

This chapter seeks to explain the divergence in current account behavior between emerging Asia and emerging Europe. It identifies financial liberalization and EU integration as the main drivers of the large and persistent deficits in emerging Europe but also raises concerns about risks of abrupt endings. In contrast, less open capital accounts and financial sectors contributed to surpluses in emerging Asia. To a large extent, however, these surpluses remain unexplained, raising questions about the role of exchange rates and the desire of some countries to build high levels of reserves after the Asian crisis.

The pattern of current account balances across emerging economies has become much more diverse in recent years than during the early 1990s, particularly between emerging Asia and Europe.¹ Most of emerging Asia (especially after the 1997–98 crisis), the Middle East, and some members of the Commonwealth of Independent States have reported large current account surpluses, while large current account deficits are observed mainly in emerging Europe and other countries such as Jordan, Pakistan, South Africa, Turkey, Vietnam, and a number of countries in Central America and the Caribbean. The current account deficits in Latin America and Africa remained on average at modest levels. Notably,

The main authors of this chapter are Stephan Danziger and Florence Jaumotte. Joshua Aizenman and Christopher Meissner provided consultancy support, and Stephanie Denis and Patrick Hettinger provided research assistance. Jonathan Ostry supervised the chapter.

¹Emerging Asia is defined to include the newly industrialized Asian economies, or NIEs (Korea, Hong Kong SAR, Singapore, and Taiwan POC), the Asian Tigers (Indonesia, Malaysia, the Philippines, and Thailand), China, and other Asia (India, Pakistan, Sri Lanka, and Vietnam). Emerging Europe includes central Europe (Czech Republic, Hungary, Poland, Slovak Republic, and Slovenia), southeastern Europe (Albania, Bulgaria, Croatia, Macedonia, FYR, and Romania), and the Baltics (Estonia, Latvia, and Lithuania).

virtually all of these emerging economies have achieved high growth during the past decade, irrespective of their current account positions.

The divergent current account patterns in emerging Asia and Europe have revived the long-standing debate over the connection between economic development and capital flows—the Lucas paradox (Lucas, 1990). Theory predicts that growth should lead to current account deficits for two reasons. On one hand, high growth and the resulting profitable investment opportunities should make the country attractive to foreign capital. On the other hand, if individuals want to smooth their consumption over time, prospects of continued high growth should lead to higher consumption today because income and consumption can be expected to rise further in the future. The traditional view that capital flows downhill to high-growth countries seems to hold for emerging Europe, whereas the opposite appears to be the case for emerging Asia after 1997–98.

The two patterns may also have different implications for macroeconomic stability. The path of the Asian countries, which combine rapid growth with current account surpluses, may seem safer, at least from the point of view of external vulnerability.² However, there may be limits to how long export-led growth can be sustained, particularly if it is associated with a low exchange rate, because of the risks of capital misallocation, overheating, and rising inflation. In contrast, although sustained current account deficits could fuel overconsumption and be vulnerable to “sudden stops” in financial flows, they need not end abruptly if they reflect consumption smoothing or the financing of productive investment during episodes of high

²The large current account surpluses may, however, entail a growth and/or welfare cost, but this issue is not examined in this chapter.

growth, as theory would predict (see, for example, Ghosh and Ostry, 1995, and Ostry, 1997).

Against this background, the chapter looks more closely at factors underlying the recent divergence in current account balances across emerging economies and attempts to assess their sustainability.³ The analysis focuses in particular on explaining the divergence between emerging Asia and emerging Europe and attempts to answer the following questions:

- What components of the current and financial accounts have driven the recent trends in the various emerging regions? How have saving and investment evolved? How does this experience compare to previous episodes of growth spurts, including those of currently advanced economies when they were emerging?
- How can the different growth-current account configurations in emerging economies be explained? Do they reflect temporary economic shocks, macroeconomic policies, or structural factors? For instance, what are the roles of financial liberalization, barriers to access to foreign capital, and the exchange rate?
- Are the current large imbalances atypically persistent relative to previous spells of current account surpluses and deficits? How long will they be sustained? Do particular factors or policies (such as export growth or the exchange rate regime) contribute to whether they resolve smoothly or abruptly?

