

## CHAPTER 4

# Financial Openness and the Chinese Growth Experience

**Geert Bekaert, Campbell R. Harvey, and Christian Lundblad**

### INTRODUCTION

If China's current rate of growth continues, the size of its economy will exceed that of the United States in only 12 years. Even if this projection is overly optimistic, China's growth track record has been remarkable, as can be seen in figure 4.1. Our chapter reflects on the Chinese growth experience from the perspective of an empirical multicountry model in the neo-classical tradition (see e.g., Barro 1997). That is, we link future growth to initial gross domestic product (GDP) per capita and a number of determinants of steady-state GDP, such as population growth, life expectancy, financial development, and the quality of institutions. We devote special attention to international openness. An extensive literature has documented the positive effects of trade openness on economic growth. China has progressively opened to trade and foreign direct investment (FDI) (see Branstetter 2006 and Branstetter and Lardy 2006 for a detailed account of this process), and we attempt to quantify the role of trade openness in the Chinese growth experience. China has also opened its capital markets to foreign investment, but this process is far from complete. Currently, a large debate is ongoing on the benefits of financial openness for growth (see, for instance, Prasad et al. 2003 for a summary article), which suggests that the growth effect is mixed. However, in this chapter we show, consistent with the results in Bekaert, Harvey, and Lundblad (2005) and Quinn and Toyoda (2003), that equity market openness and capital account openness are indeed associated with increased growth. Hence, China's efforts to open its capital account may further enhance growth.

Whatever the growth effect, many countries fear that opening their capital markets to foreign investors may have considerable costs in terms

of real economic volatility. The crises many Southeast Asian countries underwent are often attributed to the capital market integration experience and the fact that China escaped the adverse growth consequences of the crises as proof that capital controls may be beneficial (see the discussion in Forbes 2004). The current formal empirical investigations of the effects of financial openness on economic volatility do not yield a uniform picture: Kose, Prasad, and Torrones (2003) find that openness is associated with increased consumption to output volatility, whereas Bekaert, Harvey, and Lundblad (2006a) find mostly insignificant to negative effects.

In this chapter, we investigate the mean and volatility effects in a unified empirical framework developed in Bekaert, Harvey, and Lundblad (2006b). The framework also allows us to decompose the volatility experience of countries in their determinants. We estimate the system not only for GDP (output) growth but also for consumption growth. In standard representative agent models, average consumption growth and idiosyncratic consumption growth volatility would constitute the main determinants of a country's welfare.

It should be no surprise that the Chinese growth experience is difficult to capture by standard growth models and that, consequently, a benchmark model leads to a large and positive Chinese residual. We explore whether the Chinese growth puzzle can be attributed to the country receiving a high rate of foreign direct investment, low foreign debt, the high rate of domestic investment, or pure measurement problems, as suggested by, for example, Young (2003).

Our empirical framework measures average effects of financial openness, but there is much debate on whether China is "ready" for capital account openness (see, e.g., Prasad, Rumbaugh, and Wong 2005). It is quite conceivable that the effects of financial openness depend on local conditions and institutions. Prasad et al. (2003) and Bekaert, Harvey, and Lundblad (2006a) demonstrate the importance of such threshold effects. Therefore, we supplement our usual specification with a series of interaction variables to allow for heterogeneity in the openness impacts across countries. The interaction variables include measures of financial development, the role of government, the quality of institutions, and the investment climate.

The chapter, organized in seven sections, provides, respectively, some analysis of changes in the degree of financial openness through time as well as an assessment of financial development, political risk, and the

quality of institutions in China; describes the data and provides some summary statistics; presents our econometric model, which explains both growth and volatility for a panel of countries; details our results on average growth; further explores the Chinese growth puzzle; summarizes our results on growth volatility; and studies the heterogeneity of the real effects of financial openness. Some concluding remarks are offered in the final section.

## GROWTH DETERMINANTS AND CHINA

### CHRONOLOGY AND SUMMARY DATA

Any examination of China's growth experience must start with a detailed examination of the country's history. Table 4.1 presents a chronology of important economic, political, and financial events over the past twenty-five years in China. While the Prasad and Wei (2005) chronology focuses on important events related to the capital account in China, our chronology puts more focus on the equity market and broad macroeconomic events that impact financial development. We also pay special attention to regulatory events. The chronology is drawn from Bekaert and Harvey (2005) and details important events such as the dates when price fluctuation limits and stamp taxes changed, the formation of the China Securities Regulatory Commission (CSRC), and the introduction of A and B shares.

Figures 4.1–4.4 provide some summary analysis of China's growth experience. Figure 4.1 shows the time-series of real GDP and consumption growth. The growth rates are astounding. Since 1980, the lowest GDP growth rate has been 2.2 percent (in 2000). The average growth rate over this period is 7.8 percent. Consumption growth has averaged 7.0 percent; yet GDP growth and consumption have diverged in the last three years. During this period, consumption increased by only 1.7 percent per year, while GDP was increasing at a rate of 7.4 percent per year. This is also evident in figure 4.2, which shows the shares of the components of GDP. Consumption has dropped to only 40.4 percent of GDP. The comparable consumption ratio for the United States is 70.3 percent, and the average for all developing countries in 2003 is 68.3 percent. Investment in China is an extraordinary 44.3 percent of GDP. The U.S. investment ratio is 15.2 percent, and the average for developing countries is 21.5 percent. The share of investment to GDP in China is more than double the average for developing countries and almost three times the U.S. level. We show comparisons

**Table 4.1** A Chronology of Economic, Political, and Financial Events in China

Date YYMMDD	Event
850314	Regulations governing the establishment of foreign joint ventures in Shanghai Province were relaxed. <sup>IMF</sup>
850315	China and India signed a three-year agreement to develop economic and trade relations; the accord provided for encouraging joint ventures, the creation of consultancy services, the exchange of economic, trade, and technical delegations, and participation. <sup>IMF</sup>
850326	The Foreign Economic Contract Law was adopted. <sup>IMF</sup>
850401	The Chinese Patent Law, enacted in 1984, came into effect. The Ministry of Petroleum and Industry announced that foreign oil companies would be allowed to participate in exploration and development of oil and gas reserves in nine provinces and one autonomous region. <sup>IFC</sup>
850402	The State Council introduced a regulation on the control of foreign banks and joint venture banks in special economic zones. <sup>IMF</sup>
850822	China approved establishment of the first foreign branch bank office in the country since 1949. Hong Kong and Shanghai Banking Corporation (a foreign commercial bank) announced a plan to begin branch operations in Shenzhen on October 5, 1985. <sup>IMF</sup>
851106	China and Libya signed a protocol aimed at consolidating bilateral cooperation between the two countries. <sup>IMF</sup>
851203	A joint venture bank was opened in Xiamen with the Panin Group of Hong Kong. <sup>IMF</sup>
870205	Provisional regulations were approved permitting financial institutions and enterprises with sources of foreign exchange income to guarantee foreign exchange obligations of other debtors. <sup>IMF</sup>
870827	Provisional regulations were issued on a new system requiring the timely registration of external borrowing with the SAEC. <sup>IMF</sup>
880413	The National People's Congress adopted a new Chinese-foreign cooperative joint ventures law. <sup>IMF</sup>
890214	All foreign commercial borrowing required the approval of the People's Bank of China (PBOC) and is to be channeled through one of ten domestic entities. The short-term debt of each entity may not exceed 20 percent of the entity's total debt, and short-term borrowing is to be used only for working-capital purposes. <sup>IMF</sup>
890306	The SAEC announced procedures governing Chinese direct investment abroad, which required government and SAEC approval, a deposit of 5 percent of the investment to secure repatriation of dividends and other income from the investment, and repatriation of earnings within six months. <sup>IMF</sup>
900404	The state would not nationalize joint ventures, simplified the approval procedures for new foreign investment enterprises, and extended the management rights of foreigners. <sup>IMF</sup>
900514	The Shanghai City Government announced plans for the development of the Pudong New Area, offering foreign joint ventures tax incentives similar to those available in the special economic zones. <sup>IMF</sup>

*(continued)*

**Table 4.1** *continued*

Date YYMMDD	Event
900519	The State Council issued regulations for the sale and transfer of land-use rights in cities and towns to encourage foreign investors to plan long-term investment. <sup>IMF</sup>
901126	The Shanghai Securities Exchange reopened. It had been closed since December 8, 1941. <sup>DT</sup>
910409	The State Council adopted the Law Concerning the Income Tax of Foreign-Funded Enterprises and Foreign Enterprises and eliminated a 10 percent tax imposed on distributed profits remitted abroad by the foreign investors in foreign-funded enterprises. <sup>IMF</sup>
910426	The limit of daily price fluctuations increases from 0.5 percent to 1 percent. <sup>GK</sup>
910603	The stamp tax was decreased from 0.6 percent to 0.3 percent. <sup>GK</sup>
910926	"Regulations on Borrowing Overseas of Commercial Loans by Resident Institutions" and "Rules on Foreign Exchange Guarantee by Resident Institutions in China" were issued. <sup>IMF</sup>
910703	Shenzhen opened the country's second exchange. <sup>DT</sup>
9100	The "B" share came into existence. "B shares" can be owned by foreigners only, but they are afforded the same right of ownership as "A shares," which are reserved for Chinese nationals. In China, a share entitles the owner to a dividend distribution, but not to a right to influence the operations of the company. <sup>CSRC</sup>
9203	The policy on foreign trade and investment was further liberalized, opening a large number of island and border areas to such activities. <sup>IMF</sup>
920521	Free stock price was offered through free trading (less control of price formation). Shanghai index increased from 617 to 1266 on this day. <sup>GK</sup>
921026	China Securities Regulatory Commission begins. <sup>GK</sup>
9300	The Insider Trading Laws were introduced. <sup>BD</sup>
9305	Interim regulations were issued governing the activities of domestic investors, but there is no law explicitly covering the presence or activities of foreign firms. Foreign securities firms may establish representative offices, but they cannot establish representative offices, nor can they establish local branches or subsidiaries. They can only purchase seats to broker "B" shares (denominated in renminbi [RMB] but must be purchased with foreign currency, issued by Chinese companies for sale exclusively to non-Chinese). Foreign firms cannot underwrite local securities issues or act as dealers or brokers in RMB-denominated securities. <sup>DT</sup>
930701	ADR effective date. (Company=SINOPEC SHANGHAI PETRO-CHEMICAL COMPANY LIMITED, Exchange=New York Stock Exchange). <sup>BNY</sup>
930806	A common order-driven market for A shares on Shanghai Stock Exchange was introduced. (Buy and sell orders compete for the best price. Throughout the trading session, customer orders are continuously matched according to price and time priorities.) <sup>GK</sup>

**Table 4.1** *continued*

Date YYMMDD	Event
9400	The Chinese government converted four “specialized” banks into “commercial” banks by transferring their responsibilities for making noncommercial loans to three newly established “policy” bankings. The first PRC’s central and commercial banking laws were passed to allowed new, non-state-owned banks to set up business. <sup>DT</sup>
9400	The PBOC issued new supervisory guidelines requiring all banks to apply new credit control procedures designed to bring China in line with the risk-weighted capital adequacy established in the Basle Agreement. It also got approval to undertake a special U.S. \$32 billion bond issue to re-capitalize the state-owned commercial banks and enable them to meet the 8 percent capital-adequacy ratio of the Basle Agreement. <sup>DT</sup>
940312	Announcement of the “Four No” rule. The chairman of the China Securities Regulatory Commission (CSRC) announced that RMB 5.5 billion new shares are not allowed to be traded on stock exchanges within half a year; the transaction tax for stocks would not be levied in 1994. <sup>IFC</sup>
940615	Illegal futures trading was prohibited. <sup>GK</sup>
9501	Real interest rates turned positive as inflation has been squeezed out of the economy. <sup>DT</sup>
950103	Initiate T+1 trading procedure. Stocks bought in one day could not be sold until the next day. This reduces intraday trading. <sup>GK</sup>
9503	Exports surged by 62 percent over last year, increasing trade surplus by \$7 billion. <sup>IFC</sup>
950517	Futures trading stopped on treasury bonds due to CSRC concern that futures were attracting too much speculative money. On that day, the stock market surges 31 percent. <sup>GK</sup>
9505	The central bank increased the subsidy rate on bank deposits from 11.47 percent to 12.27 percent. <sup>IFC</sup>
950620	Commercial banks banned from entering stock or trust business. <sup>GK</sup>
9507	A new commercial bank law went into effect. <sup>IFC</sup>
9508	Inflation rate had decreased to 14.5 percent from 27 percent in October 1994. <sup>IFC</sup>
9511	China launched its first national interbank market linking 30 short-term credit offices across China into a single computer network. <sup>IFC</sup>
9603	China carried out three rounds of military exercise across the Taiwan Straits, clouding the relationship between two countries. <sup>IFC</sup>
9608	The government removed the authority of local city governments to manage the Shanghai and Shenzhen stock exchanges. <sup>IFC</sup>
9609	The Shanghai city government cut the income tax rate of Shanghai-based companies to 15 percent from 33 percent. <sup>IFC</sup>
960925	The regulation on External Guarantees Provided by Domestic Entities was passed, allowing for the provision of guarantees by authorized financial institutions and nonfinancial legal entities that have foreign exchange receipts. <sup>IMF</sup>
961003	Commissions for stock and fund transactions were decreased. <sup>GK</sup>

*(continued)*

**Table 4.1** *continued*

Date YYMMDD	Event
9610	The CSRC issued a circular prohibiting Chinese from opening up stock trading accounts in the name of their work units. <sup>IFC</sup>
961114	Central Bank of China prohibits use of bank loans to invest in stocks. <sup>GK</sup>
961216	The CSRC tightened restrictions on Chinese residents opening B-share accounts, which are reserved for foreign investors. A new regulation that would limit the maximum daily change to 10 percent was imposed. <sup>IFC</sup>
970219	Paramount Chinese leader Deng Xiaoping died at age 92. <sup>IFC</sup>
9704	Government agreed to extend the preferential 15 percent corporate tax rate for nine of 25 H-share stocks for another year. <sup>IFC</sup>
9705	The CSRC decided to retroactively boost the annual ceiling on new shares issued for 1996 by 50 percent. China's State Council opted to raise the stamp tax on stock trading to 0.5 percent from 0.4 percent. <sup>IFC</sup>
970606	Central Bank prohibited assets owned or controlled by banks from being used to purchase stocks. <sup>GK</sup>
970701	Hong Kong was handed over to China. <sup>IFC</sup>
9711	Securities Commission promulgated rules for establishing mutual funds. <sup>IFC</sup>
980101	Regulations for issuing bonds denominated in foreign currency by domestic institutions were issued. (Controls on credit operations) (1) The implementation bylaws of regulations for external guarantees by domestic institutions were issued. (2) Forward lines of credit with a maturity exceeding 90 days and less than 365 days have been included in the category of short-term credit, while those exceeding one year have been included in the category of medium- and long-term international commercial loans. (3) External borrowing regulations were changed. <sup>IMF</sup>
9802	Three-month interbank rates in Hong Kong drop to 7.143 percent, the lowest level since the previous October. <sup>IFC</sup>
9803	The Consumer Price Index fell 1.9 percent, marking the fifth straight monthly decline. <sup>IFC</sup>
9804	S&P revised Chinese foreign currency rating from stable to negative. <sup>IFC</sup>
9805	The government banned all activities of direct sales companies such as Amway and Avon. <sup>SP</sup>
980612	Weak Japanese yen forced Chinese exports to see its first decline in 22 months. The government cut the stock trading tax to 0.4 percent from 0.5 percent. <sup>IFC</sup>
9807	China cut bank lending rates on July 1 by 1.12 percent. The Japan Rating and Investment Information downgraded China's sovereign rating to A+ from AA-. <sup>IFC</sup>
9808	Catastrophic floods occurred along the Yangtze River, the country's worst since 1954. It was speculated that Beijing might devalue its currency because of a weaker Japanese yen and slower domestic growth. <sup>IFC</sup>
980820	(Controls on credit operations) Enterprises were barred from advance prepayment of debt. <sup>IMF</sup>

**Table 4.1** *continued*

Date YYMMDD	Event
9809	The central bank ordered all companies to repatriate foreign currency held overseas without authorization by October 1. On September 7, the Hong Kong Stock Exchange instituted a “tick rule” for short-sellers. <sup>IFC</sup>
9810	China closed the 18-year-old GITIC (the Guangdong International Trust and Investment Corporation) on October 6, after the company missed an \$8.75 million payment on a bond. <sup>IFC</sup>
9812	China’s first securities law was passed on December 29. Under the laws, brokers are banned from using client funds to finance their own operations and foreigners may not buy A shares. <sup>IFC</sup>
9901	More than 70 companies in Shenzhen and at least 63 companies in Shanghai announced that they would report a net loss for 1998. <sup>IFC</sup>
9904	The government decided to allow cash-strapped brokerages to tap funds from the interbank market and state debt repurchase market. Measures that exempted foreign companies from 3 percent of local income tax were adopted by Beijing Municipal Government. <sup>SP</sup>
9905	The stamp duty on B-share trading was cut to 0.3 percent from 0.4 percent this month. <sup>IFC</sup>
9906	The PBOC announced it would cut rates on deposits by an average of 0.75 percent. <sup>IFC</sup>
9907	The tension in the Taiwan Straits was raised by a speech of President Lee Teng Hui that scrapped the “one China” policy. <sup>IFC</sup>
990715	(Controls on credit operations) Some controls on renminbi loans to foreign-funded enterprises under foreign exchange liens or guarantees were eased. <sup>IMF</sup>
990908	The CSRC allowed state-owned enterprises and all listed companies to issue shares and trade stocks. <sup>GK</sup>
9909	China planned to allow more banks and hi-tech private firms to tap the stock market for financing. <sup>IFC</sup>
9910	The government imposed a 20 percent tax on bank deposit interest income and other market initiatives. Beijing allowed two state firms to sell state-owned shares and permitted certain share buybacks for Chinese B and H shares. <sup>IFC</sup>
9911	The Tracker Fund, representing part of the Hong Kong Special Administrative Region government’s HK\$208 billion (U.S. \$27 billion) share portfolio, was listed. The Stock Exchange of Hong Kong launched the Growth Enterprise Market (GEM) for small-cap and high-tech firms, creating an outflow of foreign liquidity from the Mainland B-share market to the Hong Kong GEM market. <sup>IFC</sup>
200004	The CSRC allowed state and listed firms to purchase domestic IPOs without restrictions on the size of these stakes. <sup>IFC</sup>
200006	China Unicom Ltd. became the third-largest IPO in the world. <sup>IFC</sup>
200006	The Chinese government decided to delay the setup of a NASDAQ-style market for high-growth companies and announced the launch of its first mutual fund to be advised by foreign fund companies. Beijing formally approved the merger of the A-share markets of the Shanghai and Shenzhen exchanges. <sup>IFC</sup>

*(continued)*



**Table 4.1** *continued*

Date YYMMDD	Event
200010	The government announced a planned interest rate reform and published regulations on the opening of the telecommunications sector. China Petroleum & Chemical Corp.'s IPO became the fifth largest in the world for the year. <sup>IFC</sup>
200100	The crackdown on share price manipulation by the China Securities Regulatory Commission rekindled investor concerns about China's volatile stock market. <sup>IFC</sup>
20010222	The opening of the B-share market to domestic investors boosted the markets. Domestic investors could only invest with existing foreign currency deposits. <sup>IFC</sup>
200105	China cut interest rates on its foreign currency deposits, following the United States' rate cuts. <sup>IFC</sup>
20010601	Domestic investors now invest in B shares with new foreign currency deposits. <sup>PW</sup>
200100	During the third quarter, the government cracked down on illegal bank loans to stock market speculators and its practice of selling shares to finance pension obligations. <sup>IFC</sup>
200108	China Mobile and China Unicom, the two leading telecommunications companies, saw share prices plunge on investor fears about market growth potential and profit margins. <sup>IFC</sup>
20010917	The World Trade organization (WTO) successfully concluded negotiations on China's entry. <sup>WTO</sup>
20010919	Rules relaxed for purchasing foreign exchange for advance repayments of certain debt. <sup>PW</sup>
200110	The government suspended the sale of state-owned shares. <sup>IFC</sup>
20011116	Stamp tax decreased from 0.3 percent to 0.2 percent. <sup>GK</sup>
200112	New regulations were announced to tighten delisting rules. A major international rating agency upgraded China's sovereign rating. <sup>IFC</sup>
20011211	China's accession to the WTO included promises to open their markets to international competition. <sup>WTO</sup>
20020129	The regulations governing foreign banks and financial institutions were issued by the People's Bank of China and were to take effect on February 1, replacing the five sets of regulations in force since 1996. <sup>IFC</sup>
20020200	U.S. President George W. Bush visits, on the 30th anniversary of President Nixon's visit to China (at the time, the first visit by a U.S. president). <sup>IFC</sup>
20020312	The government announced easing of restrictions limiting foreign investors to minority stakes in port infrastructure projects and approved foreign investment in urban pipeline projects for gas, heating, and water as part of the revised Industrial Catalogue for Foreign Investment, due to take effect on April 1, 2002. <sup>WMA</sup>
20020700	The United States said China was modernizing its military to make possible a forcible reunification with Taiwan. Beijing responded that its policy remained defensive. <sup>IFC</sup>
20021009	China let private and foreign investors buy controlling stakes in domestically listed firms for the first time. <sup>IFC</sup>
20021104	The authorities announced that foreign companies would be allowed to buy shares in listed Chinese companies. <sup>IFC</sup>

