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## Changing conditions in the Hong Kong new issues market

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### Abstract

This paper examines the Hong Kong IPO market from August 1995 to July 1999 and finds that the time of the June 30 1997 political handover coincides with the transition in the IPO market from ‘hot’ to ‘cold’. Although the handover was an anticipated event, an explanation for the change in market is that the political handover created uncertainty among investors; a type of information asymmetry where all investors faced greater uncertainty. Our finding provides empirical support to literature which proposes that events in the months preceding the October 27 1997 correction in Asian stock markets facilitated a decline in confidence in financial markets, subsequently characterised as the ‘Asia Financial Crisis’. In addition, we find initial returns of newly listed stocks in the Hong Kong market are associated with market condition but not associated with any particular industry (i.e., PROPERTY) or geographic location (i.e., ‘H’ SHARES) suggesting that the prevailing market condition was spread more generally across issues.

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### 1. Introduction

Hong Kong has a mature and well regulated capital market which is among the ten largest in the world. The procedure for making a public offer and listing on the stock market is similar to that of many British Commonwealth countries.<sup>2</sup> Issues are normally underwritten and fixed

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<sup>1</sup> Level 3, 380 St. Kilda Road, Melbourne Vic. 3004, Australia. Tel.: +61 3 8696 6768; fax: +61 8696 6769.<sup>2</sup> See Cheng and Firth (2000) for a summary of the procedures used in floating a company on the Stock Exchange of Hong Kong.

pricing is used as opposed to a book building approach. Consistent with international research, Hong Kong studies find investors in Initial Public Offerings (IPOs) typically experience systematic profits when these issues commence trading. This phenomenon, commonly known as ‘underpricing’, is a feature of financial markets worldwide. Factors found to be associated with underpricing include IPO risk, quality, investor interest, size, industry and the state of the market or market condition (i.e., ‘hot’ or ‘cold’ market). Research consistently finds higher returns in ‘hot’ compared with ‘cold’ markets (see for example [Ibbotson et al., 1994](#)). However, the methods used to identify ‘hot’ or ‘cold’ markets typically do not allow for the identification of a precise point of transition.

This study investigates the transition in the Hong Kong IPO market during the period August 1995 to July 1999. The period under review includes a number of unique events making measurement of market condition problematic. Politically, 1997 marked the Handover of Hong Kong to Mainland China on June 30, 1997 after a century’s governorship under the United Kingdom. This long anticipated political event, representing a particular type of information asymmetry, created uncertainty in financial markets. Economically, it marked the historic high of the Hang Seng Index on August 8 1997, just two months prior to the October 27 stock market correction and its resulting turmoil. Conventional wisdom is that the October 27 market correction signalled a turning point in the Hong Kong stock market. However, [Chowdry and Goyal \(2000\)](#) and [Miller \(1998\)](#) propose that the financial situation elsewhere in Asia started to deteriorate in the months prior to the October 1997 correction in Asian stock markets. Hence, there is uncertainty as to whether economic or political factors were the catalyst for the changing condition in the Hong Kong IPO market. This study aims to identify empirically at which point the Hong Kong IPO market transitions from ‘hot’ to ‘cold’. General financial market uncertainty could explain a transition around the time of the handover.

We demonstrate that the precise date of transition from ‘hot’ to ‘cold’ is unclear using traditional approaches to measuring market transition based around the underlying securities market index or characteristics of the IPO market including initial return, IPO volume and proceeds (see for example [Benveniste et al., 2003](#); [Derrien and Womack, 2003](#); [Brailsford et al., 2000](#); [Ibbotson et al., 1994](#); [Ritter, 1984](#); [Ibbotson and Jaffe, 1975](#)). Applying an econometric technique devised by [Hansen \(2000\)](#) we identify the structural break in the IPO return series that signifies the transition from ‘hot’ to ‘cold’ market. Following this we use a standard Ordinary Least Squares (OLS) linear regression model to confirm the significance of market condition to IPO underpricing, controlling for risk (using ex ante uncertainty, the number of years in operation before going public and leverage); investor interest (number of days between registration and listing); quality (reputation of underwriter, auditor and independent expert); size (issue proceeds); class of share (e.g., ‘H’ SHARES) and industry. Therefore a further contribution of this study is to provide an examination of the initial after market performance of Hong Kong IPOs at a unique and as yet unexamined time.

The paper is divided into five sections. In Section 2 we review the literature on ‘hot’ and ‘cold’ IPO markets, Hong Kong IPOs, and provide motivation for the study. Section 3 outlines the research method employed. In Section 4 we analyse results of the statistical tests employed and we conclude in Section 5.

## **2. ‘Hot’ and ‘cold’ markets and Hong Kong IPOs**

The relationship between ‘hot’ issues markets and underpricing is well documented in IPO literature. [Ibbotson and Jaffe \(1975\)](#) propose that ‘hot’ issues markets are characterised by a large

number of offerings, concentration of new issues in particular industries, preponderance of smaller issues, frequent over-subscription and abnormally high initial returns. Numerous studies have subsequently confirmed the presence of ‘hot’ and ‘cold’ markets across time and countries (see for example Wise, 1988; Marcial, 1992; Dark and Carter, 1993; Helwege and Liang, 2003; Ritter, 1998).

One of the most frequently cited works on IPOs and market condition is by Ritter (1984) who investigated the US ‘hot’ issues market of January 1980 to March 1981. Ritter reports that the average initial return on unseasoned new issues of common stock was 48.4%, significantly higher than returns found in ‘non-hot’ or ‘cold’ markets. Further, Ritter finds that this underpricing was almost entirely confined to issues of resource stocks. Allen and Faulhaber (1989) suggest that the impetus for this was the economic conditions at the time, in particular the 1979 oil crisis.

