{f,c,t}$ is the return on the net asset value of fund *f* from market *c* at time *t*, α_f is the fixed effects parameter, *EW* is the Edison Warnock measure, *CILLIQ* is the country illiquidity measure, *EFB* is the economic freedom barrier measure, *VINFL* is the variability of the inflation, *UKMKT* is the UK market return, *UKPREM* is the arithmetic average of the discount of UK funds investing in the UK, *DIVYLD* is the

dividend yield, *EXPRATIO* is the expense ratio, *FXCHG* is the foreign exchange appreciation rate, *CMKT* is the monthly market return of the foreign markets corresponding to each fund, *LNCAP* is the natural log of the market value, *LNAGE* is the natural log of fund age since listing date.

We use a fixed effects technique where each fund is allowed to have a fixed constant (α_f) to take account of the heterogeneity in the funds. One example of the difference between funds could be the size as some funds have a large fixed size over the period and some have a small fixed size. We allow for the intercepts to be different for each fund but constant over the sample period.

6.4.1 Regression results

In specification (1) of Table 6.4 we regress the share price return against the EW measure. We then add each of the indirect investment barriers in specifications (2) (5) and (8), the control variables used by Nishiotis (2004) in specifications (3) (6) and (9), and the full range of control variables in specifications (4), (7) and (10).

Table 6.4: Panel Regression of Fund Return with EW Measure and Indirect Investment Barriers

This table reports coefficient estimates from regressions of closed-end fund share price return on direct and indirect investment barriers and various control variables. In specification (1) we include only the direct EW measure, in specification (2) we include one indirect investment barrier, country illiquidity (Cilliq). In Specification (3) we include the UK market return (UKmkt) to control for time variation that is specific to the UK and the UK average premium to control for investor sentiment. In specification (4) we include all control variables. Specifications (5) (6) and (7), and (8) (9) and (10) follow the same pattern as specifications (2), (3) and (4) except that inflation variability (Vinfl) and Economic Freedom Barrier (Efb) is substituted for country illiquidity (Cilliq). The sample period is 31/12/1993 to 31/12/2009 and the sample includes 19 UK closed-end country funds investing in emerging markets. In order to take account of heterogeneity between the funds, we use country closed-end fund fixed effects. We use robust standard errors. The corresponding t-statistics are reported in parentheses. The symbol * denotes significance at the 5% level and ** denotes significance at the 1% level.

Indep Vars	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
EW	-0.059	-0.058	-0.062	0.02	-0.06	-0.064	0.019	-0.06	-0.067	0.018
	(-6.03)**	(-5.94)**	(-5.65)**	(0.82)	(-6.20)**	(-5.75)**	(0.60)	(-4.86)**	(-4.62)**	(0.56)
Cilliq		-0.0006	-0.004	-0.0004						
		(-0.30)	(-0.27)	(-0.12)						
Vinfl					0.00003	0.00003	0.00004			
					(18.61)**	(12.82)**	(0.07)			
Efb								0.004	0.005	0.004
								(0.77)	(0.67)	(0.55)
Ukmkt			0.13	0.006		0.13	0.006		0.013	0.006
			(13.73)**	(3.34)**		(14.51)**	(3.28)**		(14.54)**	(3.31)**
Ukprem			0.0004	-0.0012		0.0001	-0.0014		0.0003	-0.001
			(0.06)	(-1.97)		(0.19)	(-1.75)		(0.35)	(-1.97)
Divyld				-0.00006			-0.0003			-0.0003
				(-0.02)			(-0.14)			(-0.13)
Expratio				0.0016			0.0015			0.0013
				(1.17)			(1.05)			(0.87)
Fxchg				-0.53			-0.44			-0.43
				(-7.94)**			(-4.53)**			(-4.48)**
Cmkt				0.63			0.62			0.62
				(8.87)**			(8.54)**			(8.52)**
Lnmval				0.01			0.012			0.012
				(2.7)*			(2.83)*			(3.02)**
Lnage				0.009			0.006			0.008
				(1.34)			(0.68)			(1.4)
R-Sq	0.01	0.01	0.25	0.65	0.01	0.26	0.64	0.01	0.26	0.63
No. of Obs	1814	1728	1728	954	1814	1814	958	1814	1814	958

Table 6.4 gives support to our first hypothesis in that it shows a significantly negative relation between the fund return and the measure of restriction on investment availability regardless of which indirect barrier is being analysed. The relation is still negative in the presence of the UK market return and the average premium on domestic funds (UKPREM), only lessening in significance in the presence of the full range of control variables, where we see the significant positive relation between the return on the fund (SPRET) and the return on the country market (CMKT). The only indirect barrier to be significant is that of inflation variability (VINFL), which is positively related to the fund return. The return on the UK market (UKMKT) is significantly related to the return on the fund, as we might expect as the shares are traded in the UK market. The other significant relation is the negative relation between fund return and the foreign exchange appreciation rate (FXCHG).