The chapter finds that much of the regional differences can be explained by structural factors, while also providing some support for the traditional view that high growth prospects attract foreign capital and lower the current account balance. In emerging Europe, the liberalization of the financial sector and the process of integration into the EU are the main drivers of the large current account deficits. In emerg-

ing Asia, structural factors also matter. Low net capital inflows are linked to the more limited openness of the capital accounts and financial sectors, to demographics (younger populations), and to differences in political structures. However, these factors only partially account for these economies' surpluses. The residual current account surpluses are strongly associated with low exchange rates and large accumulations of reserves. However, it is difficult to establish whether these variables reflect deliberate policy action or other unidentified fundamental factors that both raised the current account and lowered the exchange rate since the Asian crisis in 1997–98.

The deficits in emerging Europe appear especially large and persistent relative to historical episodes, and the protracted surpluses in emerging Asia, such as those in China and Malaysia, are equally uncommon among emerging economies. Based on past experience, the very lengthy deficit episodes in emerging Europe can be partly explained by high growth prospects, highly open capital accounts, financial liberalization, and high initial net foreign asset positions. In general, however, the duration of these episodes is already reaching the upper end of expectations, raising questions about their sustainability. The chapter finds that the factors that may cause an abrupt end to these deficits include the region's fixed exchange rate regimes and open capital accounts.

This chapter is organized as follows. The next section examines current account patterns in emerging economies by reviewing developments in the current account, financial account, and saving-investment balance. The following section uses empirical evidence to identify the main economic factors driving these current account imbalances, again focusing on emerging Europe and emerging Asia. The next section puts the duration of present imbalances in historical perspective and examines the determinants of the length of imbalance episodes. The concluding section offers some policy suggestions.

³See various issues of the *World Economic Outlook* for complementary analysis of global imbalances (April 2005, September 2005, April 2006, April 2007, and October 2007).

Recent Current Account Patterns in Emerging Economies

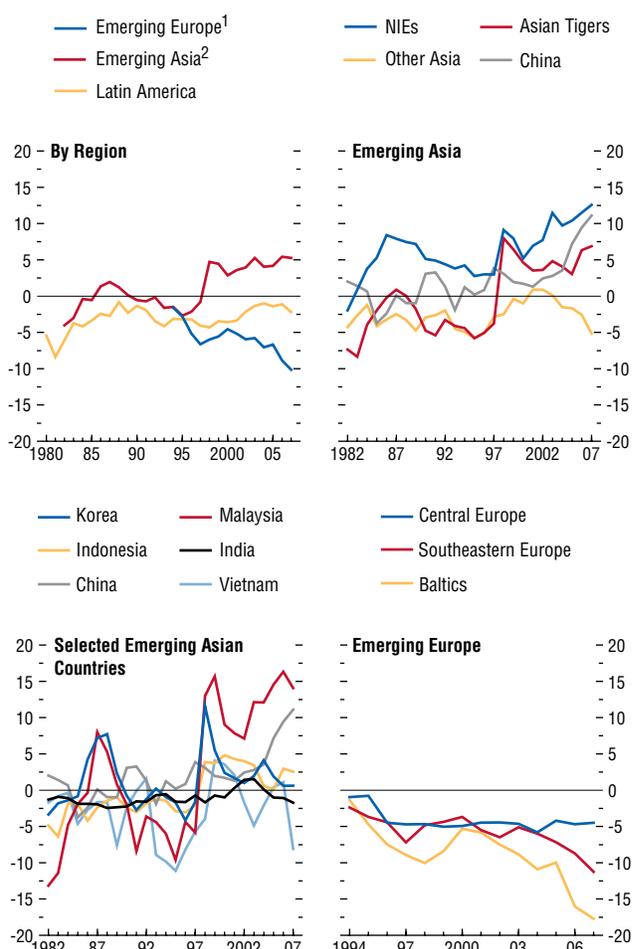
In the mid-1990s the main emerging regions all ran moderate current account deficits, but there is now an increasing divergence in current account balances across emerging regions (Figure 6.1). In particular, emerging Asia is accumulating large and increasing current account surpluses, on the order of 5 percent of GDP in 2007, whereas emerging Europe is running large and growing current account deficits reaching on average 10 percent of GDP in 2007. Most other country groups (Latin America and a group consisting of other emerging economies) are experiencing moderate current account deficits or small surpluses. Oil exporters are also running large current account surpluses, but these are driven by the particular circumstances of countries that rely on a depletable resource and are analyzed separately in Box 6.1. Because their current account positions respond differently to economic determinants, and their saving and investment behavior is driven by different considerations (such as the size of reserves), these countries were omitted from the empirical analysis below.