There are a number of competing explanations for variation in the level of underpricing in different market conditions. The Institutional hypothesis (see Ritter, 1984; Lowry and Schwert, 2002, and Helwege and Liang, 2004) suggests an opportunistic explanation for the greater volume of IPOs and associated underpricing in a ‘hot’ market as institutions rush through issues, typically in similar industries. Many new issues are in the process of going public when conditions in the market change and average overpricing eventuates. A related explanation is that of ‘speculative bubbles’ where smaller riskier stocks are put to market to take advantage of a ‘hot’ market condition; these issues are found to under-perform seasoned equity over the long run (Loughran et al., 1994; Ljungqvist et al., 2001; Loughran and Ritter, 1995; Lerner, 1994, and Field, 1997). A further explanation argues that the advent of new technology or a productivity shock creates information asymmetry which results in clusters of firms from particular industries or geographic areas being associated with greater underpricing during ‘hot’ markets (Ritter, 1984; Maksimovic and Pichler, 2001; Wilhelm et al., 2002; Helwege and Liang, 2004).

It is surprising that relatively few papers have been written on the Hong Kong IPO market given the size and importance of the Hong Kong Stock Exchange (HKSE). Within the papers that have been written though, several have considered market condition in the context of examining initial underpricing. Dawson and Hiraki (1985) in their study of the Hong Kong IPO market between 1979 and 1984 note that underpricing appeared to be larger during rising markets than during falling markets. Their study predates the unification of the four Hong Kong stock exchanges in April 1986 into one central exchange (the HKSE). McGuinness (1992), in a study of the Hong Kong IPO market 1980–1986, reports underpricing was positively associated with the state of the market (measured by the percentage change in the Hang Seng Index over weekly intervals for a 12 week period prior to issue) giving support to the proposition of Beatty and Ritter (1986) that underpricing increases during rising market periods and decreases during falling markets. McGuinness (1992) finds evidence of an exuberant market in Hong Kong characterised by high subscription rates, extensive rationing of shares and over-subscription ranging from 2.70 to 59.54 times the number of available shares. Cheng (1998) examines 168 new listings during the period 1992 to 1995 and did not find a significant association between an increase in the market index (as measured by an increase in the percentage change in the Hang Seng index in the two months prior to listing) and the level of underpricing.<sup>3</sup>

In the period under review, Asian financial markets suffered one of the most severe and protracted reversals of the post war period. The impact of market condition on IPO underpricing was likely moderated in Hong Kong by the underlying stability and structure of the financial

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<sup>3</sup> The results of Cheng and McGuinness may vary because of the different sample periods used and the short sample period in Cheng (1998).

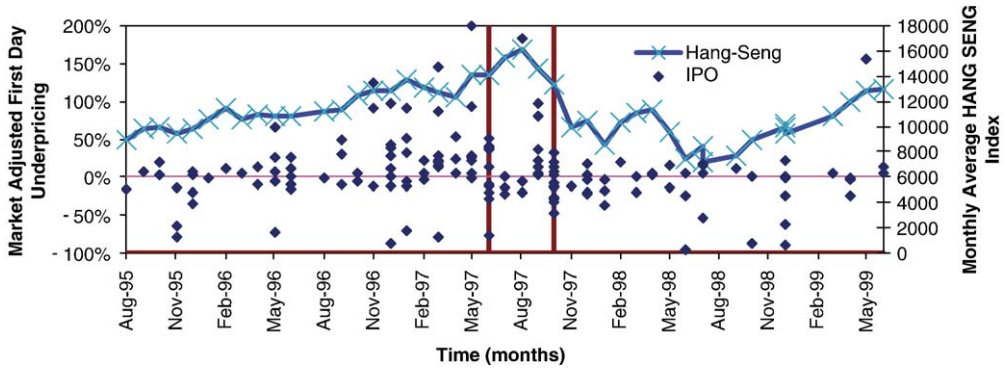


Fig. 1. Market adjusted first day underpricing and Hang Seng over time.

system. Miller (1998 p. 227) suggests that “Hong Kong was able to avoid devaluation because it has a monetary and foreign exchange system that is fundamentally different from that of the rest of Southeast Asia”. Hong Kong has a currency board, not a central bank, and as Miller points out the people of Hong Kong did not lose confidence in the board. Another source of strength was the financial stability and transparency of Hong Kong companies compared to their Asian counterparts. Pomerleano (1998) finds that Hong Kong companies had significantly higher interest coverage and return on equity than those in other Asian countries.<sup>4</sup> Also, Jaggi (1997) finds that company information used to monitor the performance and stability of Hong Kong companies was reliable (i.e., earnings forecasts tended to be highly accurate).

Notwithstanding the underlying strength of the Hong Kong market, the market correction of October 27 is associated with a change in sentiment within Asian financial markets.<sup>5</sup> DuBois (1997 pp MW8) provides anecdotal evidence of the impact of the crisis on the Hong Kong IPO market. “To defend the HK dollar which is pegged to the greenback and was perceived to be under attack by speculators, interest rates in the former colony soared.” This he notes led to the failure of the largest ever IPO by a Chinese ‘red-chip’ company, China Telecom Hong Kong.<sup>6</sup>

That a financial crisis occurred in 1997 in Hong Kong is beyond dispute. Chowdry and Goyal (2000) suggest that one of the defining characteristics of a country that experiences a financial crisis is a large drop in its traded equity prices. As illustrated in Fig. 1, Hong Kong’s Hang Seng Index falls dramatically in 1997. Normally studies investigating the impact of market condition on IPO underpricing have a well defined event which is identified with the transition from ‘hot’ to ‘cold’. The year 1997 provides a unique measurement challenge as two significant events affected Hong Kong in that year; the 27 October stock market correction and the political return of Hong Kong to Chinese rule on June 30. While the political handover was a unique event and a cause of much celebration, it was associated with a period of uncertainty and was followed soon after by the October 27 stock market correction. This uncertainty presents itself as a particular type of asymmetric information problem, with investors uncertain about the post handover economic and financial performance of Hong Kong. While asymmetric information models are typically concerned with the difference in information available between groups (e.g., informed and uninformed investors as in

<sup>4</sup> Specifically Malaysia, Indonesia and Thailand.