Table 6.5: Panel Regression of NAV Return with EW Measure and Indirect Investment Barriers

This table reports coefficient estimates from regressions of closed-end fund NAV (Net Asset Value) return on direct and indirect investment barriers and various control variables. In specification (1) we include only the direct EW measure, in specification (2) we include one indirect investment barrier, country illiquidity (Cilliq).In Specification (3) we include the UK market return (UKmkt) to control for time variation that is specific to the UK and the UK average premium to control for investor sentiment. In specification (4) we include all control variables. Specifications (5) (6) and (7), and (8) (9) and (10) follow the same pattern as specifications (2), (3) and (4) except that inflation variability(Vinfl) and Economic Freedom Barrier (Efb) is substituted for country illiquidity (Cilliq). The sample period is 31/12/1993 to 31/12/2009 and the sample includes 19 UK closed-end country funds investing in emerging markets. In order to take account of heterogeneity between the funds, we use country closed-end fund fixed effects. We use robust standard errors. The corresponding t-statistics are reported in parentheses. The symbol * denotes significance at the 5% level and ** denotes significance at the 1% level.

Indep Vars	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
EW	-0.05	-0.52	-0.057	0.015	-0.054	-0.058	0.005	-0.06	-0.066	0.004
	(-6.18)**	(-6.21)**	(-5.31)**	(0.69)	(-6.47)**	(-5.44)**	(0.19)	(-5.43)**	(-5.01)**	(0.16)
Cilliq		-0.0006	-0.0005	-0.0004						
		(-0.32)	(-0.32)	(-0.17)						
Vinfl					0.00003	0.00003	0.0009			
					(18.42)**	(12.60)**	(1.50)			
Efb								0.010	0.010	0.001
								(1.68)	(1.50)	(0.19)
Ukmkt			0.011	0.003		0.011	0.0004		0.011	0.004
			(14.20)**	(2.74)*		(15.14)**	(2.66)*		(15.14)**	(2.70)*
Ukprem			0.0004	-0.0005		0.0006	-0.0005		0.0006	-0.0007
			(0.57)	(-0.79)		(0.72)	(-0.63)		(0.72)	(-1.03)
Divyld				0.0002			0.001			0.002
				(0.76)			(0.58)			(0.85)
Expratio				-0.0002			-0.0002			-0.0005
				(-0.13)			(-0.12)			(-0.28)
Fxchg				-0.769			-0.59			-0.59
				(-9.77)**			(-4.27)**			(-4.35)**
Cmkt				0.67			0.66			0.67
				(10.48)**			(9.71)**			(9.65)**
Lnmval				0.002			0.0003			0.004
				(0.90)			(1.05)			(1.33)
Lnage				0.007			0.005			0.001
				(0.97)			(0.43)			(0.17)
R-Sq	0.01	0.013	0.23	0.78	0.013	0.23	0.77	0.013	0.23	0.77
No. of Obs	1797	1711	1711	954	1797	1797	958	1797	1797	958

As we are examining the two elements that make up the premium: the share price and net asset value (NAV), the analysis of the NAV return gives us the second part of the picture. Table 6.5 shows that the NAV return, like the share price return, is also strongly negatively related to the EW measure. This gives support to our second hypothesis – that direct investment barriers are negatively related to the NAV return. As restrictions on investment availability increase in the foreign market, the market value of the assets the fund has invested in decreases, causing the NAV to decrease. Table 6.5 shows that the only significant indirect barrier affecting the NAV return is inflation variability which also was significantly related to the share price return. The return on the UK market is significantly related to the return on the NAV, but much more significant, as we might expect, is the impact of the country market return. The other significant relation is the negative relation between NAV and the foreign exchange appreciation rate.

Next we turn to the premium. We rerun the same regressions, but this time we examine the impact of direct and indirect investment barriers on the premium. The results are shown in Table 6.6.

Table 6.6: Panel Regression of Fund Premium with EW Measure and Indirect Investment Barriers

This table reports coefficient estimates from regressions of closed-end fund premium on direct and indirect investment barriers and various control variables. In specification (1) we include only the direct EW measure, in specification (2) we include one indirect investment barrier, country illiquidity (Cilliq).In Specification (3) we include the UK market return (UKmkt) to control for time variation that is specific to the UK and the UK average premium to control for investor sentiment. In specification (4) we include all control variables. Specifications (5) (6) and (7), and (8) (9) and (10) follow the same pattern as specifications (2), (3) and (4) except that inflation variability (Vinfl) and Economic Freedom Barrier (Efb) is substituted for country illiquidity (Cilliq). The sample period is 31/12/1993 to 31/12/2009 and the sample includes 19 UK closed-end country funds investing in emerging markets. In order to take account of heterogeneity between the funds, we use country closed-end fund fixed effects. We use robust standard errors. The corresponding t-statistics are reported in parentheses. The symbol * denotes significance at the 5% level and ** denotes significance at the 1% level.

