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IPO waves and hot markets in the UK

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Abstract

This paper examines the cyclical nature of IPO activity in the UK. The results indicate a lead-lag relationship between IPO initial returns and volume. IPO volume is sensitive to recent changes in market conditions. There is evidence of industry concentration in hot markets, and firms raise more equity during these periods. Overall, IPO waves in the UK share similar characteristics with those in the US. The findings are consistent with rational explanations of IPO waves. However, explanations based on investor sentiment and market timing cannot be ruled out, since there is a strong positive relationship between IPO volume and the market's price-to-book ratio.

JEL classification: E32, G32

Keywords: IPO, underpricing, investor sentiment

1 Introduction

A stream of literature tries to explain the cyclical nature of the IPO market, which is well documented using US data. Some papers argue that IPO waves emerge as a result of improving market conditions (Pástor and Veronesi, 2005), whereas others favour a market timing explanation such that hot IPO markets (i.e., the peaks of IPO waves) coincide with windows of opportunity when the cost of equity is temporarily low (Alti, 2006).

There are also a few stylized facts documented about US IPO cycles. Lowry and Schwert (2002) show that periods of high initial returns lead to periods of high volume in

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the IPO market. Pástor and Veronesi (2005) find that IPO volume responds to changes in market conditions. Alti (2006) provides evidence that hot market IPOs issue substantially more equity. Helwege and Liang (2004) find that hot and cold market IPOs are driven from similar industries, such that 'IPOs in hot (high volume) markets are not more concentrated in particular industries than IPOs in cold markets'.

While the cyclical nature of the IPO activity in the US is well established, and the stylized facts of US IPO cycles are identified, the same cannot be said for the UK IPO market. The UK evidence on IPO waves is rather sparse. For instance, Chambers and Dimson (2009) use long time-series data on IPO volume and initial returns in the UK, but they focus on long-run changes in IPO underpricing, rather than IPO cycles. Other papers on IPO underpricing in the UK tend to focus on determinants of underpricing rather than its cyclical nature (see e.g., Levis (1990) and Brennan and Franks (1997)). Rees (1997) documents a positive relationship between the level of stock market index and IPO volume. However, he does not examine IPO initial returns and his sample ends in 1994 before the launch of Alternative Investment Market (AIM), which has caused a significant shift in the IPO activity in the UK.

The purpose of this paper is to fill a gap in the literature by investigating the IPO waves and hot markets in the UK. UK is the most important IPO market in an environment relatively similar to the US. We test whether the cyclical nature of IPO activities identified in the US are present in the UK as well. We also report stylized facts about the UK IPO market and compare them with those of the US.

Our main findings are as follows. The lead-lag relationship between IPO initial returns and volume documented by Lowry and Schwert (2002) in the US is present in the UK as well. Moreover, consistent with Pástor and Veronesi (2005), the UK IPO volume increases following periods of positive market returns and low market volatility. On the other hand, while Pástor and Veronesi (2005) find no relationship between the level of aggregate market-to-book ratio and IPO volume in the US, we document a strong positive relationship in the UK. While this relationship can be explained in a rational framework, it is also consistent with the investor sentiment explanation and the results of Pagano et al. (1998).

In terms of hot markets, we find that they tend to emerge when IPOs in the same or similar sectors cluster in time. For instance, while the UK hot market in 2000 is mainly driven technology and telecommunications firms, the one between 2004 and 2006 is fuelled by oil and mining firms. These results accord with the theoretical findings of Benveniste et al. (2002), and contradict with the empirical findings of Helwege and Liang (2004), who do not find evidence of industry clustering in the US hot markets. We also find that hot market IPOs raise substantially higher equity. This is consistent with the US evidence provided by Alti (2006).

Overall, our results suggest that the UK IPO market shares similarities with the US IPO market in the sense that IPO activity is cyclical in both of these markets. Hot markets in the UK emerge following improvements in market conditions and high market valuations. Firms raise more equity in hot markets and there is evidence of industry clustering in hot markets. While these pieces of evidence are consistent with a rational explanation in which hot markets are periods when growth opportunities are abundant and firms go public in order to raise the capital needed to invest in their projects, they do not rule out a behavioral explanation in which IPOs cluster in times when stock are overvalued and cost of equity is temporarily low.

The rest of this paper is organized as follows. In Section 2, we describe our data. IPO waves and hot markets in the UK are investigated in Sections 3 and 4 respectively. Section 5 concludes.

2 Data

We use market- and firm-level data provided by the London Stock Exchange (LSE). The market-level data includes annual time series of the number of listed firms and their total market value, and quarterly time series of the new lists and money raised by them. The annual and quarterly time series go back to 1966 and 1970 respectively. The firm-level data includes a list of new issues on AIM since its launch in 1995 and on the Main Market since 1998. It also includes variables on industry, nation, issue type, price, proceeds and market value. Our sample period ends in May 2012.

2.1 Market-level data

The number of listed firms and their total market values are presented in panels (a) and (b) of Figure 1 respectively. Panel (a) reveals a decreasing trend in the number of listed firms on the Main Market between 1966 and 1992. This trend reverses between 1993 and 1996, but has been back since then. The increase in the number of listed firms on AIM since its launch in 1995 compensates the decreasing numbers on the Main Market.[1] Consequently, the total number of listed firms has been more stable between 1995 and 2012 compared to the prior period between 1966 and 1994. Panel (b) documents a steady increase in the market value of listed firms starting around 1980 and reaching a peak around 1999 and 2000, before the burst of the dot-com bubble. During the post-bubble period, the market value remains relatively stable until 2006, and then it starts to increase again, but only to fall substantially in 2008 when the financial crisis hits. A comparison of panels (a) and (b) suggests that while AIM-listed firms contribute substantially to the number of listed firms after 1995, their contribution to the market value is tiny. For instance, at the end of 2011, there were about 1,400 UK firms listed in the Main Market and 1,100 firms listed in the AIM (56% vs. 44% of listed firms). The market value of the former group was about 3.6 trillion pounds, while that of the latter group was only 0.6 trillion pounds (86% vs. 14% of market value).

[Please insert Figure 1 about here]

The number of new lists and the total money raised by them are presented in panels (a) and (b) of Figure 2 respectively. The number of new lists includes IPOs, introductions, and readmissions, but excludes transfers between the Main Market and AIM. Panel (a) shows that, since its launch in 1995, AIM has grown rapidly to account for an increasing proportion of the total number of new lists. Panel (b) shows that, while the number of new lists has been large on AIM, most of the money raised is due to the new lists on the Main Market, except the period between 2004 and 2008 when AIM has been most active in its history both in terms of the number of new lists and the amount of money raised. As a final note, some of the spikes in panel (b) are partially due to giant IPOs, such as the 6 billion pound IPO of Glencore International Plc in the second quarter of 2011.

[Please insert Figure 2 about here]

2.2 Firm-level data

The firm-level data includes 2,761 IPOs on the LSE. 1,043 of these IPOs are conducted by financial firms and the remaining 1,718 by nonfinancial firms.[2] In our analysis, we use the 1,718 nonfinancial IPOs. The majority of these IPOs are by UK firms (1,306), which are followed by US (54), Republic of Ireland (43), Australian (34), and Canadian (30) firms. Descriptive statistics on the sample are provided in Table 1. While there were many more IPOs on AIM than on the Main Market, the firms that go public on AIM are much smaller and raise on average a significantly less amount of proceeds (see also Figures 1 and 2).

[Please insert Table 1 about here]

While the firm-level data includes offer prices, it does not provide first trading day closing prices, which are necessary to calculate initial returns. Consequently, we search for each nonfinancial IPO firm manually on Datastream and find 1,539 out of 1,718 firms. The price data from Datastream is used to calculate initial returns for these 1,539 firms. An IPO's initial return is defined as the percentage change between the offer price and the first trading day closing price.