Within emerging Asia the pattern is also heterogeneous, with some persistent large surpluses and a few substantial deficits. The aggregate surpluses for the region reflect different contributors at different times. In the aftermath of the Asian crisis, the crisis countries (Korea and the Asian Tigers) accumulated large surpluses following the loss of access to international capital flows and in an effort to rebuild reserves. More recently (starting around 2002–03), current account surpluses in several of the crisis countries have come down, with the marked exception of Malaysia, while China started accumulating large current account surpluses. China and Malaysia are the only two cases of persistent large surpluses (see below). By contrast, low-income countries, such as India, Pakistan, Sri Lanka, and Vietnam, have mostly been running deficits, importing capital in accordance with theory. The three small NIEs (Hong Kong SAR,

Figure 6.1. Patterns of Divergence in Current Account Balance

(Percent of GDP; simple average)

The increasing divergence of current account imbalances in emerging economies is the result of a homogenous shift to longer deficits in emerging Europe and a more varied transition to surpluses in Asia following the Asian crisis, with initially large improvements by the Asian Tigers and Korea and more recently large surpluses in Malaysia and China.



Sources: IMF, *Balance of Payments Statistics*; and IMF staff calculations.

¹Emerging Europe includes central Europe (Czech Republic, Hungary, Poland, Slovak Republic, and Slovenia), southeastern Europe (Albania, Bulgaria, Croatia, Macedonia, FYR, and Romania), and the Baltics (Estonia, Latvia, and Lithuania).

²Emerging Asia includes newly industrialized Asian economies (NIEs—Hong Kong SAR, Korea, Singapore, and Taiwan POC), Asian Tigers (Indonesia, Malaysia, Philippines, and Thailand), China, and Other Asia (India, Pakistan, Sri Lanka, and Vietnam).

Box 6.1. Current Account Determinants for Oil-Exporting Countries

The current account surpluses of oil-exporting countries have widened significantly in the past few years, as oil prices soared. The average current account of oil exporters increased from less than 4 percent of GDP to more than 13 percent between 2002 and 2007 (first figure). During the same period, the sum of the current accounts of those countries increased from less than \$90 billion (0.3 percent of world GDP) to almost \$500 billion (0.9 percent of world GDP). These surpluses are projected to increase further in 2008 as a result of the sharp increase in oil prices.¹

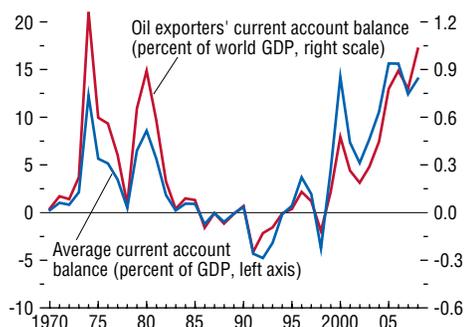
This box explores the medium-run determinants of the current account balance for oil exporters and their differences and similarities to determinants in other countries. It draws on the so-called macroeconomic balance (MB) approach, which is based on the equilibrium relationship between current account balances and a set of fundamentals (measured, when

relevant, as differences from trading partners' averages). These fundamentals include variables such as the fiscal balance, demographics, the oil balance, and economic growth, which are all robust determinants of the current account balance (Lee and others, 2008).

Before turning to the regression analysis, it is useful to highlight three macroeconomic dimensions along which oil exporters are substantially different from the rest of the world:

- Oil-exporting countries are exposed to wide fluctuations in their external accounts, because their exports, by definition, are relatively undiversified and oil prices fluctuate widely. Such volatility is directly reflected in the higher volatility of their terms of trade and current accounts as a percent of GDP (second figure).
- The fiscal balance in oil-exporting countries is typically dominated by swings in fiscal revenues related to oil exports² and is hence

Current Account Behavior in Oil Exporters



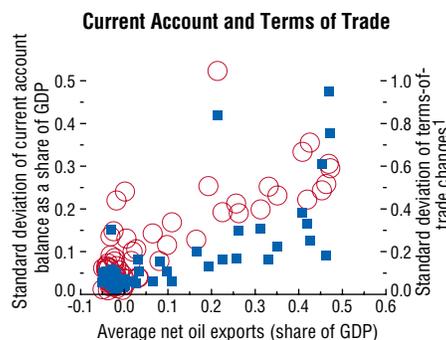
Sources: IMF, *Balance of Payments Statistics*; and IMF staff calculations.

The main authors of this box are Rudolfs Bems and Ireneu de Carvalho Filho.