<sup>5</sup> For a review of the Asian Financial Crisis see Miller (1998) and Chowdry and Goyal (2000).

<sup>6</sup> For a description of ‘red-chip’ companies see Hong Kong Stock Exchange (1998). Shares in China Telecom fell by 10% in the first three days of trading.

Rock, 1986), the handover presented all investors in the IPO market with greater uncertainty which may have impacted underpricing. If the handover is connected with the market condition, it therefore provides empirical support to the views of Miller (1998) and Chowdry and Goyal (2000) that the deterioration in Asian financial markets commenced prior to the October correction.

### 3. Method

First, we identify the point of transition in the Hong Kong IPO market. Specifically, which event coincided with the time of transition in the IPO market from ‘hot’ to ‘cold’; the June 30 political handover; the historic peak in the Hang Seng on August 8, or the October 27 stock market correction. Second, we apply a standard OLS regression model to test if market condition is associated with underpricing, controlling for factors commonly associated with underpricing in the Hong Kong IPO market for the period August 1995 to July 1999.

#### 3.1. Transition in IPO market condition

The IPO literature has adopted a number of approaches to measuring IPO market transition. Ritter (1984) uses graphical analysis to identify the condition of the underlying securities market index. Derrien and Womack (2003) extend this approach, calculating a market weighted return of the underlying securities market index based on a time period before listing. Other approaches are based around characteristics of the IPO market. Ibbotson and Jaffe (1975), Loughran and Ritter (2002) and Lowry and Schwert (2002) describe a ‘hot’ (‘cold’) issues market as existing in a month in which the average market adjusted first day return is above (below) the median first day return for the series. Helwege and Liang (2004) classify an IPO as ‘hot’ where its underpricing is in the top quartile of the sample, while an IPO is classified as ‘cold’ if it has negative or zero underpricing. Loughran and Ritter (1995) and Helwege and Liang (2004) used the number of IPOs completed per month as a basis for distinguishing between a ‘hot’ and ‘cold’ market condition.<sup>7</sup>

<sup>7</sup> More recently, Brailsford et al. (2000) attempt to resolve the problem of precise identification of transition point using a Markov Switching regime model which incorporates four measures of IPO activity:

1. The number of IPOs per month
2. The gross value of IPO proceeds
3. Value weighted underpricing defined as:

$$\frac{\sum_{i=1}^N (\text{proceeds})_{i,t} \times (\text{IPOUnderpricing})_{i,t}}{\sum_{i=1}^N (\text{proceeds})_{i,t}} \times 100$$

4. Value of underpricing defined as:

$$\frac{\sum_{i=1}^N (\text{proceeds})_{i,t} \times (\text{IPOUnderpricing})_{i,t}}{\sum_{t=1}^T \sum_{i=1}^N (\text{proceeds})_{i,t}} \times 100$$

While the Markov Switching regime model can be used to measure a single breakpoint, it is typically used to identify multiple break points given a large number of observations. The number of observations available in the Hong Kong market during the period under review (August 1995 to June 1999) is not sufficient to run this test.

The aforementioned approaches to measuring transition in the IPO market condition do not allow for identification of the precise date of transition. We therefore apply a procedure not previously used in IPO research developed by Hansen (2000) which tests for parameter instability with an unknown change point in the IPO return series.

### 3.2. The model

To investigate if market condition is associated with IPO underpricing during the period under review, we use an OLS regression model controlling for factors previously found to be associated with IPO underpricing. The OLS regression model takes the following form:<sup>8</sup>

$$\begin{aligned} \text{MAR}_{1j} = & \alpha_j + \beta_1 \text{MARKETCONDITION}_j + \beta_2 \text{AGE}_j + \beta_3 \text{DELAY}_j \\ & + \beta_4 \text{LEVERAGE}_j + \beta_5 \text{ISSUESIZE}_j + \beta_6 \text{UW\_REP}_j + \beta_7 \text{AUD\_REP}_j \\ & + \beta_8 \text{EXP\_REP}_j + \beta_9 \text{'H' SHARES}_j + \beta_{10} \text{RISK}_j + \beta_{11} \text{PROPERTY}_j + \varepsilon_j, \quad (1) \end{aligned}$$

where:

$\text{MAR}_{1j}$  Market adjusted first day underpricing

$\text{MARKETCONDITION}$  Binary variable 0='Hot' market condition

$\text{AGE}$  Number of years firm operated prior to listing

$\text{DELAY}$  The time between the prospectus registration date and listing date

$\text{LEVERAGE}$  Proportion of debt in the firm's capital structure calculated as debt/(debt+equity)

$\text{ISSUESIZE}$  Number of shares issued times offer price

$\text{UW\_REP}$  Frequency of IPOs underwritten

$\text{AUD\_REP}$  Frequency of accountant/auditor reports in IPO prospectuses

$\text{EXP\_REP}$  Frequency of independent expert reports in IPO prospectuses

$\text{'H' SHARES}$  Binary variable 1=Share of companies with their business and operation based solely in mainland China

