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Capital Flight: China's Experience

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Abstract

We study the empirical determinants of China's capital flight. In addition to the covered interest differential, our empirical exercise includes a rather exhaustive list of macroeconomic variables and a few institutional factors. Overall, our regression exercise shows that China's capital flight is quite well explained by its own history and covered interest differentials. The other possible determinants offer relatively small additional explanatory power. It is also found that China's capital flight responds differently to the components of covered interest differentials and to the positive and negative components of these variables. The response pattern, however, depends on the choice of data frequency. The general impression is that the monthly results are more intuitive than the quarterly ones.

1. Introduction

In the midst of the current financial crisis, it is hard to underestimate China's role in the global economy. Since its open-door policy was initiated in 1978, China has swiftly ascended to the league of major players in the world economy. Echoing its growing economic prowess, China has stepped up its interactions with the rest of the world apace.

Over the last two decades, China has strengthened its levels of trade and financial integration with the world economy, albeit at uneven paces. There is a plethora of analyses on China's trade integration. These studies usually emphasize China's supercharged export performance, the pressure of her demand on commodity prices, and the link between Chinese renminbi (RMB) valuation and global imbalances.[1] China's ability to draw in huge amounts of foreign direct investment (FDI), especially compared with its role as a provider in the world capital market, and its astonishing rate of accumulating international reserves in the new millennium also have attracted considerable attention in both academic and policy circles.[2] While a large collection of studies has accumulated in the last decade or so, there is still much to be done to understand the intricate relationship between China and the world economy.

The current study examines China's capital flight—an illicit financial channel through which China interacts with the world economy. Capital flight could be seen as a consequence of distortions induced by the political structure and the fiscal, monetary, and exchange rate policies. Indeed, China's capital flight is quite substantial. A quick check on the data shows that, in the 2000s, quarterly illicit capital outflows and inflows could be larger than the official FDI or the change in the external debts in the corresponding period.

Given its size, capital flight could have significant implications for the Chinese economy. For instance, it could adversely affect China's economy by draining needed

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resources from the domestic market and reducing the effectiveness of monetary and exchange rate policies. Capital flight also has implications for China's policy of further liberalizing its capital management policy. In general, a sudden and severe capital flight could inflict huge pains on an economy—the recent crises abound with examples of the detrimental impact of capital flight.[3]

Given China's current stage of development and its proclaimed gradualism reform approach, one expects the conditions and environment that give rise to capital flight will exist and persist for a while. The extant academic studies focus on measuring China's capital flight and, at the same time, recognize a few determinants, including exchange rate policy, preferential treatments for foreign capital, and domestic and foreign return differentials; see, for example, Gunter (1996, 2004), Ljungwall and Wang (2008), Sicular (1998), and Wu and Tang (2000).[4]

One hurdle facing studies on capital flight is the measurement issue. There are different interpretations of the term capital flight. One definition equates capital flight to cross-border fund movements that are taken to evade official capital control regulations. In this case, capital flight has no official record and, thus, it is hard to make a precise assessment of the size of capital flight. In this study, we adopt a commonly used procedure called the World Bank residual method to assess the magnitude of capital flight. Essentially, the residual method measures the capital flight by the difference between the reported capital inflow and outflow.

A key explanatory variable of our basic empirical framework is the covered interest differential, which measures the deviation from covered interest parity. The role of covered interest differentials is quite intuitive—one expects capital flight to respond to covered interest differential advantages. The basic framework also include standard economic determinants such as exchange rate volatility, real GDP growth, external debts, fiscal deficit, openness, real estate market index, and international reserves.

The basic framework will be extended in several directions. First, we introduce some China-specific institutional factors. The China-specific institutional factors include a political risk index, a dummy variable allowing for the effect of the US–China Strategic Economic Dialogue, a dummy variable for exchange rate policy reform, and a dummy variable tracking the evolution of China's capital control policy. It is anticipated that these factors could signal the path of RMB exchange rate in the near future and, thus, affect capital flight.

Second, we examine the presence of asymmetric responses to positive and negative covered returns. Outward and inward capital flights could be triggered by motivations other than searching for returns. For instance, in addition to capturing superior returns, outward capital flight is typical in developing countries for avoiding unfavorable political and economic conditions.[5] Thus, capital flight might respond differently to positive and negative covered interest differentials.

Third, we will examine the role of expected RMB depreciation. The main difference between expected RMB depreciation (RMB forward premium) and covered interest parity deviation is given by the US and Chinese interest rate differential. One may argue that the use of covered interest parity deviation may be too stringent as it involves Chinese money markets that are not accessible to everyone. On the other hand, the offshore nondeliverable RMB forwards are not (officially) subject to China's jurisdiction and, thus, could be viewed as a market indicator of expected currency movement. According to standard theory, expected currency depreciation (appreciation) could trigger capital outflow (inflow).

Fourth, studies on capital flight based on the World Bank residual method usually examine quarterly capital flight data. It is because the residual method uses balance of payments statistics, which are typically available at the quarterly frequency, to calculate capital flight information. Since capital could be transferred electronically rather than physically in the modern world, it is not unreasonable to expect that capital flight could respond to changes in economic and political situations in a relatively short period of time. If it is the case, then a natural concern is that the use of quarterly data could make it difficult, if not impossible, to reveal the interactions between capital flight and its determinants. Thus, it could be instructive to examine capital flight behavior at, say, the monthly frequency. To this end, we employ the Chow and Lin (1971) method to construct monthly capital flight data and compare the results from regression analyses based on quarterly and monthly capital flight data.

2. Capital Flight

The adverse effects of capital flight on the originating economy are quite well recognized in the literature.[6] The operational definition of capital flight, nonetheless, could be quite elusive and it covers a wide spectrum. The main difference between alternative measures of capital flight is the type of capital flow included in their calculations. It should be noted that, despite the usual connotation of illegality, capital flight could, at least technically speaking, have taken place via either legal or illegal channels. Thus, these measures could be interpreted as estimates of unrecorded, instead of illegal, transactions.

Figure 1 graphs the time profiles of China's annual capital flight derived from the World Bank residual measure, the hot money measure, and the errors and omissions entry in the balance of payments statistics.[7] The residual measure is arguably the most commonly used measure in literature while the hot money measure is also often considered (Cuddington, 1986; World Bank, 1985). While the errors and omissions entry mostly reflects the (net) unrecorded capital flow, it is a main component of other capital flight measures (Prasad and Wei, 2007).