¹The oil exporters are Algeria, Angola, Azerbaijan, Bahrain, Republic of Congo, Ecuador, Equatorial Guinea, Gabon, I.R. of Iran, Kazakhstan, Kuwait, Libya, Nigeria, Norway, Oman, Qatar, Russia, Saudi Arabia, Syrian Arab Republic, Turkmenistan, United Arab Emirates, Rep. Bolivariana de Venezuela, and Republic of Yemen.

Oil Dependency and Volatility, 1970–2006

■ Standard deviation of current account balances ○ Standard deviation of terms-of-trade changes¹ (right scale)



Source: IMF staff calculations.
¹Goods and services terms of trade.

²Among other revenue sources, oil-related revenues include royalties on oil exploration, export taxes, oil companies' corporate income taxes, and dividends of state-owned oil companies.

very strongly correlated with the current account as well as being more volatile than for non-oil-exporters.

- Because oil revenues accrue from the sale of an exhaustible resource, transfers from one generation to another play an important role in ensuring intergenerational equity.³ To avoid sharp decreases in absorption once oil exports decline, countries aim to accumulate foreign assets and use income from such assets to offset the decreasing income from oil. Such transfers are more important for countries that expect to deplete their exhaustible resource endowment within a few decades.

To assess the current account determinants for exporters of exhaustible resources more formally, MB-type regressions are estimated building on the work presented in Lee and others (2008). Oil exporters are incorporated in the framework by allowing for (1) the non-oil fiscal balance as the relevant fiscal variable, in order to separate the effects of oil revenues and the non-oil fiscal balance on the current account; (2) a specific oil-balance coefficient for oil exporters, as well as for those exporters with more limited reserves, to capture intergenerational transfers and the delayed response of consumption and investment to changes in oil income; and (3) a specific lagged current account coefficient for oil exporters, to capture differences in persistence. The analysis also included tests for differences in the other coefficients.

There are two important caveats to the results. First, the quality of historical data for several oil exporters is problematic—in particular, the measurement of the non-oil fiscal balance is fraught with difficulties because the definition of the “oil sector” can differ across countries. Second, the non-oil sector in oil exporters may include oil-related activities (such as petrochemicals and fertilizers). This may imply a stronger link between the cur-

³See Bems and de Carvalho Filho (forthcoming), and Thomas, Kim, and Aslam (2008).

Determinants of Current Account Balances in Oil-Exporting Countries

	MB Sample 1970–2004	All Countries 1970–2004	All Countries 1970–2006
Old-age dependency	–0.15***	–0.14*	–0.15
Population growth	–1.10**	–0.98	–1.29**
Output growth	–0.20**	–0.19**	–0.15**
Dummy for financial center	0.03***	0.03***	0.03***
Non-oil fiscal balance/GDP	0.20***	0.20***	0.21***
Non-oil fiscal balance/GDP (oil exporters)		0.45**	0.50***
Relative income	0.02*	0.03**	0.02
Relative income, for oil exporters		0.08***	0.08***
Volatility of terms of trade	0.01	0.07*	0.08*
Oil balance/GDP	0.20***	0.28**	0.33***
Oil balance/GDP (oil exporters)		0.49***	0.61***
Oil balance/GDP (oil exporters, limited reserves)		0.59***	0.68***
Lagged oil balance/GDP		–0.11	–0.16
Lagged current account	0.37***	0.38***	0.42***
Lagged current account (oil exporters)		0.56***	0.59***
Observations	359	430	483
<i>R-squared</i>	0.62	0.78	0.79

Source: IMF staff estimates.

Note: *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively.

rent account and oil prices than pure oil sales would suggest and hence a higher positive coefficient on the oil balance in the current account regression.

Regression results from the extended MB framework are reported in the table.⁴ The first column presents coefficients for a subset of developed and emerging market countries that excludes oil exporters, with the excep-

⁴The regression sample excludes Angola, Republic of Congo, Equatorial Guinea, Gabon, and Nigeria, based on average size and GDP per capita during the sample period.

Box 6.1 (concluded)

tion of Norway, based on a sample spanning 1970–2004, with each observation corresponding to a four-year average. The second and third columns present results for the entire sample of countries (with the third column adding 2005–06 as an additional observation). Estimated coefficients are, in general, statistically and economically significant and have expected signs and plausible magnitudes. Furthermore, the fit of the regression is very good, especially in light of the fact that fixed country effects are not included.