3 IPO waves in the UK

3.1 Lead-lag relationship between initial returns and volume

The literature that documents time variation and serial correlation in IPO activity goes back to Ibbotson and Jaffe (1975). Ibbotson and Jaffe find that initial returns of IPOs in the US are highly autocorrelated, such that the first order autocorrelation coefficient is 0.744. They find that the autocorrelation of monthly number of IPOs (i.e., IPO volume) is even stronger with a first order autocorrelation coefficient of 0.83. They also investigate the relationship between initial returns and volume, but their results show that the relationship is not strong. Lowry and Schwert (2002) re-examine this relationship using longer time series and vector autoregressive (VAR) models. They find that higher initial returns lead to higher future volume, whereas there is no strong relationship between volume and future initial returns. They explain that the positive relationship between initial returns and future volume can be due to the partial adjustment of issue prices to the positive information revealed during the registration period (see Hanley (1993) and Loughran and Ritter (2002) for the partial adjustment phenomenon). The idea is that, positive information increases initial returns due to the partial adjustment, and at the same time it causes more firms to go public, but since going public takes time the increase in IPO volume is only observed with a delay, hence the lead-lag relationship between initial returns and volume.[3]

We investigate the relationship between initial returns and volume in the UK using VAR models with monthly lags as in Lowry and Schwert. We use the firm-level data, since the market-level data does not include initial returns. The firm-level data gives us a time series of 204 months between June 1995 and May 2012. The mean and median monthly volume of nonfinancial IPOs over this period are 8.42 and 5 respectively. The corresponding statistics for monthly initial returns are 16.46% and 12.23% respectively. Like in the US, both time series (especially the volume series) are highly autocorrelated. The autocorrelations of volume are above 0.40 up to 7 lags; and the first and second lag autocorrelations of initial returns are 0.42 and 0.35 respectively. There are 17 months with no nonfinancial IPOs. 11 of these months are between October 2008 and October 2009, when the effects of the financial crisis were felt strongly in the UK.

Our findings are reported in Table 2. In models (1)-(4), monthly volume is the dependent variable. Model (1) is an ordinary least squares (OLS) regression. It shows that the first three lags of volume explain 41% of the time variation in this variable. Model (2) is a Cochrane-Orcutt regression.[4] The second and third lags of initial returns are significant at 1% in this model. Model (3) is a third-order VAR model. The second and third lags of initial returns remain significant at 5%, and the first lag becomes significant at 5%. The Granger F test shows that the three lags of initial returns are together significant at 1% in forecasting volume. Finally, in model (4) we add dummies to account for the seasonality of IPO activity (see e.g., Helwege and Liang (2004)). The second and third lags of initial returns still remain significant, whereas the first lag turns back to being insignificant. The lags of initial returns are together significant at 5%.

[Please insert Table 2 about here]

In models (5)-(8), monthly average initial return is the dependent variable. Model (5) shows that the first three lags of initial returns explain 20% of the time variation in this variable. In model (6), the first two lags of volume are significant at 5%. They remain significant at this level in models (7) and (8), but the Granger F tests suggest that the lags of volume are together insignificant at 5%.

These findings are broadly consistent with the US evidence provided by Lowry and Schwert: The UK evidence also suggests a lead-lag relationship between initial returns and volume, such that the lags of initial returns help predict volume, and not vice versa. Moreover, there is some evidence that the lead-lag relationship in the UK is positive like in the US: The second and third lags of initial returns have positive coefficients in models (2)-(4) (the first lag has a negative coefficient, but is significant only in model (3)).

3.2 The relationship between market conditions and volume

There is ample evidence on the positive relationship between market conditions and IPO activity. However, there are disagreements in the literature as to whether this relationship is due to rational or behavioural reasons. For instance, Pagano et al. (1998) study the decisions of Italian firms to go public and find that while firms become more likely to go public when the market-to-book ratios in their respective industries are high, their investments and profitability decline after their IPOs. They interpret this result as evidence for a behavioural explanation, such that firms time their IPOs to go public when the stocks in their industries are overvalued. On the other hand, Pástor and Veronesi (2005) offer a rational explanation based on a model of optimal IPO timing in which IPO waves emerge following improvements in market conditions. The basic idea is that when market conditions improve, many private firms that have been waiting to go public exercise their options around the same time, causing IPOs to cluster in time and form an IPO wave.

In this section, we investigate the UK evidence on the relationship between market conditions and volume. We use three variables that capture different aspects of market conditions. The first one is the level of FTSE All-Share Index each month. The second one is the standard deviation of daily returns on the FTSE All-Share Index each month. The third variable, which is a proxy for the real risk-free rate, is the difference between the official Bank of England rate and the expected inflation rate each month. Expected inflation rate estimates are obtained from the fitted values of an AR(12) process of the monthly log changes in RPI as in Pástor and Veronesi (2005).[5] Since the theory links IPO activity to *changes* in market conditions, we modify these three variables accordingly. In particular, we calculate the monthly market return MR as the return on the FTSE All-Share Index, the change in market volatility ΔMV as the first difference of the standard deviation of daily returns, and the change in real risk-free rate ΔRF as the first difference of the real risk-free rate. Then, we regress IPO volume on these variables. The results are reported in the columns headed (1) to (3) in Table 3. Note that we include lags of IPO volume and dummies for the first and third quarters as in Table 2.

[Please insert Table 3 about here]

The results in models (1) to (3) match those obtained by Pástor and Veronesi. In particular, IPO volume is positively related to past market returns and negatively related to past changes in market volatility as predicted. This is because, increases in market returns and decreases in market volatility both imply a decrease in equity premium. Decreases in equity premium make the projects of firms more valuable inducing them to go public. Pástor and Veronesi's model predicts a negative relationship between the change in the real risk-free rate and volume, but their empirical results show a positive relationship. Our results in model (3) indicate that this relationship is weak and not clear in the UK.

The results of model (4) are consistent with Pagano et al. (1998). There is a strong positive relationship between the IPO volume and the lagged price-to-book value of the market. The model of Pástor and Veronesi also imply a positive relationship, but they argue that IPO volume should be more sensitive to changes in market conditions rather than levels of market conditions. They run a regression including past market returns and past level of the aggregate market-to-book ratio in the market, and indeed find that while past market returns are highly significant, past aggregate market-to-book ratio in the market is not. They interpret this result as evidence in favor of their rational explanation and against the behavioral market timing explanations. Our results in model (5) show that the past price-to-book value of the market remains highly significant even after including past market returns in the model. Therefore, the UK evidence does not rule out the behavioral explanation. However, this result has to be interpreted carefully, since high price-to-book values can simply imply the existence of valuable growth opportunities in the market rather than a misvaluation.

Overall, results of this section provide strong evidence that the activity in the UK IPO market is highly sensitive to the market conditions. IPO volume increases following high market returns and low market volatility. Furthermore, IPO volume is closely linked to the market's price-to-book ratio.

4 Hot markets in the UK

Hot and cold markets emerge naturally as a consequence of time variation in IPO volume. Hot markets are characterized by unusually high volume and initial returns, whereas cold markets are periods during which volume and initial returns are lower than usual. The literature offers various explanations on why hot markets emerge. Benveniste et al. (2002) present a model in which private firms in an industry enjoy an informational externality when firms in their industry go public, such that if the information revealed by the market is favorable, many more firms from the same industry go public. In this model, hot markets are periods in which IPOs from either the same industry or close industries cluster in time. Helwege and Liang (2004) do not find much evidence of industry concentration in hot markets that took place in the US.

An alternative explanation for hot markets is the market timing hypothesis. According to this hypothesis firms wait to go public during windows of opportunity when the cost of equity is temporarily low. Once such a window of opportunity arrives many firms seize it at the same time yielding a hot market. Alti (2006) tests this hypothesis and finds that hot market IPOs raise substantially more equity than their cold market counterparts. He also finds that hot market IPOs do not invest more than cold market ones ex post, suggesting that the reason hot market firms are raising more equity is not their superior growth opportunities.[6]

Note that the industry concentration and market timing stories can also be linked to each other. As mentioned earlier, Pagano et al. (1998) show that firms in an industry become more likely to go public when the market-to-book ratio of their industry rises. Like Alti (2006), they find that firms do not increase their investment levels after going public. In fact, they observe a decline in investment and profitability.