Indep Vars	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
EW	-0.14	-0.02	-0.07	-0.07	-0.02	-0.07	-0.12	0.016	-0.33	-0.115
	(-0.19)	(-0.32)	(-0.95)	(-0.76)	(-0.27)	(-0.97)	(-1.3)	(0.2)	(-0.42)	(-1.28)
Cilliq		0.004	0.003	0.072						
		(0.97)	(0.77)	(3.22)**						
Vinfl					0.0001	0.0007	-0.002			
					(8.06)**	(4.11)**	(-0.46)			
Efb								-0.41	-0.04	-0.49
								(-1.3)	(-1.39)	(-0.91)
Ukmkt			0.002	0.003		0.002	0.003		0.002	0.003
			(1.81)	(3.10)**		(2.01)	(2.85)*		(1.93)	(2.64)*
Ukprem			0.008	0.009		0.008	0.009		0.009	0.009
			(2.49)*	(2.77)*		(2.65)*	(2.66)*		(2.94)**	(2.82)*
Divyld				0.01			0.03			0.025
				(1.86)			(2.43)*			(2.36)*
Expratio				-0.005			-0.003			-0.001
				(-0.96)			(-0.42)			(-0.11)
Fxchg				0.29			0.28			0.26
				(3.92)**			(3.49)**			(3.34)**
Cmkt				-0.04			-0.07			-0.07
				(-1.47)			(-2.75)			(-2.73)*
Lnmval				0.02			0.017			0.014
				(1.42)			(0.96)			(0.86)
Lnage				0.03			-0.009			-0.21
				(0.94)			(-0.22)			(-0.45)
R-Sq	0.0007	0.006	0.07	0.27	0.02	0.08	0.21	0.015	0.09	0.215
No. of Obs	1644	1572	1572	952	1644	1644	954	1644	1644	954

The results in Table 6.6 provide general support for our third hypothesis that there is no significant relation between the premium and the EW measure in any of the regressions. We argue that because both the fund return and NAV return decrease comparably when restrictions on investment availability increase, the ratio between the two (the premium) does not change significantly, which leads to the insignificant effect of changes in the restrictions on investment availability on the premium. The only consistently significant relation between the premium and investment barriers is with inflation variability where we see that a positive relation between inflation variability and the premium, consistent with other studies that find positive relations between indirect barriers and the closed-end fund premium (Kim & Song, 2010). However, we would argue that this is because the coefficient for the variability of the inflation rate is marginally more positive for the share price return than for the NAV return. As the fund return is relatively more strongly affected than the NAV return, this means that an increase in the variability of inflation corresponds to an increase in the premium, as the numerator (share price) increases relative to the denominator (NAV). Of the other control variables, the UK average premium and, to a lesser extent, the UK market return, are significantly positively related to the fund premium. The premium is also significantly positively related to the foreign exchange appreciation rate which is also found by Tsai (2005). If we compare the R-sq measure between the results for the premium and the results for the fund and NAV return we see that the fund and NAV return have a much higher R-sq measure, showing that the regression is explaining much more of the variation in fund and NAV return than that of the premium.

6.4.2 Alternative Segmentation Measures

It could be argued that these results are dependent on the measure of segmentation used and that another measure might produce a different result. Another way of considering market segmentation is to assess the degree to which the country market moves in step with movements in the world market. The greater (lesser) the degree of market segmentation, the lesser (greater) the covariance will be with the return on the world market. For this reason, we rerun the above regressions, this time using the 24 month rolling covariance measure used by Nishiotis (2004) as a measure of integration. The results are shown in Tables 7, 8 and 9.

Table 6.7: Panel Regression of Fund Return with World Market Covariance and Indirect Investment Barriers

This table reports coefficient estimates from regressions of closed-end fund share price return on direct and indirect investment barriers and various control variables. In specification (1) we include only the rolling covariance between the return on the world market and the return on the emerging market corresponding to each fund (Rcov), in specification (2) we include one indirect investment barrier, country illiquidity (Cilliq).In Specification (3) we include the UK market return (UKmkt) to control for time variation that is specific to the UK and the UK average premium to control for investor sentiment. In specification (4) we include all control variables. Specifications (5) (6) and (7), and (8) (9) and (10) follow the same pattern as specifications (2), (3) and (4) except that inflation variability(Vinfl) and Economic Freedom Barrier (Efb) is substituted for country illiquidity (Cilliq). The sample period is 31/12/1993 to 31/12/2009 and the sample includes 19 UK closed-end country funds investing in emerging markets. In order to take account of heterogeneity between the funds, we use country closed-end fund fixed effects. We use robust standard errors. The corresponding t-statistics are reported in parentheses. The symbol * denotes significance at the 5% level and ** at the 1% level.