**Table 4.1** *continued*

Date YYMMDD	Event
20021105	The CSRC and China's central bank (the PBOC) issued the Temporary Measures for Investment in Domestic Securities by Qualified Foreign Institutional Investors (the "QFII Regulation"), effective December 1, 2002. This monumental piece of legislation, for the first time in history, permitted foreign investors to directly invest and trade in publicly listed domestic securities. The historic regulation, released on the eve of the opening of the 16th Communist Party Congress, covers: (i) the eligibility standards of a Qualified Foreign Institutional Investor (a "QFII"), (ii) the foreign exchange aspect of the transactions, including the qualification and operation of the depository banks and the management of the special QFII accounts at such banks, and (iii) control of the investment transactions per se. <sup>RP</sup>
20021105	Definition of Qualified Foreign Institutional Investor. (1) Funds (at least five years of operating history, more than U.S. \$10 billion under management); (2) Insurance companies (at least 30 years of operating history, more than more than U.S. \$10 billion under management); (3) Securities firms (at least 30 years of operating history, more than U.S. \$10 billion under management); (4) Commerical banks (total assets ranked in top 100 globally and more than more than U.S. \$10 billion under management). <sup>RP</sup>
20021115	Vice-President Hu Jintao was named head of the ruling Communist Party, replacing Jiang Zemin, the outgoing president. Jiang was reelected head of the influential Central Military Commission, which oversees the armed forces. <sup>IFC</sup>
20021203	China went back on its plan to allow foreign investors into the country's bond market as the registration process for QFIIs opened (December 2). QFIIs allowed to invest in A shares, subject to regulations. <sup>IFC</sup>
20021200	The seven-year Rmb60bn (U.S. \$7.25bn) bond sale completed. The bond was oversubscribed by 22 times on generous terms offered by the Ministry of Finance. <sup>WMA</sup>
20030300	National People's Congress elected Hu Jintao as president. He replaced Jiang Zemin, who stepped down after 10 years in the post. <sup>IFC</sup>
20030311	A new rural land reform in China, extending land-use rights to 30 years, is expected to provide a significant boost to the rural economy by encouraging new investment and providing a source of capital. <sup>IFC</sup>
20030300	China and Hong Kong were hit by the pneumonia-like SARS virus, which was thought to have originated in Guangdong Province in November 2002. Strict quarantine measures were enforced to stop the disease spreading. <sup>WMA</sup>
20030400	New rules on mergers and acquisitions were issued as China sought to facilitate mergers and acquisitions activity and boost inward investment. <sup>WMA</sup>
20030527	Two foreign brokers were granted the right to trade in renmimbi-denominated securities for the first time, marking a milestone in the development of China's capital market. <sup>IFC</sup>

*(continued)*

**Table 4.1** *continued*

Date YYMMDD	Event
20030600	Sluice gates on Three Gorges Dam were closed to allow reservoir to fill up. Construction of \$25 billion project displaced almost one million people to make way for world's largest hydroelectric scheme. <sup>BBC</sup>
20030600	China and India reached de facto agreement over status of Tibet and Sikkim in landmark cross-border trade agreement. <sup>IFC</sup>
20030600	Standard and Poor's estimated that Chinese banks needed U.S. \$500bn bailout. <sup>WMA</sup>
20030700	Some 500,000 people marched in Hong Kong against Article 23, a controversial antisubversion bill. Two key Hong Kong government officials resigned. The government shelved the bill. <sup>IFC</sup>
20030800	The Chinese government announced reduction of the country's armed forces by 200,000 by 2005. <sup>IFC</sup>
20030900	Wu Bangguo, the Standing Committee chairman of the National People's Congress (NPC), confirmed that exchange rate policy would continue to focus on RMB stability, but asserted that a shift to market-based determination remained the government's ultimate goal. <sup>IFC</sup>
20031202	Authorities in China asserted no change in foreign exchange policy.
2004010	Ceiling for foreign investment in a Chinese bank was raised from 20 percent to 25 percent. Any single foreign bank's share was raised from 15 percent to 20 percent. <sup>PW</sup>
20040100	The Chinese government dipped into its U.S. \$400bn foreign exchange reserves in order to recapitalize two of the big four state-owned banks, in a move to accelerate reform in the country's ailing financial sector. <sup>WMA</sup>
20040100	The World Bank's private sector division—the International Finance Corporation (IFC)—announced that it intended to double its investment in China, up to U.S. \$500m by 2006. <sup>IFC</sup>
20040203	The country's State Council issued new investment guidelines for listed companies, clearing the way for greater capital investment and brokerage opportunities. The plan called for the establishment of a multilayered capital market system, consisting of a main board market and a secondary one for venture capital projects and corporate bond/futures products. <sup>WMA</sup>
20040200	The IFC arm of the World Bank confirmed that it had committed U.S. \$2m to the Chinese mortgage market. <sup>IFC</sup>
2004	Qualified foreign institutional investors (QFIIs) were allowed to invest in A shares. <sup>PW</sup>
20040300	The U.S. government filed its first official suit against China under the auspices of the WTO, claiming that a tax on semiconductors gave domestic exporters unfair advantage. The suit underlined the United States' increasingly hard-line stance over bilateral trade, the inequities of which were embodied in the U.S. trade deficit with China, which ballooned to U.S. \$124bn in 2003. <sup>WMA</sup>
20040426	Legislators rule out direct elections for Hong Kong leader in 2007. <sup>IFC</sup>

**Table 4.1** *continued*

Date YYMMDD	Event
20040516	Liu Mingkang, head of the China Banking Regulatory Commission, said that China's banks should sue the firms and people whose bad debts were destabilizing the banking system. <sup>IFC</sup>
20040601	China's banking regulator ordered tighter scrutiny of bank lending as part of a government campaign against reckless investment. <sup>IFC</sup>
20040614	China's Premier Wen Jiabao stressed the need for local officials to implement policies designed to cool down China's overheating economy. <sup>BBC</sup>
<b>Year</b>	<b>Regulations on Foreign Investors</b>
1998	Restrictions: Foreign investors can only hold Class B shares. Investment amounts must be registered separately with each exchange. Holdings of more than 5 percent of total issued shares of a company must be reported to the People's Bank of China. Taxation: Rules on capital gains tax are being finalized. Dividends are untaxed. 0.3 percent stamp duty, 0.5 percent value transaction fee, 0.1 percent registration fee. \$8 per transaction clearing fee with a custodian bank, and \$4 without a custodian bank, \$20 depository
1999	Restrictions: Same. All settlements and income receipts are in U.S. dollars or Hong Kong dollars, without repatriation difficulty Taxation: No capital gains tax. Dividend income is subject to 20 percent withholding tax applied at the registration company on the portion of dividends above the PBOC's (the central bank) one-year renminbi certificate of deposit rate for the same period. <sup>B</sup>
2000	Restrictions: Requirements on foreign exchange balancing and domestic sales ratios were eliminated.
2001	Restrictions: Foreign-funded firms who wish to list on the Shanghai and Shenzhen stock exchanges must have operated in China for 3 years and give details of all foreign shareholders with more than 5 percent of the firm's stock. Taxation: 30 percent national corporate tax, 3 percent local corporate tax, 33 percent capital gains tax.
2002	Restrictions: (1)-Foreign bank branches must have at least U.S. \$72.5 million in operating capital, and they will be able to conduct foreign and domestic currency business. Wholly foreign-owned banks and Sino-foreign joint venture banks must maintain a minimum registered capital of U.S. \$120.8 million, 60 percent of which must be held in local currency and 40 percent in hard currencies. (2) Nonbank financial institutions, wholly foreign-owned and joint venture firms, are required to have a minimum registered capital of U.S. \$84.6 million.

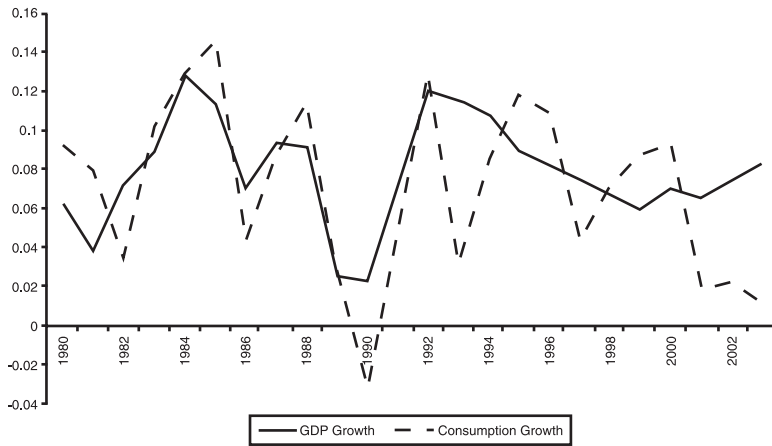
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**Table 4.1** *continued*

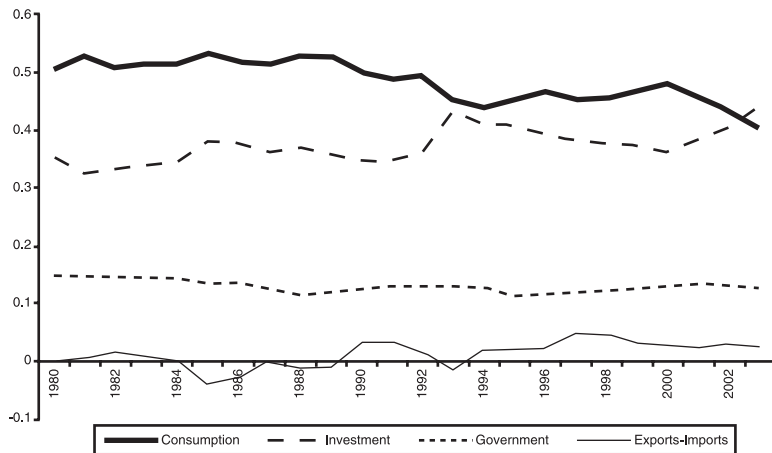
Date YYMMDD	Event
2004	Qualified foreign institutional investors (QFII) are allowed to invest in A shares with the following conditions: (1) five years of investment experience and 30 years for insurance companies, plus they must manage at least \$10 billion in assets and have no accounting irregularities over the past three years; (2) bank must be in top 100 of assets under management in world; (3) minimum paid-up capital for insurance company or a securities firm of \$1 billion; (4) maximum ownership of any company listed in Shanghai or Shenzhen stock exchange is 10 percent and for any company it cannot exceed 20 percent; (5) QFII must use local banks and local securities firms. Special renminbi accounts must be set up; (6) closed-end QFII cannot remit capital until three years have passed from initial investment. Other QFIIs can remit capital after year. Closed-end QFIIs cannot remit more than 20 percent of capital at a time, and the minimum time between installments is one month. Other QFIIs also cannot remit more than 20 percent of the capital at any time. In this case, the minimum time between remittances is three months. <sup>PW</sup>

#### References

IFC	International Finance Corporation, <i>Factbook</i> (various years).
IMF	International Monetary Fund, <i>Annual Report of Exchange Arrangements and Exchange Restrictions</i> (1980–2000).
DT	Department of Treasury, <i>National Treatment Study</i> .
BD	Utpal Bhattacharya and Hazem Daouk, “The World Price of Insider Trading,” <i>Journal of Finance</i> 57(1) (2002): 75–108.
GK	Lei Gao and Gerhard Kling, “Regulatory Changes and Market Liquidity in Chinese Stock Markets,” <i>Emerging Markets Review</i> 7(2) (2006): 162–175.
CSRC	China Securities Regulatory Commission Web site.
BNY	Bank of New York Web site.
BBC	British Broadcasting System, UK edition.
SP	Standard and Poor’s Web site.
WMA	World Market Research Centre, <i>World Market Analysis</i> . Eswar Prasad and Shang-Jin Wei, <i>Capital Flows in China</i> (2005).
RP	Roger Peng, “China Releases Temporary Measures for Investment,” Morrison and Foerster, November 2002.
B	Bridge, <i>The Bridge Handbook of World Stock, Derivative &amp; Commodity Exchanges</i> (2000).
WTO	World Trade Organization, <a href="http://www.wto.org/English/thewto_e/countries_e/china_e.htm">http://www.wto.org/English/thewto_e/countries_e/china_e.htm</a> .

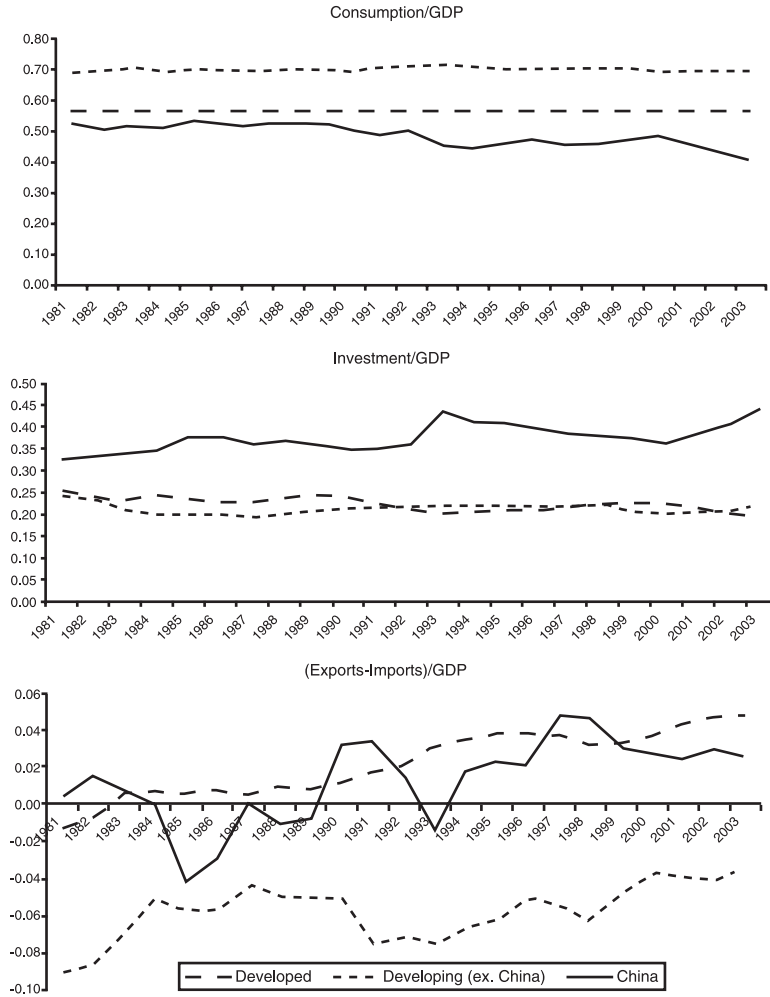


**Figure 4.1** Macroeconomic Growth: China (real per capita U.S. dollars)



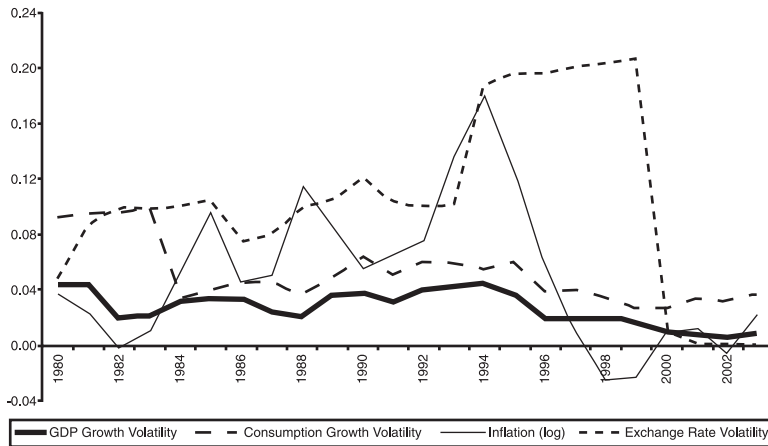
**Figure 4.2** GDP Components: China

with other countries (grouped over developed and developing countries) in figure 4.3. Interestingly, exports minus imports comprises only 2.6 percent of GDP; consequently China runs, on average, a current account surplus. This is atypical for a developing country, as figure 4.3 demonstrates. China's huge investment level is mainly financed using domestic savings.



**Figure 4.3** GDP Components: Comparison.

China's high growth has not been associated with increased macroeconomic volatility (see figure 4.4). A rolling five-year standard deviation in China's GDP growth has dropped from a level of about 3 percent in the 1980s and 1990s to a level of 0.8 percent since 2000. Consumption growth volatility is higher but shows a similar pattern. In the 1980s, consumption growth volatility averaged 6.3 percent. The volatility decreased to 4.9 percent in the 1990s. Over the past four years, the volatility has decreased to 3.3 percent.



**Figure 4.4** Macroeconomic Volatility: China (five-year rolling standard deviation)

#### DATA

Our multicountry macroeconomic and financial data, spanning the period from 1980 through 2003, are drawn from a number of sources detailed in table 4.2.<sup>1</sup> In our empirical exercises, we consider a broad cross section of countries. Unfortunately, measures of stock market development and the quality of institutions are only available for a limited set of countries. Our sample size is determined by data availability and ranges from 51 to 96 countries.

#### SUMMARY STATISTICS

We now examine some of the key variables and provide summary statistics. We consider developed markets as well as developing markets; regional averages across Asia, Africa, and Latin America; and the values for China. As a general warning sign, one difficulty our analysis faces is that quantitative measures do not always reflect the true regulatory constraints faced by economic agents operating in China. Before we examine a number of potentially important determinants of economic growth, let's use the numbers reported in table 4.3 to compare the Chinese growth experience with that of the rest of the world. Developed countries grow on average about 2 percent per year on a per capita basis, with about 2 percent volatility. Developing countries do not even generate 1 percent growth,



**Table 4.2** Description of the Variables

Variable	Description
Gross domestic product (GDP) and its subcomponents	Real per capita GDP (and its components: consumption, investment, government expenditures, and exports less imports). Available for all countries from 1980 through 2003. <i>Source: World Bank Development Indicators</i> CD-ROM.
Capital Stock and Total Factor Productivity (TFP) Growth	We build per capita physical capital stocks over the 1980–2003 period using the method in King and Levine (1993). We derive an initial estimate of the capital stock, assuming each country is at its steady-state capital-output ratio at that time. Then, we use the aggregate real investment series and the perpetual inventory method with a depreciation rate of 7 percent to compute the capital stock in later years. TFP is calculated as the difference between the GDP growth rate and 0.3 times the capital stock growth rate, assuming a capital share of 0.3.
<i>Measures of Openness</i>	
Quinn Capital account openness indicator	Quinn's capital account openness measure is also created from the text of the annual volume published by the International Monetary Fund (IMF), <i>Exchange Arrangements and Exchange Restrictions</i> . Rather than the indicator constructed by the IMF that takes a 1 if any restriction is in place, Quinn's openness measure is scored 0–4, in half-integer units, with 4 representing a fully open economy. The measure thus facilitates a more nuanced view of capital account openness and is available for 48 countries in our study. We transform the measure into a 0 to 1 scale.
Official equity market liberalization indicator	Corresponding to a date of formal regulatory change after which foreign investors officially have the opportunity to invest in domestic equity securities. Official liberalization dates are based on Bekaert and Harvey (2005), <i>A Chronology of Important Financial, Economic and Political Events in Emerging Markets</i> , <a href="http://www.duke.edu/~charvey/chronology.htm">http://www.duke.edu/~charvey/chronology.htm</a> . This chronology is based on over 50 different source materials. A condensed version of the chronology, along with the selection of dates for a number of countries appears in Bekaert and Harvey (2000). We have extended their official liberalization dates to include Japan, New Zealand, and Spain. For the liberalizing countries, the associated official liberalization indicator takes a value of one when the equity market is officially liberalized and thereafter, and zero otherwise. For the remaining countries, fully segmented countries are assumed to have an indicator value of zero, and fully liberalized countries are assumed to have an indicator value of one.