It is evidenced that these measures give a qualitatively similar portrait of the capital flight pattern. In essence, capital flight was relatively mild before 1990. It started to pick

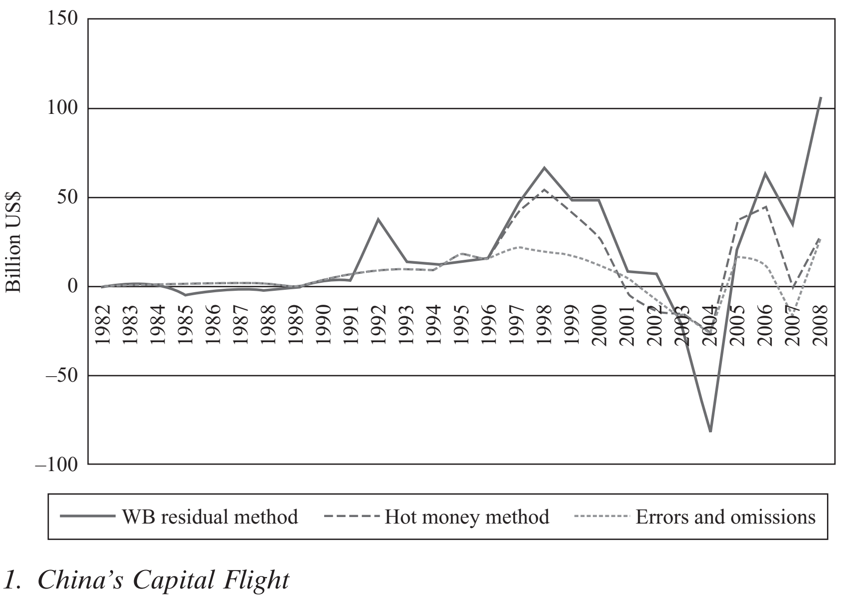

Figure 1. China's Capital Flight

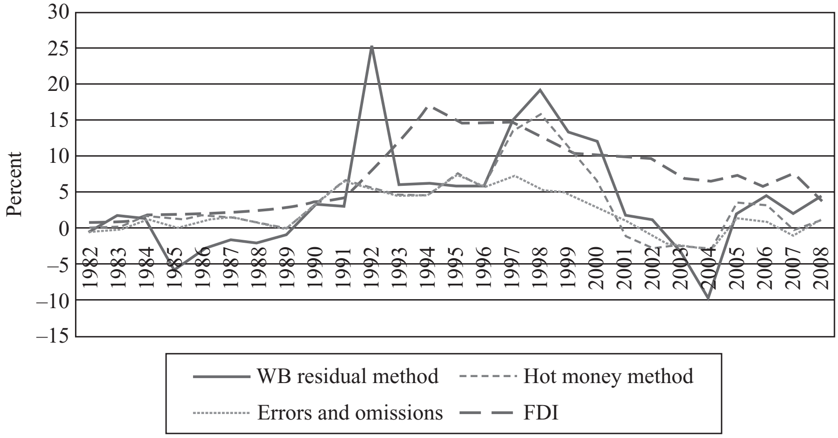

Figure 2. China's Capital Flight and FDI, Normalized by China's Fixed Assets Investment

up in the 1990s and exhibited substantial swings in the new millennium. The World Bank residual method indicates some minute inward capital flight from 1985 to 1989 that could be induced by China's current account deficits in those years.[8] Another recorded inward capital flight occurs around 2004—explanations offered in the media often point to the intense market expectations about RMB appreciation and the bubbly Chinese real estate market in that period. Comparing the three measures, the World Bank residual method gives the most volatile measure of capital flight.

To gauge its economic relevance, we plot China's capital flight and FDI inflow normalized by its fixed assets investment in Figure 2. China's fixed assets investment is deemed to be a crucial factor driving its phenomenal growth. The residual method shows that capital flight could be more than 20% of fixed assets investment. The FDI capital is another significant driving force behind China's phenomenal growth. These ratios suggest that capital flight could easily offset, if not dwarf, FDI flow to China. The economic implication of China's capital flight is quite obvious if the capital transferring out of China is as productive as FDI.

With all its capital control measures in place, how could China have such volatile capital flight? Anecdotal evidence, indeed, has suggested that capital controls are always porous and (illicit) capital flows are not completely shut. A good share of historical capital movements occurs outside of formal regulations, as indicated by the errors and omissions entry of the balance of payments statistics. Even in the early stage of China's open-door policy, capital flight is attributed to corrupt officials running state-owned enterprises and beneficiaries of corruption and economic crimes. It is perceived that, taking advantage of regulatory loopholes, banks and corporations shuttle money in and out of the economy via, say, unrecorded cross-border transactions and mis-invoicing. Even China's capital controls present significant barriers for capital movements: they are not watertight and, apparently, do not dampen capital flight over time.

3. Empirical Analyses

The subsequent empirical analyses are based on capital flight data derived from the World Bank residual method, which is commonly adopted in empirical studies. A few advantages of the residual method are (a) its broad coverage, (b) it is intuitive, and (c) it could be easily replicated.[9] In essence, the residual method obtains an indirect measure of capital flight by comparing the "sources of funds" and "uses of funds." According to the World Bank residual method, capital flight is given by

$$\textit{Capital flight} = \Delta ExD + NFDI - CAD - \Delta IR,$$

where ΔExD is the change in external debts, $NFDI$ is the net foreign direct investment, CAD is the current account deficit, and ΔIR is the change in international reserves. There is outward (*inward*) capital flight when the recorded sources of funds given by increases in external debts and net FDI inflow are larger (*smaller*) than the recorded uses of funds given by current account deficit and international reserve accumulation.

When capital flight is positive, resources are leaving the country and not servicing the domestic economy. Alternatively, it reflects some disutility of domestic assets. When capital flight is negative, we have *inward* capital flight; that is, there is a relative preference for domestic assets.[10]

The Basic Model

One framework for analyzing capital flight is offered by the portfolio balance approach (Cuddington, 1986; Diwan, 1989; Dornbusch, 1984). Intuitively, an economy tends to experience a capital drain when it offers a rate of return lower than the rest of the world. A persistent return differential, net of transaction costs, is only possible in the presence of capital controls. In the absence of perfect capital controls, return differentials induce capital flow but the flow is not strong enough to equalize domestic and foreign returns. To capture the idea, we consider the regression equation

$$F_t = \alpha + \sum_i^p \beta_i F_{t-i} + \sum_i^q \lambda_i CID_{t-i} + \varepsilon_t, \tag{1}$$

where F_t is the capital flight variable given by the stock of capital flight and CID_t is the covered interest differential that measures the deviation from covered interest parity between the Chinese RMB and the US dollar (US\$).[11]

Our quarterly capital flight data are derived from the balance of payments statistics provided by the State Administration of Foreign Exchange, China. The stock of capital flight variable is obtained by compounding capital flight data using the US$ London interbank offer rates and then discounting the resulting series by the US inflation rates. The sample period is from 1999:Q1 to 2008:Q2, which is constrained by the availability of data required to construct the capital flight variable and data on other variables used in the subsequent analyses. The covered interest differential is calculated from the three-month RMB interbank offer rate, the three-month US$ London interbank offer rate, and the corresponding spot and nondeliverable forward rates of RMB against US$.[12] A larger covered interest differential represents a higher covered return on RMB investment.[13] See Appendix Table A1 for a detailed description of these and other variables used in the exercise.