Indep Vars	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Rcov	4.54	4.73	5.00	-0.65	4.55	4.63	-0.74	4.22	4.33	-0.74
	(3.22)**	(2.97)**	(2.88)*	(-0.42)	(3.21)**	(2.83)*	(-0.43)	(2.78)*	(2.53)*	(-0.49)
Cilliq		-0.04	-0.035	0.001						
		(-6.70)**	(-5.77)**	(0.2)						
Vinfl					0.0003	-0.0003	0.0003			
					(0.55)	(-0.39)	(0.60)			
Efb								-0.007	-0.008	0.006
								(-1.5)	(-1.22)	(1.07)
Ukmkt			0.012	0.006		0.012	0.006		0.012	0.006
			(10.36)**	(3.53)**		(10.79)**	(3.5)**		(10.78)**	(3.54)**
Ukprem			-0.000	-0.001		-0.000	-0.001		-0.000	-0.001
			(-0.07)	(-1.67)		(-0.42)	(-1.44)		(-0.32)	(-1.64)
Divyld				-0.000			-0.0004			-0.0003
				(-0.18)			(-0.27)			(-0.13)
Expratio				0.003			0.003			0.002
				(1.19)			(1.45)			(-0.11)
Fxchg				-0.51			-0.52			-0.51
				(-7.53)**			(-7.6)**			(-7.56)**
Cmkt				0.62			0.62			0.62
				(9.00)**			(9.00)**			(9.00)**
Lnmval				0.10			0.009			0.10
				(2.35)*			(2.19)*			(2.38)*
Lnage				0.004			0.005			0.007
				(0.72)			(0.73)			(1.68)
R-Sq	0.005	0.022	0.25	0.64	0.005	0.24	0.63	0.006	0.24	0.63
No. of Obs	1767	1749	1749	919	1767	1767	919	1767	1767	919

Table 6.7 shows that the level of integration is significantly positively related to the share price return of emerging market closed-end funds in every case. This shows that the greater the level of integration, the higher the return on the fund. This finding is consistent with the earlier findings for the EW measure, which showed that the lower the level of restriction on investment availability, the higher the return on the fund. Indirect barriers exert less of an impact on the share price return, except for country illiquidity, which is negatively related to the share price return. When the control variables of the UK market return and UK average premium are added we see the significant impact of UK market movement on the share price return. The country market return and foreign exchange rate continue to be highly significant.

Table 6.8: Panel Regression of NAV Return with World Market Covariance and Indirect Investment Barriers: This table reports coefficient estimates from regressions of closed-end fund NAV (Net Asset Value) return on direct and indirect investment barriers and various control variables. In specification (1) we include only the rolling covariance between the return on the world market and the return on the emerging market corresponding to each fund (Rcov), in specification (2) we include one indirect investment barrier, country illiquidity (Cilliq).In Specification (3) we include the UK market return (UKmkt) to control for time variation that is specific to the UK and the UK average premium to control for investor sentiment. In specification (4) we include all control variables. Specifications (5) (6) and (7), and (8) (9) and (10) follow the same pattern as specifications (2), (3) and (4) except that inflation variability(Vinfl) and Economic Freedom Barrier (Efb) is substituted for country illiquidity (Cilliq). The sample period is 31/12/1993 to 31/12/2009 and the sample includes 19 UK closed-end country funds investing in emerging markets. In order to take account of heterogeneity between the funds, we use country closed-end fund fixed effects. We use robust standard errors. The corresponding t-statistics are reported in parentheses. The symbol * denotes significance at the 5% level and ** at the 1% level.

