

# Uncertainty and investment evidence from a panel of Chinese firms

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## Abstract

Using data from various Chinese companies for the period 1994–2005 and applying GMM (System) technique, we report some stylized facts regarding the link between uncertainty and investment, where uncertainty is measured as the volatility of daily stock market returns. Controlling for the short- and long-run investment dynamics, we discover important effects of measured uncertainty on firm-level investment. Our study consistently indicates a positive and statistically significant effect of uncertainty on the company investment. Further more the macroeconomic and firm-specific components of uncertainty also have a significant positive effect on their own. Higher risk perception leading to higher investment, and in turn stronger aspirations of reinvestment.

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## 1. Introduction

The benefits of financial globalization aside, the growing interdependence of trade, investment, and finance have arguably increased the developing countries exposure to volatility. In 1990s several emerging market economies witnessed a series of macroeconomic crisis. Pedagogues would stress a simple insight that investment is the most volatile component of GDP, and is therefore, central to understanding the degree and nature of output fluctuations. To the extent that economies suffering from recent financial crisis also experienced a dramatic investment collapse, a careful examination of the investment behavior of firms is doubly useful. A major theoretical advance in the study of investment during the last decade pertains to the role of uncertainty as a critical determinant of investment. In particular, the real options literature in investment has underscored that uncertainties facing a firm's environment can deter investment, as argued by <sup>2</sup>Dixit and Pindyck (1994). These new insights have sparked much theoretical work on the relation between uncertainty and investment, but a central feature of this work is the considerable ambiguity on the long-run effects of uncertainty on investment. In particular, there is no unanimity whether uncertainty deters or promotes investment.

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<sup>2</sup> The influential theoretical work of Dixit and Pindyck (1994) demonstrates that uncertainty could be a significant deterrent to a firm's decision to invest but we cannot rule out the possibility of a positive relation.

Table 1a  
Main indicators of the Chinese stock market (1994–2005)

Year	Number of firms	Nominal GDP	Total market capitalization		Market capitalization of negotiable shares	Total trading volume (turnover)
			Volume <sup>a</sup>	% of GDP		
1994	287	48197.9	3,690	7.89	969	8,128
1995	311	60793.7	3,474	5.94	938	4,036
1996	514	71176.6	9,842	14.50	2,867	21,332
1997	720	78973.0	17,529	23.44	5,204	30,722
1998	825	84402.3	19,521	24.52	5,745	23,527
1999	922	89677.1	26,471	31.82	8,214	31,320
2000	1060	99214.6	48,090	53.79	16,088	60,827
2001	1140	109655.2	43,522	45.37	14,463	38,305
2002	1213	120332.7	38,329	37.43	12,484	27,990
2003	1277	135822.8	42,457	36.38	13,179	32,115
2004	1363	159878.3	37,055	27.14	11,689	42,334
2005	1381	183084.8	32,430	17.8	10,630	

Note: RMB Yuan: 100 million.

<sup>a</sup> Including both A shares and B shares.

Table 1b  
Turnover rates of major stock exchanges<sup>a</sup> (1994–2005) (percent)

Stock exchange	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Average
Shanghai	1135	529	913	702	454	471	493	269	214	251	289	274	500
Shenzhen	583	255	1350	817	407	424	509	228	198	214	288	316	467
New York	53	59	52	66	70	75	88	87	95	90	90	99	77
Tokyo	25	27	27	33	34	49	59	60	68	83	97	115	56
London	77	78	58	44	47	57	69	84	97	107	117	110	79
Hong Kong	40	37	44	91	62	51	61	44	40	52	58	50	53
Singapore	28	18	14	56	64	75	59	99	54	74	61	48	51

<sup>a</sup> Sources: China Securities and Futures Statistical Yearbook (2005); website of the World Federation of Exchange (<http://www.world-exchanges.org>).

In the face of such theoretical ambiguities, empirical evidence on the links between uncertainty and investment remains surprisingly limited. Recent reviews on investment have alluded to this dearth of evidence. As Bond and Jenkinson (1996) note: “Agreement on the effects of uncertainty on the level of investment remains elusive”. Of whatever limited evidence that is available in this area, relates to the developed countries and for the developing and transitional economies the hard econometric evidence is notoriously lacking. This is a serious omission given the fact that developing countries suffer from greater output fluctuations and, if anything, uncertainty is likely to be a much more important concern in these economies.

The main goal of this paper is to fill the empirical deficit about an important transitional economy with the latest data. China is in a state of metamorphosis, simultaneously growing, developing and being transformed from a command system to a market economy. A significant driving factor of this transformation is the accession of China to the World Trade Organization (WTO) and will give added impetus to its pursuit of economic reforms. To be specific, this study investigates few stylized facts on the relation between uncertainty and investment using a panel of Chinese firms (1994–2005). It is since the 1990s that the Chinese government has adopted extensive market-based reform policies and established two stock markets. The stock markets have developed remarkably in a limited time period in terms of total market capitalization and total trading volume (Table 1a). In terms of total market capitalization, China ranks as the second largest in Asia, only behind Japan (Economist, 6/1/2000, 2/6/2003). Total market capitalization as the ratio of GDP increased from 4% in 1992 to over 50% at the end of 2000 (Table 1a). The annual turnover ratios<sup>3</sup> averaged around 500%, which is very high as compared to any market in the world. Volatility has also reached unparalleled levels.

<sup>3</sup> See Table 1b.

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