**Table 4.2** *continued*

Variable	Description
Intensity equity market openness indicator	Following Bekaert (1995) and Edison and Warnock (2003), the intensity measure is based on the ratio of the market capitalization of the constituent firms comprising the IFC Investable index to those that comprise the IFC Global index for each country. The IFC Global index, subject to some exclusion restrictions, is designed to represent the overall market portfolio for each country, whereas the IFC Investable index is designed to represent a portfolio of domestic equities that are available to foreign investors. A ratio of one means that all of the stocks are available to foreign investors. Fully segmented countries have an intensity measure of zero, and fully liberalized countries have an intensity measure of one.
Initial GDP	Logarithm of real per capita GDP in 1980. Available for all countries. <i>Source: World Bank Development Indicators CD-ROM.</i>
Log life expectancy	Life expectancy at birth indicates the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life. Available for all countries. <i>Source: World Bank Development Indicators CD-ROM.</i>
Population growth	Growth rate of total population which counts all residents regardless of legal status or citizenship. Available for all countries. <i>Source: World Bank Development Indicators CD-ROM.</i>
Trade/GDP	The trade dependency ratio is the sum of exports and imports of goods and services measured as a share of gross domestic product. Available for all countries. <i>Source: World Bank Development Indicators CD-ROM.</i>
Inflation	Inflation as measured by the log annual growth rate of the GDP implicit deflator. We use the CPI; if the GDP-deflator is not available. Available for all countries. <i>Source: World Bank Development Indicators CD-ROM.</i>
Private credit/GDP	Private credit divided by GDP. Credit to private sector refers to financial resources provided to the private sector, such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable that establish a claim for repayment. Available for all countries. <i>Source: World Bank Development Indicators CD-ROM.</i> We also construct an <i>adjusted</i> private credit measure controlling for state ownership of the banking system. We interpolate the state ownership ratios provided by La Porta, Lopez de Silanes, and Shleifer (2002) for two years during our sample to the full sample, and create a new measure of banking development as official private credit to GDP times (1- the ratio of state ownership).
Equity market turnover	The ratio of equity market value traded to the market capitalization. The data are available for 50 countries. <i>Source: Standard and Poor's/International Finance Corporation's Emerging Stock Markets Factbook.</i>

*(continued)*

**Table 4.2** *continued*

Variable	Description
MCAP/GDP	The ratio of equity market capitalization to GDP. The data are available for 50 countries. <i>Source:</i> Standard and Poor's/ International Finance Corporation's <i>Emerging Stock Markets Factbook</i> .
Economic risk rating	The value of the Political Risk Service (PRS) Group's economic risk indicator (which ranges between 0 and 50). The risk rating is a combination of 5 subcomponents: GDP levels and growth, respectively, inflation, balanced budgets, and the current account. The minimum number of points for each component is zero, while the maximum number of points depends on the fixed weight that component is given in the overall economics risk assessment.
Political risk rating	The value of the PRS Group's political risk indicator (which ranges between 0 and 100). The risk rating is a combination of 12 subcomponents (documented below). Overall, a political risk rating of 0.0 to 49.9 percent indicates a Very High Risk; 50.0 to 59.9 percent High Risk; 60.0 to 69.9 percent Moderate Risk; 70.0 to 79.9 percent Low Risk; and 80.0 percent or more Very Low Risk. The data are available for 75 countries from 1984 through 1997. For each country, we backfill the 1984 value to 1980. <i>Source:</i> Various issues of the <i>International Country Risk Guide</i> . There are 12 subcomponents to this index. We create four subindices: POL1 (Political Conditions), POL2 (Quality of Institutions), POL3 (Socioeconomic conditions), and POL4 (Conflict).
<b>Political Conditions</b>	The sum of International Country Risk Guide (ICRG) subcomponents: Military in Politics and Democratic Accountability
Military in Politics	ICRG political risk subcomponent (6 percent weight). The military is not elected by anyone. Therefore, its involvement in politics, even at a peripheral level, is a diminution of democratic accountability. However, it also has other significant implications. The military might, for example, become involved in government because of an actual or created internal or external threat. Such a situation would imply the distortion of government policy in order to meet this threat, for example by increasing the defense budget at the expense of other budget allocations. In some countries, the threat of military takeover can force an elected government to change policy or cause its replacement by another government more amenable to the military's wishes. A military takeover or threat may also represent a high risk if it is an indication that the government is unable to function effectively and that the country therefore has an uneasy environment for foreign businesses. A full-scale military regime poses the greatest risk.

**Table 4.2** *continued*

Variable	Description
Democratic Accountability	ICRG political risk subcomponent (6 percent weight). This is a measure of how responsive government is to its people, on the basis that the less responsive it is, the more likely it is that the government will fall, peacefully in a democratic society, but possibly violently in a nondemocratic one. However, assessing democratic accountability is more complex than simply determining whether the country has free and fair elections. Even democratically elected governments, particularly those that are apparently popular, can delude themselves into thinking they know what is good for their people even when the people have made it abundantly clear that they do not approve particular policies. Therefore, it is possible for an accountable democracy to have a lower score, that is, a higher risk, for this component than a less democratic form of government.
<b>Quality of Institutions</b>	The sum of ICRG subcomponents: Corruption, Law and Order, and Bureaucratic Quality.
Corruption	ICRG political risk subcomponent (6 percent weight). This is a measure of corruption within the political system. Such corruption distorts the economic and financial environment, reduces the efficiency of government and business by enabling people to assume positions of power through patronage rather than ability, and introduces an inherent instability into the political process. The most common form of corruption is met directly by business is financial corruption in the form of demands for special payments and bribes connected with import and export licenses, exchange controls, tax assessments, police protection, or loans. Although the PRS measure takes such corruption into account, it is more concerned with actual or potential corruption in the form of excessive patronage, nepotism, job reservations, "favor-for-favors," secret party funding, and suspiciously close ties between politics and business. In PRS's view, these sorts of corruption pose risk to foreign business, potentially leading to popular discontent, unrealistic and inefficient controls on the state economy, and encourage the development of the black market.
Law and Order	ICRG political risk subcomponent (6 percent weight). PRS assesses Law and Order separately, with each subcomponent comprising zero to three points. The Law subcomponent is an assessment of the strength and impartiality of the legal system, while the Order subcomponent is an assessment of popular observance of the law. Thus, a country can enjoy a high rating (3.0) in terms of its judicial system but a low rating (1.0) if the law is ignored for a political aim.

*(continued)*

**Table 4.2** *continued*

Variable	Description
Bureaucratic Quality	ICRG political risk subcomponent (4 percent weight). The institutional strength and quality of the bureaucracy can act as a shock absorber that tends to minimize revisions of policy when governments change. Therefore, high points are given to countries where the bureaucracy has the strength and expertise to govern without drastic changes in policy or interruptions in government services. In these low-risk countries, the bureaucracy tends to be somewhat autonomous from political pressure and to have an established mechanism for recruitment and training. Countries that lack the cushioning effect of a strong bureaucracy receive low points because a change in government tends to be traumatic in terms of policy formulation and day-to-day administrative functions.
<b>Socioeconomic Conditions</b>	The sum of ICRG subcomponents: Government Stability, Socioeconomic Conditions, and Investment Profile.
Government stability	ICRG political risk subcomponent (12 percent weight). This is a measure both of the government's ability to carry out its declared program(s) and its ability to stay in office. This will depend on the type of governance, the cohesion of the government and governing party or parties, the closeness of the next election, the government's command of the legislature, and popular approval of government policies.
Socioeconomic Conditions	ICRG political risk subcomponent (12 percent weight). This is an attempt to measure general public satisfaction, or dissatisfaction, with the government's economic policies. In general terms, the greater the popular dissatisfaction with a government's policies, the greater the chances that the government will be forced to change direction, possibly to the detriment of business, or will fall. Socioeconomic conditions cover a broad spectrum of factors ranging from infant mortality and medical provision to housing and interest rates. Within this range different factors will have different weight in different societies. PRS attempts to identify those factors that are important for the society in question, that is, those with the greatest political impact, and assess the country on that basis.
Investment Profile	ICRG political risk subcomponent (12 percent weight). This is a measure of the government's attitude to inward investment. The investment profile is determined by PRS's assessment of three subcomponents: (1) risk of expropriation or contract viability; (2) payment delays; and (3) repatriation of profits. Each subcomponent is scored on a scale from zero (very high risk) to four (very low risk).
<b>Conflict</b>	The sum of ICRG subcomponents: Internal Conflict, External Conflict, Religious Tensions, Ethnic Tensions.

**Table 4.2** *continued*

Variable	Description
Internal Conflict	ICRG political risk subcomponent (12 percent weight). This is an assessment of political violence in the country and its actual or potential impact on governance. The highest rating is given to those countries where there is no armed opposition to the government and the government does not indulge in arbitrary violence, direct or indirect, against its own people. The lowest rating is given to a country embroiled in an ongoing civil war. The intermediate ratings are awarded on the basis of whether the threat posed is to government and business or only business (e.g., kidnapping for ransom); whether acts of violence are carried out for a political objective (i.e., terrorist operations); whether such groups are composed of a few individuals with little support or are well-organized movements operating with the tacit support of the people they purport to represent; whether acts of violence are sporadic or sustained; and whether they are restricted to a particular locality or region, or are carried out nationwide.
External Conflict	ICRG political risk subcomponent (12 percent weight). The external conflict measure is an assessment of the risk to both the incumbent government and inward investment. It ranges from trade restrictions and embargoes, whether imposed by a single country, a group of countries, or the whole international community, through geopolitical disputes, armed threats, exchanges of fire on borders, border incursions, foreign-supported insurgency, and full-scale warfare.
Religion in Politics	ICRG political risk subcomponent (6 percent weight). Religious tensions may stem from the domination of society and/or governance by a single religious group that seeks to replace civil law by religious law and to exclude other religions from the political and/or social process; the desire of a single religious group to dominate governance; the suppression of religious freedom; the desire of a religious group to express its own identity, separate from the country as a whole. The risk involved in these situations ranges from inexperienced people imposing inappropriate policies through civil dissent to civil war.
Ethnic Tensions	ICRG political risk subcomponent (6 percent weight). This component measures the degree of tension within a country attributable to racial, nationality, or language divisions. Lower ratings are given to countries where racial and nationality tensions are high because opposing groups are intolerant and unwilling to compromise. Higher ratings are given to countries where tensions are minimal, even though such differences may still exist.

*(continued)*

**Table 4.2** *continued*

Variable	Description
BERI Measures on Privatization, Credit Market and Financial Openness	Three indices collected from Business Environment Risk Intelligence (BERI). Privatization measures the degree of privatization within each country. The Credit Market index reflects the stability and operating climate of the short-term credit, long-term loans and venture capital markets. Finally, the Financial Openness index reflects the legal framework surrounding remittances and the repatriation of capital, with attention to both how the laws are formally written and the actual practices within each country. For each index, a larger number denotes an improvement.
Social Security Index	From Botero, Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2002), measures social security benefits: (1) old age, disability, and death benefits; (2) sickness and health benefits; and (3) unemployment benefits. The first group covers the risk of old age, disability, and death: months of contributions or employment required for normal retirement by law; percentage of the worker's monthly salary deducted by law to cover old-age and disability benefits; and percentage of the pre-retirement salary covered by the old-age cash-benefit pension. The second group covers the risk of sickness: months of contributions or employment required to qualify for sickness benefits by law; percentage of the worker's monthly salary deducted by law to cover sickness and health benefits; waiting period for sickness benefits; and percentage of the salary covered by sickness cash benefits for a two-month sickness spell. The final group covers the risk of unemployment: months of contributions or employment required to qualify for unemployment benefits by law; percentage of the worker's monthly salary deducted by law to cover unemployment benefits; waiting period for unemployment benefits; and percentage of the salary covered by unemployment benefits in case of a one-year unemployment spell. Each subgroup is quantitatively scored and summed to create the overall index.
Foreign Debt Index	ICRG financial risk subcomponent. The constructed index reflects the estimated gross foreign debt in a given year as a percentage of the GDP. The risk points are then assigned so that lower levels of foreign debt denote a higher index level.
Gross FDI/GDP	Gross foreign direct investment is the sum of the absolute values of inflows and outflows of foreign direct investment recorded in the balance-of-payments financial account. It includes equity capital, reinvestment of earnings, other long-term capital, and short-term capital. The indicator is calculated as a ratio to GDP.

NOTE: All data are employed at the annual frequency.

Table 4.3 Summary Statistics

Panel A: Average (1981–2003)		Consumption Growth	Consumption Growth Deviation	GDP Growth	GDP Growth Standard Deviation
Developed Countries		0.019	0.025	0.020	0.022
Developing Countries		0.009	0.079	0.009	0.050
Africa		0.003	0.090	0.003	0.057
Asia		0.029	0.046	0.030	0.037
Latin America		0.003	0.071	0.001	0.045
China		0.070	0.044	0.078	0.027

	Trade/GDP	Private Credit/GDP	Mcap/GDP	Turnover	Official Equity Liberalization	Equity Openness Intensity	Capital Account Openness (Quinn)
Developed Countries	0.600	0.864	0.599	0.509	0.954	0.929	0.855
Developing Countries	0.590	0.326	0.253	0.304	0.267	0.117	0.480
Africa	0.636	0.267	0.289	0.139	0.150	0.033	0.430
Asia	0.486	0.617	0.420	0.499	0.588	0.374	0.511
Latin America	0.418	0.284	0.179	0.225	0.312	0.233	0.564
China	0.354	0.923	0.235	1.477	0.565	0.078	0.326

	Political Risk (Composite)	Political Conditions	Quality of Institutions	Socio-economic Conditions	Conflict Risk	Investment Profile
Developed Countries	0.835	0.963	0.923	0.649	0.939	0.675
Developing Countries	0.550	0.520	0.491	0.482	0.699	0.533
Africa	0.532	0.478	0.485	0.480	0.656	0.518
Asia	0.628	0.629	0.610	0.556	0.746	0.583
Latin America	0.553	0.524	0.469	0.446	0.741	0.496
China	0.658	0.440	0.571	0.612	0.815	0.707

(continued)



Table 4.3 continued

Panel B: Most Recent Data (2000–2003)		Consumption Growth	Consumption Growth Deviation	GDP Growth	GDP Growth Standard Deviation
Developed Countries		0.016	0.020	0.016	0.015
Developing Countries		0.004	0.058	0.011	0.027
Africa		–0.009	0.070	0.007	0.026
Asia		0.028	0.048	0.024	0.033
Latin America		–0.004	0.043	–0.004	0.028
China		0.036	0.033	0.073	0.007

	Trade/GDP	Private Credit/GDP	Mcap/GDP	Turnover	Official Equity Liberalization	Equity Openness Intensity	Capital Account Openness (Quinn)
Developed Countries	0.746	1.022	1.322	0.832	1.000	0.952	0.923
Developing Countries	0.765	0.366	0.332	0.480	0.493	0.252	0.650
Africa	0.757	0.267	0.316	0.161	0.342	0.123	0.534
Asia	0.716	0.760	0.479	0.996	0.875	0.585	0.617
Latin America	0.532	0.295	0.258	0.126	0.571	0.419	0.821
China	0.546	1.333	0.457	1.022	1.000	0.349	0.375

	Political Risk (Composite)	Political Conditions	Quality of Institutions	Socioeconomic Conditions	Conflict Risk	Investment Profile
Developed Countries	0.869	0.956	0.908	0.738	0.952	0.754
Developing Countries	0.664	0.546	0.534	0.630	0.793	0.692
Africa	0.631	0.476	0.496	0.625	0.750	0.664
Asia	0.703	0.590	0.670	0.648	0.834	0.680
Latin America	0.663	0.589	0.509	0.601	0.817	0.685
China	0.658	0.281	0.469	0.688	0.826	0.917

We explore averages of trade/GDP, private credit/GDP, market capitalization/GDP, equity market turnover, the official liberalization indicator, Quinn's capital account liberalization indicator, and political risk index (and various subgroups). For the political risk indices, higher numbers denote better conditions. Political conditions reflect the role of the military in politics and democratic accountability. Quality of institutions reflects law and order, corruption, and bureaucratic quality. The third group reflects government stability, socioeconomic conditions, and the investment profile for the country (which we also consider separately). Finally, conflict risk reflects both internal and external conflict and religious and ethnic tensions. We also present evidence for consumption and GDP growth and standard deviations. The averages are reported for several country groups: developed, developing, Africa, Asia, and Latin America (as described by the World Bank). In panel A, we report full sample averages, whereas we report only the most recent data in panel B. We also report the associated numbers for China.

and volatility is 5 percent. Thus, China manages to grow much faster than developed markets with relatively low growth volatility (3 percent).

### Trade Sector

There is a perception that foreign trade has been an important engine of Chinese economic growth. To test this conjecture, we first need a measure of trade openness. We will simply use the size of the trade sector, exports plus imports to GDP. Table 4.3 shows that the actual size of the sector compared to GDP is remarkably modest. The trade sector comprises only 35 percent of GDP on average in China compared to an average of 59 percent in all developing countries. The trade sector in China is even smaller than the African regional average. Of course the average reflects a continued upward trend in trade openness, with the trade sector standing at over 60 percent in 2003. This increase is the mirror image of significant reforms to the trade regime, taking place during the 1980s and 1990s, including accession to the World Trade Organization (WTO) in 2001, which led to a steady decrease in tariffs. Branstetter (2006), who provides a detailed analysis of trade liberalization in China, shows that tariff revenues as a fraction of imports decreased from about 12 percent in 1980 to 2.5 percent in 2002. The four-time decrease in tariffs nicely mirrors the approximately four-time increase in the trade sector documented in figure 4.5. Nevertheless, Wacziarg and Welch (2003) still view China as not having experienced trade liberalization.

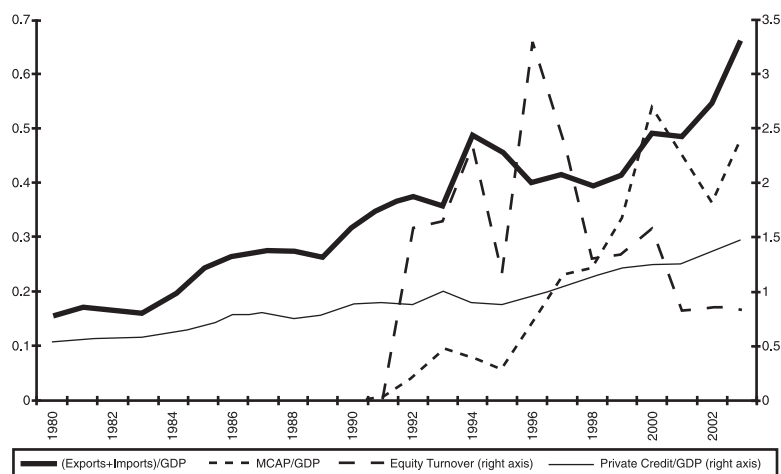


Figure 4.5 Trade and Financial Development: China

The Chinese national statistics do not reveal the large discrepancies in openness and likely its effects on economic growth within China. The major exporting and importing industries in China are located in east coastal provinces, whereas most inland provinces are still relatively isolated from world trade. A recent analysis by Jin (2005) suggests that the beneficial effects of trade openness may not extend to these inland provinces. Although it seems imperative for policymakers to address such regional divergences in economic performance, our data do not permit further analysis of this issue.

### Financial Development

We consider two measures of financial development. The first is based on the size of the banking system where we measure the amount of private credit divided by GDP, which is a standard banking development indicator. For this metric, China scores highly, 92 percent of GDP on average. This is higher than the average proportion for developed countries, 86 percent. Figure 4.5 shows that this measure of China's banking development has steadily improved over the sample period and that private credit to GDP is now over 100 percent. However, this statistic illustrates the tremendous measurement problem any analysis of China faces. While this ratio suggests that China's banking system is highly developed, experts have revealed a number of serious deficiencies in China's banking system. Fung, Ho, and Zhu (2005) describe how reforms to the banking system have been rather limited, with a large proportion of financial resources allocated through the state banking system and with interest rates playing little role in the resource allocation. This state of affairs was pointedly illustrated by the recent change in the official lending rate, the first in nine years!! There are frequent articles in the press and in practitioner research describing serious problems with nonperforming loans (NPLs) in the banking sector. For example, table 4.1 shows that a report by Standard & Poor's in June 2003 argued that Chinese financial institutions needed a \$500 billion bail-out. Apart from the formal sector, an informal credit market has emerged supplying funds to the non-state sector (see Allen, Qian, and Qian 2005), which is presumably guided by market principles. In a robustness check, we will use a financial development measure that is more correlated with the quality of the financial system.

A similar admonition holds for measures of equity market development. The turnover in the Chinese market is 148 percent per year compared to only 51 percent in developed markets on average. This does not

necessarily mean that the equity market is highly developed in China. In fact, the modern Chinese stock market is very young, the two stock exchanges in Shanghai and Shenzhen having been established only in 1990 after a 49-year hiatus.<sup>2</sup> An important feature of the Chinese stock market is the existence of A shares for local investors and B shares for foreign investors. Until February 2001, the two markets were totally separated, with the A shares trading in local currency and the B shares, a much more limited set of companies, trading in dollars or Hong Kong dollars. Since then, Chinese residents have been allowed to purchase B shares using foreign currency. More recently, foreign qualified institutional investors have been allowed to invest in the A market.

Our turnover number is for the B shares; turnover is even higher for A shares. The huge turnover and the surprising discount on the “less liquid” B shares has generated much research into their causes. Mei, Scheinkman, and Xiong (2005) convincingly demonstrate the existence of a speculative component in Chinese share prices, which may help explain both the discount on B shares and the tremendous turnover in A shares. The increase in turnover on the B share market after February 2001 is then viewed as due to speculation, not to an improvement in market efficiency. Other standard measures of stock market development paint a more realistic picture of the development of the Chinese stock market. For instance, the size of the equity market compared to GDP in China is only 23 percent, which is lower than the average for all developing countries and sharply lower than the 60 percent average for developed countries.

Other informal indicators suggest that Chinese stock market efficiency is still at a relatively low level (see Wang and Cheng 2004). Individual investors dominate the market, and while free float has been increasing it is still pretty limited. Short selling is impossible, and China has no futures or options markets in stocks. There are also accounts of stock price manipulation (see Aggarwal and Wu, forthcoming) and rampant insider trading (see Du and Wei 2004). That being said, it is conceivable that the proximity of the relatively efficient Hong Kong market mitigates the adverse effects of an inefficient stock market on resource allocation. High-quality Chinese companies tend to list on the Hong Kong market rather than the domestic market, and the so-called Red Chip companies raise much more capital through the Hong Kong market than through the domestic market.