Indep Vars	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Rcov	4.27	4.58	4.99	-0.67	4.29	4.59	-1.19	4.23	4.51	-0.78
	(3.43)**	(2.98)**	(3.03)**	(-0.44)	(3.46)**	(3.20)**	(-0.76)	(3.18)**	(2.90)*	(-0.52)
Cilliq		-0.04	-0.04	-0.0009						
		(-6.92)**	(-6.33)**	(-0.21)						
Vinfl					0.0010	0.0004	0.0001			
					(1.82)	(0.52)	(3.33)			
Efb								-0.0006	-0.00017	0.004
								(-0.14)	(-0.26)	(0.57)
Ukmkt			0.011	0.004		0.011	0.004		0.011	0.004
			(10.35)**	(2.79)*		(10.88)**	(2.75)*		(10.83)**	(2.81)*
Ukprem			0.0003	-0.0005		0.0002	-0.0001		0.0002	-0.0005
			(0.56)	(-0.80)		(0.79)	(-0.20)		(0.30)	(-0.76)
Divyld				0.003			0.0012			0.002
				(0.69)			(0.41)			(0.71)
Expratio				0.0006			0.002			0.0003
				(0.24)			(0.95)			(0.12)
Fxchg				-0.76			-0.76			-0.75
				(-9.37)**			(-9.33)**			(-9.35)**
Cmkt				0.67			0.67			0.67
				(10.46)**			(10.50)**			(10.43)**
Lnmval				0.0015			0.0003			0.002
				(0.51)			(0.10)			(0.56)
Lnage				0.005			0.011			0.007
				(0.80)			(0.07)			(1.20)
R-Sq	0.005	0.025	0.23	0.78	0.007	0.22	0.78	0.0005	0.21	0.78
No. of Obs	1750	1732	1732	919	1750	1750	919	1750	1750	919

Table 6.8 shows that the NAV return, like the fund return, is significantly positively related to the level of covariance between the country market return and the world market return, indicating that when emerging markets become integrated, the value of the assets increases. Again this finding is consistent with the earlier findings for the EW measure, which showed that the lower the level of restriction on investment availability, the higher the return on the fund. The only indirect measure to show a significant effect is that of market illiquidity. Again it is negatively related to the NAV return, as we might intuitively expect. The fact that the NAV return is more strongly negatively related to illiquidity than the fund return again gives us the reason why illiquidity could be positively related to the fund premium. Another way of looking at it is to infer that UK investors, who are primarily long-term institutional investors, are less concerned with foreign market illiquidity which may be caused by short-term economic uncertainty, than investors in the foreign market itself.

Table 6.9: Panel Regression of Fund Premium with World Market Covariance and Indirect Investment Barriers

This table reports coefficient estimates from regressions of closed-end fund premium on direct and indirect investment barriers and various control variables. In specification (1) we include only the rolling covariance between the return on the world market and the return on the emerging market corresponding to each fund (Rcov), in specification (2) we include one indirect investment barrier, country illiquidity (Cilliq).In Specification (3) we include the UK market return (UKmkt) to control for time variation that is specific to the UK and the UK average premium to control for investor sentiment. In specification (4) we include all control variables. Specifications (5) (6) and (7), and (8) (9) and (10) follow the same pattern as specifications (2), (3) and (4) except that inflation variability(Vinfl) and Economic Freedom Barrier (Efb) is substituted for country illiquidity (Cilliq). The sample period is 31/12/1993 to 31/12/2009 and the sample includes 19 UK closed-end country funds investing in emerging markets. In order to take account of heterogeneity between the funds, we use country closed-end fund fixed effects. We use robust standard errors. The corresponding t-statistics are reported in parentheses. The symbol * denotes significance at the 5% level and ** at the 1% level.

Indep Vars	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Rcov	-4.59	-5.34	0.15	-2.5	-4.87	0.89	1.46	-6.43	-0.63	1.41
	(-1.01)	(-1.12)	(0.04)	(-0.73)	(-1.07)	(0.24)	(0.3)	(-1.38)	(-0.17)	(0.31)
Cilliq		0.065	0.065	0.11						
		(4.65)**	(5.15)**	(7.95)**						
Vinfl					0.002	0.002	-0.003			
					(0.67)	(0.76)	(-0.63)			
Efb								-0.06	-0.06	-0.05
								(-2.11)	(-2.55)*	(-0.78)
Ukmkt			0.002	0.003		0.002	0.003		0.002	0.003
			(2.29)*	(3.25)**		(1.77)	(2.9)*		(1.82)	(2.65)*
Ukprem			0.008	0.008		0.009	0.008		0.009	0.008
			(2.63)*	(2.67)*		(2.69)*	(3.09)**		(2.75)*	(3.13)**
Divyld				0.006			0.02			0.022
				(0.67)			(1.95)			(1.8)
Expratio				-0.01			-0.014			-0.10
				(-1.66)			(-1.85)			(-1.24)
Fxchg				0.32			0.301			0.27
				(3.57)**			(3.32)**			(2.95)*
Cmkt				-0.03			-0.05			-0.05
				(-1.05)			(-2.12)*			(-2.15)*
Lnmval				0.023			0.01			0.01
				(1.48)			(0.67)			(0.54)
Lnage				0.06			0.04)			0.022
				(2.46)*			(0.84)			(0.48)
R-Sq	0.005	0.04	0.10	0.30	0.009	0.07	0.21	0.03	0.09	0.21
No. of Obs	1597	1593	1593	917	1597	1597	917	1597	1597	917