$\text{RISK}$  The standard deviation of the first 20 days return excluding the initial (first day) return

$\text{PROPERTY}$  Binary variable 1=Property Industry

### 3.3. Market adjusted first day underpricing ( $\text{MAR}_{1j}$ )

To measure the dependent variable  $\text{MAR}_{1j}$ , we first define the raw return for the  $j$ -th company based on the first day of trading as:

$$\text{UND}_j = \frac{P_j - O_j}{O_j} \quad (2)$$

where  $P_j$  is the closing price on the first trading day (the listing date), and  $O_j$  being the offer price identified in the prospectus. Consistent with previous studies, such as Ibbotson and Ritter (1995), returns are adjusted for market movements as follows:

$$\text{MAR}_{ij} = \text{UND}_{ij} - \frac{M_i^c - M_i^0}{M_i^0} \quad (3)$$

<sup>8</sup> White's (1980) heteroskedasticity consistent estimation of the covariance matrix is considered because of the variability in our data. All the results are based on standard errors adjusted for heteroskedasticity.

where  $MAR_{ij}$  is the market-adjusted return of company  $j$  at the end of the  $i$ -th trading day (for the listing date  $i=1$ ). Note that  $M_i^c$  is the closing value of the Hang Seng Accumulation Index on that date, and  $M_i^0$  is the closing value of the Index on the day prior to listing.<sup>9</sup>

### 3.4. Control variables

The variable MARKETCONDITION is calculated based on results from the primary analysis which estimates the point of transition in the IPO return series (see Section 4.2). In testing the impact of MARKETCONDITION on IPO underpricing, we control for factors commonly associated with IPO underpricing.

Companies with longer operating histories prior to going public are expected to be less risky than newer companies (see Ritter, 1984). Thus, a negative relationship between the age of the company and the degree of underpricing is expected. As in Firth and Liao-Tan (1997), we define the age of the firm (AGE) as the number of years of operation prior to the year of listing.

While it is difficult to directly measure the level of demand for an IPO, the period of time between the prospectus registration date and the listing date is a useful proxy for IPO demand. The familiar ‘winners curse’ model suggests that the shorter the time period within which the IPO is filled, the higher the level of underpricing because informed investors react more quickly to profitable investment opportunities (Rock, 1986). The variable DELAY is used as a proxy for informed investor demand. Shorter delay means higher demand and prior research confirms that delay is inversely associated with underpricing (see for example How et al., 1995; Taylor and Walter, 1990). Delay is measured in this study as the natural logarithm of the number of calendar days between the prospectus registration date and the date of listing.

James and Weir (1990) find that IPOs with debt are significantly less underpriced than those without debt, implying that lenders play a monitoring role. Campbell and Kracaw (1980) and Fama (1985) argue that borrowing from intermediaries can reduce information costs for all of a firm’s claimants by providing a credible signal about the firm’s creditworthiness. Monitoring by intermediaries may also reduce agency costs arising from conflicts among inside equity holders, outside claimants, and the managers of the firm (James and Weir, 1990). Hence we expect a negative association between the proportion of debt in the firm’s capital structure (LEVERAGE) and IPO underpricing. LEVERAGE (pre-listing) is calculated as debt/(debt+equity).

Banz (1981) finds that on average smaller firms are associated with higher returns than larger firms. One explanation is that larger issuing firms are associated with less risk and therefore less underpricing. This inverse relationship between underpricing and size is supported by the findings of Chalk and Peavy (1990) and Wolfe and Cooperman (1990). We measure firm size using issue proceeds (ISSUESIZE), calculated as the number of shares sold to the public multiplied by the offer price.

A commonly cited signal of IPO quality thought to influence the level of underpricing is the reputation or prestige of the underwriter, auditor/accountant, or expert. Cater and Manaster (1990) argue that underpricing is costly to the issuing firm and represents a transfer of wealth from the firm to investors. To ensure the success of an issue, low risk firms attempt to reveal their low risk characteristic to the market. One way to do this is by hiring reputable underwriters, auditors/accountants, or experts. IPO research typically controls for these reputation effects on IPO

<sup>9</sup> A potential limitation of our calculation of the market adjusted return is that due to data constraints we use listing date rather than the date the registration price was fixed. It is noteworthy that a number of related studies have similarly used issue date (see How, 1990).

underpricing despite mixed results from empirical research (see for example Booth and Smith, 1986; Simunic and Stein, 1987; Firth and Liao-Tan, 1997; Beatty and Welch, 1996; How et al., 1995).

Underwriter reputation is usually classified either by the fee paid for underwriting services or by the frequency of engagement. In Hong Kong it is not possible to separate the underwriting fee from the fees for other services provided by the underwriter. Although all IPO prospectuses mention a 2.5% underwriting fee on gross proceeds, underwriting fees are not separately identified from other legal, professional and consultation fees, thus making the underwriter fee quoted in prospectuses unsuitable as a proxy for reputation. Hence, in this paper we use the frequency of engagements as a proxy for underwriter prestige (UW\_REP). Auditor/accountant reputation is usually measured as a dichotomous classification between Big 5 and non-Big 5 accounting firms (Simunic and Stein, 1987). However, in Hong Kong the Big 5 dominated the provision of accounting services. As an alternative to the traditional binary size proxy for audit quality, the frequency of IPOs audited by each audit/accounting firm is used as a proxy for their reputation (AUD\_REP).<sup>10</sup> Consistent with underwriter and auditor/accountant reputation measures, the frequency with which an independent expert reports in IPO prospectuses is used to proxy the expert's reputation (EXP\_REP).<sup>11</sup>

'H' SHARES, shares of companies with their businesses and operations in mainland China, were found by Cheng (1998) to be positively associated with IPO underpricing. We use the binary variable 'H' SHARES to control for their impact on underpricing.