Focusing first on those variables that have similar effects on the current account balance in both groups of countries, the estimates imply that the effects of the dependency ratio (ratio of population above age 65 to population between ages 30 and 64), population growth and per capita GDP growth are statistically and economically indistinguishable across oil exporters and importers. A higher dependency ratio reduces the current account balance, a 1 percentage point increase in the population growth rate relative to trading partners lowers the current account by about 0.7–1.0 percent of GDP, and a 1 percentage point increase in per capita GDP growth relative to trading partners lowers the current account by about 0.2 percent of GDP.

As for the impact of other variables on the current account, there are statistically and economically significant differences between oil exporters and other countries:

- A 1 percentage point improvement in the (non-oil) fiscal balance leads to a 0.4–0.5 percentage point increase in the current account balance in percent of GDP for oil exporters, and to an increase of about 0.15 percentage point for other countries. This result is consistent with evidence that, in less financially developed countries, the relationship between fiscal balance and the current account balance is stronger.
- The current account balance responds more strongly to the oil balance in oil exporters than in oil importers. This result

is consistent with the notion that, because oil is an exhaustible resource, the propensity to save out of an oil price windfall is higher. Also, oil typically plays a more central economic role in oil exporters than in oil importers—as a result, the same oil price shock implies a larger change in income for oil exporters. With adjustment costs to consumption and investment, the response of the current account to an oil price shock is likely to be larger for oil exporters, at least in the short run.

- Among oil exporters, the response of the current account to the oil balance is stronger in countries with lower oil and gas reserves (such as Algeria and Norway), consistent with the fact that their oil revenues are more temporary than for other exporters.
- An increase in relative income raises the current account balance significantly more in oil-exporting countries than in other countries—an oil-exporting country with income half the level in the United States will have, on average, a current account balance that is 3–4 percentage points of GDP smaller than that of a country with income equal to the U.S. level (the difference is $\frac{1}{2}$ –1 percentage point for other countries). A possible interpretation is that, in countries with volatile relative income and exhaustible resources, like oil exporters, a higher fraction of income would be saved in “good times” (and dissaved in “bad times”) because shocks to income are more likely to be temporary.

In conclusion, this preliminary evidence is broadly consistent with theoretical predictions. Oil-exporting countries are likely to have large external surpluses, particularly at times of peaks in production and high oil prices. This is consistent with the need to smooth consumption over time and between generations, in light of the exhaustible-resource nature of oil, as well as with the partly transitory nature of oil revenue booms and the presence of adjustment costs to consumption and investment.

Singapore, and Taiwan POC) have been running very large current account surpluses, well above 10 percent of GDP, but they are very much special cases: all three have high income levels, and Singapore and Hong Kong SAR are financial centers, pointing to different determinants for their international capital flows. For the most part, these economies are omitted from the rest of the chapter.

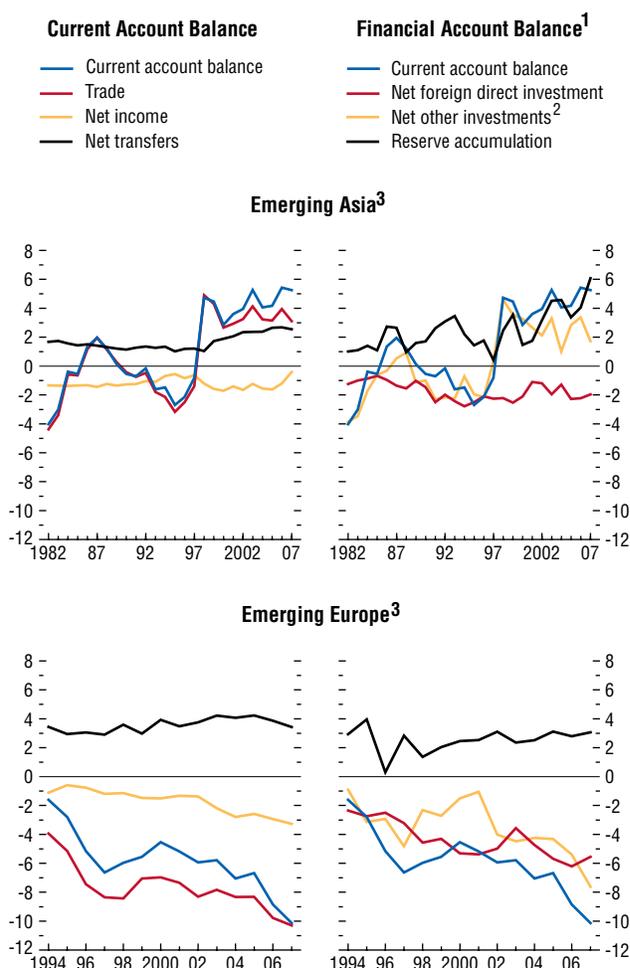
In contrast to the Asian experience, the current account patterns in emerging Europe are more homogenous and include many large, persistent imbalances. Deficits are very large and growing in the Baltics and southeastern Europe, averaging 18 percent and 11 percent of GDP in 2007, respectively. The deficits in central Europe have stabilized at more moderate levels, around 5 percent of GDP on average.