Table 6.9 shows an insignificant relation between the covariance and the fund premium. By decomposing the premium into the fund return and the NAV return and observing that both are similarly related to the covariance measure, we can explain why an increase in covariance has no significant effect on the premium. Our findings contrast with those of Nishiotis (2004) who finds a significant negative relation between covariance and the US closed-end fund premium, indicating that the premium decreases as covariance with the world market increases. His analysis of US funds from 1989 to 2001 shows a significant effect in five out of nine countries. But when our sample is compared with his sample, we have six countries in common, and in only two of these countries (Philippines and Thailand) does Nishiotis find a significant relation. Table 6.9 shows that illiquidity has a positive relationship with the fund premium, consistent with other studies (Chan et al. 2008) Davies, Fletcher and Marshall (2012), but that other indirect barriers are not significantly related to the UK closed-end fund premium. When the control variables of the UK market return and UK average premium are added we see the significant impact of UK factors, in particular the UK fund premium. The other consistently significant control variable is the foreign exchange rate.

6.5 Conclusion

Our findings indicate that, the lower the level of restriction on investment availability and the higher the level of integration between the market the fund invests in and the world market, the higher the NAV and share price return of UK closed-end funds in emerging markets. In a post-liberalisation world, a decrease in covariance is often the sign of some internal financial crisis within an emerging market country. These

crises are often accompanied by restrictions on investment availability which in turn decrease the covariance between the affected country and the rest of the world. These are negatively perceived by investors as we saw in the quotation at the beginning of the paper.

Because both share price return and NAV return are similarly affected, the changes in restriction on investment availability do not significantly affect the UK closed-end country fund premium. This does not mean that changes in the restriction on investment availability do not affect closed-end fund pricing, however. We have shown that closed-end fund pricing continues to be affected significantly affected by levels of market integration and restriction on investment availability.

Tightening or loosening of restrictions on investment availability is likely to affect the NAV before it affect the share price and so this implies that investors in closed-end country funds should respond quickly to announcements of changes in restriction on investment availability, selling when restriction on investment availability increase and buying when restriction on investment availability decrease.

7. Conclusion

In this thesis we have conducted a detailed analysis of UK closed-end country funds, which have not been examined before in the literature.

In the introduction we set out the context and history of UK closed-end funds, noting the differences between US and UK closed-end funds and the significance of UK closed-end funds to the UK economy. We provide a historical overview charting the various rises and falls of UK closed-end funds within the larger context of a decline in the sector as a whole. We focus particularly on closed-end country funds which expanded rapidly in the 1990s only to decline partly due to the Asian currency crisis and to European monetary union.

The second chapter provides a broad-based review of research into closed-end funds. We focus on recent contributions in the area of sentiment, liquidity and segmentation particularly as these areas of investigation apply to closed-end country funds. The literature review shows that there are two broad streams of investigation into closed-end funds which reflect the two competing interpretations of price movement in financial markets as a whole: interpretations based on sentiment and interpretations based on rational factors such as liquidity and investment barriers or segmentation.

Our investigation of the data in the third chapter provides substance to the historical overview of the first chapter. The data reveals the decline in the number of UK closed-end funds in general after an initial resurgence of investor interest in the early 1990s. This is reflected in the decline of single country funds in Asia after the Asian currency crisis and in Europe after monetary union. At one end of the scale the

large global funds show the greatest stability over time and highest dividend yields whereas at the other end emerging market funds tend to be smaller, shorter-lived and provide smaller dividend yields. The exceptions in the emerging market field are the funds managed by larger fund managers, such as JPMorgan.

Part of the risk of investing in single country funds, particularly those in emerging markets is the lack of liquidity in such markets. In the fourth chapter we consider the impact of illiquidity on the closed-end country fund premium. We find that country illiquidity in emerging markets in fact has a positive impact on the premium, suggesting that UK investors are less deterred by country illiquidity in emerging markets than in developed markets. We find that fund illiquidity, on the other hand, adversely affects the premium. We see clear differences between developed and emerging market funds, particularly during the recent economic crisis.

Sentiment has often been cited as the cause of fluctuations in the closed-end fund premium and in the fifth chapter we examine the predictive effect of country and UK sentiment on the pricing of closed-end country funds. We use measures of consumer confidence to proxy for sentiment in the UK and in the countries invested in by the funds. We find that country consumer sentiment measures have a predictive effect on both the NAV return and share price return of closed-end country funds over different time horizons. We do not find that there is an overall effect on the premium, however, as both NAV return and share price return are similarly affected. The premium is more affected by UK sentiment and the UK market return. We argue that the activity of two investor groups, institutional investors and retail investors, may be affecting the pricing. We suggest that the share price may be influenced by the activity of institutional investors who are investing for the long term and being

influenced by country market sentiment. Retail investors or ‘market traders’, on the other hand, may influence the premium as they buy funds at low premiums in the expectation that the premium will rise or the fund will be taken over.