Beatty and Ritter (1986) argue that IPOs with higher ex ante uncertainty are expected to be more underpriced to compensate for the greater risk. Consistent with prior research, this study uses the standard deviation of the first 20 days returns excluding the initial (first day) return, (RISK), as a proxy for ex ante uncertainty (see for example Beatty and Ritter, 1986; How et al., 1995; Carter et al., 1998; and Allen et al., 1999).

Ritter (1984) in his study of US IPOs (January 1980 to March 1981) finds high initial returns were attributed almost entirely to one industry (i.e., the natural resources industry). Research investigating the 'hot' market of the late 1990s finds high levels of underpricing clustered in both the telecommunication and internet related industries (see for example Steen and Turpie, 2000). The largest industry group of companies to list in our sample period are those classified as property. Hence we control for industry effects using the binary variable PROPERTY.<sup>12</sup>

### 3.5. Sample

The sample of 153 was derived from the population of 188 companies listed in Hong Kong from August 1995 to July 1999.<sup>13</sup> Table 1 shows the distribution of the IPOs in the sample by year. Variables were collected from prospectuses published in the South China Morning Post. Listings were removed if they were not true IPOs (e.g., compliance listings, relistings or listed on another stock exchange). Share prices were obtained from Datastream and were adjusted for

<sup>10</sup> Audit firms classified as a Big 5 are Price Waterhouse Coopers, Deloitte, Peat Marwick, Ernst and Young, and Arthur Andersen. In this sample Kwan, Wong, Tan and Fong was initially a large local auditing firm but eventually merged with one of the Big 5 audit firms. We therefore classify them as a Big 5 firm.

<sup>11</sup> The role of the expert report in an IPO prospectus can be varied; in our sample it is chiefly to estimate the market value of assets, such as property, machinery, equipment or even the business itself.

<sup>12</sup> We inspected the data of property issues and did not detect any evidence of clustering at any point in the sample period.

<sup>13</sup> A complete list of new admissions to the main board was supplied by the Hong Kong Stock Exchange.



Table 1  
Annual distribution

Year	Total listings	IPOs included	Percent included
1995 <sup>a</sup>	15	11	73.3
1996	49	32	65.3
1997	83	75	90.4
1998	32	28	87.5
1999 <sup>b</sup>	9	7	77.8
<i>Total</i>	<i>188</i>	<i>153</i>	<i>81.4</i>

<sup>a</sup> For 1995, only the issues from August are included.

<sup>b</sup> For 1999, only issues for the first half of the year are included.

market movements using the Hang Seng Accumulation Index. Listings were removed if share price data was not available from Datastream. Table 2 provides descriptive statistics for the sample.

## 4. Results

### 4.1. IPO underpricing

For the sample of 153 listings, the initial mean raw return was 12.42% (median 4%; SD 59.9%). After adjusting for market movements the mean initial return on the first day of trading was 13.05% (median 3.88%, SD 62.1%). A review of the standardised residuals of market adjusted first day IPO returns (derived from Eq. (3)) suggests that around the June 30 1997 political handover, the proportion of underpriced issues begins its decline (see Fig. 1). The first vertical line in Fig. 1 covers the first day returns for IPOs listed in the month of June and the concentration of overpriced issues in that month presents the first indication of a changing market condition.<sup>14</sup>

### 4.2. Estimating IPO market transition

A variety of methods are considered to determine the transition point in the IPO market. Initially, we applied graphical and autocorrelation analysis to identify IPO market condition. For example, Ritter (1984 p. 222) defines a ‘hot’ issue market on the basis of ‘expost eyeballing’. Applying this technique, the peak in the Hang Seng on August 8, 1997 is a proxy for the point of transition in the IPO market (see Fig. 1). An alternative technique is to calculate a market weighted return based on a time period before listing, usually 3 months (see for example Derrien and Womack, 2003). The month of September is accordingly identified as the first in a series of ‘cold’ months immediately following a series of ‘hot’ months.

As can be seen in Fig. 1, issues preceding the June 30 1997 handover generally exhibit a higher level of underpricing than issues after the October 27 1997 stock market correction. However, the period between is characterised by a mixture of both underpricing and overpricing. While a transition is apparent, the precise point of transition in market condition based on IPO returns is unclear.

<sup>14</sup> The initial mean raw return for the period prior to the June 30 1997 political handover was 19.47 (Median 8.33, SD 61.99,  $n=83$ ) and for the period after the handover was 4.05 (Median 10.0, SD 56.68,  $n=70$ ). However a statistical comparison of the two periods finds a non-significant difference ( $t=1.51$ ,  $df(151)$   $p=.133$ ).

Table 2  
Descriptive statistics for independent variables

Variable	Mean (SD)
Market condition (issued in hot market prior to July 1997)	54%
Age (years)	16.40 (12.76)
Delay (days)	12.46 (3.16)
Leverage (percentage)	0.65 (0.508)
Issue size (HK\$)	1874 m (7,144 m) <sup>a</sup>
Log of issue size	19.32 (1.64)
Frequency of IPOs underwritten (UW_REP)	0.04 (0.034)
Frequency of audits of IPO prospectuses (AUD_REP)	0.23 (0.120)
Frequency of independent expert reports in an IPO prospectuses (EXP_REP)	0.14 (0.097)
'H' SHARE	14%
Risk (SD first 20 days trading)	0.107 (0.079)
Property	12%

<sup>a</sup> Median HK\$1408 million.