Developments in the current account are mostly driven by the trade balance (Figure 6.2). In emerging Asia, the trade surplus accounts for most of the rise in the current account surplus, although an increase in net private transfers has added an extra percentage point to the current account balance since 1997 (mostly in the Philippines, Vietnam, and Pakistan). Similarly in emerging Europe, the trade deficit explains most of the increase in the current account deficit, with an additional 1½ percentage points of deficit coming from a recent decline in net investment income. However, in recent years, the Czech Republic and Hungary have been running trade surpluses, with their current account deficits mostly driven by negative income balances.

Turning to financial flows, the large surpluses in emerging Asia have been associated with large outflows of non-foreign-direct-investment (non-FDI) capital and an unprecedented accumulation of reserves. Reserves have now reached 39 percent of GDP and cover 9.2 months of imports. A by-product of the large accumulation of reserves in emerging Asia and the oil-producing countries has been the creation of large sovereign wealth funds (SWFs), which has potentially important implications for global capital flows and asset prices (Box 6.2). Emerg-

Figure 6.2. External Balances by Component
(Percent of GDP; simple average)

Developments in the current account are mostly driven by the trade balance. In emerging Asia the current transfer balance also improved after 1997, whereas in emerging Europe rising deficits were associated with a deterioration of the net income balance.



Sources: IMF, *Balance of Payments Statistics*; and IMF staff calculations.
¹Financial account transactions have been multiplied by -1.
²Includes net portfolio investments and net other investments.
³See footnotes 1 and 2 in Figure 6.1 for regional breakdowns.

Box 6.2. Sovereign Wealth Funds: Implications for Global Financial Markets

This box discusses how large, persistent current account surpluses in several, mostly emerging, economies have resulted in sovereign wealth funds (SWFs) becoming key players in the global financial landscape (first figure). It also examines the possible impact of the growing role of SWFs on global capital flows, key asset prices, and financial markets more broadly.¹

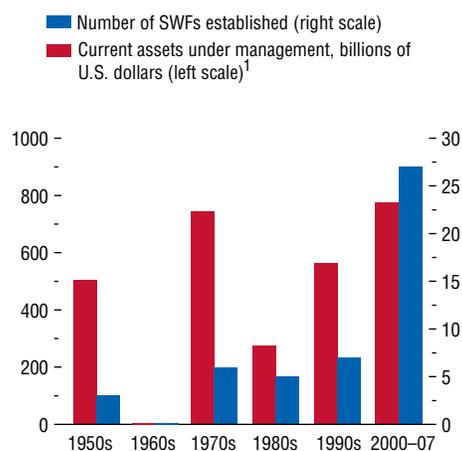
Although many SWFs have been around for many years, if not decades, there has been a sharp increase since 2000 in the number of SWFs and in the assets estimated to be under their management. The growing presence of SWFs is a result of sustained large current account surpluses in several Asian economies and oil-exporting countries. These surpluses—reflecting high commodity prices and favorable trade balances—have translated into a rapid accumulation of foreign reserves by central banks. Reserves have reached a level that many countries have come to believe provides a sufficient cushion against financial or economic shocks. Although many of these countries still have enormous development needs, their absorptive capacity is limited. Therefore, quickly spending the oil- or export-related revenues may be inappropriate or unfeasible. Moreover, there is a growing sense that turning “resources in the ground” into financial assets is an important channel for transferring wealth across generations.

As a result, many countries are seeking to enhance the returns on these large pools of funds. Rather than continuing to invest conservatively through sustained reserve accumulation, they are transferring these assets to SWFs with broader and more aggressive investment mandates. Estimates by market participants suggest that assets under management of SWFs range from \$2 to \$3 trillion—exceeding assets managed by hedge funds (\$1.9 trillion)—and account for about one-fourth to one-third of foreign assets held by sovereigns. Although SWF assets remain small relative to total global

The main authors of this box are Julie Kozack, Douglas Laxton, and Krishna Srinivasan.