Technically speaking, equation (1) is an agnostic regression examining the (Granger) causal effect of covered interest differential on capital flight. The coefficient λ_i gives the change in F_t for a unit change in CID_t. The lagged F_t's are included to control for spurious CID_t effects.

Before estimating equation (1), the Elliott et al. (1996) ADF-GLS unit-root test, which assumes the highest test power, was used to determine the stationarity properties of F_t and CID_t. Specifically, the ADF-GLS$^\tau$ test that allows for a linear time trend was used. The lag structure of the test was determined by the Bayesian information

Table 1. Empirical Capital Flight Equations

	(2)	(3)	(4)	(5)	(6)	(7)	(8)
F(–1)	0.920***	0.916***	0.968***	0.911***	0.947***	0.960***	0.925***
	(0.08)	(0.06)	(0.08)	(0.07)	(0.09)	(0.08)	(0.07)
CID(–1)	–0.074						
	(0.06)						
CID(–3)		–0.020***	–0.012*	–0.015***	–0.016**	–0.018**	–0.012*
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
dOPENNESS		0.485**	0.560**	0.484**	0.586**	0.613***	0.464*
		(0.19)	(0.23)	(0.22)	(0.23)	(0.21)	(0.24)
Ex_R			0.025**				0.027**
			(0.01)				(0.01)
SED				0.029*			0.031
				(0.02)			(0.02)
RISK					–0.002		0.000
					(0.00)		(0.00)
CONTROL						–0.001	0.010
						(0.01)	(0.01)
Adj. R^2	0.83	0.85	0.87	0.88	0.86	0.86	0.88
Q-stat(4)	6.09	3.09	6.82	3.99	4.68	4.12	6.91
Q-stat(8)	7.51	3.73	8.12	8.87	8.49	7.05	9.52

Notes: The table reports the results of estimating equations (1), (2), and (3). Column (2) gives results based on equation (1), column (3) gives results based on equation (2), and columns (4) to (8) report results based on equation (3). See the text for detail. Robust standard errors are given in the parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. *Q*-stat(4) and *Q*-stat(8) are the Box–Ljung *Q*-statistics calculated from the first 4 and 8 estimated residual autocorrelations. None of the *Q*-statistics is significant.

criterion. See Elliott et al. (1996) for a detailed discussion of the test procedure. The test statistics calculated from the F_t and CID_t series are, respectively, –3.052 and –3.406—both are significant and reject the unit-root null hypothesis (Cheung and Lai, 1995). Thus, equation (1) is not a spurious regression.

The results of estimating (1) are reported in the second column of Table 1. In Table 1 and the subsequent tables we, for brevity, did not report the constant and trend estimates, which are presented in Cheung and Qian (2009b). The covered interest differential variable, *CID*, has a negative coefficient estimate. That is, a large covered return on RMB investment reduces capital flight; a result that is consistent with the conventional wisdom. Nevertheless, the coefficient estimate has a *t*-statistic of –1.23 and is insignificant at the conventional 5% level.

The use of quarterly data could also make it difficult to disentangle the covered interest differential effect if, for instance, capital flight adjusts in less than a quarter. Indeed, if the contemporaneous covered interest differential variable is included in the regression, it has a significant and negative estimate. Nonetheless, a contemporaneous association between F_t and CID_t does not offer an ambiguous interpretation of capital flight behavior. We explore the data frequency issue in the next subsection.

Equation (1) is arguably simplistic for modeling capital flight. The absence of the relevant determinants could bias the estimation results. To better understand capital flight behavior, we extend (1) by including standard economic determinants of capital flight.

Drawing from the extant theoretical and empirical studies, we considered the following economic determinants of capital flight: China's real GDP growth rate, China's government deficit normalized by its GDP, the difference between the US and China inflation rates, the change in China's openness, the real estate investment return in China, and the change in China's international reserves normalized by its GDP. The last three variables deserve some comments. First, openness captures the import and export activity. It is perceived that capital flight could be related to mis-invoicing of exports and imports, which is a common strategy to evade capital controls and to move money in and out of China. Second, on the real estate market index, the strong Shanghai property market is perceived to be a triggering factor for hot money flowing into China started in 2003. Third, in recent years, the rapid build-up of international reserves has brought China the pressure to move capital overseas and, conceivably, to ease the effort to curb capital flight. Thus, it would be interesting to determine the empirical relevance of these variables to China's capital flight.

A description of these variables and their sources is provided in Appendix Table A1. The theoretical links between these economic variables and capital flight are discussed in, for example, Cuddington (1986), Dooley (1988), and Dornbusch (1984).[14] We estimate the regression equation

$$F_t = \alpha + \sum_i^p \beta_i F_{t-i} + \sum_i^q \lambda_i CID_{t-i} + \theta' X_t + \varepsilon_t, \qquad (2)$$

where X_t is a vector containing economic variables. In a pilot study, we found that these economic variables are mostly insignificant when they were included jointly or individually in (2). It turned out that only the openness variable, *dOPENNESS*, is significant in our regression analysis; the results are presented in column (3) of Table 1. The insignificant results pertaining to the other economic variables are not reported for brevity and are available from the authors.

The openness variable has a positive and significant coefficient estimate. It is noted that capital flight through mis-invoicing may not show up in the balance of payments statistics. Nonetheless, it is widely perceived that trade mis-invoicing via under- and over-invoicing imports and exports is a main conduit for capital flight. If the motivation behind mis-invoicing is in line with the general one behind capital flight, then openness could bear some information on capital flight. A higher level of openness offers a better chance to manipulate the reported trade prices and the related capital flight. Our estimation results are in accordance with such an interpretation—an increase in openness implies an increase in capital flight.

In the presence of the openness variable, the coefficient estimates of both the lagged capital flight and *CID* variables are smaller in magnitude. The *CID* variable is only significant at the third lag instead of the first one. The switch in the responding lag to three quarters is quite puzzling—does it take three quarters for capital movement to respond, on the margin, to a change in covered interest differential? We will come back to the *CID* lag structure later.