In the following subsections we first identify the hot markets in the UK. Then, we examine the level of industry concentration in UK hot markets and investigate whether UK firms raise more equity in hot markets.

4.1 Identifying hot markets between 1970 and 2012

We use the market-level quarterly data on new issues between 1970 and 2012. A limitation is that new issues include introductions and readmissions as well as IPOs. In other words, the quarterly time series of new issues and IPOs are not the same. However, an inspection of the firm-level data between 1995 and 2012, which is the period when we can calculate the quarterly number of IPOs, shows that the two time series have a very similar pattern. This is illustrated in panel (a) of Figure 3. Therefore, we assume that the quarterly series of new lists closely approximates the quarterly series of IPOs.

[Please insert Figure 3 about here]

Descriptive statistics on quarterly series of new lists are provided in Table 4. The median number of new lists per quarter was 27 before the launch of AIM, which has more than doubled to 60 after its launch in 1995. There is evidence of seasonality in the series such that the median number of new lists is lower in the first and third quarters in both the pre- and post-AIM periods. The median value of proceeds raised by new lists also more than doubles after the launch of AIM and it also exhibits seasonality with lower figures in the first and third quarters in both the pre- and post-AIM periods.

[Please insert Table 4 about here]

We now move on to identifying hot markets in the UK using the quarterly series of new lists volume. The method of identifying hot markets varies across papers. Helwege and Liang (2004), Pástor and Veronesi (2005), and Alti (2006) use monthly IPO volume to detect hot markets, but each of these papers uses a different cut-off level to classify months as hot or cold. Yung et al. (2008) and Çolak and Günay (2011) identify hot and cold markets on a quarterly basis, whereas Bustamante (2012) identifies them on an annual basis. Furthermore, these methods differ in terms of the ways they smooth and deflate the time series of IPO volume. Banerjee et al. (2013b) compare these methods and propose a robust and intuitive method. We use their method in this paper. This method is essentially akin to a moving-average trading rule, such that hot markets are periods during which short-run moving average of quarterly IPO volume exceeds its long-run counterpart by a sufficient margin. In particular, the method involves three parameters: s, l, and k, such that a quarter is classified as hot (cold) if the difference between its s-quarter short-run moving and l-quarter long-run moving average volume is higher (lower) than k standard deviations of volume in the past l quarters. We calibrate the method by setting $s = 1$, $l = 20$, and $k = 0$. In other words, a quarter is classified as hot (cold) if its volume exceeds (falls below) the average volume of past 20 quarters. Quarterly volume is adjusted for seasonality before applying the method.[7]

The hot markets identified using this method are presented in panel (b) of Figure 3. The first major hot market takes place in 1972, which is followed by a long cold market that lasts till 1979. 1980s are characterized by a series of small hot markets. The market is cold for the first three years of 1990s, but then a major hot market takes place between 1993 and 1994. After a short hot market in 1996, the next major hot market is in 2000, which coincides with the high-tech boom in the US. Finally, there is a long hot market between 2004 and 2006, which is followed by a long cold market that coincides with the credit crunch and financial crisis periods.[8]

4.2 Industry concentration in hot markets

In this section we investigate whether hot markets in the UK are industry specific, such that in each hot market IPOs are concentrated in a narrow set of industries. To this end, we use the firm-level data, which includes the Industry Classification Benchmark (ICB) code of each IPO firm. Table 5 shows that between June 1995 and May 2012, 62.22% of 1,718 nonfinancial IPOs took place in hot markets and the remaining 37.78% in cold markets. We identify 23 industries (4-digit ICB subsectors) with at least 20 IPOs.[9] In 8 of these industries, more than 70% of the IPOs took place in hot markets. The figure exceeds 80% in the software, telecommunications equipment, mobile telecommunications, and electrical components & equipment industries.

[Please insert Table 5 about here]

At first sight, IPOs in some industries seem to be less clustered in hot markets than expected. For instance, one would expect IPOs in the internet industry to be heavily clustered in hot markets, but 65.71% of the IPOs in this industry takes place in hot markets, which is barely larger than the sample average of 62.22%. However, the figure of 65.71% is deceiving as it is an aggregate figure for all hot markets. A closer look at the cross section of hot markets tells a different story as we show next.

To further investigate industry concentration in hot markets, we run a logistic regression, such that the dependent variable HM is equal to 1 if the IPO took place in a hot market and 0 if it was in a cold market. The independent variables are a set of dummies for the 23 industries in Table 5. The odds ratio estimates of this model are reported in the second column of Table 6. The 8 industries that were identified in Table 5 as having more than 70% of their IPOs in hot markets all have odds ratios that exceed 1 substantially. That is, the odds that a firm from one of industries will go public in a hot market is much higher than the odds that it will go public in a cold market. While 2 industries have odds ratios less than 1, the difference between the odds ratio and 1 is not statistically significant for both industries. Therefore, the odds of going public in a cold market does not exceed those of going public in a hot market in any of the 23 industries. This is in contrast to Helwege and Liang (2004), who find that computer hardware and energy firms cluster in cold markets.

[Please insert Table 6 about here]

We further examine industry concentration by studying the 4 hot markets between June 1995 and May 2012 individually (see panel (b) in Figure 3): (1) 1996 Q2 - Q4, (2) 2000 Q1 - 2001 Q1, (3) 2003 Q4 - 2006 Q4, (4) 2007 Q2 - Q3. The results are reported in the 3rd to the 6th columns of Table 6. HM_i is equal to 1 if an IPO took place in the ith hot market and 0 otherwise. We mentioned earlier that it is rather puzzling why IPOs in some industries, like the internet industry, are not as clustered in hot markets as expected. The results in Table 6 resolve this puzzle. The second column shows that while the odds that a firm went public in *a* hot market are 52% higher if that firm is in the internet industry, the estimate is not statistically significant. This is because, there were no internet firms in the first and last hot markets, and being an internet firm decreased the odds of going public in the third market. In other words, internet firms are not clustered in all hot markets, but in the 2nd hot market only. Software firms are most heavily clustered in the 2nd hot market as well. Firms in the remaining two industries of the technology sector, telecommunications equipment and computer services, are also clustered to some extent in the 2nd hot market. Furthermore, firms in the telecommunications sector, fixed line and mobile telecommunications industries, are heavily clustered in the 2nd hot market too. Other industries that are particularly concentrated in this hot market and not in the others are pharmaceuticals, publishing, and business training & employment agencies. Therefore, the 2nd hot market, which coincides with the high-tech boom period in the US, can be thought of as a result of the clustering of IPOs in technology and telecommunications sectors, coupled with clusterings in pharmaceuticals, publishing, and business training & employment agencies industries.

The 3rd hot market, on the other hand, is dominated by firms in the mining and oil sectors. For instance, no diamonds & gemstones firms went public in the first or the last hot markets, and they were not more likely to go public in the 2nd market, but their odds of going public in the 3rd hot market were almost 200% higher. Biotechnology, media agencies, and electrical components & equipment are the other industries that are clustered in this hot market particularly. As a result, the 3rd hot market can be viewed as a hot market of the mining and oil sectors that is supported by hot markets of the biotechnology, media agencies, and electrical components & equipment industries.

The 1st and 4th hot markets are shorter and have less IPOs than the 2nd and 3rd hot markets. These two smaller hot markets are not characterized particularly by any group of industries. However, the 4th hot market follows shortly after the 3rd one with a gap of one quarter only. As a robustness check we combine the 3rd hot market, the 4th hot market, and the 1-quarter gap between them into a single hot market. The results reported in the last column of Table 6 suggest that the mining and oil sector still dominates the combined hot market. Biotechnology and media agencies industries remain heavily clustered as well. Not surprisingly, electrical components & equipment industry becomes even more heavily clustered, such that the odds of a firm going public in the combined hot market increases by 767% if the firm belongs to this industry.