The potentially beneficial effects of further stock market development, especially with the goal of attracting foreign investors, cannot be

underestimated. We will illustrate the real benefits of equity market liberalizations below, but here we will note that the Chinese market should be very attractive for foreign investors as returns appear to correlate very little with world markets returns. For the period from 1993 through 2003, Lin, Menkveld, and Yang (2004) show that the correlation between returns on both A-share markets and other countries (Hong Kong, Singapore, Taiwan, Japan, the United States, France, Germany, the United Kingdom, and Australia) is not higher than 5 percent. For the B shares, the correlations are higher but do not exceed 22 percent (with Hong Kong) for countries in the East and 8 percent (with Germany) for countries in the West. Hence, Chinese stocks are very attractive diversification vehicles for international investors.

### Financial Openness

We construct three measures of financial openness, which are detailed in table 4.2. The first indicator, denoted throughout the chapter as the “Official Liberalization” indicator, takes a value of one when the equity market is officially liberalized; otherwise, it takes a value of zero. Official liberalization dates are taken from the chronology presented in Bekaert and Harvey (2005) and expanded to all the countries considered in this study in Bekaert, Harvey, and Lundblad (2006a). It is difficult to know precisely when an equity market is effectively liberalized. That is, while regulations may change to allow foreigners to access the local equity market, the market may be effectively open years prior to the official date if American Depositary Receipts (ADRs) and country funds are available to foreign investors. Conversely, savvy investors may circumvent official capital controls. Furthermore, most liberalizations are not one-time events; rather, they are gradual and may not be comprehensive at first.

The Official Liberalization measure does not reflect the degree of openness of the equity market. Our second equity market openness measure addresses the extent of the liberalization by taking the ratio of the market capitalizations of the constituent members of the International Finance Corporation (IFC) investable and the IFC global indices for each country, following Bekaert (1995) and Edison and Warnock (2003). In this context, a ratio of one means that all of the stocks are available to foreign investors. For example, during the 1990s Korea lifted foreign ownership restrictions in a number of steps leading to an intensity indicator that gradually moved from zero to one. For both indicators, fully segmented

countries have an indicator value of zero, and fully liberalized “open” countries have an indicator value of one.

The usual measure of capital account openness is based on the IMF’s *Annual Report on Exchange Arrangements and Exchange Restrictions* (AREAER). The IMF publication details several categories of information, mostly on current account restrictions. A capital account openness dummy variable takes on a value of zero if the country has at least one restriction in the “restrictions on payments for the capital account transactions” category. However, Eichengreen (2001) has criticized the IMF capital account measure for being too coarse and therefore uninformative. Our measure of capital account openness is from Quinn (1997) and Quinn and Toyota (2003) and is also created from the annual volume published by the IMF’s AREAER. However, in contrast to the binary IMF indicator, Quinn’s openness measure is scored from 0 to 4, with 4 representing a fully open economy. Quinn grades capital payments and receipts separately on a scale of 0 to 2 (0.5 increments), and then adds the two. The scale is determined as follows: 0=approval required and rarely granted; 0.5=approval required and sometimes granted; 1.0=no restrictions but official approval required (and frequently granted) plus transaction is taxed; 1.5=no official approval needed but transaction may be taxed; and 2.0=free. The Quinn variable measures the degree to which the capital account is open and is analogous to our intensity indicator for equity market liberalization. We transform the Quinn measure into a 0 to 1 scale.

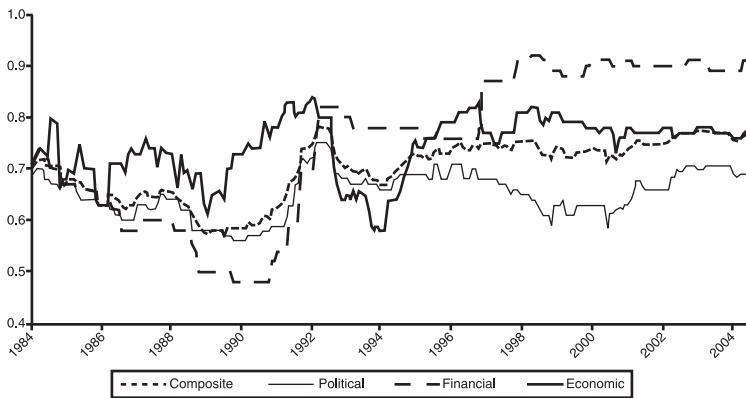
In table 4.3 we report some summary statistics on these measures for groups of countries and China. The value of 0.565 in the table for China’s Official Liberalization variable reflects the fact that the date for the official stock market liberalization is 1991 about halfway through the sample. The values for the other groups of countries show that developed countries were mostly open during the whole sample, whereas only a minority of country years (26.7 percent) for developing countries is characterized as open. Asia has been more open than Latin-America. This measure ignores the fact that significant foreign ownership restrictions remain and that much of the Chinese stock market capitalization is not traded on the stock market at all. The intensity measure averages only 7.8 percent over the entire sample, which is less than the average of developing countries. By the end of the sample, only 35 percent of market capitalization is available to foreigners. This ratio still falls short of the averages for Asian countries as well as Latin American countries.

In terms of capital account openness, China was on average less open than both the average developing country and the average Asian country. The Quinn measure stood at 0.0 in 1980 and is now 0.375. Prasad and Wei (2005) provide a detailed account of the remaining capital controls and how they evolved over time. One reason for the low value of the Quinn measure is that the Chinese government has relaxed restrictions on FDI inflows quite substantially but has only recently and cautiously started to relax restrictions on FDI outflows. Moreover, its regulations and currency inconvertibility have made foreign borrowing and portfolio inflows difficult. As a result, the composition of inflows has been very heavily tilted toward FDI. Despite this fact, Prasad and Wei debunk the myth that China has been an attractive FDI destination in terms of regulations and that FDI has been a large driver of Chinese economic growth. They show that FDI is subject to more restrictions than in other countries and that the FDI inflows in percentage of GDP are rather moderate both compared to the level of FDI in other countries and compared to the massive levels of domestic savings funneled into real investments. Finally, it is also conceivable that part of the FDI inflows reflects other forms of capitals disguised as FDI to circumvent capital controls. Nevertheless, it is worth examining whether China's reliance on FDI and reluctance to incur foreign debt has contributed to the country's growth spurt. We will do so below.

#### Institutions and Political Risk

Political unrest and institutional factors feature prominently in classic work on growth determinants (Barro 1997; Acemoglu, Johnson, and Robinson 2002). They may also affect risk assessments of foreign investors. That is, financial openness might not attract foreign capital if the country is viewed as risky. Therefore, these variables are also important in analyzing why countries respond differently in terms of both growth and growth volatility to financial openness. We use the International Country Risk Guide's (ICRG) ratings to measure the quality of institutions and political risk.

The ICRG provides ratings in three different categories: economic, financial, and political risk. A higher value means lower risk. Figure 4.6 shows the time series of these indices along with the composite risk measure. Over the entire period, the political risks that China faces have changed very little. The average value of this indicator in the 1990s was 65.6; in the last four years, it has averaged 66.4. There has also been only



**Figure 4.6** Political, Financial, and Economic Risk in China

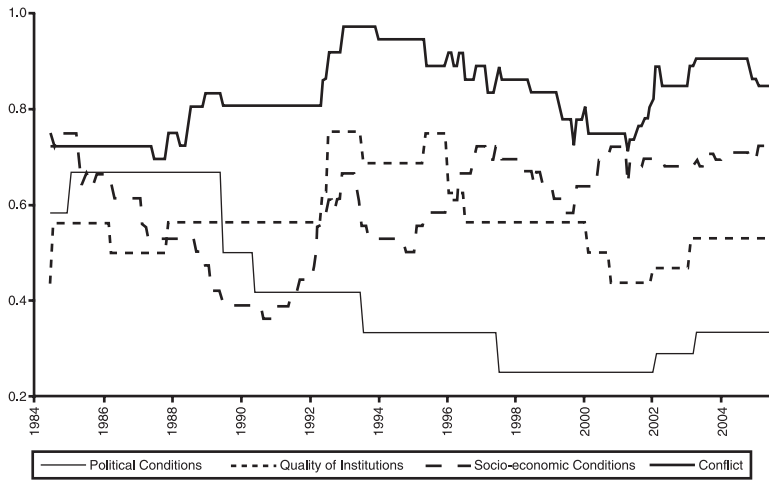
a marginal change in the economic indicator. Most of the increase in the composite is due to the financial risk indicator.

It is important to look within these indices. Most of our study focuses on the political risk indicator and four subcategories of this indicator, reflecting political conditions, the quality of institutions, socioeconomic conditions, and conflict. Table 4.3 presents some summary statistics for these measures. We report investment profile separately as well (see table 4.2 for details).

China has on average less political risk than developing countries but substantially more risk than developed countries. The good performance relative to other developing countries is due to good scores on socioeconomic conditions and conflict risk.

Figure 4.7 shows the time-variation in four subindices that we have created. For Political Conditions (the extent of the military involvement in politics and democratic accountability), China's rating has fallen from an average value of 34.4 in the 1990s to 28.1 in the last few years. The quality of political institutions (corruption, law and order, and bureaucratic quality) has also declined. The average rating in the 1990s was 62.0, and it has fallen to 46.9 in the last four years. Socioeconomic conditions (government stability, socioeconomic conditions, and investment profile) show a substantial improvement rising from an average of 56.9 in the 1990s to 68.8 in the last four years. Looking within the subcomponents, we see that both government stability and investment profile have improved. The conflict indicator (internal conflict, external conflict, religion in politics, and ethnic tensions) has been relatively flat over the past 15 years. The substantial





**Figure 4.7** The Components of Political Risk in China

improvement from the values in the 1980s is almost entirely driven by the perceived lower probability of external conflict.

## EMPIRICAL FRAMEWORK

### GROWTH, GROWTH VOLATILITY, AND INTERNATIONAL RISK SHARING

There is a considerable literature on the risk-sharing benefits that may come from financial market integration. In stylized representative agent endowment models, perfect risk sharing has stark implications. Consumption growth rates across countries should be perfectly correlated, idiosyncratic consumption risk should be diversified away, and consumption growth should not react to country-specific income shocks. Early work by Backus, Kehoe, and Kydland (1992) shows that consumption correlations across countries are surprisingly low and often lower than output growth correlations. One interpretation of this result is that the benefits of risk sharing have not been realized (for example, because of home asset preference), and the literature has mostly resorted to “counterfactual” exercises within the context of parameterized general equilibrium models to compute the cost of imperfect risk sharing. A survey

article by van Wincoop (1999) suggests that the benefits of perfect risk sharing are quite substantial even when only focusing on the reduction in consumption growth volatility. These benefits could be even more substantial given that open capital markets may also increase growth (see Obstfeld 1994), an implication of market integration ignored by most previous studies.

In Bekaert, Harvey, and Lundblad (2006b), we view changes in *de jure* international financial openness as an exogenous improvement in international risk sharing, an idea also present in Lewis's (1996) work. We then build on the framework of Athanasoulis and van Wincoop (2000) to simultaneously measure the effects of financial and trade openness on average consumption growth and idiosyncratic consumption growth volatility. Of course, opening equity markets (or opening capital markets more generally) is not likely a sufficient step to realize the theoretical benefits of perfect risk sharing. For example, markets are incomplete, and the proportion of output represented by tradable claims is probably quite small. In addition, only a minority of the population of most countries hold stocks. Nevertheless, it is likely that the benefits of risk sharing are relatively larger for emerging markets (see, for example, Lewis 1996; Obstfeld 1992; Tesar 1995).

Note that in terms of risk sharing, the benefits of equity market liberalization in emerging markets are twofold. For the world at large, emerging markets provide a great opportunity to diversify risk because of their low correlations with other global equity markets and with one another. From this perspective, any liberalization should serve to increase the total risk-sharing potential of world capital markets. Of course, the small size of many emerging markets may limit this potential. From the perspective of the emerging market, liberalization of inward investment mostly goes hand-in-hand with liberalization of outward investment (e.g., Mathieson and Rojz-Suarez 1993). Hence, equity market liberalization provides potentially large risk-sharing opportunities for the local population as well. Consequently, for countries with asymmetric financial liberalization regimes with respect to outflows and inflows, such as China, our results must be interpreted with care.

#### A DIRECT MEASURE OF RISK SHARING

We use a simplified version of the specification proposed in Bekaert, Harvey, and Lundblad (2006a):

$$g_{i,t+k} - g_{w,t+k} = \alpha'(x_{i,t} - x_{w,t}) + \varepsilon_{i,t+k} \quad (4.1)$$

$$\sigma_{i,t}^2 = \gamma_k'(z_{i,t} - z_{w,t}) \quad (4.2)$$

where  $i$  is the country,  $w$  is the world,  $g_{i,t+k}$  is the logarithmic consumption growth rate for country  $i$  from time  $t+1$  to  $t+k$ ,  $x$  and  $z$  represent instrumental variables and  $\sigma_{i,t}^2$  is the conditional variance of  $\varepsilon_{i,t+k}$ .

Equation (4.1) describes a classic Barro-type empirical growth regression, except that we formulate it in deviations from world growth. The residual in such a regression represents idiosyncratic, unpredictable growth, and its variance is the idiosyncratic growth volatility. It is also conceivable that the sensitivity of domestic growth to world growth varies with openness. We explicitly accommodate this possibility in Bekaert, Harvey, and Lundblad (2006a) but ignore it here.

The set of  $x$  instruments is largely based on Barro's (1997) work, including life expectancy, population growth, the size of the government sector, secondary school enrollment (a measure of human capital), inflation (a measure of the quality of macroeconomic policy), private credit to GDP (a financial development variable), trade to GDP and a financial openness measure. These variables should help account for steady-state GDP across countries. We also include initial per capita GDP to account for the standard conditional convergence effect in empirical growth regressions. It is well known that growth regressions suffer from a fragility problem as many variables such as human capital and life expectancy measure closely related "good" characteristics of a country. We follow the lead of Roll and Talbot (2004) in focusing primarily on variables that governments can easily modify and influence. In robustness checks, we do include investment variables as well because part of the Chinese growth experience must be related to its extraordinarily high savings rates. However, as we are interested in the growth effects of financial openness, it is problematic to directly include investment as liberalization may mainly work through the investment channel.

The system of equations in (4.1)–(4.2) defines a very large Generalized Method of Moment system with moment conditions:

$$f_t = \begin{pmatrix} \varepsilon_{i,t+k} \otimes (x_{i,t} - x_{w,t}) \\ (\varepsilon_{i,t+k}^2 - \sigma_{i,t}^2) \otimes (z_{i,t} - z_{w,t}) \end{pmatrix} \quad (4.3)$$

The system contains  $N \times 2 \times L$  moment conditions (where  $L = L_x + L_z$ ,  $L_x$  is the dimension of  $x_{i,t}$ ,  $L_z$  is the dimension of  $z_{i,t}$ ) and  $2L(N-1)$  overidentifying conditions. Because the system is so large, it would be difficult to estimate with a general weighting matrix. We only allow for a restricted form of correlation across countries. The country mean and volatility errors are allowed to be correlated within one country but not across countries. Furthermore, the correlation is assumed to be the same across countries. The weighting matrix corrects for the induced serial correlation in the errors for overlapping growth horizons, following Bekaert, Harvey, and Lundblad (2001). We estimate the model for  $k=5$ . It should be noted that our results are robust to slight variations on the weighting matrix, for example, setting the mean-volatility correlation to zero. Also note that we add a constant to both the mean and variance specifications.

## RESULTS FOR AVERAGE GROWTH

### BASE RESULTS ON GROWTH PREDICTABILITY

In panel A of table 4.4, we report the results of estimating (4.1)–(4.2) for our panel of, respectively, 96 countries (equity openness measures) or 77 countries (capital account openness measure). We report the regressions for both consumption and output growth. The coefficients on the size of the government sector and inflation were not significantly different from zero in any of our specifications and were therefore omitted from the regressions. The initial GDP variable is updated every five years. In all the regressions, we observe strong convergence effects. Countries that have per capita GDP below their steady states grow faster than average. Life expectancy and population growth have the expected, strongly significant effects, which are remarkably robust across the different specifications, especially for life expectancy. The effects are invariably larger for GDP growth. Secondary school enrollment makes a positive and usually significant contribution to growth. Trade has a robustly positive and significant effect on growth. The coefficients on the financial development measure are always more than one standard error from zero and are significant in the capital account openness specification. Equity market openness has a robust and significant growth effect varying between 57 basis points and 73 basis points. The effect of full capital account openness is even larger—1.33 percent for consumption and 1.88 percent for output

**Table 4.4a** Growth Predictability: Annual Average Real Consumption and GDP Growth in Excess of the World (five-year horizon), 1980–2003

Panel A	Official Equity Market Liberalization				Equity Market Openness			
	Consumption Growth		GDP Growth		Consumption Growth		GDP Growth	
	Estimate	Standard Error	Estimate	Standard Error	Estimate	Standard Error	Estimate	Standard Error
Constant	-0.0066	0.0020	-0.0057	0.0019	-0.0063	0.0022	-0.0060	0.0023
Initial GDP	-0.0070	0.0015	-0.0108	0.0009	-0.0072	0.0016	-0.0112	0.0009
Secondary School	0.0031	0.0037	0.0113	0.0050	0.0032	0.0038	0.0107	0.0047
Log(Life Expectancy)	0.0784	0.0123	0.0934	0.0126	0.0806	0.0127	0.0963	0.0123
Population Growth	-0.1437	0.0878	-0.2562	0.1072	-0.1623	0.0856	-0.2593	0.1068
Trade/GDP	0.0073	0.0023	0.0070	0.0017	0.0073	0.0024	0.0074	0.0017
Private Credit/GDP	0.0032	0.0027	0.0044	0.0026	0.0035	0.0028	0.0044	0.0029
Financial Openness	0.0073	0.0021	0.0063	0.0029	0.0057	0.0022	0.0067	0.0028
R <sup>2</sup>	0.140		0.225		0.136		0.223	

Capital Account Openness (Quinn)

Panel A	Consumption Growth		GDP Growth	
	Estimate	Standard Error	Estimate	Standard Error
Constant	-0.0042	0.0017	-0.0064	0.0019
Initial GDP	-0.0100	0.0015	-0.0147	0.0010
Secondary School	0.0088	0.0043	0.0198	0.0043
Log(Life Expectancy)	0.0809	0.0141	0.0976	0.0133
Population Growth	-0.3107	0.0879	-0.4186	0.0913
Trade/GDP	0.0034	0.0020	0.0049	0.0015
Private Credit/GDP	0.0075	0.0025	0.0062	0.0026
Financial Openness	0.0133	0.0037	0.0188	0.0037
R <sup>2</sup>	0.154		0.278	

The dependent variable is the overlapping five-year average growth rate of either real per capita consumption or GDP in excess of the corresponding world growth rate. Initial GDP is the log real per capita GDP level updated every five years (1980, 1985, 1990, 2000). Secondary School is the enrollment percentage for that level; Log(Life Expectancy) is the log life expectancy of the total population; Population Growth is the growth rate of total population; Trade/GDP is the ratio of export plus imports to GDP; Private Credit/GDP is the ratio of private credit to GDP. The control variables are all in excess of the world. We report the coefficient on one of three openness indicators (also in excess of the world): the Official Equity Liberalization indicator that takes a value of one when the equity market is liberalized; the Equity Liberalization Intensity measure is the ratio of IFC Investables to Global market capitalization; or the Capital Account Openness (Quinn) indicator that takes a value between 0 and 1 depending on the intensity of the reported capital account restrictions. The first two sets of regressions include 96 countries, whereas the last includes 77 countries. All standard errors provide a correction for the overlapping nature of the data.

**Table 4.4b** China's Experience: Decomposing the Growth Regression, Annual Average Real Consumption and GDP Growth (five-year horizon), 1980–2003

Panel B									
	Excess Consumption Growth (5-year)	Initial GDP	Secondary School	Log(Life Expectancy)	Population Growth	Trade/GDP	Private Credit/GDP	Official Equity Liberalization	Predicted Excess Growth
Developed Countries	0.495%	-1.035%	0.143%	1.289%	0.132%	0.162%	0.132%	0.392%	0.555%
Developing Countries	-0.614%	0.934%	-0.034%	-0.589%	-0.090%	0.201%	-0.037%	-0.110%	-0.384%
Africa	-1.312%	1.206%	-0.065%	-1.397%	-0.163%	0.223%	-0.055%	-0.190%	-1.099%
Asia	1.300%	0.696%	0.015%	0.217%	-0.018%	0.108%	0.055%	0.131%	0.545%
Latin America	-1.050%	0.496%	-0.019%	0.200%	-0.060%	0.034%	-0.050%	-0.071%	-0.130%
<b>China</b>	<b>5.950%</b>	<b>1.742%</b>	<b>-0.017%</b>	<b>0.449%</b>	<b>0.049%</b>	<b>-0.048%</b>	<b>0.151%</b>	<b>0.108%</b>	<b>1.774%</b>
Temporal Dimension									
<b>China—1980</b>		2.203%	-0.020%	0.499%	0.069%	-0.166%	-0.085%	-0.129%	<b>1.710%</b>
<b>China—2003</b>		1.269%	-0.010%	0.461%	0.079%	0.052%	0.026%	0.289%	<b>1.505%</b>
	Excess Consumption Growth (5-year)	Initial GDP	Secondary School	Log(Life Expectancy)	Population Growth	Trade/GDP	Private Credit/GDP	Capital Account Openness (Quinn)	Predicted Excess Growth
Developed Countries	0.495%	-1.479%	0.403%	1.331%	0.284%	0.075%	0.317%	0.362%	0.871%
Developing Countries	-0.614%	1.335%	-0.095%	-0.608%	-0.194%	0.093%	-0.089%	-0.136%	-0.115%
Africa	-1.312%	1.723%	-0.182%	-1.442%	-0.352%	0.104%	-0.131%	-0.193%	-0.895%
Asia	1.300%	0.994%	0.042%	0.224%	-0.038%	0.050%	0.132%	-0.085%	0.899%
Latin America	-1.050%	0.709%	-0.054%	0.206%	-0.130%	0.016%	-0.118%	-0.015%	0.191%
<b>China</b>	<b>5.950%</b>	<b>2.489%</b>	<b>-0.049%</b>	<b>0.464%</b>	<b>0.106%</b>	<b>-0.022%</b>	<b>0.361%</b>	<b>-0.339%</b>	<b>2.588%</b>
Temporal Dimension									
<b>China—1980</b>		3.147%	-0.056%	0.515%	0.150%	-0.077%	-0.204%	-0.676%	<b>2.377%</b>
<b>China—2003</b>		1.813%	-0.030%	0.475%	0.171%	0.024%	0.062%	-0.463%	<b>1.631%</b>

This table reports the decomposition of the first and third regressions in panel A, where the dependent variable is the overlapping five-year average growth rate of real per capita consumption in excess of the corresponding world growth rate. This table shows the case for the official equity liberalization and capital account openness (Quinn) indicators. The values are reported for several country groups: Developed, Developing, Africa, Asia, and Latin America (as described by the World Bank). We also report the associated numbers for China, including the comparison of predicted growth across the sample from 1980 to 2003. Each entry shows the average for that country group multiplied by the coefficient reported in panel A.

growth. Consequently, a country with a fully open capital account grows, on average, 1.88 percent per year faster than a country with a fully closed capital account.