Extensions

In addition to economic variables, we consider some institutional factors that are specific to China. Specifically, we augment equation (2) with a dummy variable *Ex_R* that captures the July 2005 exchange rate policy reform, a dummy variable *SED* accounting for the effect of the US–China Strategic Economic Dialogue,[15] a political risk index *RISK*,[16] and a dummy variable *CONTROL* tracking the evolution of China's capital control policy.[17] These institutional factors, *a priori*, signify certain economic and political conditions that could affect capital flight. Again, data on these factors are described in Appendix Table A1. To accommodate these institutional factors, we modify equation (2) to

$$F_t = \alpha + \sum_i^p \beta_i F_{t-i} + \sum_i^q \lambda_i CID_{t-i} + \theta' X_t + \psi' Z_t + \varepsilon_t, \tag{3}$$

where Z_t is a vector containing institutional factors.

The results of adding each one of these factors and all four of them together are presented in columns (4) to (8) in Table 1. Individually, the exchange rate policy and Strategic Economic Dialogue variables have a positively significant impact and the two other factors have a negative but insignificant effect on capital flight.

The exchange rate policy variable effect is in accordance with the anecdotal evidence that the policy change released the pressure of a one-off sharp appreciation. Recall that the policy change announced on 21 July 2005 was a long-anticipated one and was accompanied by one-off 2.1% revaluation. Since then, the jump risk of RMB is quite small and not a factor deterring capital flight. The positive effect of the Strategic Economic Dialogues variable effect is likely attributed to stern statements and the uncertainty related to the Dialogue's outcomes.

When the four factors are jointly included in the regression, the exchange rate policy dummy variable is the only significant institutional factor—indicating the implication of the policy change dominates the other three factors.

In general, the adjusted R-squares statistics that measure the goodness of fit suggest that the specifications based on the standard economic determinants and the selected China-specific factors perform quite well. All the reported models have an adjusted R-squares statistic larger than 80%. The marginal explanatory power of the openness and institutional variables, nonetheless, seems low.

In the remaining part of this subsection, we explore two additional features that could shed some further insight about China's capital flight.

Historically, capital flight appears to be a more prominent phenomenon in developing than in developed economies. To be sure, developed economies experience capital flight—but it is usually associated with, say, money laundering that allows criminals to transfer gains from illegal activities including drug dealing and tax evasion. Besides money laundering, capital flight in developing economies is designated to circumvent capital controls, and to benefit favorable economic and political climates in overseas markets. Thus, the illicit capital movement in developing economies would be biased towards *outward* instead of *inward* capital flight.[18] In view of this, we anticipate China's capital flight could display asymmetric responses to positive and negative covered returns on RMB.

We define the variables $CID_t^+ \equiv \max[CID_t, 0]$ and $CID_t^- \equiv \min[CID_t, 0]$ and use them to assess the asymmetric response of China's capital flight to covered interest differentials. The results of estimating equations (1), (2), and (3), with CID_t replaced by CID_t^+ and CID_t^-, are presented in Table 2. The coefficient estimates of CID_t^- are larger in magnitude than the corresponding ones of CID_t^+ and, with two exceptions, are statistically significant. In essence, the results indicate that a negative covered return on RMB has a stronger impact on capital flight than a positive covered return.

Comparing Tables 1 and 2, the use of CID_t^+ and CID_t^- instead of CID_t does not lead to substantial changes in the coefficient estimates of the lagged capital flight and openness variables. The noticeable change in institutional factor effects is that the *SED* variable becomes the only significant institutional variable.

Table 2. Empirical Capital Flight Equations—Asymmetric CID Effects

	(3)	(4)	(5)	(6)	(7)	(8)
F(–1)	0.909***	0.931***	0.897***	0.925***	0.926***	0.913***
	(0.07)	(0.08)	(0.07)	(0.08)	(0.08)	(0.08)
CID(+,–3)	–0.005	–0.007	–0.009	–0.007	–0.008	–0.011
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
CID(–,–3)	–0.036***	–0.029	–0.024*	–0.032**	–0.041***	–0.020
	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.03)
dOPENNESS	0.520**	0.570**	0.491**	0.574**	0.615**	0.503*
	(0.22)	(0.25)	(0.24)	(0.25)	(0.25)	(0.25)
Ex_R		0.005				0.018
		(0.03)				(0.03)
SED			0.024*			0.029*
			(0.01)			(0.02)
RISK				0.000		0.000
				(0.00)		(0.00)
CONTROL					0.011	0.012
					(0.01)	(0.01)
Adj. R^2	0.88	0.87	0.88	0.87	0.87	0.87
Q-stat(4)	6.28	6.29	7.08	5.80	6.21	7.04
Q-stat(8)	8.34	9.55	10.66	7.47	7.12	9.82

Notes: The table reports the results of estimating equations (1), (2), and (3) with the *CID* variable replaced by its positive and negative components. See the Notes to Table 1.

The second additional feature is related to the role of expected RMB valuation. Discussions of capital flight routinely refer to the role of currency speculation. Theoretically, the currency speculation effect should be accounted for by the covered return differential variable which is the sum of an interest differential component and an expected RMB depreciation component given by an RMB premium. However, one may argue that the use of covered interest parity deviation may not be relevant because the Chinese money market is not readily accessible to everyone. Further, in the early 2000s, it is perceived that speculation on RMB revaluation was a main factor driving capital movements. China's capital flight could, thus, respond differently to interest differentials and RMB expectations.

To investigate the individual roles of its components, we re-estimate equations (1), (2), and (3) with CID_t replaced by $RDIFF_t$ and $PREM_t$, where $RDIFF_t$ is the three-month RMB interbank offer rate minus the three-month US$ London interbank offer rate, and $PREM_t$ is the three-month RMB premium derived from offshore nondeliverable forward and spot rates. The offshore nondeliverable RMB forwards are not (officially) subject to China's jurisdiction and, thus, could be viewed as a market indicator of expected currency movement. Table 3 presents the estimation results.

Both $RDIFF_t$ and $PREM_t$ garner a negative coefficient estimate, indicating capital flight is discouraged by either a favorable interest rate differential or exchange rate premium. For each specification, the coefficient estimate of the $PREM_t$ variable is much larger (in magnitude) than that of $RDIFF_t$. Nevertheless, $PREM_t$ is insignificant in all the cases presented in the table. $RDIFF_t$, on the other hand, is significant in the absence of institutional factors and significant in three out of five other cases. Contrary to the hyped RMB revaluation effect in the early 2000s, the covered interest differential effect on quarterly capital flight is mainly driven by the interest differential $RDIFF_t$ variable.