Ibbotson and Jaffe (1975), Loughran and Ritter (2002) and Lowry and Schwert (2002) define a 'hot' ('cold') issues market as existing in a month in which the average market adjusted first day return is above (below) the median first day return for the series. In Fig. 2 we plot the monthly average first day return against the median first day return for the series. The period preceding the June 30 1997 handover is characterised by a large number of issues with market adjusted underpricing in excess of the median for the series, characteristic of a 'hot' market condition. The opposite applies in the period following the October 27 1997 stock market correction indicating a 'cold' market condition. Again the precise transition point from 'hot' to 'cold' market is unclear with most issues in the intervening period clustered around the median.

Helwege and Liang (2004) consider an alternative definition of 'hot' ('cold') market based on underpricing. An IPO is classified as 'hot' where its underpricing is in the top quartile of the sample, while an IPO is classified as 'cold' if it has negative or zero underpricing. Helwege and

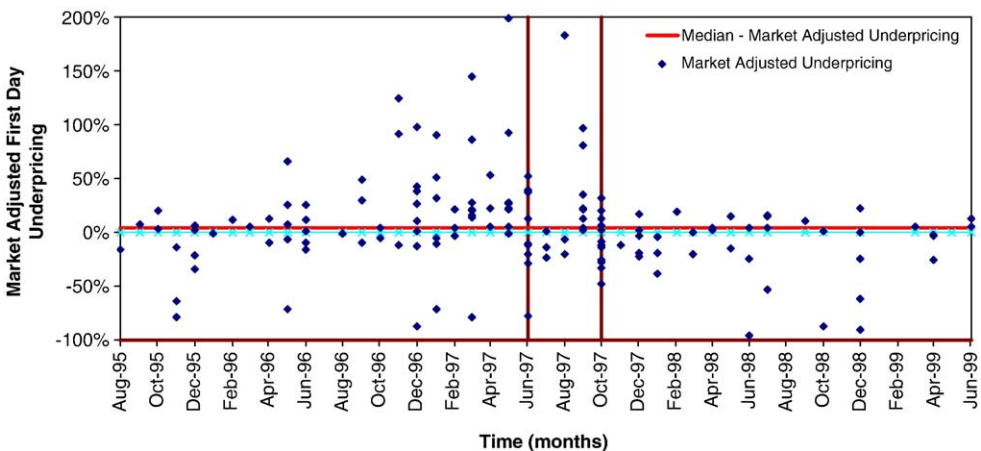


Fig. 2. Market adjusted first day underpricing (with median value).

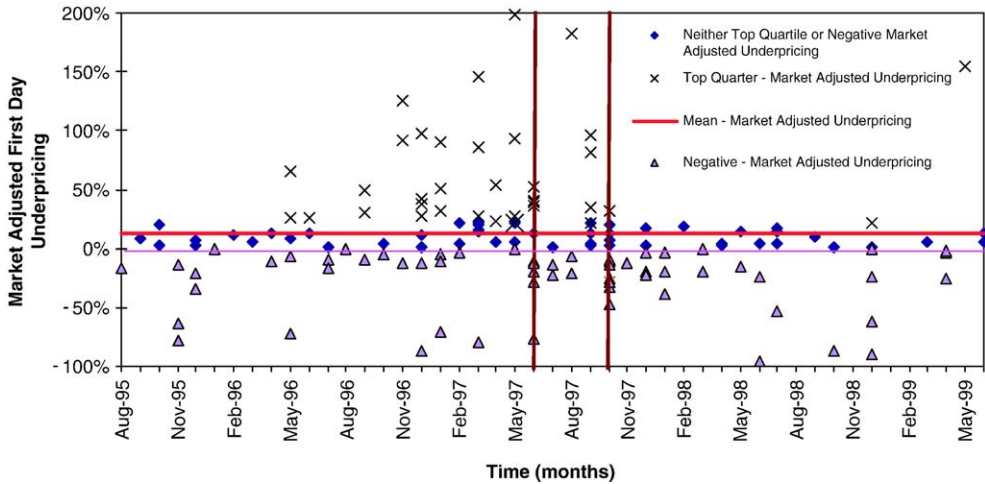


Fig. 3. Market adjusted first day underpricing (with mean value).

Liang determine ‘hot’ and ‘cold’ periods by plotting and visually inspecting the results. Following this methodology in Fig. 3, we observe a large number of issues in the top quartile of underpricing during the 15 months preceding the June 30 1997 handover. In the period following the October 27 1997 stock market correction, a clear majority of issues are either underpriced below the mean, or overpriced. Again the market condition during the intervening period can be classified as neither ‘hot’ nor ‘cold’ under this methodology with 6 IPOs classified as ‘hot’ and 10 classified as ‘cold’. It is noteworthy that prior to April 1996 we do not observe an issue in the top quartile of underpricing. The market clearly heats up after this.

Loughran and Ritter (1995) and Helwege and Liang (2004) also use the number of IPOs completed per month as a basis for distinguishing between a ‘hot’ and ‘cold’ market condition. Fig. 4 plots the number of IPOs per month and the log of average monthly proceeds. While both the number and value of IPOs is greater in the earlier half of the series compared with the latter half, the results are inconclusive as to the precise point of transition. In October 1997 we see the largest volume of monthly IPOs in the series after particularly quiet months in July and August. This could be interpreted as underwriters rushing IPOs to market in anticipation of an imminent reversal in market performance.