We conduct further robustness checks. First, instead of running separate logistic regressions for each hot market, we run a multinomial logistic regression where the dependent variable HC is equal to 0 if the IPO took place in a cold market, or to i if it was in the ith hot market. We choose $HC = 0$ as the base case and estimate risk ratios relative to this case. The difference between separate logistic regressions and the multinomial regression is that in the former case the question is whether firms from a particular industry are more likely to go public in the ith hot market rather than any other time (i.e. all other hot markets as well as cold markets); whereas in the latter case it is whether firms from a particular industry are more likely to go public in the ith hot market rather than in cold markets. The results of the multinomial regression are very similar to those in Table 6, so we do not report them for the sake of brevity. Furthermore, we run logistic regressions for each hot market using sectors, instead of industries, as explanatory variables. The conclusions do not change: technology and telecommunications sectors dominate the 2nd hot market, oil and mining sectors dominate the 3rd one, and electronic & electrical equipment sector is highly clustered in the 3rd and 4th hot markets combined.

To summarize, the UK evidence of industry clustering in hot markets is much stronger than the US evidence provided by Helwege and Liang (2004). It seems that long hot markets with many IPOs are fueled by firms in close sectors and supported by clustering in a few other industries. Since 1995, the first major hot market that took place in the UK around 2000 is driven by technology and telecommunications sector and supported by pharmaceuticals, publishing, and business training & employment agencies industries. The second major hot market between 2004 and 2006 is driven by oil and mining sectors and supported by biotechnology, media agencies, and electrical components & equipment industries.

4.3 Proceeds raised in hot markets

Market timing and investor sentiment hypotheses imply that IPOs cluster when the cost of equity is temporarily low. Moreover, IPO firms raise more equity during hot markets, since equity capital is relatively cheap during those periods. On the other hand, according to the capital demands hypothesis (see e.g., Lowry (2003)), if hot markets are periods during which firms have more growth opportunities, it is not surprising that they will raise more equity to invest in those opportunities. Therefore, all of these hypotheses predict that more equity will be issued during hot markets.

Table 7 provides descriptive statistics on median primary proceeds raised in hot, neutral, and cold quarters. In panel A, we see that the median primary proceeds raised in hot markets is about 25% higher (10.08 versus 8.12 million pounds in 2011). Moreover, the median rises from 10.08 to 11.06 as we make our hot market definition stricter. While the figures in panel A provide some evidence that firms raise more equity in hot markets, they do not take firm size into account. It is quite a different matter when a firm with a market value of 20 million pounds raises 10 million pounds, versus another with a market value of 200 million pounds raises the same amount. The figures in panel B control for this size effect. In particular we calculate primary proceeds raised as a percentage of post-IPO market value estimated at the offer price. The conclusion does not change. In hot markets, the median is about 3 percentage points higher (41.41 versus 38.67). Again, as the hot market definition becomes stricter the median rises from 41.41 to 42.35 percent and the gap between hot and cold markets widens to 5.7 percentage points.

[Please insert Table 7 about here]

More evidence on higher proceeds raised in hot markets is provided in Table 8. We run a series of regressions that control for industry sectors and the market segment in which the IPO takes place (i.e., Main Market vs AIM). In columns 2 to 7, we run OLS regressions. The dependent variable is the natural logarithm of proceeds in columns 2 to 4 and the natural logarithm of proceeds as a percentage of post-IPO market value estimated at the offer price in columns 5 to 7. The variables of interest are H_0, $H_{0.5}$, and H_1, which categorize IPOs as cold, neutral, or hot with an increasing level of strictness. As expected, the coefficients of these variables are positive significant. Moreover, the magnitudes of coefficients tend to increase as the hot market definition becomes stricter. As a robustness check we also run median regressions. We use the same dependent variables without taking the natural logarithms. The conclusions remain the same.

[Please insert Table 8 about here]

The evidence presented in this section suggests that UK IPOs raise more equity in hot markets. We estimate that median proceeds raised by firms that go public during the hottest periods can be more than 6 percentage points higher than those that conduct an IPO during the coldest periods. Overall, these results match the US evidence (see Alti (2006)).

5 Conclusion

In this paper we show that the IPO market in the UK has a cyclical nature as in the US. The IPO volume varies substantially over time in the UK. For instance, while there were as many as 250 IPOs in 2005, the number of IPOs in 2009 was only 5. The average monthly initial returns in the UK also exhibits substantial time variation reaching levels of 100% during the high-tech boom period of 2000, while averaging only 10% in 2001 following the burst of dot-com bubble. Following Lowry and Schwert (2002), we investigate the relationship between IPO initial returns and volume in the UK. We find that periods of high initial returns lead to periods of high volume, which is the same pattern documented by Lowry and Schwert in the US.

After providing evidence for the cyclical nature of UK IPO market, we investigate the factors that drive the time variation in IPO activity in the UK. We find a strong link between market conditions and IPO volume. In particular, UK IPO volume is positively related to past market returns and negatively related to past changes in market volatility. These results agree with those in the US market obtained by Pástor and Veronesi (2005). However, unlike Pástor and Veronesi, we also find a strong relationship between IPO volume and past level of the market's price-to-book ratio. While this relationship is consistent with a rational explanation of IPO cycles, it also supports market timing explanations, such as the one offered by Pagano et al. (1998).

We also identify the hot IPO markets in the UK. Unlike Helwege and Liang (2004), who study the US hot markets, we find evidence of industry concentration in the UK hot markets. In particular, the hot market that took place during the high-tech boom period of 2000 mainly features IPOs from the technology and telecommunications sectors, while the hot market between 2004 and 2006 is characterized to a large extent by firms from the oil and mining sectors. Overall, our results lend support to models that predict industry clustering in hot markets such as Benveniste et al. (2002).

Finally, we compare the proceeds raised by UK firms in hot versus cold markets. We find that UK firms raise substantially higher amounts of proceeds during hot markets. The result is robust to firm size, industry, and the market segment in which the firm's shares are listed. It is consistent with the US evidence provided by Alti (2006).

Overall, the IPO waves in the UK are driven by changes in market conditions. Furthermore, industry clustering contributes to the emergence of hot markets in the UK. The fact that IPO volume rises following improvements in market conditions supports the rational explanation of hot markets. However, it is not possible to rule out the market timing explanation, since IPO volume also rises when firm valuations are high in the market.

Notes

[1]Part of the decline in the number of listed firms on the Main Market since 1995 is due to transfers to AIM. Between 1995 and May 2012, 303 firms took this route, while only 130 firms took the opposite route.

[2]A large proportion of the financial firms are investment trusts, venture capital trusts, and real estate holding & development firms.

[3]Banerjee et al. (2013a) offer an alternative theoretical explanation for this lead-lag relationship. In their model, time variation in initial returns and volume is due to changes in market conditions. Initial returns rise first as good firms lead IPO waves and signal quality with underpricing. Volume rises later when (and if) bad firms follow.

[4]OLS regression of model (2) yields substantially autocorrelated residuals (the Durbin-Watson statistic is 0.97). Running Cochrane-Orcutt regressions, as in Ibbotson and Jaffe (1975), helps remedy this problem (the Durbin-Watson statistics becomes 2.40).

[5]Pástor and Veronesi (2005) use the CPI. However, the CPI data goes back to 1996 in the UK, while our data starts in 1995. Therefore, we use the RPI data which goes back to 1947 instead.

[6]On the other hand, Banerjee et al. (2013a) provide evidence that *leaders* in hot markets invest more ex post due to their superior growth opportunities. In their model, high-quality firms lead hot markets to signal quality. Similarly, Bustamante (2012) presents an IPO timing model, which shows that firms with better investment prospects accelerate their IPOs when the adverse selection problem is severe.