Table 3. Empirical Capital Flight Equations—Interest Rate and Forward Premium Effects

	(3)	(4)	(5)	(6)	(7)	(8)
F(–1)	0.949***	0.973***	0.902***	0.938***	0.955***	0.921***
	(0.07)	(0.07)	(0.06)	(0.07)	(0.07)	(0.06)
PREM(–1)	–0.015	–0.013	–0.014	–0.020	–0.020	–0.012
	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)
RDIFF(–1)	–0.005**	–0.002*	–0.004**	–0.003*	–0.003	–0.002
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
dOPENNESS	0.456**	0.432*	0.333	0.445**	0.447**	0.329
	(0.20)	(0.23)	(0.20)	(0.21)	(0.20)	(0.22)
Ex_R		0.030***				0.023**
		(0.01)				(0.01)
SED			0.033**			0.029
			(0.02)			(0.02)
RISK				–0.003**		–0.001
				(0.00)		(0.00)
CONTROL					–0.012	0.004
					(0.01)	(0.01)
Adj. R^2	0.86	0.88	0.89	0.87	0.87	0.89
Q-stat(4)	2.10	5.06	2.31	3.56	2.59	5.26
Q-stat(8)	5.69	6.56	7.15	9.17	6.86	8.72

Notes: The table reports the results of estimating equations (1), (2), and (3) with the *CID* variable replaced by its interest rate differential and forward premium components. See the Notes to Table 1.

Table 4 presents the results of estimating model specifications that allow for asymmetric responses to positive and negative interest differentials and forward premiums, where $RDIFF_t^+ \equiv \max[RDIFE_t, 0]$, $RDIFF_t^- \equiv \min[RDIFF_t, 0]$, $PREM_t^+ \equiv \max[PREM_t, 0]$, and $PREM_t^- \equiv \min[PREM_t, 0]$.

Similar to Table 3, the coefficient estimates of $PREM_t^+$ and $PREM_t^-$ are typically larger (in magnitude) than the corresponding coefficient estimates of $RDIFF_t^+$ and $RDIFF_t^-$. Among the four components of covered interest differential, it is $RDIFF_t^+$ that has a significant coefficient estimate in the absence of institutional factors and is significant in three out of five other cases. That is, when the Chinese interest rate is higher than the corresponding US rate, there is a slowdown in capital flight. The result, however, is different from the one in Table 2, which indicates that a statistically significant change in capital flight occurs when China experiences a negative covered return differential.

A few observations from Tables 1 to 4 are in order. First, the capital flight variable displays considerable persistence. Second, trade openness is the main economic variable that has a statistically significant implication for capital flight. Third, the significance of selected institutional factors depends on specification. Fourth, the adjusted *R*-squares estimates show that the selected macroeconomic and institutional regressors offer some marginal explanatory power. The incremental improvement is, however, quite limited as these estimates are typically in the range of 83% to 89%. Fifth, the covered return differential variable is in most cases significant only with a lag of three quarters. On the other hand, its components—namely, the interest differential and RMB premium—affect capital flight with only a one-quarter lag. The concern is, of course, how long does it take to move capital in and out of the country. The capital flight

Table 4. Empirical Capital Flight Equations—Combined Specifications

	(3)	(4)	(5)	(6)	(7)	(8)
F(–1)	0.961***	0.974***	0.902***	0.940***	0.955***	0.914***
	(0.07)	(0.07)	(0.06)	(0.08)	(0.07)	(0.07)
PREM(+, –1)	–0.011	–0.014	–0.014	–0.020	–0.023	–0.020
	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)
PREM(–, –1)	–0.025	–0.007	–0.011	–0.018	–0.014	0.007
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)
RDIFF(+, –1)	–0.009**	–0.006**	–0.009**	–0.007	–0.007	–0.006**
	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)
RDIFF(–, –1)	–0.001	0.001	0.000	0.001	0.002	0.003
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
dOPENNESS	0.474**	0.458*	0.360	0.470**	0.479**	0.358
	(0.22)	(0.25)	(0.22)	(0.23)	(0.23)	(0.25)
Ex_R		0.032**				0.027**
		(0.01)				(0.01)
SED			0.035*			0.032
			(0.02)			(0.02)
RISK				–0.003*		0.000
				(0.00)		(0.00)
CONTROL					–0.016	–0.004
					(0.01)	(0.01)
Adj. R^2	0.86	0.87	0.89	0.87	0.86	0.89
Q-stat(4)	5.27	6.18	4.07	5.14	4.39	6.93
Q-stat(8)	9.94	7.59	10.44	11.05	9.00	13.15

Notes: The table reports the results of estimating equations (1), (2), and (3) with the *CID* variable replaced by the positive and negative interest rate differential and forward premium components. See the Notes to Table 1.

is also found to respond asymmetrically to covered interest differentials and their components.

Monthly Data

Most studies on capital flight rely on quarterly data that are typically retrieved from the balance of payments statistics. Depending on its speed of adjustment to changes in political and economic conditions, capital flight's reactions to its determinants might not be accurately revealed using quarterly data. Higher frequency data, say, monthly data, could offer a finer grid to gauge the information about capital flight behavior and better capture the interaction between capital flight and its determinants. In our exercise, monthly data are not available only for the capital flight and GDP variables. Thus, if we could construct monthly capital flight and GDP data from their quarterly counterparts and re-estimate various capital flight regression equations, we could have an alternative perspective on China's capital flight behavior.

The method detailed in Chow and Lin (1971) is used to interpolate monthly data from the corresponding quarterly ones. Essentially, information from monthly data on comparable and related variables is used to obtain the monthly capital flight and GDP data from the corresponding quarterly data. Wilcox (1983), for example, reports that the Chow and Lin method can successfully recover the essential dynamic

Table 5. Empirical Capital Flight Equations, Monthly Data

	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$F(-1)$	0.569***	0.536***	0.532***	0.536***	0.536***	0.532***	0.526***
	(0.12)	(0.13)	(0.09)	(0.13)	(0.13)	(0.13)	(0.13)
$F(-2)$	0.296***	0.342***	0.337***	0.341***	0.342***	0.340***	0.333***
	(0.07)	(0.08)	(0.09)	(0.08)	(0.08)	(0.07)	(0.07)
$CID(-1)$	–0.029*	–0.024	–0.031*	–0.024	–0.025	–0.028	–0.031*
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
$dIR(-1)$		–0.191*	–0.196***	–0.193*	–0.191*	–0.195*	–0.207*
		(0.10)	(0.07)	(0.10)	(0.10)	(0.10)	(0.11)
Ex_R			–0.010				–0.009
			(0.01)				(0.02)
SED				0.003			0.006
				(0.01)			(0.01)
$RISK$					0.000		–0.001
					(0.00)		(0.00)
$CONTROL$						0.005	0.008
						(0.01)	(0.01)
Adj. R^2	0.67	0.69	0.69	0.69	0.69	0.69	0.68
Q-stat(12)	10.72	17.72	17.62	18.21	17.44	16.72	17.74
Q-stat(24)	26.17	23.01	23.01	23.35	22.65	21.69	23.81

Notes: The table reports the results of using monthly data to estimate equations (1), (2), and (3). See the Notes to Table 1.

characteristics of a data series, including autocorrelation structure and turning points. The data construction procedure is described in the Appendix. The constructed monthly capital flight and GDP data and other monthly data series were then used to study capital flight behavior. The results of using the monthly data to re-estimate capital flight equations are reported in Tables 5 to 8, which are presented in a format similar to Tables 1 to 4.