In panel B of table 4.4, we provide a number of different decompositions of the regression results. We consider five different groups: all developed countries, all developing countries, African countries, Asian countries, and Latin American countries. We also consider China separately. For each group we average the right-hand side variables over the sample period and compute average predicted excess consumption growth. We perform the decomposition for the official equity market liberalization (top panel) and capital account openness regressions (bottom panel). We start by discussing the top panel results.

The regression seems to capture average growth relatively well for the five groupings, although it tends to overpredict growth for Latin American and African countries, and underpredict growth for developed and Asian countries. The major contributors to growth overall seem to have been the convergence effect, life expectancy, and financial openness. Trade openness is less important quantitatively than expected. The results for GDP growth are similar.

The China experience stands out: China has the largest residual of all countries. That is, the regression fails to describe the Chinese growth experience. Financial development and equity market liberalization provide a small positive contribution to growth, but as we indicated before, these indicators are hard to interpret for China. Trade seemed to have played a relatively minor role on average. The main contributors are the convergence effect—China's per capita GDP was at least 70 percent below the world average during the sample period—and life expectancy.

These results ignore the dynamics of what China accomplished over the sample period: increased trade opening, partial financial liberalization, improvements in health care that increased life expectancy, and so on. To see the effects of these changes on growth, we repeat the experiment of panel B for 1980 and 2003. We multiply the regression coefficients by the values for China in 1980 and 2003. For 2003, we can only show predicted growth, not the actual experience. We find that the predicted excess consumption growth decreases from 1.7 to 1.5 percent from 1980 to 2003 in the equity market liberalization specification. The decrease is driven by a much higher initial GDP. In 1980, China's per capita GDP represented only 4.3 percent of the world average; in 2003, it represented 26.3 percent of the world average. The decrease in the convergence effect

is partially offset by the positive impact of the equity market liberalization as well as the growing trade sector. However, again trade is shown to have played only a minor role in the Chinese growth experience.

The capital account openness regression displays similar results. Even though capital account openness provides a negative contribution to overall growth, its contribution is less negative in 2003 than in 1980 and is one of the main factors offsetting the influence of initial GDP. Later, we further explore the specific role of China's promotion of inward FDI.

Another relatively large contributor to growth in the capital account regression, both overall and in a temporal sense, is private credit to GDP. This is entirely because the private credit to GDP only measures the quantity of loans provided without taking into account the notorious poor capital allocation by Chinese state banks. La Porta, Lopez de Silanes, and Shleifer (2002) and Dinc (2005) correct the standard measures of banking development for state ownership of banks, viewing state control as synonymous with inefficient resource allocation. We interpolate the state ownership ratios provided by La Porta, Lopez de Silanes, and Shleifer (2002) for two years during our sample to the full sample and create a new measure of banking development as private credit to GDP  $\times$  (1-ratio of state ownership). This correction drives China's private credit to GDP ratio close to zero for most of the sample, while leaving banking development in many developed countries unaffected. When we use this measure in the capital account regression (not reported), the lack of banking development now detracts 0.242 percent of China's relative growth. This suggests that one sustainable source of new growth for China may be to improve resource allocation through the banking system.

Many believe that China's embrace of trade openness (and FDI; see below) has played a significant role in its rapid economic development over the least decade or so. While we are not the first to argue that their effects are likely less important than seems generally accepted (see, e.g., Branstetter and Lardy 2006), we explore the possibility of the import plus exports measure scaled by GDP being a poor proxy to the true trade-liberalizing effects of China's trade policy. We therefore obtained the trade liberalization dates developed in Wacziarg and Welch (2003) for 75 countries. As we noted before, China is assumed to be effectively not trade liberalized. Wacziarg and Welch look at five factors: average tariff rates of 40 percent or more; nontariff barriers covering 40 percent or more of trade; a black market exchange rate that is depreciated by 20



percent or more relative to the official exchange rate, on average, during the 1970s or 1980s; a state monopoly on major exports; and a socialist economic system. If a country meets any of these five criteria, it is classified with indicator variable equal to zero and is deemed closed. Given that China is a socialist economy, it is given a closed rating. Although China undoubtedly cannot be classified as totally open, this classification seems erroneous given the account of trade liberalization in Branstetter and Lardy (2006). We therefore replaced the series for China with a series used in the Branstetter study that captures the gradual trade liberalization in China over the last two decades: 1 minus tariff revenue as a fraction of import revenue. We view this series as providing us with an upper bound on the effects of trade liberalization in China on growth. Although we do not report the results in detail, we find that the trade liberalization variable is very significant. Because China is relatively open, trade openness now contributes significantly to excess growth, but on average never much more than 50 basis points per year.

#### POLITICAL RISK AND GROWTH

To examine the role of political risk for consumption and GDP growth, we reestimate our benchmark regressions, adding six different specifications for the political risk variable: overall political risk; political conditions; quality of institutions; socioeconomic conditions; conflict; and the investment profile subcomponent. A higher rating means a lower level of risk. There are 36 coefficients estimated (consumption and GDP growth for three openness measures and six political risk specifications). Although detailed results are available upon request, we note that the coefficients on the political risk measures are positive in 35 of 36 cases, more than one standard error from zero in 34 of 36 cases, and more than two standard errors from zero in 28 of 36 regressions. Overall political risk is a significant predictor of relative growth and generally diminishes the importance of the financial openness variables.

Table 4.5 reports the coefficients on the political risk variables and the growth decomposition for consumption growth. We focus on the equity market liberalization and capital account openness specifications. Examining the political risk indicators separately, we find that political conditions enter the capital account openness regressions with a coefficient that is three standard errors from zero. While the coefficient on the openness variables decreases somewhat (not reported), it is still

**Table 4.5** Decomposing the Growth Predictability and Political Risk: Annual Average Real Consumption and GDP Growth in Excess of the World (five-year horizon), 1980–2003

Panel A Official Equity Market Liberalization							
Coefficient Estimate Standard Error	Political Risk (composite)		Political Conditions		Quality of Institutions		
	0.040 0.012		0.008 0.006		0.014 0.007		
	Predicted Excess Growth		Predicted Excess Growth		Predicted Excess Growth		
	Total	Contribution	Total	Contribution	Total	Contribution	
Excess Consumption Growth (5-year)							
Developed Countries	0.495%	0.602%	0.863%	0.600%	0.555%	0.469%	
Developing Countries	−0.614%	−0.559%	−0.279%	−0.451%	−0.500%	−0.152%	
Africa	−1.312%	−1.235%	−0.352%	−1.186%	−1.201%	−0.159%	
Asia	1.300%	0.444%	0.036%	0.507%	0.479%	0.020%	
Latin America	−1.050%	−0.389%	−0.270%	−0.191%	−0.300%	−0.182%	
China	5.950%	2.105%	0.165%	1.749%	−0.099%	−0.035%	
Investment Profile							
					0.046		
					0.009		
Socioeconomic Conditions							
	0.051		0.013				
	0.010		0.008				
Conflict							
Investment Profile							
Predicted Excess Growth							
Predicted Excess Growth							
Predicted Excess Growth							
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Predicted Excess Growth							

(continued)

Table 4.5 continued

Panel B  
Capital Account Openness (Quinn)

Coefficient Estimate Standard Error	Political Risk (composite)		Political Conditions		Quality of Institutions	
	0.043 0.012		0.018 0.006		0.021 0.007	
	Predicted Excess Growth		Predicted Excess Growth		Predicted Excess Growth	
Developed Countries Developing Countries Africa Asia Latin America China	Excess Consumption Growth (5-year)		Contribution		Contribution	
	Total	Contribution	Total	Contribution	Total	Contribution
	0.495%	0.930%	1.194%	0.591%	1.069%	0.685%
	-0.614%	-0.301%	-0.261%	-0.191%	-0.361%	-0.221%
	-1.312%	-0.379%	-1.116%	-0.266%	-1.158%	-0.232%
1.300%	0.039%	1.147%	0.105%	1.051%	0.029%	
-1.050%	-0.291%	-0.093%	-0.188%	-0.233%	-0.266%	
5.950%	3.317%	0.178%	3.096%	0.228%	3.193%	-0.052%
Coefficient Estimate Standard Error	Socioeconomic Conditions		Conflict		Investment Profile	
	0.044 0.010		0.013 0.007		0.038 0.009	
	Predicted Excess Growth		Predicted Excess Growth		Predicted Excess Growth	
Developed Countries Developing Countries Africa Asia Latin America China	Total	Contribution	Total	Contribution	Total	Contribution
	0.980%	0.557%	1.191%	0.241%	0.912%	0.407%
	-0.453%	-0.180%	-0.223%	-0.078%	-0.366%	-0.131%
	-1.225%	-0.192%	-1.138%	-0.133%	-1.185%	-0.172%
	0.963%	0.145%	1.172%	-0.012%	0.961%	0.090%
-0.419%	-0.345%	0.047%	-0.018%	-0.283%	-0.263%	
3.086%	0.310%	3.373%	0.076%	3.383%	0.539%	

This table reports the decomposition of the regressions, where the dependent variable is the overlapping five-year average growth rate of real per capita consumption in excess of the corresponding world growth rate. The regressions have the same controls as employed in table 4.4, but add separately one-by-one Political Risk, Political Conditions, Quality of Institutions, Socioeconomic Conditions, Conflict, and Investment Profile indices. For each case, we report the associated prediction for total excess consumption growth and the contribution from the added variable (along with the estimate coefficient and standard error for the added variable). This table shows the case for the official equity liberalization indicator (panel A) covering 86 countries and capital account openness (Quinn) (panel B) covering 72 countries. The values are reported for several country groups: developed, developing, Africa, Asia, and Latin America (as described by the World Bank). We also report the associated numbers for China, including the comparison of predicted growth across the sample from 1980 to 2003.

large in value and highly significant. The political conditions variable does not play a significant role in the equity market liberalization/openness regressions. The quality of institutions variable plays a key role in each of the six regressions; being highly statistically significantly different from zero in every case. The magnitude of the openness variable is decreased when institutions are included in the regression. However, the equity market liberalization variable remains significant for the consumption growth specification, and capital account openness remains highly significant in both regressions. It is conceivable that the liberalization effect and the quality of institutions effect are correlated. Bekaert, Harvey, and Lundblad (2006b) document the notion that countries that liberalize their capital markets tend to be countries with high-quality institutions.

The results are stronger for socioeconomic conditions than for the quality of institutions variables. On average, the coefficients on this political risk indicator are close to 5.5 standard errors from zero. In this case, the equity market openness variables are no longer significant at standard levels. However, the capital account openness variable remains economically and statistically significant. The conflict variable is close to two standard errors from zero in each of the equity market liberalization/openness regressions; it is almost four standard errors from zero in the GDP growth specification with capital account openness. The coefficients on the openness variable are relatively less affected when this political risk variable is used.

The final columns look at one important subcomponent of the political risk variable: investment profile. Investment profile assesses the risk of expropriation or contract viability, payment delays, and the ease with which profits can be repatriated. It is therefore a very important determinant of foreign (direct) investment and may be most closely associated with our openness measures. Moreover, China scores relatively well on this indicator. In all six regressions, the coefficient is significant, averaging 5.3 standard errors from zero.

Most of table 4.5 is devoted to the economic impact of the five subindices of political risk (as well as the composite) in explaining excess consumption growth in each region, as well as China. This table allows us to identify the political risk factors that make the largest growth contributions for China. The first panel examines equity market liberalization and suggests that socioeconomic conditions plays the most important role of all of the subcomponent measures, contributing 0.358 percent to the 2.006

percent excess growth prediction. A similar result can be found for capital account openness. Socioeconomic conditions contribute 0.310 percent of the predicted 3.086 percent excess consumption growth. The investment profile subcomponent accounts for 0.65 percent of 2.38 percent predicted growth in the case of the equity market liberalization and 0.54 percent of 3.38 percent predicted in the capital account openness regression. Poor political conditions subtract 0.23 percent of the predicted growth in the capital account specification. Thus, China's economic growth potential benefits from policies that create an attractive climate for foreign investment and good socioeconomic conditions, but its poor political conditions and relative lack of high-quality governmental institutions are growth detractors.

#### OTHER GROWTH DETERMINANTS

In this section, we investigate other potentially important determinants of growth, including state ownership of assets, the existence of a high-quality social security system, and stock market development. Table 4.6 contains a summary of the results.

The first panel focuses on state ownership. Although it was difficult to find a direct indicator, we obtained the political risk indicators from Business Environment Risk Intelligence (BERI). They include a measure of the degree of privatization in the 44 countries the service follows, which includes China. BERI also assesses the quality of the credit market (which includes both long- and short-term credit as well as the availability of venture capital), and we use that measure as an alternative financial development market indicator. Recall that China scores rather highly on private credit to GDP, whereas most China experts rate the Chinese banking sector as highly inefficient. In the BERI data, China's credit market score is below average. BERI also has a measure for the legal framework for remittance and repatriation that is likely very correlated with financial openness, and we use it to replace our standard financial openness measure.

The results reveal that our standard growth determinants are rather robust to the inclusion of these new variables, except for the coefficient on trade to GDP, which is no longer significantly different from zero. The coefficient on the Privatization measure is significantly different from zero for both the consumption and GDP growth regressions and provides a substantial negative contribution to Chinese excess consumption growth

**Table 4.6** Other Growth Determinants: Privatization, Financial Development, and Financial Openness Annual Average Real Consumption and GDP Growth in Excess of the World (five-year horizon), 1980–2003

44 countries	Consumption Growth			GDP Growth			Predicted Excess Consumption Growth				
	Estimate	Standard Error	Estimate	Standard Error							
Constant	−0.0096	0.0024	−0.0098	0.0012			Actual Growth	Total	Privatization	Credit Market	Openness
Initial GDP	−0.0161	0.0016	−0.0215	0.0010		Developed Countries	0.561%	0.411%	0.327%	0.081%	0.341%
Secondary School	0.0080	0.0044	0.0148	0.0053		Developing Countries	−0.034%	−0.647%	−0.130%	−0.040%	−0.187%
Log(Life Expectancy)	0.1408	0.0162	0.1644	0.0151		Africa	−1.147%	−1.706%	−0.082%	−0.024%	−0.183%
Population Growth	−0.4124	0.1142	−0.5434	0.1308		Asia	1.623%	1.198%	0.061%	0.013%	0.148%
Trade/GDP	−0.0028	0.0024	0.0011	0.0023		Latin America	−0.729%	−0.268%	−0.170%	−0.074%	−0.330%
Privatization (BERI)	0.0213	0.0109	0.0353	0.0062		China	5.950%	3.318%	0.328%	−0.033%	−0.285%
Credit Market (BERI)	0.0045	0.0098	−0.0001	0.0081							
Openness (BERI)	0.0196	0.0046	0.0184	0.0045							
R <sup>2</sup>	0.247			0.352							

(continued)

Table 4.6 continued

53 countries	Consumption Growth		GDP Growth		Predicted Excess Consumption Growth		
	Estimate	Standard Error	Estimate	Standard Error	Actual Growth	Total	Social Security Contribution
Constant	-0.0058	0.0021	-0.0031	0.0020	0.522%	1.487%	0.858%
Initial GDP	-0.0165	0.0010	-0.0180	0.0010	0.100%	-0.446%	-0.440%
Secondary School	0.0132	0.0039	0.0154	0.0039			
Log(Life Expectancy)	0.1185	0.0108	0.1136	0.0148			
Population Growth	-0.3942	0.1179	-0.3707	0.1222			
Trade/GDP	-0.0031	0.0022	0.0027	0.0017			
Private Credit/GDP	0.0092	0.0025	0.0118	0.0026			
Financial Openness (Quinn)	0.0158	0.0033	0.0174	0.0036			
<b>Social Security</b>	<b>0.0151</b>	<b>0.0032</b>	<b>0.0189</b>	<b>0.0039</b>	<b>5.950%</b>	<b>5.041%</b>	<b>0.706%</b>
R <sup>2</sup>	0.210		0.226				

51 countries	Consumption Growth		GDP Growth		Predicted Excess Consumption Growth		
	Estimate	Standard Error	Estimate	Standard Error	Actual Growth	Total	Mcap Contribution
Constant	-0.0061	0.0021	-0.0049	0.0018			
Initial GDP	-0.0165	0.0011	-0.0191	0.0012	0.522%	0.475%	0.435%
Secondary School	0.0150	0.0041	0.0184	0.0045			
					Developed Countries		
Log(Life Expectancy)	0.1156	0.0138	0.1262	0.0139			
Population Growth	-0.4488	0.1464	-0.4466	0.1348			
Trade/GDP	-0.0078	0.0023	-0.0043	0.0020			
Private Credit/GDP	0.0044	0.0031	0.0056	0.0030			
Financial Openness (Quinn)	0.0218	0.0039	0.0259	0.0040			
<b>Mcap</b>	<b>0.0027</b>	<b>0.0031</b>	<b>0.0034</b>	<b>0.0028</b>			
R <sup>2</sup>	0.230		0.280				
					Developing Countries		
					Africa		
					Asia		
					Latin America		
					<b>China</b>	<b>3.753%</b>	<b>-0.664%</b>

(continued)



Table 4.6 continued

51 countries	Consumption Growth		GDP Growth		Predicted Excess Consumption Growth		
	Estimate	Standard Error	Estimate	Standard Error	Actual Growth	Total	Turnover Contribution
Constant	-0.0062	0.0018	-0.0051	0.0015			
Initial GDP	-0.0162	0.0011	-0.0188	0.0014	0.522%	0.444%	0.228%
Secondary School	0.0150	0.0039	0.0187	0.0041	0.045%	-0.185%	-0.147%
Log(Life Expectancy)	0.1110	0.0141	0.1209	0.0144	-1.029%	-1.520%	-0.522%
Population Growth	-0.4005	0.1250	-0.3748	0.1195	1.435%	1.473%	0.244%
Trade/GDP	-0.0061	0.0025	-0.0022	0.0021	-0.573%	0.166%	-0.279%
Private Credit/GDP	0.0041	0.0022	0.0053	0.0021	5.950%	4.888%	0.847%
Financial Openness (Quinn)	0.0208	0.0039	0.0251	0.0043			
Turnover	0.0113	0.0025	0.0135	0.0030			
R <sup>2</sup>	0.252		0.313				

The dependent variable is the overlapping five-year average growth rate of either real per capita consumption or GDP in excess of the corresponding world growth rate. Initial GDP is the log real per capita GDP level updated every five years (1980, 1985, 1990, 2000). Secondary School is the enrollment percentage for that level; Log(Life Expectancy) is the log life expectancy of the total population; Population Growth is the growth rate of total population; Trade/GDP is the ratio of export plus imports to GDP; Private Credit/GDP is the ratio of private credit to GDP. The control variables are all in excess of the world. The first regression includes three indices reflecting the level of privatization, credit market quality, and financial openness provided by BERI. The second regression includes an index of the quality of the social security system. The last two regressions also include measures of equity market size (MCAP/GDP) and equity market turnover (Turnover). These regressions also include the Quinn capital account openness indicator. Finally, for a collection of geographical regions and China, we report the contribution toward predicted excess consumption growth provided by each of these additional explanatory variables, total predicted excess growth from the regression, and actual excess growth.

(-0.33 percent). The Credit Market variable is economically and statistically unimportant. The Openness measure has a highly significant effect on growth. China scores relatively poorly on this measure, and its contribution to excess growth is negative (0.29 percent). At first glance, this seems inconsistent with the effect Investment Profile had in the previous section, but the set of countries is different here and China's record on financial openness is indeed mixed.