In the sixth chapter we extend the approach of chapter five of parsing the premium into the NAV return and the share price return, this time looking at market segmentation. An argument that has had a lot of weight in closed-end fund research is that capital market segmentation resulted in higher premiums for emerging market funds before the capital controls were lifted. The reason for this is that such funds provided a unique means of diversification. We revisit this argument in a time frame that begins after most emerging market countries had officially lifted capital controls. Using the Edison Warnock measure, we find that restriction on investment availability continues to have a negative impact on the share price and NAV return, but that there is no net effect on the premium. As we found in Chapters 3 and 4, the biggest influence on the closed-end fund premium is associated with UK factors.

In 1994 Hardouvelis, LaPorta and Wizman asked, “What moves the discount of country equity funds?” As a result of this thesis we can rephrase this as “What moves the NAV return?” “What moves the share price return?” and “What moves the premium?” When the NAV return and share price return are similarly affected there is an insignificant net effect on the premium. If they are differently affected, there is an impact on the premium which expresses the relation between the two. But as well as considering the effects on the NAV return and share price return, there are also factors of sentiment and arbitrage acting on the premium itself.

At another level, we wish to challenge the traditional dichotomy between the two competing explanations of asset pricing based on assumptions of investors being motivated either by sentiment or by reason.

Research Implications

For Managers

Our study has shown that foreign market illiquidity and volatility is not necessarily a deterrent to UK investors, when the markets are expected to be illiquid and volatile, as is the case with emerging markets. Furthermore, our study has shown that the premium of emerging market funds was relatively more stable during the financial crisis than that of developed market funds. Closed-end funds therefore provide a structure that is particularly suited to both less liquid and more volatile markets and offer fund managers greater downside protection than open-end funds during times of market volatility. Furthermore, by their ability to take on gearing, they can take advantage of market upswings in a way that is not available to open-end funds.

Managers could therefore benefit from highlighting the distinctive features of closed-end funds in general when they come to be offered to investors alongside open-end funds. Clearly there are possibilities of attracting large subscriptions with the combination of a good marketing campaign and a high profile manager.

For Regulators

It would benefit retail investors if they were aware of the role of sentiment in investing in emerging market funds, particularly if they buy the fund around the time of the launch. The fund may be flooded with retail investment which it finds hard to

invest and it may therefore be some years before the investor obtains a positive return.

It would also benefit retail investors if the fee structure could be simplified and made more comprehensible, particularly as many of the funds have performance fees.

For Investors

Closed-end country funds can be good for long-term investment. Smaller funds, however, are more likely to go into liquidation or open-end and so a larger fund offers more stability during times of volatility. It can be a good way to invest in emerging markets, but a single country fund can leave the investor vulnerable to unexpected market restrictions, whereas a diversified fund will provide more protection from the pricing impact of such restrictions.

If an investor is looking for dividend income, closed-end single country funds are not the best investment to make as many do not pay dividends. A global fund or a UK fund is more suitable. If the investor is looking for long-term capital growth, however, emerging market funds have been a good investment opportunity. The average monthly share price return in the Emerging Market fund sector as a whole has been considerably more, however, than for single country emerging market funds, suggesting that diversified funds are a better investment.

As UK country fund NAVS and prices are negatively related to foreign market sentiment, investors could improve their return by investing in a country fund when the country sentiment is low, as the future share price return should be positive

for periods up to a year. Of course it may be difficult to sell when the price has risen, due to the thin trading in some closed-end country funds and the possible large spread implications.

Investors in UK closed-end funds can achieve diversification benefits by adding closed-end country funds to their portfolio as funds move together with foreign market. Bekaert and Urias (1996) find that UK funds were a better source of diversification than US funds. We argue that this is because the fund share price is more in line with the foreign market than is the case with US funds.

Limitations

One limitation of the study is the size of the dataset. There are also considerable differences in the characteristics of the funds across the sample, as compared with US funds which are more homogeneous.

Another limitation of the study is the difficulty of obtaining details of historical share ownership of UK closed-end funds, other than a general statistic from the Office of National Statistics, or the annual disclosure of shareholdings above 3%. It would be good to be able to compare the pricing of funds with different levels of retail and institutional share ownership and to relate these findings to the sentiment findings.

Another possible limitation of the study is that other proxies for investor sentiment and investment barriers could be used for additional robustness.

Further Research

In further research we would like to extend into each of the areas of liquidity, sentiment and segmentation.

We would like to explore the relation between liquidity and sentiment, along the lines of Baker and Stein (2004) who argue that ‘measures of liquidity provide an indicator of the relative presence or absence of these [irrational] investors, and hence of the level of prices relative to fundamentals.’ (p 273)

At a general level we would like to investigate further the broader issue of what sentiment measures capture and which ones are most relevant to closed-end funds. We plan to further explore the argument of Bodurtha et al. (1995) that the premium captures differential sentiment by using sentiment indices.