There are a few differences between the monthly and quarterly results. First, the sum of lagged capital flight coefficient estimates obtained from the monthly data is smaller than the corresponding one from the quarterly data. One possible interpretation is that the estimated persistence of monthly capital flight is lower than the one of quarterly data. It is noted that quarterly capital flight displays a single lag structure, while two lagged capital flight variables are significant in the case of monthly data. Thus, it is likely that, in this case, quarterly data are too coarse to reveal temporal interactions and they overstate persistence.

Second, the responses of monthly capital flight to the covered interest differential and its related variables are different from those of quarterly capital flight. In Tables 5 to 8, the covered interest differential variable, CID_t, and its derivatives including CID_t^+, CID_t^-, $RDIFF_t$, $PREM_t$, $RDIFF_t^+$, $RDIFF_t^-$, $PREM_t^+$, and $PREM_t^-$ are found to significantly affect capital flight with a one-month time lag. In a world where capital could move via various channels including electronic means, a response rate of one month appears not unlikely. For quarterly data, the effect of the covered interest differential variable and its derivatives is significant with a one-quarter or a three-quarter lag; a response lag that seems a bit long in the context of the modern capital market.

Besides the response time, there are other discernible differences. In Table 5, the monthly overall covered interest differential effect given by CID_t is negative and is

Table 6. Empirical Capital Flight Equations—Asymmetric CID Effects, Monthly Data

	(3)	(4)	(5)	(6)	(7)	(8)
F(–1)	0.505***	0.505***	0.506***	0.500***	0.504***	0.498***
	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)
F(–2)	0.321***	0.320***	0.316***	0.318***	0.319***	0.309***
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
CID(+, –1)	–0.046***	–0.047***	–0.047***	–0.044***	–0.045***	–0.050***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
CID(–, –1)	0.022	0.019	0.025	0.034	0.034	0.031
	(0.03)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)
dIR(–1)	–0.182*	–0.184*	–0.187*	–0.182*	–0.176*	–0.189*
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)
Ex_R		–0.003				–0.011
		(0.01)				(0.01)
SED			0.010			0.009
			(0.01)			(0.01)
RISK				–0.001		–0.001
				(0.00)		(0.00)
CONTROL					–0.005	–0.003
					(0.01)	(0.01)
Adj. R^2	0.71	0.70	0.71	0.71	0.71	0.70
Q-stat(12)	17.47	16.99	17.02	18.20	18.08	17.85
Q-stat(24)	22.46	21.58	23.23	23.17	22.85	26.04

Notes: The table reports the results of using monthly data to estimate equations (1), (2), and (3) with the *CID* variable replaced by its positive and negative components. See the Notes to Table 2.

significant in only three of the seven cases. Nonetheless, these monthly estimates are in general larger (in magnitude) than the corresponding ones in Table 1.

Monthly capital flight, similar to quarterly capital flight, responds asymmetrically to positive and negative covered interest differentials. However, monthly capital flight is found to respond to positive, but not negative, covered interest differentials in a statistically significant manner. That is, when the covered interest is in favor of Chinese RMB there is a slowdown or even a reverse of outward capital flight. This result is in sharp contrast to the finding in Table 2 that quarterly capital flight is significantly affected by negative, instead of positive, covered interest differentials. Apparently, the monthly results are in line with the media hype about the hot money flows to China in anticipation of RMB appreciation and dramatic growth opportunities.

The monthly interest differential and RMB premium effects are also different from those reported for quarterly data. In Table 7, it is clear that the covered interest differential effect is mainly driven by the premium component. The coefficient estimates of $PREM_t$ are significant and larger (in magnitude) than those of CID_t in Table 5, while $RDIFF_t$ has small and insignificant estimates. Again, the finding derived from monthly data, instead of quarterly data, lends support to the anecdotes that are quite common in the media on hot money influx triggered by, among other factors, an expected RMB appreciation.

The asymmetric effects presented in Table 8 are in accordance with the results in Tables 6 and 7; namely, it is mainly the positive return to RMB holdings given by nondelivery forward premiums that has a significant impact on monthly capital flight.

Table 7. Empirical Capital Flight Equations—Interest Rate and Forward Premium Effects, Monthly Data

	(3)	(4)	(5)	(6)	(7)	(8)
F(–1)	0.531***	0.532***	0.532***	0.528***	0.533***	0.527***
	(0.13)	(0.13)	(0.12)	(0.13)	(0.13)	(0.13)
F(–2)	0.318***	0.318***	0.316***	0.312***	0.316***	0.311***
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
PREM(–1)	–0.234**	–0.231**	–0.234**	–0.242**	–0.241**	–0.240**
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)
RDIFF(–1)	0.000	0.001	0.000	0.001	0.001	0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
dIR(–1)	–0.191*	–0.190*	–0.193*	–0.193*	–0.188*	–0.196*
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.11)
Ex_R		0.000				–0.001
		(0.03)				(0.01)
SED			0.004			0.002
			(0.01)			(0.01)
RISK				–0.002		–0.002
				(0.00)		(0.00)
CONTROL					–0.003	0.002
					(0.01)	(0.01)
Adj. R^2	0.70	0.70	0.70	0.70	0.70	0.69
Q-stat(12)	15.39	15.52	16.22	16.39	15.69	16.70
Q-stat(24)	19.74	19.87	20.37	20.88	20.09	21.10

Notes: The table reports the results of using monthly data to estimate equations (1), (2), and (3) with the *CID* variable replaced by its interest rate differential and forward premium components. See the Notes to Table 3.

These results reinforce the finding that the monthly and quarterly capital flight data reveal different sources of the covered interest differential effect.