All of the other panels use the standard regression (with private credit to GDP and capital account openness), but the number of countries is reduced substantially. The second panel includes a social security measure due to Botero et al. (2004). While China scores relatively high on this measure, Allen, Qian, and Qian (2005) point out some important caveats. Clearly, social security is a very important growth determinant, and according to the official numbers, having a high-quality social security system contributes 0.71 percent to Chinese excess growth. Financial openness remains important, but the significance of trade openness is severely diminished. In this regression, the predicted Chinese excess growth reaches 5.04 percent, significantly reducing unexplained growth.

Panels 3 and 4 of table 4.6 focus on stock market development, reducing our set of countries to 51. As we indicated before, measuring China's stock market development is problematic. It scores very high on the standard turnover measure but rather low on the size of the equity market (market capitalization to GDP measure). The latter number may be closer to the truth. Unfortunately, for our panel of countries the turnover measure is a much more significant predictor of growth. The regression with turnover leads to a very high-predicted excess growth for China (4.89 percent) with turnover contributing 0.85 percent. For the other regions, relative stock market development is important as well. The financial openness measure remains a very important predictor of growth.

While the results in table 4.6 suggest that the growth regressions capture the Chinese experience much better than our previous specifications, it is important to note two important caveats. First, a substantial part of the increase in China's predicted economic growth arises from a stronger convergence effect. It is well known that convergence effects are stronger among more homogeneous sets of countries and our smaller data sets here cause the convergence coefficients to more than double in magnitude. Second, although the tables show impressive growth contributions of

China's social security system and stock market turnover rates, we stress again that measurement issues suggest another interpretation. Table 4.6 shows that privatization, financial openness, a good social security system, and stock market development are all important sustainable sources of economic growth; in all these areas, China needs to catch up with the developed world.

### THE CHINA PUZZLE

In the previous sections, standard growth regressions substantially underpredicted the Chinese growth numbers. Once we included institutional features such as social security or turnover (stock market development), China's excess growth was considerably reduced but still close to 1 percent. Unfortunately, China's relative outperformance on these measures is rather suspect, so that the puzzle remains. How can China achieve such extraordinary growth that is not explained by the usual predictors of GDP growth that explain other countries' growth experiences relatively well?

In this section, we explore three possibilities. First, China's asymmetric attitude toward foreign investment, promoting FDI and shunning foreign debt, may have been particularly beneficial. Second, partial state control of investments has led to investment rates that are extraordinarily high (see figure 4.3), and these may not be properly accounted for in our analysis. Third, Chinese economic statistics have met with some serious criticism, and measurement error may drive the Chinese growth puzzle.

### FDI AND FOREIGN DEBT

Table 4.7 includes measures of FDI and foreign debt in our benchmark specification. We take the Foreign Debt Index from ICRG, so that higher values actually indicate less foreign debt. China's foreign debt index is 0.711 over the full sample, which is sharply higher than the 0.519 level for developing countries. Over the last four years, the debt index has climbed to 0.900, while the same measure for developing countries has slightly deteriorated to 0.510. The FDI measure is the sum of inflows and outflows over GDP. We have already noted that relative FDI levels for China are not as elevated as many may suspect and, in fact, are dwarfed by the FDI ratios in developed markets. Table 4.7 shows that the ratio of FDI to GDP

**Table 4-7** The Impact of FDI and Foreign Debt: Annual Average Real Consumption and GDP Growth (five-year horizon), 1980–2003

Capital Account Openness (Quinn, 72 countries)						
Consumption Growth			GDP Growth			
	Estimate	Standard Error	Estimate	Standard Error		
Constant	-0.007861	0.002087	-0.010309	0.001787	Average	
Initial GDP	-0.0109	0.0015	-0.0156	0.0010	Developed Countries	0.850
Secondary School	0.0016	0.0041	0.0149	0.0046	Developing Countries	0.519
Log(Life Expectancy)	0.0785	0.0140	0.0986	0.0122	Africa	0.490
Population Growth	-0.4177	0.1052	-0.4311	0.0865	Asia	0.657
Trade/GDP	0.0022	0.0024	0.0046	0.0020	Latin America	0.501
Private Credit/GDP	0.0018	0.0031	0.0009	0.0023	<b>China</b>	<b>0.711</b>
<b>Foreign Debt Index</b>	<b>0.0381</b>	<b>0.0091</b>	<b>0.0382</b>	<b>0.0077</b>		
<b>Financial Openness</b>	<b>0.0053</b>	<b>0.0044</b>	<b>0.0089</b>	<b>0.0040</b>		
R <sup>2</sup>	0.197		0.330			

Capital Account Openness (Quinn, 49 countries)						
Consumption Growth			GDP Growth			
	Estimate	Standard Error	Estimate	Standard Error		
Constant	-0.009448	0.00245	-0.007559	0.001886	Average	
Initial GDP	-0.0164	0.0011	-0.0191	0.0012	Developed Countries	0.060
Secondary School	0.0107	0.0040	0.0160	0.0044	Developing Countries	0.022
Log(Life Expectancy)	0.1079	0.0146	0.1201	0.0146	Africa	0.016
Population Growth	-0.4439	0.1373	-0.4061	0.1213	Asia	0.031
Private Credit/GDP	0.0023	0.0028	0.0041	0.0024	Latin America	0.026
<b>Gross FDI/GDP</b>	<b>0.0541</b>	<b>0.0255</b>	<b>0.0487</b>	<b>0.0199</b>	<b>China</b>	<b>0.030</b>
<b>Foreign Debt Index</b>	<b>0.0256</b>	<b>0.0097</b>	<b>0.0236</b>	<b>0.0085</b>		
<b>Financial Openness</b>	<b>0.0136</b>	<b>0.0048</b>	<b>0.0186</b>	<b>0.0051</b>		
R <sup>2</sup>	0.239		0.293			

(continued)

**Table 4.7** continued

	Excess Consumption Growth (5-year)	Initial GDP	Secondary School	Log(Life Expect)	Population Growth	Private Credit/GDP	Gross FDI/GDP	Foreign Debt Index	Capital Account Openness (Quinn)	Predicted Excess Growth
Developed Countries	0.522%	-2.402%	0.487%	1.775%	0.421%	0.096%	0.157%	0.663%	0.404%	0.655%
Developed Countries	0.045%	1.624%	-0.014%	0.014%	-0.170%	-0.027%	-0.050%	-0.091%	-0.169%	0.173%
Africa	-1.029%	2.105%	-0.084%	-0.967%	-0.490%	-0.039%	-0.072%	-0.222%	-0.252%	-0.966%
Asia	1.435%	1.386%	0.075%	0.461%	-0.049%	0.040%	0.005%	0.146%	-0.049%	1.070%
Latin America	-0.573%	0.224%	0.000%	0.854%	-0.105%	-0.036%	-0.019%	-0.039%	-0.100%	-0.166%
<b>China</b>	<b>5.950%</b>	<b>4.072%</b>	<b>-0.060%</b>	<b>0.621%</b>	<b>0.151%</b>	<b>0.109%</b>	<b>-0.005%</b>	<b>0.260%</b>	<b>0.062%</b>	<b>4.264%</b>
<b>Temporal Dimension</b>										
<b>China—1980</b>		<b>5.148%</b>	<b>-0.069%</b>	<b>0.687%</b>	<b>0.214%</b>	<b>-0.061%</b>	<b>-0.061%</b>	<b>0.211%</b>	<b>-0.694%</b>	<b>4.432%</b>
<b>China—2003</b>		<b>2.966%</b>	<b>-0.036%</b>	<b>0.619%</b>	<b>0.225%</b>	<b>-0.012%</b>	<b>-0.065%</b>	<b>0.834%</b>	<b>-0.475%</b>	<b>3.110%</b>

The dependent variable is the overlapping five-year average growth rate of either real per capita consumption or GDP in excess of the corresponding world growth rate. Initial GDP is the log real per capita GDP level updated every five years (1980, 1985, 1990, 2000). Secondary School is the enrollment percentage for that level; Log(Life Expectancy) is the log life expectancy of the total population; Population Growth is the growth rate of total population; Trade/GDP is the ratio of export plus imports to GDP; Private Credit/GDP is the ratio of private credit to GDP. The control variables are all in excess of the world. The first regression includes an index reflecting the reliance on foreign debt. The second regression includes the foreign debt index and the gross level of foreign direct investment relative to GDP. These regressions also include the Quinn capital account openness indicator. We report a geographical breakdown of the Foreign Debt Index and the ratio of gross FDI to GDP. Finally, for a collection of geographical regions and China, we report the growth decomposition detailing the contribution of each variable toward predicted excess growth.

is only 0.03 in China over the full sample compared to a ratio of 0.06 for developed countries. In the last four years, the Chinese ratio has increased to 0.046. However, during the same period, the ratio for developed countries jumped to 0.134. Adding these two measures reduces our sample to 49 countries.

Table 4.7 shows that both measures have the expected effects on growth and that both coefficients are significantly different from zero. Interestingly, capital account openness remains significant by itself, even though it may have some correlation with the new variable. The growth decomposition shows that FDI was relatively unimportant for China's growth experience but the lack of foreign debt did provide a positive growth contribution of 0.265 percent on average. Total predicted excess growth increases to 4.264 percent, and most of its value is driven by the convergence effect. Hence, China's special foreign investment policy does not account for its growth miracle.

#### DOMESTIC INVESTMENT

Another possibility is that China has simply invested much more capital than other countries, and this is not directly reflected in our base specification. Table 4.8 reports some statistics on average GDP and consumption growth, the investment to GDP ratio, capital stock growth, and factor productivity. We will return to the analysis of factor productivity growth and the Young corrections later, but first we will focus on China's investment expenditures.

Both in terms of investment growth and investment to GDP, China is clearly an outlier. It is important to investigate how much these extraordinary levels of investment have contributed to growth because it is likely that they are not sustainable in the long run. For a country to really catch up with the developed world and increase GDP per capita levels, it is important to bring factor productivity levels up to developed country levels (see the discussion in Gourinchas and Jeanne 2004).

In Table 4.9, we attempt to measure how much the very high investment levels in China have contributed to growth by including investment/GDP as an explanatory variable in the regression (again in excess of the world average). We suspect that this component of growth will gradually disappear; instead China must improve institutions, financial development,

and the capital allocation process to enhance factor productivity and thus sustain its growth miracle. The investment/GDP coefficient is more than two standard errors away from zero in all of the excess consumption and GDP growth regressions. However, inclusion of this variable does not completely resolve the problem of a large growth residual. For instance, for the equity market liberalization regression, the predicted excess consumption growth rate increases from 1.774 to 2.084 percent. Across all three openness specifications, the investment to GDP ratio comprises approximately 40 percent of the total predicted excess consumption growth. We conclude that China's extraordinary investment levels can only explain part of the Chinese growth miracle. As an important side note, financial openness remains significant in the presence of investment to GDP. This indirectly suggests that the growth effect of capital market liberalization does not work only through an investment channel but that it may help increase factor productivity.

#### MEASUREMENT ERROR

In a series of papers, Young (1994, 1995) critically assessed the growth experience of the New Industrializing Countries in Southeast Asia, finding that

**Table 4.8** Growth, Investment, and Total Factor Productivity

	GDP Growth	Consumption Growth	Investment/ GDP	Capital Stock Growth	Total Factor Productivity Growth
Developed Countries	0.020	0.019	0.225	0.021	0.014
Developing Countries	0.009	0.009	0.216	0.019	0.003
Africa	0.003	0.003	0.204	0.012	-0.001
Asia	0.030	0.029	0.260	0.042	0.018
Asia (Young adjusted)					0.017
Latin America	0.001	0.003	0.203	0.015	-0.004
<b>China</b>	<b>0.078</b>	<b>0.070</b>	<b>0.375</b>	<b>0.087</b>	<b>0.052</b>
<b>China (Young adjusted)</b>	<b>0.051</b>	<b>0.061</b>		<b>0.079</b>	<b>0.020</b>

We explore averages of real per capita GDP growth (U.S. \$), real per capita consumption growth (U.S. \$), the investment/GDP ratio, capital stock growth, and total factor productivity growth. The averages are reported for several country groups: developed, developing, Africa, Asia, and Latin America (as described by the World Bank). We also report the associated numbers for China, both official and Young (2003) adjusted data.

**Table 4-9** Growth Predictability Including Investment: Annual Average Real Consumption and GDP Growth in Excess of the World (five-year horizon), 1980–2003

Panel A:	Official Equity Market Liberalization			Equity Market Openness		
	Consumption Growth		GDP Growth	Consumption Growth		GDP Growth
	Estimate	Standard Error	Estimate	Estimate	Standard Error	Standard Error
Constant	−0.0066	0.0020	−0.0059	−0.0065	0.0022	−0.0063
Initial GDP	−0.0059	0.0016	−0.0102	−0.0060	0.0017	−0.0105
Secondary School	0.0036	0.0038	0.0120	0.0033	0.0039	0.0113
Log(Life Expectancy)	0.0667	0.0130	0.0875	0.0683	0.0134	0.0899
Population Growth	−0.1740	0.0819	−0.2561	−0.1884	0.0807	−0.2578
Trade/GDP	0.0037	0.0024	0.0049	0.0036	0.0025	0.0053
Private Credit/GDP	0.0001	0.0031	0.0026	0.0001	0.0031	0.0024
Investment/GDP	0.0546	0.0178	0.0334	0.0575	0.0177	0.0358
Financial Openness	0.0061	0.0020	0.0056	0.0053	0.0023	0.0064
R <sup>2</sup>	0.154		0.233	0.152		0.233

Panel A:	Capital Account Openness (Quinn)		
	Consumption Growth		GDP Growth
	Estimate	Standard Error	Standard Error
Constant	−0.0057	0.0017	−0.0073
Initial GDP	−0.0089	0.0014	−0.0140
Secondary School	0.0085	0.0043	0.0197
Log(Life Expectancy)	0.0666	0.0152	0.0882
Population Growth	−0.3811	0.0907	−0.4679
Trade/GDP	0.0002	0.0020	0.0029
Private Credit/GDP	0.0020	0.0029	0.0029
Investment/GDP	0.0803	0.0222	0.0547
Financial Openness	0.0150	0.0035	0.0199
R <sup>2</sup>	0.183		0.293

(continued)



Table 4.9 continued

Panel B:

	Predicted Excess Growth		Predicted Excess Growth		Predicted Excess Growth	
	Total	Contribution	Total	Contribution	Total	Contribution
Developed Countries	0.307%	0.000%	0.136%	0.000%	0.453%	0.000%
Developing Countries	-0.566%	-0.055%	-0.531%	-0.058%	-0.471%	-0.081%
Africa	-1.264%	-0.113%	-1.204%	-0.119%	-1.254%	-0.167%
Asia	0.455%	0.182%	0.338%	0.191%	0.698%	0.267%
Latin America	-0.335%	-0.127%	-0.276%	-0.133%	-0.218%	-0.186%
<b>China</b>	<b>2.084%</b>	<b>0.787%</b>	<b>1.950%</b>	<b>0.829%</b>	<b>2.968%</b>	<b>1.156%</b>

In panel A, the dependent variable is the overlapping five-year average growth rate of either real per capita consumption or GDP in excess of the corresponding world growth rate. Initial GDP is the log real per capita GDP level updated every five years (1980, 1985, 1990, 2000). Secondary School is the enrollment percentage for that level; Log(Life Expectancy) is the log life expectancy of the total population; Population Growth is the growth rate of total population; Trade/GDP is the ratio of export plus imports to GDP; Private Credit/GDP is the ratio of private credit to GDP; and Investment/GDP represented the ratio of Investment to GDP. The control variables are all in excess of the world. We report the coefficient on one of three openness indicators (also in excess of the world): the Official Equity Liberalization indicator that takes a value of one when the equity market is liberalized; the Equity Liberalization Intensity measure is the ratio of IFC Investables to Global market capitalization; or the Capital Account Liberalization (Quinn) indicator that takes a value between 0 and 1 depending on the intensity of the reported capital account restrictions. The first two sets of regressions include 96 countries, whereas the last includes 77 countries.

Panel B reports the decomposition of the consumption growth regressions in panel A, where the dependent variable is the overlapping five-year average growth rate of real per capita consumption in excess of the corresponding world growth rate. The values are reported for several country groups: developed, developing, Africa, Asia, and Latin America (as described by the World Bank). We also report the associated numbers for China. Each entry shows the average for that country group multiplied by the coefficient reported in panel A. All standard errors provide a correction for the overlapping nature of the data.

careful measurement of inputs makes their growth experience less extraordinary. It is striking that in our tables, Asia as a whole is still an outlier as well. Therefore, we estimated our benchmark specification with regional dummy variables (Africa, Asia, Europe, North America, and South America). This impacts the significance of some of our variables in the three specifications. However, many of the same results hold. For example, the openness variable is always positive but not significantly different from zero in the official liberalization or equity openness regressions. Similar to the results without regional dummies, the capital account openness variable is significant and economically large in size (137 basis points for consumption growth and 202 basis points for GDP growth). The openness indicator in the GDP regression is more than six standard errors from zero. These results are available on request. More importantly, the Asia regional dummy is plus 50 basis points, but this does little to better explain either the Asian or Chinese growth experience. However, there are very concrete indications of problems with Chinese statistics.

Young (2003) argues that the official government statistics in China have two relevant biases: a price deflation bias and growth in the labor force that outstrips population growth. We provide a robustness analysis of our standard growth regressions that implements the Young adjustment. GDP growth is scaled down by 1.8 percent to reflect the price adjustment and 0 percent to capture the growth in the labor force and increased labor participation. With data from 1980 to 2003, the official GDP growth rate averages 7.84 percent per year. The Young adjusted data show a growth rate of 5.14 percent. Such an adjustment substantially reduces excess GDP growth.

Young (2003) argues that consumption growth rates suffer substantially less from the price deflation bias. Consequently, we only adjust consumption growth by 0.9 percent, the labor force adjustment. We report the corrected numbers in table 4.8.

Table 4.10 investigates whether the Young adjustments to consumption and GDP growth affect the ability of the growth regressions to explain China's growth experience. In an effort to maximize explanatory power, we augment our benchmark specification with the composite political risk measure and investment to GDP. The private credit to GDP measure we use is adjusted for state ownership. When we run this specification, trade to GDP is no longer significant and has the wrong sign. We therefore

remove it from the specification reported in table 4.10. We use capital account openness as the financial openness measure.

The results largely confirm the results in previous tables in the consumption growth regressions, but for GDP growth, private credit to GDP is now significantly positive, whereas the investment to GDP ratio no longer is. When we perform the growth decomposition for consumption growth, we still find unexplained excess growth close to 2 percent, but several variables have a nonnegligible effect on Chinese excess growth, including life expectancy, population growth, investment to GDP, and political risk. The lack of full financial openness is the largest growth detractor. Table 4.10 also reports a decomposition for GDP growth, with the surprising result that China's excess growth is now fully accounted for. Although this result undoubtedly confirms that measurement issues are of first-order importance, we must caution again that the convergence effect is the main contribution. This implies that Chinese growth is explained "on average"

**Table 4.10a** Growth Predictability (Young adjusted Chinese GDP data): Annual Average Real GDP Growth in Excess of the World (five-year horizon), 63 Countries, 1980–2003

A. Benchmark regression

	Consumption Growth		GDP Growth	
	Estimate	Standard Error	Estimate	Standard Error
Constant	−0.0069	0.0015	−0.0101	0.0016
Initial GDP	−0.0100	0.0017	−0.0165	0.0016
Secondary School	0.0042	0.0048	0.0159	0.0050
Log(Life Expectancy)	0.0645	0.0173	0.0996	0.0166
Population Growth	−0.6341	0.1180	−0.5657	0.1096
Private Credit/GDP (adjusted)	0.0005	0.0026	0.0049	0.0022
Investment/GDP	0.0643	0.0208	0.0143	0.0243
Political Risk (composite)	0.0217	0.0109	0.0332	0.0089
Financial Openness (Quinn)	0.0070	0.0037	0.0119	0.0038
R <sup>2</sup>	0.189		0.278	

The dependent variable is the overlapping five-year average growth rate of either real per capita consumption or GDP in excess of the corresponding world growth rate. Per capita consumption and GDP growth for China are adjusted following Young (2003). Initial GDP is the log real per capita GDP level updated every five years (1980, 1985, 1990, 2000). Secondary School is the enrollment percentage for that level; Log(Life Expectancy) is the log life expectancy of the total population; Population Growth is the growth rate of total population; Private Credit/GDP (adjusted) is the ratio of private credit to GDP adjusted for state ownership; Investment/GDP represented the ratio of Investment to GDP; and Political Risk is the ICRG composite political risk index. The control variables are all in excess of the world. We also report the coefficient on the Capital Account Openness (Quinn) indicator that takes a value between 0 and 1 (also in excess of the world) depending on the intensity of the reported capital account restrictions. All standard errors provide a correction for the overlapping nature of the data.