We would like to explore the role of information access as an indirect investment barrier using data provided by the World Bank. We would like to investigate the relation between direct and indirect investment and direct and indirect investment barriers.

Appendix A

Consumer confidence indices are standardised for most developed market countries. Respondents are asked to answer questions based on the following areas: their opinions on current business conditions, their expectations for business conditions in 6 months time, current employment conditions, their expectations for employment in 6 months time and their expectations for their total family income in 6 months time.

Country	Consumer Confidence Index	Frequency	Start/end	Unit	Funds
Turkey	TK CONFIDENCE INDEX - REAL SECTOR VOLN	Monthly	12/1987-	Index	1
China	CH CONSUMER CONFIDENCE INDEX ((NADJ))	Monthly	01/1991-	Percentage	2
Russia	RS CONSUMER CONFIDENCE INDEX (NADJ)	Quarterly	10/1998-	Net Balance	1
Canada	CN CONSUMER CONFIDENCE INDEX (NADJ)	Quarterly	08/2001-	Index	1
US	US CONSUMER CONFIDENCE INDEX (SADJ)	Monthly	02/1967	Index	11
Thailand	TH CONSUMER CONFIDENCE INDEX (NADJ)	Monthly	07/1999-	Index	2
Japan	JP CONSUMER CONFIDENCE INDEX (EXCL. 1 PERSON HH.) (SADJ)	Monthly	09/1998-	Index	17
Germany	BD CONSUMER CONFIDENCE INDICATOR - GERMANY (SADJ)	Monthly	01/1973-	Net Balance	4
UK	UK CONSUMER CONFIDENCE INDICATOR - UK (SADJ)	Monthly	01/1974-	Index	All funds
New Zealand	NZ CONSUMER SURVEY - CONSUMER CONFIDENCE INDICATOR VOLN	Quarterly	04/1998-	Index	1
Ireland	IR ESRI & IIB BANK SVY: CONSUMER SENTIMENT (NADJ)	Monthly	02/1996-	Index	1
Australia	AU MELBOURNE/WESTPAC CONSUMER SENTIMENT INDEX (SADJ)	Monthly	09/1974	Net Balance	2
France	FR SURVEY - HOUSEHOLD CONFIDENCE INDICATOR (SADJ)	Monthly	10/1972-	Net Balance	1

Appendix B

Composition of the Economic Freedom of the World (EFW) Index (Gwartney & Lawson, 2013)

The Areas and Components of the EFW Index

Area 1: Size of Government: Expenditures, Taxes, and Enterprises

A		General government consumption spending
B		Transfers and subsidies as a percentage of GDP
C		Government enterprises and investment
D		Top marginal tax rate
	i	Top marginal income tax rate
	ii	Top marginal income and payroll tax rates

Area 2: Legal Structure and Security of Property Rights

A	Judicial independence (GCR)
B	Impartial courts (GCR)
C	Protection of property rights (GCR)
D	Military interference in rule of law and the political process (CRG)
E	Integrity of the legal system (CRG)
F	Legal enforcement of contracts (DB)
G	Regulatory restrictions on the sale of real property (DB)

Area 3: Access to Sound Money

A	Money Growth
B	Standard deviation of inflation
C	Inflation: Most recent year
D	Freedom to own foreign currency bank accounts

Area 4: Freedom to Trade Internationally

A		Taxes on international trade
	i.	International trade tax revenues (% of trade sector)
	ii	Mean tariff rate
	iii	Standard deviation of tariff rates
B		Regulatory Trade Barriers
	i	Non-tariff trade barriers (GCR)
	ii	Compliance cost of importing and exporting (DB)
C		Size of the trade sector relative to expected
D		Black-market exchange rates
E		International capital market controls
	i	Foreign ownership/investment restrictions (GCR)
	ii	Capital controls

Area 5: Regulation of Credit, Labor, and Business

A	Credit market regulations

	i.	Ownership of banks
	ii	Foreign bank competition
	iii	Private sector credit
	iv	Interest rate controls/Negative real interest rates
B		Labor market regulations
	i	Minimum wage (DB)
	ii	Hiring and firing regulations (GCR)
	iii	Centralized collective bargaining (GCR)
	iv	Mandated cost of hiring (DB)
	v	Mandated cost of worker dismissal (DB)
	vi	Conscription
C		Business Regulations
	i	Price controls
	ii	Administrative requirements (GCR)
	iii	Bureaucracy costs (GCR)
	iv	Starting a business (DB)
	v	Extra payments/Bribes/Favoritism (GCR)
	vi	Licensing restrictions (DB)
	vii	Cost of tax compliance (DB)

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