[7]In particular, raw volume is regressed on dummies representing the quarters in a year. Then, the raw volume is divided by the volume predicted by the regression and re-meaned to have the same mean as the original series. This procedure is conducted separately for the pre- and post-AIM periods, since IPO volume experiences a permanent shift after the launch of AIM.

[8]Vismara et al. (2012) detect a Europe-wide hot market between 2004 and 2006. They argue that AIM's success as an exchange-regulated market has contributed to the emergence of this hot market.

[9]There are 92 nonfinancial subsectors in total.

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Table 1: Firm-level data on IPOs

Descriptive statistics on nonfinancial IPOs in the London Stock Exchange. The sample period is June 1995 - May 2012. The data on IPOs in the Main Market is available from 1998. *pro* is the median primary proceeds in million pounds, *mv* is the post-IPO market value based on the offer price.

	AIM			Main Market			All		
Year	count	*pro*	*mv*	count	*pro*	*mv*	count	*pro*	*mv*
1995	16	3.10	7.81				16	3.10	7.81
1996	94	3.55	12.94				94	3.55	12.94
1997	70	2.50	7.98				70	2.50	7.98
1998	37	2.96	10.91	66	38.07	68.71	103	13.00	34.21
1999	38	3.26	11.70	34	73.20	141.91	72	6.60	24.56
2000	124	5.39	20.91	76	51.70	164.02	200	11.95	46.98
2001	72	2.94	10.10	12	42.42	92.91	84	3.36	13.44
2002	47	3.00	9.13	13	173.77	570.40	60	4.50	13.41
2003	48	2.22	14.83	5	27.00	213.69	53	4.00	15.51
2004	176	5.03	18.07	24	78.97	130.88	200	6.20	21.13
2005	221	6.02	20.35	29	148.80	353.29	250	8.00	23.21
2006	172	6.97	24.94	36	139.30	272.20	208	9.67	35.41
2007	113	8.80	30.75	38	184.37	328.82	151	15.27	55.00
2008	25	7.49	35.50	9	152.82	227.32	34	18.29	53.72
2009	3	5.26	20.28	2	45.98	111.02	5	9.75	23.51
2010	39	10.00	24.78	16	215.92	345.45	55	28.00	78.74
2011	38	4.09	16.55	10	283.45	1,166.15	48	11.00	27.57
2012	12	6.20	32.23	3	117.00	390.00	15	7.01	33.20
Total	1,345	4.91	18.18	373	82.50	196.96	1,718	7.33	24.48

Table 2: Lead-lag relationship between initial returns and volume

Granger causality tests for monthly time series of initial returns and volume. Nonfinancial IPOs in the LSE between June 1995 and May 2012 are used. V is the monthly number of IPOs and I is the monthly average initial return of IPOs. $Li.$ signifies the ith lag of a monthly time series variable. q_1 (q_3) is a dummy for the first (third) quarter, such that it is equal to 1 if the observation comes from a month in that quarter. The dependent variable is V in models (1)-(4) and I in the rest. Models (2) and (5) are Cochrane-Orcutt regressions, and the rest are ordinary least squares regressions. D-W stat. is the Durbin-Watson statistic. Granger F is the p-value of the Granger F test. Robust standard errors are in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1% levels respectively.

	Volume (V)				Initial returns (I)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$L1.V$	0.36***		0.28***	0.27***		0.36**	0.34**	0.38**
	(0.10)		(0.10)	(0.09)		(0.15)	(0.16)	(0.16)
$L2.V$	0.18**		0.25***	0.27***		-0.38**	-0.40**	-0.39**
	(0.09)		(0.09)	(0.10)		(0.15)	(0.18)	(0.16)
$L3.V$	0.22***		0.17**	0.24***		0.09	0.13	-0.07
	(0.07)		(0.08)	(0.08)		(0.16)	(0.15)	(0.16)
$L1.I$		-0.03	-0.06**	-0.03	0.22		0.26	0.17
		(0.03)	(0.03)	(0.03)	(0.18)		(0.18)	(0.17)
$L2.I$		0.09***	0.07**	0.07**	0.25**		0.25**	0.23**
		(0.03)	(0.03)	(0.03)	(0.11)		(0.11)	(0.09)
$L3.I$		0.09***	0.07**	0.05*	0.02		-0.02	0.03
		(0.03)	(0.03)	(0.03)	(0.06)		(0.07)	(0.06)
q_1				-5.98***				13.37***
				(1.21)				(4.06)
q_3				-4.36***				3.88*
				(1.15)				(2.17)
Cons.	2.04***	7.60***	1.40	2.93***	6.76***	15.09***	6.16**	4.68*
	(0.53)	(1.62)	(0.91)	(1.01)	(1.91)	(4.05)	(2.63)	(2.46)
Obs.	201	146	154	154	147	163	147	147
Adj R-sq.	0.41	0.05	0.37	0.46	0.20	0.04	0.22	0.30
D-W stat.	2.10	2.40	2.02	2.14	2.11	2.46	2.12	2.10
Granger F			0.00	0.02			0.13	0.06

Table 3: The relationship between market conditions and volume

OLS regression results. The dependent variable V is the monthly number of nonfinancial IPOs in the LSE between June 1995 and May 2012. MR is the monthly return on the FTSE All-Share Index. ΔMV is the first difference of the standard deviation of daily returns on the same index each month. ΔRF is the first difference of the real risk-free rate. The real risk-free rate is the difference between the official Bank of England rate and the expected inflation rate each month. Expected inflation rate estimates are obtained from the fitted values of an AR(12) process of the monthly log changes in RPI. $P2B$ is the price-to-book value of Datastream's UK Total Market index (mnemonic: TOTMKUK) each month. $Li.$ signifies the ith lag of a monthly time series variable. q_1 (q_3) is a dummy for the first (third) quarter, such that it is equal to 1 if the observation comes from a month in that quarter. Robust standard errors are in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1% levels respectively.

	(1)	(2)	(3)	(4)	(5)
$L1.MR$	0.14**				0.11
	(0.07)				(0.07)
$L2.MR$	0.06				0.05
	(0.09)				(0.08)
$L3.MR$	0.23***				0.23***
	(0.08)				(0.08)
$L1.\Delta MV$		-2.48***			
		(0.69)			
$L2.\Delta MV$		-1.44			
		(0.88)			
$L3.\Delta MV$		-2.32***			
		(0.79)			
$L1.\Delta RF$			-0.14		
			(0.14)		
$L2.\Delta RF$			0.14		
			(0.14)		
$L3.\Delta RF$			0.22*		
			(0.13)		
$L1.P2B$				5.18***	4.91***
				(1.52)	(1.49)
$L1.V$	0.29***	0.29***	0.33***	0.25***	0.23***
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
$L2.V$	0.22**	0.22**	0.21**	0.16*	0.16*
	(0.08)	(0.09)	(0.09)	(0.09)	(0.09)
$L3.V$	0.29***	0.32***	0.27***	0.21***	0.23***
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
q_1	-4.86***	-5.45***	-5.18***	-4.29***	-4.69***
	(1.07)	(1.18)	(1.24)	(1.05)	(1.06)
q_3	-3.96***	-4.47***	-4.91***	-3.56***	-3.46***
	(0.96)	(0.94)	(1.22)	(0.97)	(0.95)
Cons.	3.62***	3.91***	4.18***	-3.86*	-3.59
	(0.68)	(0.68)	(0.76)	(2.24)	(2.18)
Obs.	201	201	201	201	201
Adj R-sq.	0.49	0.50	0.48	0.50	0.51

Table 4: Descriptive statistics on quarterly series of new lists

The sample is quarterly time series of new lists and their proceeds on the LSE between January 1970 and May 2012. The series on proceeds start in 1972. Proceeds are measured in billions of 2011 pounds. Median values are reported for each quarter separately in columns q_1 to q_4 and for all quarters pooled in column All. K-W p is the Kruskal-Wallis p value. Pre-AIM is the period prior to the second quarter of 1995 and post-AIM is the remaining period when AIM has been in existence.

	q_1	q_2	q_3	q_4	All	count	K-W p
Panel A: Volume							
pre-AIM	18.5	33	27	36	27	101	0.06
post-AIM	41	72	56	72	60	69	0.30
Panel B: Proceeds							
pre-AIM	0.86	1.71	0.99	2.12	1.31	65	0.08
post-AIM	1.96	4.95	2.95	3.38	3.02	69	0.06

Table 5: Frequency of IPOs across industries and hot/cold markets

The sample is 1,718 nonfinancial IPOs in the LSE between June 1995 and May 2012. Industry classification is based on 4-digit ICB subsectors. Industries with at least 20 IPOs are reported.