Comparing the results in Tables 5 and 8, we note that the effects of the covered interest differential and its related variables on monthly capital flight data are quite consistent across the specifications under consideration. The estimated covered interest differential effect is negative and is driven by returns in favor of RMB. Further, it is the premium component rather than the interest differential component that affects capital flight.

The quarterly data, on the other hand, give some conflicting messages about the covered interest differential effect. For instance, the response time shifts from one quarter to three quarters when a macroeconomic variable is introduced (see columns (2) and (3) in Table 1), and then reverts back to one quarter when its components $RDIFF_t$ and $PREM_t$ are considered (see Tables 3 and 4). Further, the quarterly results are ambiguous on whether the capital flight is affected by positive or negative covered interest differentials—results in Table 2 are suggestive of negative ones, while those in Table 4 are indicative of positive ones. One possible explanation of imprecision is that the number of quarterly observations is quite small. Another possible explanation is that the ambiguity arises because the quarterly frequency may be too coarse to fully capture the adjustment mechanism that could have taken place in less than three months.

On balance, the monthly covered interest differential effects are more intuitive and appealing than the quarterly ones. A caveat is that the monthly capital flight data are

Table 8. Empirical Capital Flight Equations—Combined Specifications, Monthly Data

	(3)	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
F(–1)	0.505***	0.504***	0.505***	0.495***	0.505***	0.496***
	(0.14)	(0.14)	(0.14)	(0.13)	(0.14)	(0.14)
F(–2)	0.292***	0.291***	0.287***	0.278***	0.283***	0.275***
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
PREM(+, –1)	–0.286***	–0.278***	–0.289***	–0.298***	–0.308***	–0.298***
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.09)
PREM(–, –1)	0.170	0.231	0.188	0.225	0.214	0.280
	(0.19)	(0.18)	(0.20)	(0.19)	(0.18)	(0.18)
RDIFF(+, 1)	–0.007	–0.005	–0.007	–0.002	–0.005	–0.001
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
RDIFF(–, –1)	0.002	0.003	0.002	0.002	0.002	0.003
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
dIR(–1)	–0.176*	–0.168*	–0.181*	–0.175*	–0.165*	–0.168*
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.10)
Ex_R		0.012				0.009
		(0.01)				(0.01)
SED			0.010			0.005
			(0.01)			(0.01)
RISK				–0.003*		–0.002
				(0.00)		(0.00)
CONTROL					–0.009	–0.003
					(0.01)	(0.01)
Adj. R^2	0.71	0.71	0.71	0.71	0.71	0.71
Q-stat(12)	15.74	14.98	17.30	16.50	16.46	16.96
Q-stat(24)	20.49	19.77	21.78	21.81	21.69	22.23

Notes: The table reports the results of using monthly data to estimate equations (1), (2), and (3) with the *CID* variable replaced by the positive and negative interest rate differential and forward premium components. See the Notes to Table 4.

derived (interpolated) from the quarterly data. Even though established standard statistical procedures are used to construct the data, there is no guarantee that these monthly data represent the true, but unobservable, underlying monthly capital flight dynamics. Thus, we should interpret these results with caution.

Third, in the case of monthly data, the only statistically significant macroeconomic variable is, *dIR*, the international reserve variable. Specifically, an increase in international reserves (per GDP) deters capital flight. An increase in China's international reserves is typically associated with an increase in trade surplus and an increase in the economic and political pressures on RMB appreciation—these two factors are perceived to curb capital flight. The interesting observation is that the international reserve variable is significant in the presence of RMB premiums, other macroeconomic variables, and the selected institutional factors.

Fourth, with one exception, the four selected institutional factors are insignificant; either when they were included in the regression one at a time or as a group. The only significant case is given by the *RISK* variable in Table 8 with a negative coefficient estimate indicating a low level of political risk implies a low level of capital flight.

4. Concluding Remarks

We study the empirical determinants of China's capital flight. In addition to the key covered interest differential variable, our empirical exercise includes macroeconomic economic variables that are commonly considered in the literature and a few institutional factors. The results on covered interest differential effect are largely in accordance with the conventional wisdom—a favorable covered interest differential deters capital flight. Our exercise, nonetheless, shows that the specifics of the covered interest differential effect depend on whether monthly or quarterly data are considered. The monthly data, compared with quarterly data, offer results that are quite consistent across specifications examined and in line with the media anecdotes on capital flight and expected RMB appreciation.

One result we do not expect is the limited impact of standard macroeconomic factors. Among a rather exhaustive list of macroeconomic variables, we only identify a few that are significant in China's capital flight regressions. Specifically, quarterly capital flight data are significantly affected by a trade openness variable, while monthly capital flight is significantly affected by an international reserve variable. The relevance of the selected institutional factors depends on both data frequency and regression specification. In general, the selected institutional factors do not offer a substantial marginal explanatory power even when they are significant; indeed, they are insignificant in most of the monthly specifications.

Overall, our regression exercise shows that China's capital flight—both at the quarterly or monthly frequency—is quite well explained by its own history and covered interest differentials. The other possible determinants offer relatively small incremental explanatory power. Our estimation results highlight the role of data frequency—different data frequencies could have some significant implications for the empirical capital flight behavior. For the current exercise, we consider the monthly results more intuitive than the quarterly ones.

It is believed that capital flight could adversely affect China's economy by diverting the needed resources and reducing the effectiveness of monetary and exchange rate policies. It also has implications for China's approach of further liberalizing capital management policy. With its proclaimed gradualism approach to economic reform, we do not expect China to implement dramatic measures to curtail capital controls and open up its capital account. Thus, we expect capital flight, even in the presence of official controls, will display its persistence in the near future.

Gradual policy changes, however, would reduce the need for moving capital around in an illicit manner. For instance, on 13 July 2009, China's State Administration of Foreign Exchange issued new rules that make it easier for both Chinese and foreign corporations to move foreign exchanges overseas. The change is part of China's continuing efforts to liberalize foreign exchange controls. We anticipate that these changes in control measures, even if they occur slowly, will remove some of the motivations behind the current capital flight and, thus, reduce its magnitude and economic impacts.