¹See Kozack, Laxton, and Srinivasan (forthcoming).

The Number of Sovereign Wealth Funds (SWFs) Has Grown Dramatically



Sources: Media and analyst reports; and IMF staff estimates.

¹Current estimated assets under management for SWFs established in each time period.

financial assets (about \$190 trillion), they are large relative to mature market stock capitalization and the size of debt and capital markets in emerging economies. That said, part of SWFs’ portfolios is often invested in nonfinancial assets, such as real estate. SWF assets are projected to surpass the stock of global foreign exchange reserves in the not-so-distant future and to top \$7 to \$11 trillion by 2013. Thus it is clear that SWFs will play an increasingly prominent role in global finance.

Against this background, a key concern is the impact of the growing presence of SWFs on the pattern of global capital flows, asset prices, and financial stability more generally. SWFs typically have medium- to long-term investment horizons, suggesting that they are less likely to make abrupt portfolio shifts that could affect market stability. Indeed, during the current financial market turmoil, SWFs have made large capital injections into systemically important financial institutions, suggesting that SWFs can play a stabilizing role in global financial markets. Yet

even a gradual shift toward greater portfolio diversification of reserve assets by sovereigns, including through SWFs, could have implications for the flow of funds between countries, the absolute and relative price of assets, and the evolution of global imbalances.²

Analyzing the potential impact of a diversification of sovereign reserves through SWFs is challenging because of the lack of reliable information for several large SWFs, notably concerning their asset allocations. To examine the possible implications of the growing presence of SWFs, illustrative scenarios of asset allocation were constructed for countries that are in the process of shifting away from holding reserves and toward diversifying their assets through SWFs.^{3,4} Two stylized, diversified portfolios—one replicating that of Norway's Government Pension Fund (GPF-Global) and the other representative of well-established SWFs—are calibrated and compared with a stylized portfolio of

foreign exchange reserve assets, with a view to assessing likely changes in the pattern of global capital flows and the impact on asset prices (second figure).⁵ To complement this scenario analysis, the exercise also estimates the impact of a modest shift away from dollar assets in the current stock of reserves for the 10 largest emerging economy reserve holders. A note of caution is warranted. As in many modeling exercises, the results are highly sensitive to the underlying assumptions. For instance, by assuming no portfolio shifts for long-established SWFs, the exercise provides only a partial picture of the possible magnitude of the impact on capital flows and asset prices arising from possible diversification strategies. Moreover, other sovereigns may choose to diversify their existing stock of reserve assets (and not just the top 10 emerging market reserve holders as assumed in the exercise). Finally, while the two stylized portfolios aim to capture possible asset-allocation strategies, it must be recognized that in practice, SWFs are a diverse group with differing mandates, transparency, and governance structures. Even so, this limited exercise provides a sense of the direction and magnitude of the possible impact on markets.

The analysis suggests that the pattern of global capital flows would change significantly, with advanced economies facing lower capital inflows and emerging economies attracting substantially larger inflows (third figure). Relative to reserve assets, which are predominantly dollar-denominated and generally held in the form of U.S. Treasury bills or agency securities, the stylized SWF portfolios are more diversified

²Foreign official investors are estimated to have kept 10-year U.S. Treasury nominal yields 100 basis points lower than otherwise (Warnock and Warnock, 2006).

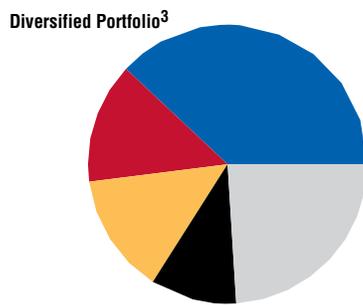
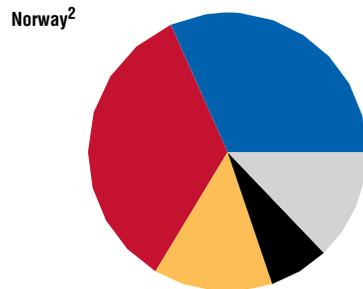
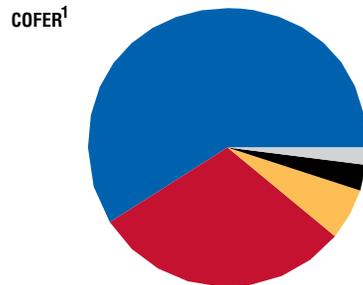
³The analysis assumes that countries that have recently established SWFs or have announced their intention to do so will channel a portion of their prospective foreign exchange inflows to their respective SWFs. Countries that have recently established or are in the process of establishing SWFs or SWF-type investment funds include Brazil, China, Korea, Russia, and Saudi Arabia; those that are considering the establishment of SWFs (according to market reports) include India, Japan, and Thailand.