	Cold		Hot	
	count	percent	count	percent
OIL				
0533 Exploration & Production	39	42.86	52	57.14
0573 Oil Equipment & Services	9	40.91	13	59.09
MINING				
1773 Diamonds & Gemstones	7	30.43	16	69.57
1775 General Mining	30	35.29	55	64.71
1777 Gold Mining	15	35.71	27	64.29
ELECTRONIC & ELECTRICAL EQUIPMENT				
2733 Electrical Components & Equipment	4	14.29	24	85.71
2737 Electronic Equipment	11	36.67	19	63.33
SUPPORT SERVICES				
2791 Business Support Services	38	41.30	54	58.70
2793 Business Training & Employment Agencies	14	38.89	22	61.11
HEALTH CARE				
4535 Medical Equipment	12	42.86	16	57.14
4573 Biotechnology	15	36.59	26	63.41
4577 Pharmaceuticals	15	29.41	36	70.59
MEDIA				
5553 Broadcasting & Entertainment	12	36.36	21	63.64
5555 Media Agencies	11	20.75	42	79.25
5557 Publishing	17	33.33	34	66.67
LEISURE				
5752 Gambling	5	20.83	19	79.17
5755 Recreational Services	22	51.16	21	48.84
TELECOMMUNICATIONS				
6535 Fixed Line Telecommunications	7	26.92	19	73.08
6575 Mobile Telecommunications	4	19.05	17	80.95
TECHNOLOGY				
9533 Computer Services	44	48.89	46	51.11
9535 Internet	12	34.29	23	65.71
9537 Software	19	18.10	86	81.90
9578 Telecommunications Equipment	3	12.00	22	88.00
Other industries	284	44.17	359	55.83
Total	649	37.78	1069	62.22

Table 6: Industry concentration in hot markets

Odds ratio estimates of logistic regression models. The sample is 1,718 nonfinancial IPOs in the LSE between June 1995 and May 2012. 4 hot markets are identified during this period: (1) 1996 Q2 - Q4, (2) 2000 Q1 - 2001 Q1, (3) 2003 Q4 - 2006 Q4, (4) 2007 Q2 - Q3. HM (HM_i) is a binary variable equal to 1 if the IPO took place in a (the ith) hot market. Explanatory variables are industry dummies. *, **, and *** indicate significance at 10%, 5%, and 1% levels respectively. AUC is the area under the ROC curve. Perfect predictor industries are dropped in each regression.

	HM	HM_1	HM_2	HM_3	HM_4	HM_{3+4}
Exploration & Production	1.05	0.14*	0.23**	1.79**	1.04	1.84***
Oil Equipment & Services	1.14	0.62	0.48	1.32	1.79	1.73
Diamonds & Gemstones	1.81		0.96	2.97**		4.09***
General Mining	1.45		0.50	2.60***	0.43	2.65***
Gold Mining	1.42	0.32	0.25	2.55***	0.44	2.12**
Electrical Components & Equipment	4.75***	0.48	0.37	3.44***	2.99*	8.67***
Electronic Equipment	1.37	2.60*	0.35	1.27	0.62	1.10
Business Support Services	1.12	0.75	1.37	0.92	1.71	1.06
Business Training & Employment A.	1.24		2.88**	1.22		1.03
Medical Equipment	1.05		0.78	1.65	0.66	1.44
Biotechnology	1.37	0.67		2.00**	1.41	2.04**
Pharmaceuticals	1.90**	0.53	2.77***	1.23	1.12	1.28
Broadcasting & Entertainment	1.38		1.80	1.41	1.16	1.36
Media Agencies	3.02***	0.25	1.29	3.15***	0.70	2.81***
Publishing	1.58	1.41	6.51***	0.41**		0.31***
Gambling	3.01**		2.02	2.26*	1.63	2.41**
Recreational Services	0.76	1.71	1.64	0.51*	0.43	0.44**
Fixed Line Telecommunications	2.15*		2.40*	1.91	0.72	1.69
Mobile Telecommunications	3.36**		4.03***	2.10*		1.59
Computer Services	0.83	1.62	1.70	0.66*		0.50***
Internet	1.52		6.72***	0.66		0.50*
Software	3.58***		4.83***	1.49*	1.09	1.53**
Telecommunications Equipment	5.80***		2.52*	2.86**	1.56	3.72***
Cons.	1.26***	0.08***	0.10***	0.52***	0.06***	0.69***
Obs.	1,718	1,277	1,677	1,718	1,462	1,718
R-sq.	0.03	0.03	0.09	0.04	0.02	0.05
AUC	0.61	0.63	0.71	0.63	0.59	0.64

Table 7: Descriptive statistics on proceeds raised in hot, neutral, and cold markets

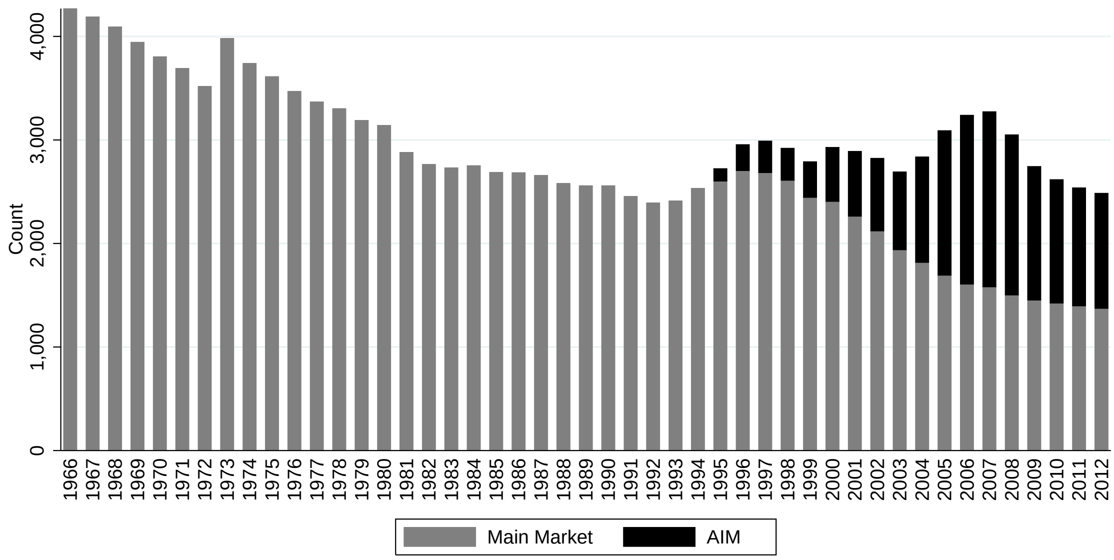
Median primary proceeds raised in cold, neutral, and hot markets. The sample is 1,718 nonfinancial IPOs in the LSE between June 1995 and May 2012. In panel A, the primary proceeds are in millions of 2011 pounds. In panel B, proceeds as a percentage of market value is equal to $100 \times (pro/(mv - pro))$, where pro is the primary proceeds raised by a firm, and mv is the firm's market value based on its offer price. The cases where $mv = pro$ are excluded. H_i is a categorical variable equal to 1 (0) if the IPO took place in a quarter in which the volume of that quarter exceeds (falls below) the average volume of past 20 quarters by at least i standard deviations of those 20 quarters, and equal to 0.5 otherwise.