Appendix

Table A1. Data—Definition and Sources

F	The stock of China's capital flight in trillion US$. The US dollar LIBORs are used to compound capital flight data, and the compounded series is adjusted by the US inflation rates. The World Bank residual method is used to construct the capital flight data. The required balance of payments data are obtained from the State Administration of Foreign Exchange (SAFE) of China.
CID	The covered interest differential. It is given by $(1 + r) - (F/S)(1 + r^*)$, where r is the Chinese interbank offer rate (CHIBOR), r^* is the US$ LIBOR, F is the renminbi nondeliverable forward rate (yuan/$); and S is the spot exchange rate (yuan/$). For the quarterly data exercise, CHIBOR, LIBOR, and F are three-month rates. For the monthly data exercise, they are one-month rates. Data are retrieved from CEIC.
RGDPG	China's real GDP growth rate calculated from seasonal adjusted data from CEIC.
FISC	China's government deficit scaled by GDP. (Data source: CEIC.)
dIR	China's international reserve changes scaled by GDP. (Data source: CEIC.)
REAL	The return of China's index of real estate investment. (Data source: CEIC.)
dOPENNESS	The change of China's trade openness scaled by GDP. The openness is given by the sum of seasonally adjusted imports and exports (Data source: CEIC.)
INFL	The difference between the Chinese and US inflation rates. (Data source: CEIC.)
Ex_R	A dummy variable for China's July 2005 exchange rate policy reform, I(t >= July 2005).
SED	A dummy variable for the semi-yearly Strategic Economic Dialogue (SED) between the US and Chinese governments, starting from Dec. 2006. The variable is set equal to 1 in the month (quarter) when the SED takes place.
RISK	China's Political Risk Index—a higher value means a lower level of political risk. (Data source: ICRG.)
CONTROL	A dummy variable to capture the timing of China's capital control policy changes. It is assigned a value of –1 for the observations before Sept. 2001, when China tightened capital outflow; a value 0 for the observations between Sept. 2001 and Oct. 2002, when it is deemed as a transition period; and a value +1 for the observations after Oct. 2002, when Chinese authorities start to encourage or promote capital outflow.
RDIFF	Interest rate differential. The data are calculated by subtracting the US$ LIBOR from CHIBOR.
PREM	The renminbi nondeliverable forward premium given by $(NDF_{t+k} - e_t)/e_t$, where NDF_t and e_t are, respectively, nondeliverable forward and spot rates expressed as the price of renminbi. The 90-day and 30-day forwards are used in, respectively, quarterly and monthly data regressions.

Note: The change of a variable is used when it itself is I(1).

Constructing the Monthly Capital Flight and GDP Data

In the text, we use the Chow and Lin (1971) method, which is built upon Chang and Liu (1951), to extract the information to construct monthly capital flight and GDP data. For example, to construct the monthly GDP series, the Chow and Lin method uses information on variables that are closely related to GDP and, at the same time, available on the monthly frequency. Usually, these monthly variables are components of GDP. Wilcox (1983), for example, reports that the Chow and Lin method can successfully recover the essential dynamic characteristics of a data series, including autocorrelation structure and turning points.

The residual method-based capital flight is given by

$$Capital\ flight = \Delta ExD + NFDI - CAD - \Delta IR.$$

Monthly data on international reserves are available. Thus, we have to construct the monthly data on CAD, $NFDI$, and ΔExD. In our exercise, data on China's trade balance are used to derive the monthly current account balance. The net FDI series is derived using data on inward FDI. The monthly external debt series is derived from the regression framework given in Eaton and Gersovitz (1981) with a dummy variable capturing China's Qualified Foreign Institutional Investor program that was instituted in 2002 and allows designated foreign entities to participate in the local Chinese stock markets.

For the GDP data, only data on the aggregate consumption component are not available at the monthly frequency. Thus, we derived monthly consumption data using information on monthly retail sales on consumer goods, and the consumption of transportation and telecommunication services (Chang and Liu, 1951).

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Notes

1. See, for example, Blanchard and Giavazz (2006), Cheung et al. (2007a,b), Feenstra and Wei (2009), Lane and Schmukler (2007), Obstfeld (2006), and Rodrik (2006).
2. See, for example, Cheung and Qian (2009a), Eichengreen and Tong (2007), Hale and Long (forthcoming), Jeanne (2007), and Prasad and Wei (2007).
3. See, for example, Harrigan et al. (2002), Pastor (1990), and Rojas-Suarez (1990).
4. It is noted that the cointegration between capital flight and its determinants reported in Ljungwall and Wang (2008, Table 2) does not exist when the relevant finite sample critical values are used (Cheung and Lai, 1993).

5. Mandilaras and Popper (2009) find domestic economic condition is the best predictor of capital flows in seven East Asian economies.
6. See, for example, Boyce and Ndikumana (2001), Cuddington (1986), Dooley et al. (1986), Dornbusch (1984), and Khan and Haque (1987).
7. Another popular measure of capital flight is the Dooley approach, which is shown to be a variant of the residual approach (Claessens and Naudé, 1993; Dooley, 1986, 1988). Also, individual measures of capital flight could be combined to form new alternative measures; see, for example, Claessens and Naudé (1993) and Kar and Cartwright-Smith (2008).
8. Gunter (2004) reports inward capital flight in 1985, but not for the 1986–89 period. The difference could be due to data revision.
9. See, for example, Claessens and Naudé (1993), Kant (1996), and Kar and Cartwright-Smith (2008) for a detailed description of various capital flight measures and their limitations.
10. The media typically focuses on the "basic balance" given by $NFDI - CAD$. When the sum is in surplus, it means a net inflow of foreign exchange from the net trade proceeds and/or net foreign money into the economy for long-term investment, but these are not the total (portfolio) capital inflow.
11. Studies examining the stock of capital flight include Collier et al. (1999), Cuddington (1987), and Rojas-Suarez (1990).
12. Nondeliverable forward markets are described in, for example, Ma et al. (2004).
13. The covered interest differential is sometimes associated with capital controls or the threat of their imposition. In general, see, for example, Aliber (1973), Dooley and Isard (1980), and Frankel and Engel (1984), and in the content of China, see, for example, Cheung et al. (2003) and Ma and McCauley (2008).
14. Also, see Boyce (1992), Conesa (1987), Cuddington (1986), Dooley (1986, 1988), Dornbusch (1984), Gibson and Tsakalotos (1993), Lessard and Williamson (1987), Mikkelsen (1991), and Smit and Mocke (1991).
15. The first Strategic Economic Dialogue took place in December 2006. The Dialogue was re-named the US–China Strategic and Economic Dialogue in July 2009; see http://www.ustreas.gov/initiatives/us-china/index.shtml.
16. See Clark and Jokung (1998) for the role of political risk in determining capital flight.
17. See, for example, Hung (2008) and Prasad and Wei (2007) for China's capital control policy.
18. China's data on *outward* and *inward* capital flight could be distorted by capital round-tripping, which refers to transferring capital illicitly out of China and then investing it back in the country via, say, Hong Kong, in order to take advantage of preferential tax concessions offered to foreign capital. See, for example, Tseng and Zebregs (2002) and World Bank (2002).