To identify the date of the structural break in the IPO returns series we perform a test developed by Hansen (2000), which tests for parameter instability with an unknown change point. (i.e., it does not require specification of the structural break in the series of IPOs as would be required with a test such as Chow, 1960). The ‘Fixed Regressor Bootstrap’ suggested by Hansen is used to estimate the structural break.<sup>15</sup> Truncating the sample to capture a single market cycle as per Hansen (2000), the test indicates a breakpoint occurred between the 10th and 13th of June 1997.<sup>16</sup> Results suggest that that the time of the June 30 1997 political handover coincides with the transition in the IPO market from a ‘hot’ to ‘cold’.

<sup>15</sup> This procedure for detecting an arbitrary structural change considers polynomial trends, exogenous stochastic trends and structural shifts in the regressors.

<sup>16</sup> To capture events within a single market cycle, we ran the Hansen test for 15 truncated data sets ranging from 90 to 153 observations. We find that in the majority of instances (67%) either June 10 or 13 1997 was identified as the transition point.

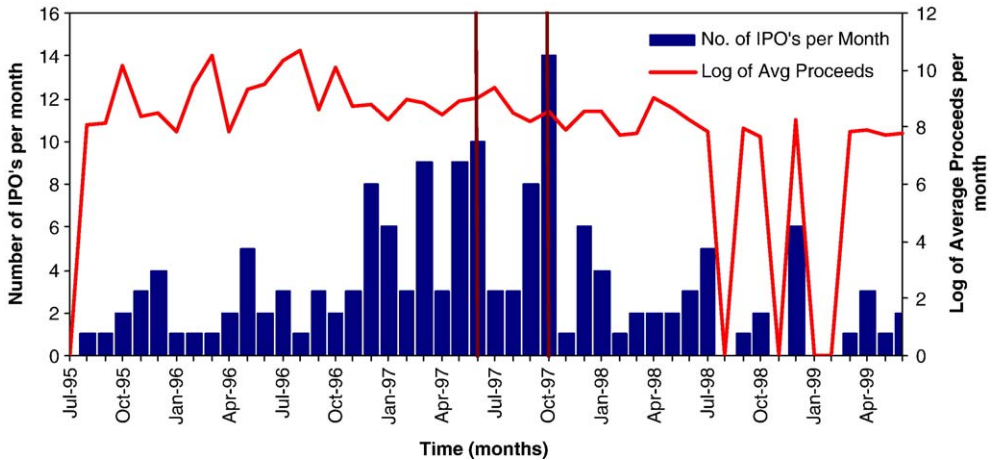


Fig. 4. Number of IPOs per month and log of average monthly proceeds.

While the October 27 1997 market correction is popularly perceived as the time the Asia financial crisis impacted on the Hong Kong financial system, we find that the IPO market condition deteriorated immediately prior to the June 30 1997 political handover. This finding is consistent with Chowdry and Goyal (2000) and Miller (1998) who note that the crisis began much earlier than October 1997. They point to July 1997 when the Bank of Thailand ran out of foreign currency reserves to support the baht. The baht lost around 50% of its value against the US dollar after it was floated and contagion spread, culminating with the October 1997 market correction. The uncertainty associated with the political handover might be interpreted as a particular type of asymmetric information problem with investors uncertain about the post handover economic and financial performance of Hong Kong.

Masih and Masih (1998) find that conditions in Hong Kong markets lead other Asian markets. Our results suggest a link between the Hong Kong IPO market condition and the emerging instability and contagion that spread into the markets across Asia. Indeed, such a link would be broadly consistent with Dungey and Martin (2002) who provide evidence that the crisis was driven by spillovers from equity markets into currency markets.

#### 4.3. IPO underpricing — causal modelling

Table 3 provides a correlation matrix of all variables used in the multiple regression. The largest correlations are between DELAY and ISSUE SIZE at  $-0.455$  and 'H' SHARES and ISSUE SIZE at  $-0.448$ .<sup>17</sup>

Table 4 reports results of the OLS multiple regression model which includes the variable MARKET CONDITION, a binary variable where observations prior to July 1997 are classified 'hot', and subsequent observations classified 'cold'. MARKET CONDITION is negatively associated with initial returns of newly listed stocks on the Hong Kong market during the period

<sup>17</sup> When we run the following OLS multiple regression model excluding both DELAY and 'H' SHARES, results are consistent with those reported in Table 4 and we conclude that multicollinearity is not a problem.

Table 3  
Correlation matrix independent variables

	Market condition	Age	Delay	Leverage	Issue size	UW_REP	AUD_REP	EXP_REP	'H' SHARE	Risk
Market condition	1									
Age	0.035	1								
Delay	0.055	0.111	1							
Leverage	-0.131	0.006	0.031	1						
Issue size	-0.310*	-0.195**	-0.455*	0.046	1					
UW_REP	-0.101	0.082	0.210*	-0.023	-0.163*	1				
AUD_REP	0.080	0.177**	0.195**	-0.127	-0.392*	0.240*	1			
EXP_REP	0.068	0.131	-0.053	-0.006	0.110	0.076	-0.011	1		
'H' SHARE	-0.040	0.014	-0.359*	-0.068	0.448*	-0.119	-0.257*	-0.117	1	
Risk	-0.035	0.058	-0.072	-0.030	0.172**	-0.036	-0.058	0.219*	-0.006	1
Property	-0.010	-0.181**	-0.050	-0.005	0.211*	-0.056	-0.159**	0.057	-0.092	0.080

\* $p < .01$ , \*\* $p < .05$ .