**Table 4.10b** Growth Predictability (Young adjusted Chinese GDP data): Annual Average Real GDP Growth in Excess of the World (five-year horizon), 63 countries, 1980–2003

<b>B. Growth Decomposition</b>		Excess Growth (5-year) (Young Adjusted)	Initial GDP	Secondary School	Log(Life Expectancy)	Population Growth	Private Credit/GDP (adjusted)	Investment/ GDP	Pol (Political Risk- composite)	Openness (Capital Account- Quinn)	Predicted Excess Growth
Developed Countries		0.495%	-1.479%	0.193%	1.060%	0.581%	0.017%	0.000%	0.468%	0.192%	0.345%
Developing Countries		-0.294%	1.334%	-0.046%	-0.484%	-0.397%	-0.008%	-0.065%	-0.151%	-0.072%	-0.577%
Africa		-1.292%	1.722%	-0.088%	-1.149%	-0.719%	-0.005%	-0.137%	-0.189%	-0.103%	-1.356%
Asia		1.489%	0.994%	0.020%	0.179%	-0.078%	0.005%	0.218%	0.018%	-0.045%	0.622%
Latin America		-0.813%	0.708%	-0.026%	0.164%	-0.266%	-0.012%	-0.148%	-0.144%	-0.008%	-0.420%
<b>China</b>		<b>5.051%</b>	<b>2.594%</b>	<b>-0.027%</b>	<b>0.380%</b>	<b>0.187%</b>	<b>-0.018%</b>	<b>0.907%</b>	<b>0.090%</b>	<b>-0.157%</b>	<b>3.265%</b>
<b>Temporal Dimension</b>											
China—1980			3.145%	-0.027%	0.410%	0.306%	-0.013%	0.657%	0.206%	-0.359%	3.636%
China—2003			1.812%	-0.014%	0.370%	0.321%	-0.024%	1.267%	-0.022%	-0.246%	2.797%
<b>GDP</b>											
Developed Countries		0.760%	-2.436%	0.728%	1.637%	0.518%	0.156%	0.000%	0.715%	0.325%	0.638%
Developing Countries		-0.180%	2.198%	-0.172%	-0.748%	-0.354%	-0.071%	-0.014%	-0.231%	-0.122%	-0.520%
Africa		-1.292%	2.837%	-0.330%	-1.774%	-0.642%	-0.050%	-0.030%	-0.289%	-0.173%	-1.456%
Asia		1.786%	1.637%	0.076%	0.276%	-0.070%	0.048%	0.048%	0.028%	-0.076%	0.962%
Latin America		-0.826%	1.167%	-0.098%	0.254%	-0.237%	-0.106%	-0.033%	-0.220%	-0.013%	-0.293%
<b>China</b>		<b>3.965%</b>	<b>4.273%</b>	<b>-0.102%</b>	<b>0.587%</b>	<b>0.166%</b>	<b>-0.166%</b>	<b>0.202%</b>	<b>0.137%</b>	<b>-0.265%</b>	<b>3.826%</b>
<b>Temporal Dimension</b>											
China—1980			5.181%	-0.102%	0.634%	0.273%	-0.115%	0.146%	0.314%	-0.607%	5.035%
China—2003			2.985%	-0.054%	0.571%	0.286%	-0.217%	0.282%	-0.033%	-0.416%	2.433%

This table reports the decomposition of the regressions in panel A, where the dependent variable is the overlapping five-year average growth rate of real per capita consumption or GDP in excess of the corresponding world growth rate. Per capita consumption and GDP growth for China are adjusted following Young (2003). The values are reported for several country groups: Developed, Developing, Africa, Asia, and Latin America (as described by the World Bank). We also report the associated numbers for China, including the comparison of predicted growth across the sample from 1980 to 2003. Each entry shows the average for that country group multiplied by the coefficient reported in panel A.

over the sample but that with initial GDP increasing over time, predicted Chinese growth in 2003 is much lower than in 1980.

#### FACTOR PRODUCTIVITY GROWTH

Because of its importance to long-run development, let's return to the factor productivity statistics produced in table 4.8. Factor productivity here is defined in the usual way. We build per capita physical capital stocks over the period from 1980 through 2003 using the method in King and Levine (1993). We derive an initial estimate of the capital stock for 1950, assuming each country is at its steady-state capital-output ratio at that time. Then, we use the aggregate real investment series from the Penn World Tables 6.0 and the perpetual inventory method with a depreciation rate of 7 percent to compute the capital stock in later years. Productivity growth is calculated as the difference between the GDP growth rate and 0.3 times the capital stock growth rate, assuming a capital share of 0.3.

As we can see from the table, developing countries have on average much lower factor productivity growth than developed countries. Again, China is an exception, displaying factor productivity growth in excess of 5 percent per annum. It is almost certain that this does not reflect the true state of affairs. Reports from experts typically mention the existence of a relatively efficient private sector, but a largely inefficient state sector. The factor productivity growth results may arise in a number of ways. First, the assumed capital share ratio of 0.3 may be erroneous for China. In fact, Young (2003) provides alternative (and higher) estimates for China and a number of Southeast Asian countries. Second, the GDP growth numbers may have been overstated, but some reports suggest that for some years official statistics may even understate Chinese growth. Third, investment growth might be understated in the official statistics.

We reestimated factor productivity growth using our data set but making use of the corrections in Young (2003): a decrease in GDP growth with 2.7 percent a decrease in capital growth of 0.9 percent, reflecting the increased labor participation also reflected in GDP growth, and an increased capital share of 0.4. With these corrections, China's factor productivity growth falls to a more mundane 2 percent. Though still high, this may make China less of an outlier. In Bekaert, Harvey, and Lundblad (2006c), we explore the determinants of factor productivity growth. These regressions reveal that the same variables that explain growth also explain factor

productivity growth. Interestingly, that decomposition reveals that the regression explains Chinese factor productivity growth, when the Young adjustments are taken into account. We intend to explore this issue further in future work.

### RESULTS ON GROWTH VOLATILITY

Panel A of table 4.11 reports the results for idiosyncratic growth variability. We focus on consumption growth variability because that is most relevant from a welfare perspective.

The regression shows relatively few significant effects. The level of development, proxied by life expectancy and secondary school enrollment, has a negative effect on variability, and the coefficients are always more than one standard error below zero. High population growth significantly increases variability in each case. These results are consistent with those reported in Bekaert, Harvey, and Lundblad (2006b).

Trade openness significantly increases the variability of idiosyncratic consumption growth. This notion seems consistent with the Rodrik (1998a, 1998b) hypothesis, which conjectures that open countries are more buffeted by international shocks. However, Rodrik suggests that such countries would have large government sectors to help them smooth such shocks. By including the size of the government sector as an independent variable, we control for this effect. Nonetheless, the trade variable retains its significance. Moreover, the larger government sectors increase growth variability.

The equity market liberalization indicator is negative but is only 1.7 standard errors from zero. In contrast, the equity market openness variable is negative and 3.7 standard errors from zero. Although the capital account openness variable is also negative, it is not significantly different from zero. Consequently, having an open capital account does not necessarily lead to more real variability. In contrast, an open equity market is associated with significant lower real variability.

The bottom part of panel A compares actual idiosyncratic volatility (the square root of the average squared residuals) with the model. When we group over various regions, the model clearly gets the absolute and relative magnitudes about right. Because China represents such a big outlier in the regressions, we had to adapt the procedure to compute actual idiosyncratic volatility, subtracting the average residual first. Clearly, the regression slightly overpredicts the variability of Chinese

Table 4.11 Idiosyncratic Volatility Predictability: Annual Real Consumption Squared Growth Residuals, 1980–2003

Panel A: Volatility model estimates

	Official Equity Market Liberalization		Equity Market Openness		Capital Account Openness (Quinn)	
	Estimate	Standard Error	Estimate	Standard Error	Estimate	Standard Error
Constant	0.00076	0.00010	0.00085	0.00011	0.00069	0.00008
Initial GDP	0.00002	0.00006	0.00005	0.00006	0.00008	0.00007
Secondary School	−0.00061	0.00029	−0.00047	0.00030	−0.00050	0.00022
Log(Life Expectancy)	−0.00031	0.00050	−0.00052	0.00049	−0.00149	0.00063
Population Growth	0.01175	0.00510	0.01122	0.00514	0.01416	0.00512
Trade/GDP	0.00048	0.00021	0.00041	0.00022	0.00065	0.00016
Gov/GDP	0.00411	0.00165	0.00412	0.00167	0.00153	0.00126
Private Credit/GDP	0.00017	0.00013	0.00024	0.00014	0.00011	0.00014
Financial Openness	−0.00027	0.00016	−0.00052	0.00015	−0.00008	0.00018
R <sup>2</sup>	0.071		0.074		0.088	

	Observed Growth Volatility (residual)		Predicted Growth Volatility		Observed Growth Volatility (residual)		Predicted Growth Volatility	
	Estimate	Standard Error	Estimate	Standard Error	Estimate	Standard Error	Estimate	Standard Error
Developed Countries	1.292%	2.220%	1.296%	2.230%	1.315%	2.230%	1.315%	2.033%
Developing Countries	3.032%	3.114%	3.038%	3.217%	3.008%	3.143%	3.008%	3.143%
Africa	3.250%	3.526%	3.251%	3.614%	3.253%	3.584%	3.253%	3.584%
Asia	2.506%	2.413%	2.553%	2.548%	2.385%	2.485%	2.385%	2.485%
Latin America	2.777%	2.528%	2.766%	2.614%	2.787%	2.505%	2.787%	2.505%
China	4.743%		4.846%		4.192%		4.192%	
China (mean-adjusted)	1.752%	2.346%	1.783%	2.694%	1.780%		1.780%	1.914%

**Panel B: Variance decomposition: What happens to growth volatility when a variable is omitted**

	Secondary School	Log(Life Expectancy)	Population Growth	Trade/GDP	Gov/GDP	Private Credit/GDP	Openness (Quinn)
Developed Countries	-0.407	-0.478	-0.297	0.334	0.114	0.143	0.005
Developing Countries	0.040	0.091	0.085	0.173	-0.036	-0.017	-0.001
Africa	0.060	0.169	0.120	0.151	0.002	-0.019	-0.001
Asia	-0.027	-0.051	0.025	0.140	-0.120	0.038	-0.001
Latin America	0.036	-0.049	0.090	0.046	-0.139	-0.035	-0.000
China	0.039	-0.132	-0.088	-0.078	-0.124	0.129	-0.004

In panel A, the dependent variable is the squared residual (idiosyncratic volatility) from the associated growth regressions. Initial GDP is the log real per capita GDP level updated every five years (1980, 1985, 1990, 2000). Secondary School is the enrollment percentage for that level; Log(Life Expectancy) is the log life expectancy of the total population; Population Growth is the growth rate of total population; Trade/GDP is the ratio of export plus imports to GDP; Gov/GDP is the ratio of government consumption to GDP; and Private Credit/GDP is the ratio of private credit to GDP. The control variables are all in excess of the world. We report the coefficient on one of three openness indicators (also in excess of the world): the Official Equity Liberalization indicator that takes a value of one when the equity market is liberalized; the Equity Liberalization Intensity measure is the ratio of IFC Investables to Global market capitalization; or the Capital Account Liberalization (Quinn) indicator that takes a value between 0 and 1 depending on the intensity of the reported capital account restrictions. The first two sets of regressions include 96 countries, whereas the last includes 77 countries. We compare the predicted level of growth volatility with the observed residual volatility; for China, we also consider the volatility of the de-measured growth residual. In panel B, we set the coefficient on the particular variable equal to zero. We then report the proportional change in the predicted variance when we set the variable back to its original value, that is, (actual predicted variance–new predicted variance)/(actual predicted variance). This exercise omits initial GDP from the regression.



consumption growth. However, the model does so for the developed countries as well and more dramatically so. Hence, although China has achieved remarkable growth with less variability than expected, the volatility of its growth experience is less puzzling given its economic, political, and financial infrastructure as captured by the regression variables.

Panel B of table 4.11 decomposes the contribution of each regressor to volatility. To do this, we set the coefficient on a particular variable to zero and compute the predicted variance.<sup>3</sup> The numbers reported are the change in the predicted variance from setting the variable back at its actual value relative to the actual predicted variance. For example, if setting life expectancy to zero increases the variance, as it does for developed countries, we report a negative value. The value of  $-0.478$  means that having high life expectancy reduces the variance by 47.8 percent. Before we conduct this exercise, we actually rerun the regression, omitting the initial to GDP variable. The variable is never significant and has a sign that is hard to interpret, likely because it is relatively colinear with life expectancy and secondary school enrollment. For developing countries, the table reveals that secondary school enrollment, life expectancy, and population growth significantly contribute to low real volatility. Interestingly, the effect of external risk, as proxied by the trade sector, is not only statistically but also economically significant. Both profligate governments and a well-developed banking sector still increase real volatility by 10 percent. Although the latter result seems counterintuitive, it is conceivable that countries with a better institutional framework to smooth income shocks can afford to incur more real risk and actually do so. China also receives a relative large contribution to private credit to GDP, but the use of the unadjusted measure makes this result difficult to interpret. Interestingly, what most contributed to China's relatively low variability is its high score on life expectancy. For a typical developing country, life expectancy has a small positive impact on idiosyncratic volatility. China behaves more like developed countries where life expectancy is a negative contributor to idiosyncratic growth volatility. Similarly, the contribution of population growth is negative and reasonably large, whereas the opposite is true for developing countries as a group. Financial openness has negligible effects on volatility.

### HETEROGENEOUS RESPONSES TO FINANCIAL MARKET INTEGRATION

Does the growth and volatility effect from financial openness differ across countries? For example, theories of financial fragility (Furman and Stiglitz 1998) suggest that a good institutional framework is essential to prevent crises. We now consider a menu of characteristics that might affect both the growth and volatility response. We consider variables related to financial development, government-provided insurance, the quality of political institutions, and the investment environment.

Our method for table 4.12 is as follows. In panel A, we focus on the official equity market liberalization variable. In the main regression with control variables, we break up the liberalization indicator variable into three pieces. The first indicator is for countries that are fully liberalized throughout our sample. The second indicator is for liberalizing countries with a lower than median value of the particular characteristic that we are considering. The third indicator is for liberalizing countries with a higher than median value of the characteristic. We also consider the direct effect of the characteristic by adding it to the main regression. By examining the difference between the “from the low level of the variable” and the “from the high level of the variable,” we can determine whether the growth and growth volatility response to a liberalization differs across key characteristics. For all characteristics, “high” is good (high development, low risk) and vice versa. Finally, we report the low versus high separating value and the average value for China.

In panel B of table 4.12, we explore the Quinn measure of capital account openness. Here a liberalizing country (and the date at which it liberalizes) is defined as a country that increases its capital account openness measure by more than 0.25. A fully liberalized country is a country with an openness measure above 0.75 for the full sample. We ignore the few reversals that are observed.

### FINANCIAL DEVELOPMENT

We consider three measures of financial development: size of the banking system, equity market turnover, and size of the equity market.

Countries with more developed banking sectors experience significantly higher consumption growth and lower consumption growth volatility using both measures of openness. The coefficients for countries

**Table 4.12** Do the Growth and Volatility Effects Differ Across Countries? Annual Average Real Excess Consumption Growth (five-year horizon), 1980–2003

	Mean			Volatility			# of Countries	Low versus High Separating Value	China Average Value
	Estimate	Standard Error	Wald Test	Estimate	Standard Error	Wald Test			
<b>Priv/GDP</b>									
Fully Liberalized	0.00291	0.00261		0.00027	0.00014		96	0.36	0.92
Low Value	0.00775	0.00173		−0.00058	0.00009				
High Value	0.00249	0.00326		0.00011	0.00022				
	0.01214	0.00424	4.03**	−0.00044	0.00019	5.66**			
<b>Priv/GDP (adjusted)</b>	0.00129	0.00230		−0.00010	0.00016		67	0.31	0.004
Fully Liberalized	0.00964	0.00146		−0.00028	0.00009				
Low Value	0.00022	0.00235		0.00009	0.00024				
High Value	0.01489	0.00554	7.72***	−0.00030	0.00024	1.22			
<b>Turnover</b>	0.01107	0.00274		0.00010	0.00007		51	0.12	1.48
Fully Liberalized	0.01008	0.00210		−0.00022	0.00007				
Low Value	−0.01106	0.00574		0.00001	0.00019				
High Value	0.00479	0.00422	8.55***	−0.00006	0.00011	0.10			
<b>MCAP/GDP</b>	0.00325	0.00303		−0.00012	0.00009		51	0.13	0.24
Fully Liberalized	0.00968	0.00217		−0.00031	0.00007				
Low Value	−0.00842	0.00468		0.00040	0.00015				
High Value	0.00515	0.00457	8.22***	−0.00031	0.00015	10.25***			



Table 4.12 continued

Panel B: Capital Account Openness (Quinn)

Mean			Volatility			# of Countries	Low versus High Separating Value	China Average Value
Estimate	Standard Error	Wald Test	Estimate	Standard Error	Wald Test			
<b>Priv/GDP</b>						77	0.35	0.92
Fully Liberalized	0.00899	0.00264	0.00015	0.00014				
Low Value	0.00456	0.00129	-0.00018	0.00007				
High Value	-0.00148	0.00540	0.00062	0.00032				
	0.01464	0.00455	-0.00013	0.00026	2.94*			
<b>Priv/GDP (adjusted)</b>	0.00676	0.00201	-0.00013	0.00011		63	0.30	0.004
Fully Liberalized	0.00591	0.00132	-0.00009	0.00005				
Low Value	-0.00701	0.00582	0.00080	0.00026				
High Value	0.02462	0.00430	-0.00048	0.00013	20.11***			
<b>Turnover</b>	0.01108	0.00264	0.00000	0.00007		49	0.22	1.48
Fully Liberalized	0.00455	0.00162	-0.00003	0.00006				
Low Value	0.03273	0.00535	0.00049	0.00032				
High Value	0.02298	0.00418	-0.00004	0.00012	3.51*			
<b>MCAP/GDP</b>	0.00226	0.00314	-0.00014	0.00008		49	0.21	0.24
Fully Liberalized	0.00740	0.00160	-0.00005	0.00006				
Low Value	0.02281	0.00476	0.00050	0.00025				
High Value	0.03077	0.00534	-0.00021	0.00016	10.24***			
<b>Privatization</b>	0.03000	0.00960	0.00003	0.00031		44	0.58	0.44
Fully Liberalized	0.00132	0.00151	0.00002	0.00006				
Low Value	0.00425	0.00621	0.00035	0.00018				
High Value	0.01798	0.00410	0.00002	0.00022	1.60			
<b>Social Security</b>	0.01230	0.00343	-0.00048	0.00017		59	1.98	2.06
Fully Liberalized	0.00514	0.00183	-0.00008	0.00006				
Low Value	0.02505	0.00454	0.00061	0.00025				
High Value	0.00200	0.00486	-0.00008	0.00021	3.45*			



that are lower than median private credit to GDP are not significant for either the growth or volatility regressions. However, high private credit to GDP countries experience increased growth and decreased volatility upon liberalization. The Wald tests indicate that the difference between the two coefficients is statistically significant. As noted earlier, using this standard indicator, we see that China can be placed in the “high” private credit/GDP group of countries, but in reality China’s banking system is underdeveloped. We also rerun the regression using the adjusted private credit measure, which more accurately reflects China’s true banking development. For the equity liberalization regression, the mean interaction effects become much stronger and the volatility effects are weaker. Nevertheless, it remains the case that only countries with a well-developed banking sector derive unambiguously beneficial effects of equity market liberalization. In the case of the capital account openness regression, the adjusted measure leads to even stronger interaction effects than were present for the unadjusted measure.

The results are more mixed for the other two measures of financial development. For the official liberalization indicator, the growth response to liberalization is positive (negative) for high (low) turnover countries and the difference in responses is statistically significant at the 1 percent level; for the capital account openness indicator, the sign is reversed. There is no significant difference in the volatility response using the official liberalization measure, whereas in the capital account openness regression, only high turnover countries experience a modest volatility decrease.

Countries with a high market capitalization to GDP measure experience significantly higher growth than low market capitalization countries after official liberalizations. However, there is no significant difference in the growth effect when we examine the capital account liberalization measure. However, for volatility, both the official equity market and the capital account liberalizations measures produce significantly lower volatility for countries with relatively large stock markets compared to countries with small stock markets.

#### PRIVATIZATION

There is a general perception that an inefficient state sector misallocates capital and that most of the growth in China comes from more or less pri-

vate enterprises. Relaxing state control of the resource allocation process could potentially generate substantial additional growth and improve the efficiency with which foreign funds are allocated. In table 4.12, we use BERI's privatization measure to test whether there are threshold effects for the liberalization effect with respect to this measure. Not surprisingly, China ranks in the bottom half of our country set on the privatization measure. Privatization has a strong and significant direct effect on growth but does not significantly affect volatility. The growth effect of liberalizing countries with a small government sector (high levels of privatization) is 63 basis points, whereas it is minus 61 basis points for countries with low levels of privatization in panel A. The difference is significant at the 10 percent level. The volatility effect of liberalization is more negative for highly privatized countries, but the difference is not significant. The results using capital account liberalization in panel B are qualitatively similar for growth, but volatility in countries with low privatization levels actually increases upon liberalization, whereas it remains unchanged for the highly privatized countries.

#### THE GOVERNMENT AS A PROVIDER OF INSURANCE

Social security systems may be the most important means of smoothing income shocks in most countries, especially for low-income people. The effect of social security is significantly positive for growth and negative for growth volatility. As we discussed, China places somewhat implausibly in the "high" group of countries for social security. Note that our sample here is much smaller and that we do not have panel data on social security. In the consumption growth volatility regression, the coefficient for the higher than median countries is negative in both panels A and B, but only in the capital account openness specification is the difference with the coefficient for countries with poor social security systems statistically significant at the 10 percent level. Hence, there is only weak evidence that social security systems help in realizing the consumption insurance benefits from open capital markets. As to the effects of financial openness on average growth, social security generates adverse effects in the capital account openness regressions. Countries with low levels of social security seem to generate significantly larger liberalization effects. In the official equity market liberalization regression, there are neither significant coefficients nor significant interaction effects.