	H_0		$H_{0.5}$		H_1	
	median	count	median	count	median	count
Panel A: Proceeds in millions of 2011 pounds						
Cold	8.12	649	8.07	442	9.48	150
Neutral		0	8	452	8.54	967
Hot	10.08	1069	10.76	824	11.06	601
Panel B: Proceeds as a percentage of market value						
Cold	38.67	547	38.15	372	36.66	121
Neutral		0	38.87	395	39.2	862
Hot	41.41	977	42.12	757	42.35	541

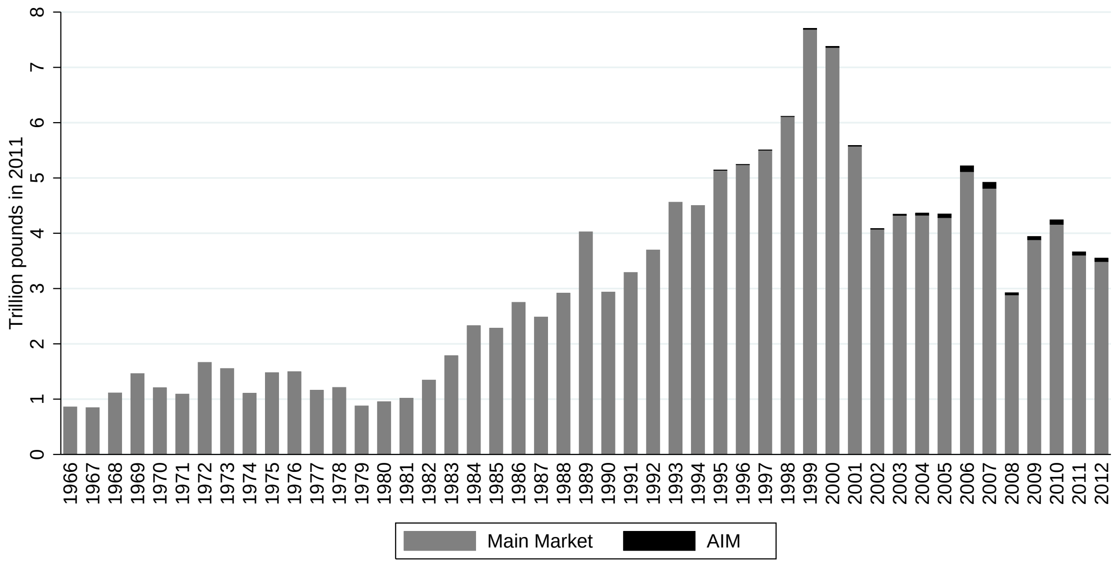
Table 8: Proceeds raised in hot markets

OLS and median regression results. The sample is 1,718 nonfinancial IPOs in the LSE between June 1995 and May 2012. pro_a is the primary proceeds raised by a firm in millions of 2011 pounds. pro_s is equal to $100\times(pro/(mv-pro))$, where pro is the primary proceeds raised by a firm, and mv is the firm's market value based on its offer price. H_i is a categorical variable equal to 1 (0) if the IPO took place in a quarter in which the volume of that quarter exceeds (falls below) the average volume of past 20 quarters by at least i standard deviations of those 20 quarters, and equal to 0.5 otherwise. The control variables are industry sector dummies (see Table 5). MM is a dummy variable equal to 1 if the IPO firm is listed on the Main Market. *, **, and *** indicate significance at 10%, 5%, and 1% levels respectively.

	Panel A: OLS regressions						Panel B: Median regressions					
	$ln(pro_a)$			$ln(pro_s)$			pro_a			pro_s		
H_0	0.31***			0.12**			1.94***			3.76**		
	(0.065)			(0.055)			(0.592)			(1.826)		
$H_{0.5}$		0.39***			0.24***			3.20***			5.28**	
		(0.076)			(0.062)			(0.557)			(2.234)	
H_1			0.44***			0.23**			3.54***			6.62**
			(0.106)			(0.088)			(0.774)			(3.154)
Elec.	0.07	0.08	0.09	-0.08	-0.09	-0.08	2.42	1.88	3.15**	3.29	2.83	2.87
	(0.155)	(0.156)	(0.156)	(0.119)	(0.119)	(0.118)	(1.603)	(1.290)	(1.321)	(4.699)	(4.931)	(5.059)
Health.	-0.30**	-0.32***	-0.32***	-0.26**	-0.27***	-0.27***	-0.98	-1.58*	-1.55	-4.08	-4.19	-4.92
	(0.118)	(0.117)	(0.117)	(0.104)	(0.104)	(0.105)	(1.165)	(0.936)	(0.963)	(3.478)	(3.681)	(3.785)
Leisure	0.15	0.14	0.14	0.02	0.01	0.01	-0.79	-0.80	-0.72	4.02	3.49	4.20
	(0.193)	(0.192)	(0.191)	(0.154)	(0.154)	(0.153)	(1.500)	(1.208)	(1.237)	(4.586)	(4.816)	(4.943)
Media	-0.13	-0.14	-0.13	0.02	0.01	0.01	-1.30	-1.35	-1.59*	-2.42	-3.89	-2.67
	(0.123)	(0.124)	(0.125)	(0.099)	(0.099)	(0.100)	(1.107)	(0.892)	(0.914)	(3.363)	(3.535)	(3.630)
Mining	-0.18	-0.20*	-0.19*	-0.15*	-0.16*	-0.16*	-1.67	-2.28***	-1.94**	-3.42	-4.69	-4.35
	(0.113)	(0.113)	(0.112)	(0.086)	(0.085)	(0.086)	(1.070)	(0.862)	(0.883)	(3.199)	(3.361)	(3.449)
Oil	0.62***	0.61***	0.61***	0.03	0.03	0.03	7.77***	8.67***	7.37***	6.28*	4.87	5.41
	(0.131)	(0.131)	(0.130)	(0.094)	(0.094)	(0.094)	(1.194)	(0.961)	(0.984)	(3.581)	(3.759)	(3.841)
Support	-0.10	-0.11	-0.11	0.02	0.01	0.02	-1.14	-1.02	-0.91	2.69	2.38	0.77
	(0.121)	(0.121)	(0.121)	(0.109)	(0.108)	(0.108)	(1.130)	(0.910)	(0.932)	(3.406)	(3.577)	(3.669)
Tech.	-0.16*	-0.18*	-0.16*	-0.17**	-0.18**	-0.17**	-1.13	-1.13	-1.45**	-2.59	-4.57	-4.16
	(0.092)	(0.092)	(0.092)	(0.073)	(0.073)	(0.074)	(0.871)	(0.703)	(0.719)	(2.657)	(2.794)	(2.870)
Telecom.	0.30	0.30	0.31	-0.34**	-0.35**	-0.34**	5.33***	4.80***	4.81***	-8.49	-9.96*	-10.10*
	(0.230)	(0.230)	(0.230)	(0.169)	(0.167)	(0.167)	(1.769)	(1.424)	(1.458)	(5.655)	(5.857)	(6.010)
MM	2.95***	2.94***	2.92***	0.39***	0.40***	0.39***	105.76***	105.10***	105.00***	5.48**	5.24**	6.09**
	(0.080)	(0.080)	(0.080)	(0.071)	(0.071)	(0.071)	(0.702)	(0.564)	(0.576)	(2.306)	(2.413)	(2.476)
Con.	1.63***	1.59***	1.55***	3.60***	3.54***	3.54***	5.41***	4.68***	4.34***	37.57***	37.52***	36.14***
	(0.069)	(0.073)	(0.088)	(0.061)	(0.063)	(0.074)	(0.609)	(0.511)	(0.616)	(1.897)	(2.068)	(2.493)
Obs.	1,718	1,718	1,718	1,524	1,524	1,524	1,718	1,718	1,718	1,524	1,524	1,524
R-sq.	0.48	0.48	0.48	0.03	0.04	0.03	0.13	0.13	0.13	0.01	0.01	0.01