Table 4  
Results of regression model—dependent variable MAR<sub>i</sub>

Independent variables	Coefficient ( <i>t</i> -Statistic)
Market condition	−0.220** (−2.300)
Age	0.052 (0.793)
Delay	−0.045* (−2.770)
Leverage	−0.193** (−2.185)
Issue size	−0.099** (−2.341)
UW_REP	0.023 (0.017)
AUD_REP	−0.477 (−1.155)
EXP_REP	−0.721 (−1.501)
‘H’ SHARES	0.109 (0.690)
Risk	2.198* (6.608)
Property	0.210 (1.440)
Constant	2.635* (2.763)
Adjusted <i>R</i> -square	0.273
<i>F</i> -statistic	6.094*

\* $p < .01$ , \*\* $p < .05$ .

under review.<sup>18</sup> Results are consistent with the majority of prior studies that find market condition is associated with IPO underpricing across time and international markets.

Control variables found to be significantly associated with IPO underpricing were DELAY, LEVERAGE, ISSUE SIZE, and RISK.<sup>19</sup> Consistent with the explanation offered by Rock (1986) that investor demand is reflected by how quickly applications are filled, DELAY is significant and is negatively associated with underpricing, indicating the shorter the period between the opening of subscriptions and listing the more significant is underpricing. LEVERAGE is found to be negatively associated with underpricing indicating the higher the proportion of debt in the capital structure (LEVERAGE) of the IPO, the lower the degree of underpricing. This result is consistent with the argument that due to the monitoring role played by lenders there should be less risk and hence underpricing (see Campbell and Kracaw, 1980; Fama, 1985 and James and Weir, 1990).

Consistent with Banz (1981), Chalk and Peavy (1990) and Wolfe and Cooperman (1990) an inverse relationship is found between ISSUE SIZE and underpricing, with small issues associated with higher initial returns. As in Ritter (1984) and Beatty (1989), there is a positive relationship between the ex ante uncertainty (RISK) and the degree of underpricing. The proxy measure of the prestige of the underwriter (UW\_REP), investigative accountant (AUD\_REP) and expert (EXP\_REP) or the age of the IPO (AGE) are not associated with underpricing. The mean age of

<sup>18</sup> Results from a sensitivity analysis where the experimental variable MARKET CONDITION is coded with a breakpoint at June 10, 1997 (i.e., in accordance with results from the Hansen test) are consistent with results from the primary analysis presented in Table 2 (Adjusted *R* Square 28.7%,  $F=7.39$   $P<.0005$ , variables found to be significantly associated with market adjusted underpricing are MARKET CONDITION, DELAY, LEVERAGE, ISSUE SIZE, and RISK). We conduct another sensitivity analysis excluding the 27 IPOs issued between 1 July 1997 and 27 October 1997, and find similar results (Adjusted *R* Square 23.7%,  $F=5.22$   $P<.0005$ ; variables found to be significantly associated with market adjusted underpricing are MARKET CONDITION, DELAY, LEVERAGE, ISSUE SIZE, and RISK).

<sup>19</sup> Results from a sensitivity analysis where we delete cases with market adjusted underpricing at more than three standard deviations from the mean ( $n=2$ ) are consistent with the results from the full sample reported (Adjusted *R* Square 28.3%,  $F=7.46$   $P<.0005$ ). Variables found to be significantly associated with market adjusted underpricing are MARKET CONDITION, AGE, LEVERAGE, and RISK.

the firms in our sample is 16.40 years (SD 12.76). This indicates that relatively few issues are what could be described as ‘start-ups’. Hence we do not find a significant difference in underpricing between firms of varying ages.

We control for the effect of industry or clusters of firms with particular characteristics by investigating the association between firm type and underpricing. We find that the two largest groups of IPOs, PROPERTY and ‘H’ SHARES, accounted for 26% of Hong Kong IPOs listed but were not associated with IPO underpricing.<sup>20</sup> This finding is inconsistent with much prior research (see for example Ritter, 1984; Maksimovic and Pichler, 2001; Wilhelm et al., 2002) that finds clusters of firms from particular industries or geographic areas are associated with greater underpricing during ‘hot’ markets. However, our results are consistent with Helwege and Liang (2004) who found no evidence of industry concentration during the ‘hot’ market condition in the US over a similar time frame.

## 5. Conclusions

Applying a technique devised by Hansen (2000), we identify the June 30 1997 political handover as the point where the Hong Kong IPO market moved from ‘hot’ to ‘cold’, predating the October 27 1997 stock market correction. While the market correction is popularly perceived as the time the Asian Financial Crisis impacted on Hong Kong financial markets, we find the transition in the IPO market condition began several months prior to this. The transition coincides with the time of the political handover. Although this was an anticipated event, an explanation for the change in market is that the political handover created uncertainty among investor; a type of information asymmetry where all investors faced greater uncertainty. This result is consistent with an emerging literature (see Chowdry and Goyal, 2000; Miller, 1998) which supports the view that events preceding the October 27 correction signalled a decline in confidence in financial markets, subsequently characterised as the ‘Asian Financial Crisis’. That a long anticipated political event is associated with the IPO market condition might have implications for future capital market conditions. i.e., Closer political ties between Taiwan’s and China. Whether, and to what extent the transition in the IPO market condition contributed to the ensuing ‘Asian Financial Crisis’ remains as a question for future research.

We find that initial returns of newly listed stocks on the Hong Kong market during the period August 1995 to July 1999 are associated with market condition. Results are consistent with the majority of international studies that report a significantly higher level of underpricing during a ‘hot’ market. While it is generally accepted that clusters of firms from particular industries or geographic areas are associated with ‘hot’ markets (see for example Ritter, 1984; Maksimovic and Pichler, 2001; Wilhelm et al., 2002), we find that the two largest groups of IPOs in Hong Kong, PROPERTY and ‘H’ SHARES, were not associated with IPO underpricing, suggesting that the prevailing market condition was spread more generally across issues.

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<sup>20</sup> ‘H’ SHARES comprise offers from many different industries.

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