We also use the size of the government sector as a proxy for the extent of shock insurance through the government. For this variable, China places in the “low” group of countries. We find that countries with higher than median government sectors have a significantly positive consumption growth effect associated with financial openness. Countries with lower than median government sectors also have a positive growth increment, but the coefficient is not significantly different from zero. Although the direct effect of the size of the government sector on volatility remains positive, liberalizing countries with relatively large government sectors experience a decrease in volatility. However, the coefficient is not significantly different from zero. Countries with small government sectors experience small and insignificant volatility increases upon liberalization. Overall, we do not observe significant threshold effects.

#### QUALITY OF POLITICAL INSTITUTIONS

We focus on the components of the ICRG Political Risk Rating that are associated with the quality of political institutions (table 4.2). Acemoglu, Johnson, and Robinson (2002) stress the importance of the institutional environment in explaining cross-country differences in economic development. Our variable includes Corruption, Law and Order, and Bureaucratic Quality. China is slightly above the median value. The own effect of this variable is positive for growth and negative for growth volatility—both being statistically significant in each of the liberalization specifications. In the official equity liberalization specification, both countries with higher and lower than median quality of political institutions, experience positive growth increments associated with financial openness. However, neither coefficient is significantly different from zero. In the capital account liberalization specification, countries that liberalize and have higher quality institutions have significantly higher growth than liberalizing countries with poor institutions.

The volatility specifications provide consistent results. Although some of the coefficients are not significant, liberalizations (both definitions) are associated with higher volatility for countries with poor quality institutions and lower volatility for countries with good quality institutions.

## SOCIOECONOMIC CONDITIONS

The coefficient on our indicator of socioeconomic conditions (government stability, socioeconomic conditions, and investment profile) shows a significant increment to consumption growth in both the official and capital account liberalization specification. However, the liberalization effect for low versus high socioeconomic conditions countries is only significant in the official liberalization specification. The volatility regression yields consistent results across both liberalization specifications. Higher than median socioeconomic conditions are associated with significantly lower consumption growth volatility upon liberalization versus countries with poor socioeconomic conditions which face higher consumption growth volatility. In addition, the difference between the two effects is significant.

## INVESTMENT CLIMATE

Finally, we consider the investment profile (which is a subcomponent of our socioeconomic conditions index) of different countries. China places in the “high” group of countries. The own growth effect of this variable is very substantial in both specifications, being more than five standard errors above zero. In the volatility regressions, the coefficients are negative but only about 1.6 standard errors below zero.

For both lower and higher than median values of investment profile, the coefficients on the liberalization variables are positive but not significantly different from zero. Both volatility regressions indicate significantly different liberalization responses between investment-friendly and investment-unfriendly countries. The Wald statistics are higher for these tests than for any other tests in the two panels in table 4.12. Investment-friendly countries experience significantly lower consumption growth volatility after liberalizations.

Table 4.12 suggests that both the consumption growth and the consumption volatility response to financial openness depends on the particular situation within a country. We measure country heterogeneity by looking at the extent of financial development, the role of the government sector, the quality of institutions, and the investment climate. Although many of the coefficients are not significantly different from zero, viewed together the evidence is supportive of the hypothesis of heterogeneous responses

depending on country characteristics. The responses are consistent with good institutions and financial development generating relatively larger growth and risk-sharing benefits.

## CONCLUSIONS

For some, China has become critical to world economic growth. However, little is known about the sources of its extraordinary economic growth over the last two decades. In this chapter, we use panel data and Barro-type cross-country growth regression to see if we can learn something about the Chinese growth experience. From the perspective of a simple cross-country growth regression, China is a huge outlier with the bulk of its past growth unaccounted for by the standard variables. China also has achieved this remarkable growth with relatively low growth volatility, but this seems less of a puzzle given the experiences of countries with similar institutional, financial, and economic backgrounds. Surprisingly, its trade openness played an insignificant role, even though it continues to put China in the spotlight. Among the key variables in predicted growth for China are the simple convergence effect and life expectancy. We find that avoiding foreign debt was beneficial, but the FDI levels China experienced do not suffice to help explain much excess growth. Once we account for political risk variables, the quality of institutions, social security, and state ownership, the cross-country regressions predictions become closer to the actual growth numbers but still under-predict China's growth.

Interestingly, among the variables that seem important to growth and can be affected by policy (for instance, capital account openness, the quality of political institutions, and state ownership), China performs relatively poorly. Lack of full financial openness is an important growth detractor. Although it may appear that China need not grow any faster than it does right now, this perception is incorrect. China's GDP per capita is still only 26.3 percent of the world average. A large gap still needs to be closed. Moreover, as Young convincingly showed, past growth and factor productivity growth was probably overstated, and we find that the unusually high investment to GDP levels China ran also contributed significantly to its growth. Soon, China will also grapple with the consequences of a rapidly aging population, which will absorb significant resources. Before it does, it must find sustainable sources of growth that raise productivity levels toward those of the Western world and improve the capital

allocation process. We believe that foreign capital can be rather helpful in this endeavor, but our threshold analysis suggests that full capital account convertibility should probably be preceded by a sound institutional framework of a highly financially developed system, less state ownership, attractive socioeconomic conditions, and a favorable investment profile. On the latter two measures, China appears to score favorably relative to other developing countries. On the other measures, China must still implement significant reforms.

In future work, we plan to investigate more closely what factors are most important in ensuring increased factor productivity. It is conceivable that trade and FDI indirectly provided significant contributions to factor productivity (see also Branstetter 2006), and hence, such research may overturn our surprising finding that they played a relatively minor role in China's extraordinary growth.

## NOTES

1. These data do not reflect the revisions implemented by the Chinese government at the end of 2005.
2. The Shanghai Stock Exchange was founded in the 1860s and ceased operations in December 1941.
3. Note that this is equivalent to setting the variable in question at the world average, since variables enter the regression in excess form.

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## COMMENT

**Mary Wadsworth Darby**

Bekaert, Harvey, and Lundbland use Barro-type cross-country empirical growth models<sup>1</sup> and build on standard regression techniques to address the question of what variables explain why China is growing so rapidly.<sup>2</sup> China's real GDP growth over the past 25 years measures nearly 7.8 percent per annum, and consumption growth has averaged 7.0 percent, a performance apparently unmatched by any other developing or developed economy. During a recent visit to the United States, China's premier, Hu Jintao, reportedly asked President Bush whether China should be seen as the new economic model for a developing economy. The chapter's methodology is ideally suited to answering this question, as the framework the authors employ is designed to permit factors identified as contributing to economic growth to be decomposed further into elements that can be related to policy prescriptions.

It is commonly accepted that one of the two key factors driving China's economic success has been its openness to the world economy.<sup>3</sup> The chapter examines the evidence for this hypothesis with great care, treating both trade openness and financial sector openness. Special emphasis is given to studying correlations of both GDP growth and consumption growth with measures of (de jure) openness and how the real effects of these policies are affected by financial developments, political risk, and the quality of institutions.<sup>4</sup> In addition, the contribution of the specified variables to volatility is analyzed with a view to analyzing the implications for policy choices by economic decision makers. The analysis rests on the foundation of the econometric cross-country growth model, which explains growth and volatility for the panel of countries the authors include.

For the panel of countries on which the authors' regressions are based, trade has a robustly positive and significant effect on growth; the



coefficients on the financial development measure are always more than one standard deviation from zero. Capital account openness and equity market openness have robust and significant effects. The chapter uses several key measures of financial openness as regression variables, which are mainly intended to capture the openness of the equity markets to foreign investors and capital account openness. Indirectly related are measures of political unrest and institutional factors connected with the riskiness of foreign investment.

The authors' econometric models show that neither trade openness nor financial openness is a critical determinant of China's performance. A popular misconception about key variables affecting China's growth is that trade sector openness has been an essential engine of Chinese economic growth. There is, in the chapter's terminology, a very large "residual,"<sup>5</sup> which represents idiosyncratic, unpredictable growth. In fact, the residual for China is the largest of all countries in the panel.

The authors show that the trade sector comprises only 35 percent of GDP on average in China compared to 59 percent in all developing countries, with China's sector being even smaller in comparison to the African regional average. Trade openness is positively correlated and makes a significant contribution to excess growth, but on average never more than 50 basis points per year. The chapter also demonstrates that the measures of financial openness used do not seem to correlate particularly well with the measures of China's economic growth or its volatility. The authors seek to correlate growth with two different kinds of measures of financial openness—equity market liberalization and capital account openness. China does not score well under either measure. In terms of the equity markets, there are significant restrictions on foreign ownership of traded A shares.<sup>6</sup> In terms of capital account openness, China was on average less open, using virtually any measure, than both the average developing country and the average Asian country. This partially reflects the fact that the yuan is still largely inconvertible for capital account balances, and there are severe restrictions of outflow of foreign direct investment. Nevertheless, even FDI inflows in relation to GDP are rather moderate compared to those of other countries.<sup>7</sup>

As a practitioner, I can say that the conclusion about the relatively modest contribution of trade and financial openness to the excess growth of China's economy is very surprising. It definitely runs counter to my impressions as someone who has lived and worked in China since 1973, when I made my first trip to China to import Tsingtao beer. Since 1994 I have

been working in the financial industry with Morgan Stanley, living in Hong Kong through 2004. I now travel back and forth to China on business fairly frequently. Over this period, I have had the opportunity to observe first hand the opening of the economy generally and more recently the financial sector in China to foreign investors and foreign investment. There is no doubt in my mind that improvements in “openness” have had a dramatic positive effect on China’s economic growth. Are these impressions simply wrong, or are there other reasons why the regressions of the Bekaert model indicate that openness has made, from an econometric standpoint, little positive contribution to China’s economic growth?

The authors consider three possible explanations as to why the regressions seem to conflict with both the results for the country panels and anecdotal impressions such as mine. The most interesting possibility is that while the single-variable FDI may not itself contribute significantly to excess growth, China’s embrace of FDI in combination with its shunning of foreign debt may have been particularly beneficial. However, decomposing the growth factor analysis showed that, while the lack of foreign debt did provide a positive contribution, most of the value was driven by the convergence effect and hence could not be an explanation of China’s extraordinary performance over the long term.

A second possibility is that measurement error biases the result. Here the authors follow Young, who found significant measurement errors widespread in the assessment of the growth performance of countries in Southeast Asia, the so-called NICs or newly industrialized countries.<sup>8</sup> It would seem to be worthwhile to do a further study of the problems in relation to the data underlying the measures of financial openness used and the econometric model employed. However, it is hardly surprising, given the enormous changes in China’s economy over the period in question, that the data may not entirely capture what is happening in China.

A third possibility is that China’s large capital investment is the primary driver of China’s growth and this fact was not properly reflected in the base specification underlying the econometric model. Apart from its astonishing growth rate, the authors point out that the most extraordinary economic statistic about China is the ratio of investment to GDP. Investment in China in 2003 was 44.3 percent of GDP. This compares with the U.S. investment ratio of 15.2 percent and an average for developing countries of 21.5 percent. The authors point out that this huge investment has been financed largely through domestic savings. Although China has attracted large amounts of FDI, it is by no means the primary

source of funds for capital accumulation in China. It is also an inescapable conclusion that a significant portion of China's growth can be attributed to both the propensity of the Chinese to save and governmental policies favoring savings over consumption. However, even though the investment to GDP coefficient is more than two standard deviations away from zero, the authors conclude that the heavy commitment to investment can account for no more than 40 percent of China's excess growth.

One wishes that the authors had pursued this theme in greater depth, for it raises many important questions. Earlier studies of China's economic growth examined the investment to output ratio, employment growth, and output growth and concluded that, historically, during the period of central planning, up until about 1980, physical investment played the dominant role in China's economic growth and factor productivity contributed less. The heavy emphasis on investment during the period before 1980 is usually attributed to Maoist economic ideology adopted from Soviet planning in the 1950s and 1960s. Perhaps ensuing papers from Bekaert and his co-authors will address the question of why the investment to output ratio has remained so high even though there appear to be declining returns and developed countries have much lower ratios of investment to output.

The authors devote considerable attention to the issue of factor productivity growth. China is an outlier with a factor productivity growth in excess of 5 percent per annum. While the authors conclude that China's higher factor productivity makes a significant positive contribution, they leave the analysis of the determinants of this fact to another paper.

My overall impression is that although the conclusions from the chapter's methodology and its application have produced interesting and important results, it is to be hoped that the authors will further explore some of the secondary linkages between FDI and growth. It is also hoped that they will give more emphasis to the effects of technology transfer on growth, including the adoption and absorption, from and through Sino-foreign joint ventures, of corporate forms of business organization, better management techniques, and improved labor practices, as well as "hard" technology. For every firm in China—or elsewhere—both internal and external factors affect its productivity. Clearly, the manner in which these factors affect firms differs considerably according to the form of business organization and location and probably industry (apparel firms vs. insurance companies for example). As a practitioner, the impact of the policy of financial openness, which has encouraged growth in FDI, appears to

be valuable in leading to new technologies, improvement in production methods, better managerial techniques, and better labor practices. The changes that have favorably influenced productivity of both capital and labor are accompaniments to investment inflows made possible by the policy of improving financial openness. Of course, it is difficult to generalize, as the impact of new financial and investment policies vary according to characteristics of the firm (size, management, place in manufacturing cycle, region, etc.), as mentioned before. In China, however, the overburden of state regulation and bureaucracy—and the fact that practically two-thirds of every firm is state owned—has significant implications. The degree of state ownership of the firms indirectly affects competition and productivity. Competition itself would seem an important factor in growth of the economy, and it is increased by capital inflows.

In the state-owned sector, because it has been dominated by sluggish bureaucracies, new financial openness and new extant capital have had a much lower rate of absorption and hence less effect than in other non-public sectors of the economy. Where the most dramatic impact might have been expected, among Sino-foreign joint venture enterprises, where improved technology and better management techniques have been employed and enterprises are freed from the most restrictive labor practices, excess growth appears to me to be the norm. The chapter touches on this issue in its discussion of privatization. After remarking that China ranks in the bottom half of the country set in respect to the privatization measure employed, the authors note that privatization has a strong and significant direct effect on growth generally, but the growth effect of liberalizing countries with low levels of privatization is minus 61 basis points. I find it difficult to accept this conclusion and urge the authors to consider alternative measures of what effect the import of corporate forms of organization has had in China. One difficulty is that “privatization” is not necessarily coincident with the import of legal and management systems in private firms. Earlier studies claimed that “privatization” had little or even a negative effect on firm performance.<sup>9</sup> The better comparison, however, may be to study truly “private” firms. Allen, Jun, and Meijun (2005) find that the “private sector” grows much faster than the state sector or the listed sector. They conclude that China is a significant counterexample to the existing literature that the adoption of legal, institutional, and financial systems from Western models leads to improved economic results.<sup>10</sup> These apparent paradoxes simply demonstrate to me how difficult it is to capture measures of organizational improvement. It is very

difficult to select the appropriate measures of change in a society and to then try to correlate these measures with economic variables. I would suggest that more work needs to be done to identify and quantify the impact on growth of improved managerial and financial practices as well as legal structure. I would also suggest that linkages to China's huge investment in education be explored. China now awards college degrees to four or five times as many students as it did in 2000. The improvements in education are surely key to more rapid absorption of improved business and financial methods.

What one observes everywhere is that China is placing important emphasis on importing foreign best practices as a means of revitalizing the financial sector. There are numerous examples; let me now mention several. China has now listed on international stock exchanges two of its four large banks—Bank of China and China Construction Bank. Prior to listing, China insisted on lining up major international banks to take minority stakes in advance of the listing—the obvious message being that they would act as watchdogs over reform efforts through their representatives' seats on the board. Indeed, the mere process of preparing for a listing involves a financial transformation and underwriters; accountants and lawyers pore over financial records to prepare the listing prospectus.

Recently, when China wanted to allow its banks, which have long been subject to a Glass Steagall-like separation of banking and securities, to enter the mutual fund distribution business, it did so by requiring that the banks partner with large foreign mutual fund complexes with improved investment management technology. Also, as everyone knows, China very much wants to improve its banking system from both a financial and a regulatory perspective. Right now, China has been strongly encouraging large foreign banks to take minority stakes in Chinese banks, in the anticipation that opening up this sector of the economy to significant foreign investment will bring benefits. Indeed, recently, some Chinese banks have complained that the large foreign banks were permitted to buy pre-initial public offering (IPO) stakes at significant discounts to IPO valuation. Another example is Ping An Insurance. Ping An was second in the life insurance sector after China Life, which held over 50 percent of the life business market share for a long time. The combination of restrictive investment regulations and virtual monopoly by one life insurance company meant that product innovation had been lacking. One exception was the introduction of unlinked policies by

Ping An, which reports growth in its new premium income in excess of the average of the industry. Another innovation has been group and personal pensions. Pension reform in 1997 sparked tremendous growth in the life insurance sector.

Though anecdotal, these examples appear to be convincing evidence that, at least from a policy perspective, China considers financial openness to be a linchpin of its efforts to modernize its economy. The importance of FDI and financial openness lies not just in the increase in the amount of capital available to the society; it is that the quality of the capital imported is so high because of the secondary effects that its importation brings.

The Chinese government is committed to the principle that the country's financial markets need to be modernized and their efficiency improved. Specifically, the government continues to introduce measures, regulations, and initiatives to deal with the issues of lack of transparency, poor corporate governance, the high degree of state-ownership, and other problems. One response has been to encourage the new growth of institutional players. China has the potential to build one of the largest institutional investor bases worldwide. Promoting the emergence of competent institutional investors is an important complement to an overall capital markets development strategy.

Institutional investors tend to have longer-term investment time horizons and provide an ideal source of funds for investment in longer-term government and infrastructure bonds. Many new initiatives and regulations have emerged in the last few years to encourage the growth of this new institutional investor base—insurance companies, pension funds, investment fund managers, trust and investment corporations, and securities companies. We do not have space to discuss these here. But these investors will add depth and liquidity to the equity markets and will improve prospects for the market to better absorb increased share supply resulting from the sale of the state shares. Institutional investors will also increase pressure on firms, listed and otherwise, to adopt better corporate governance structures and practices. This has not been an easy task. Let me also mention another new development that demonstrates China's commitment vividly. China has recently announced that it will allow foreign investors to purchase strategic stakes (10 percent or more equity interests) in listed companies that have been approved for the sale of state-owned shares (so-called G shares). Investors need only have \$100 million in assets outside China or manage over

\$500 million in such assets to be eligible to participate in the program. This is an important step in China's effort to use foreign investment to transform state-owned enterprises from the loss-making inefficiency that now plagues them.

Though admittedly an oversimplification, two kinds of theories of growth may be said to explain the "Asian Miracle" generally and China as part of that. One group is the "accumulation" theories, which attributed success in economic growth policies to very high rates of investment that push the economies "along their production functions." The other group is the "assimilation" theories, which stress entrepreneurship, innovation, and learning as the engines of economic growth.<sup>11</sup> Chinese policymakers have found an extraordinarily successful balance of these ingredients. Further work by Bekaert and his colleagues employing the sophisticated methodology of this chapter should place more emphasis on "assimilation" elements and may thereby help us unlock the puzzle of China's explosive economic growth.

#### NOTES

1. See Robert Barrow, "Economic Growth in a Cross-Section of Countries," *Quarterly Journal of Economics* 106(2) (1991): 407–43.

2. The authors' model formulates the regressions in terms of relating instrumental variables to deviations from world growth, with a residual representing idiosyncratic, unpredictable growth.

3. See, for example, C. Bergsten, G. Bates, N. Lardy, and D. Mitchell, *China: The Balance Sheet* (New York: Public Affairs Press, 2006).

4. A very useful part of the chapter is the detailed chronology of important economic, political, and financial events over the past 25 years included in table 4.1.

5. Bekaert also pointed out in his research that traditional neoclassical growth factor models do not seem to explain China's explosive growth very well either. This fact has long been recognized. See Hu Zhuli and Mohsin Khan, "Why Is China Growing So Fast?" International Monetary Fund Working Paper Series WP/96/75, 2006.

6. The authors measure the percentage of market capitalization available to foreigners at the end of the sample at 35 percent. This seems too high as, except for the limited program permitting very large foreign institutional investors to purchase "A" shares as qualified foreign institutional investors, the only traded shares available to foreigners at the time were the relatively illiquid "B" shares, which is a very much smaller market. (There are only approximately 70 companies with traded B shares, while there are about 1,200 companies with traded A shares.)

7. Citing E. Prasad and Shang-Jin Wei, "Capital Flows Into China," Working Paper (Author: add pub date).

8. Alwyn Young, "The Tyranny of Numbers: Confronting the Statistical Realities of the East Asian Growth Experience," *Quarterly Journal of Economics* 110 (1995): 641–80.

9. For example, J. S. Qian, J. Tong, and T. Tong, "How Does Government Ownership Affect Private Firm Performance? Evidence from China's Privatization Experiment," *Journal of Business, Finance and Accounting* 29 (2002): 1–27.

10. F. Allen, Jun Qian, and Meijun Qian, "Law, Finance, and Economic Growth in China 2005," *Journal of Financial Economics* 77 (2005): 57–116.

11. R. Nelson and H. Pack, *The Asian Miracle and Modern Growth Theory* (Washington, DC: World Bank, 1997).