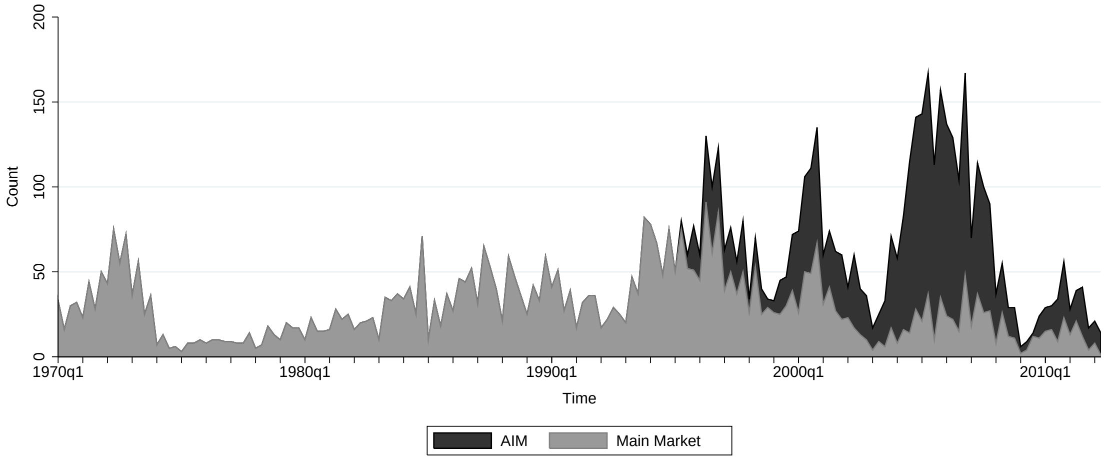
(a) Number of listed firms



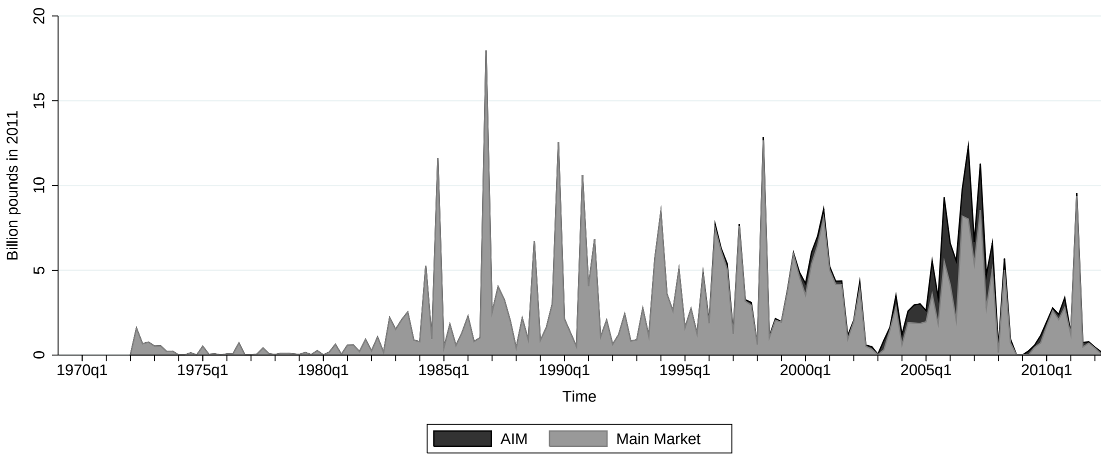
(b) Market value of listed firms

Figure 1: Market-level annual data on listed firms

The main market data includes UK and international firms. The market value figures are reported in trillions of 2011 pounds.



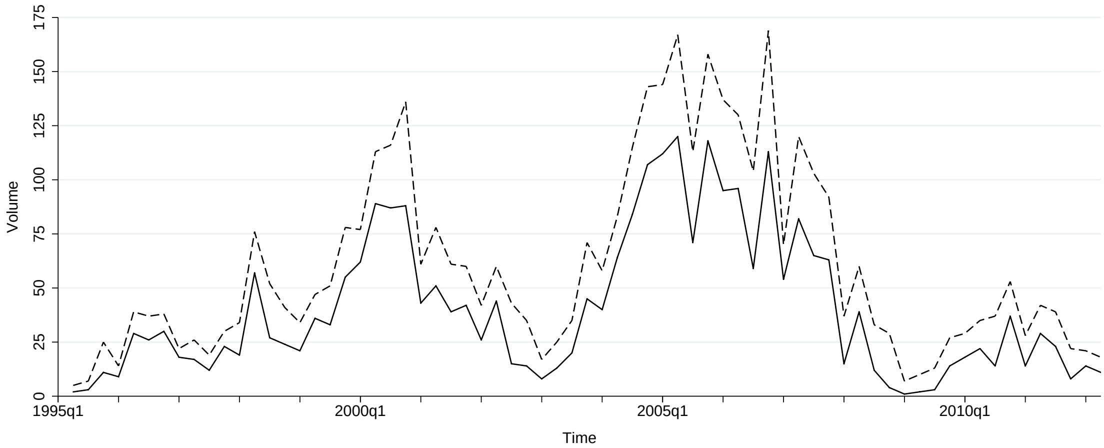
(a) Number of new lists



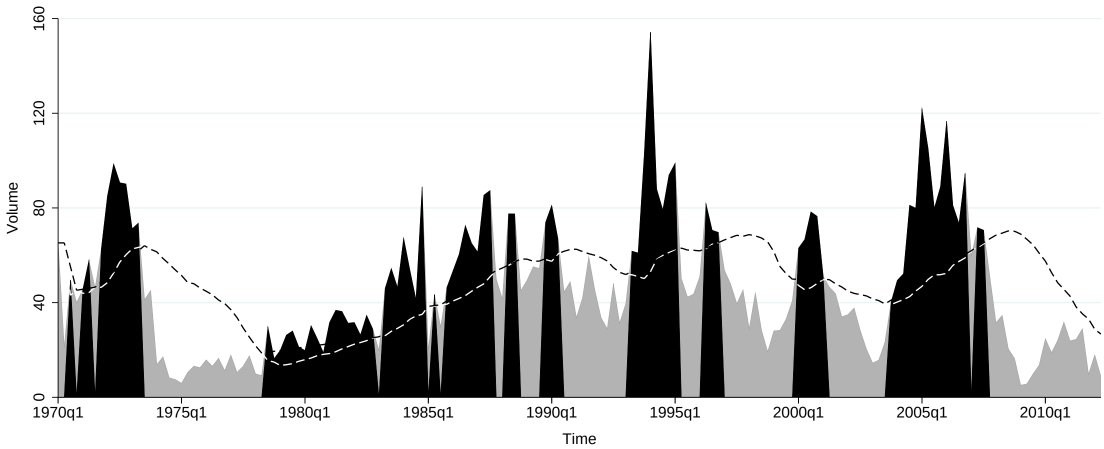
(b) Money raised by new lists

Figure 2: Market-level quarterly data on new lists

The number of new lists includes IPOs, introductions, and readmissions, but excludes transfers between the Main Market and AIM. The main market data includes UK and international firms. For UK and international firms, the data on money raised is available from 1972 and 1979 respectively. The money raised figures are reported in billions of 2011 pounds.



(a) Quarterly series of new lists vs IPOs between 1995 and 2012



(b) Hot markets between 1970 and 2012

Figure 3: Hot markets in the UK

In panel (a), the dashed line is the series of new lists in the LSE. The solid line is the series of IPOs in the LSE. The sample period is between June 1995 and May 2012. The sample includes new lists on AIM starting from June 1995 and those on the Main Market starting from January 1998. In panel (b), the area plot is the quarterly series of new lists in the LSE. Black and gray areas represent hot and cold markets respectively. The dashed line is the 20-quarter moving average volume.