⁴The new flows are calculated as the sum of each country's current account balance and net private capital flows, based on *World Economic Outlook* projections for 2008–13. The analysis provides for a *lower bound*—which assumes that countries with recently established SWFs will invest 50 percent of newly available foreign currency inflows in their SWFs; and an *upper bound*—which assumes that in addition, countries that are considering establishing SWFs (based on market reports) invest 50 percent of newly available foreign currency inflows in their SWFs. The upper bound also assumes that 10 percent of the stock of existing reserves of the top 10 emerging economy reserve holders is shifted from reserves to SWF holdings during 2008–13. It is assumed that all new flows into SWFs are invested abroad.

⁵The stylized portfolio of a representative diversified SWF is based on market reports concerning asset allocation and currency composition. Currency Composition of Official Foreign Exchange Reserves (COFER) is an IMF database that records end-of-period quarterly data on the currency composition of official foreign exchange reserves. Aggregate COFER data are used to derive a stylized reserves portfolio, assuming that assets are allocated exclusively toward government bonds, according to the COFER currency composition.

Box 6.2 (concluded)

Currency Composition of Stylized Portfolios



Sources: COFER database; Norges Bank; and IMF staff estimates.

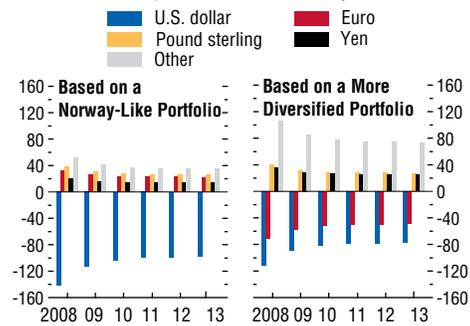
¹Aggregate data. COFER is an IMF database on the currency composition of official foreign exchange reserves.

²At present, Norway's portfolio is invested in 47 percent equities and 53 percent bonds.

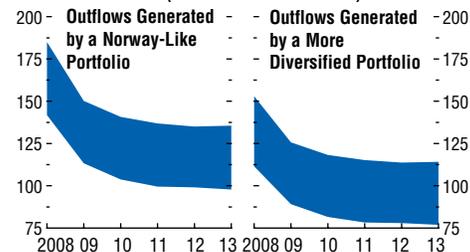
³Stylized portfolio of a representative diversified SWF based on market reports about their asset allocation and currency composition.

Simulation Results

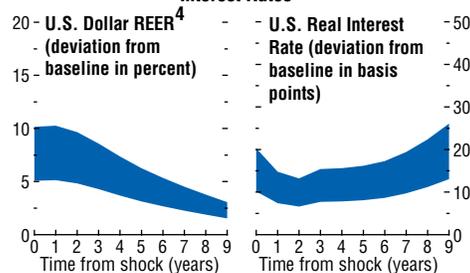
Possible Change in the Currency Composition of Capital Outflows from Selected SWF Countries (billions of U.S. dollars)^{1,2}



Range of Possible Capital Outflows from U.S. Dollar Assets (billions of U.S. dollars)^{2,3}



Range of Possible Effects on U.S. Exchange and Interest Rates^{2,3}



Source: IMF staff estimates.

¹Based on the assumption that 50 percent of available foreign currency flows to countries listed in footnote 2 are placed with the sovereign wealth fund (SWF) and invested in foreign assets.

²Includes Brazil, China, Korea, Russia (National Wealth Fund only), and Saudi Arabia.

³The lower bound of the range is based on the assumption described in footnote 1. The upper bound assumes that countries with prospective SWFs (based on media reports) also place 50 percent of available foreign exchange in SWFs to be invested abroad. The upper bound also assumes that 10 percent of the stock of existing reserves of the top 10 emerging economy reserve holders is shifted from reserves to SWF holdings over the period 2008–13.

⁴REER = real effective exchange rate.

across both asset classes and currency exposure. This suggests reduced inflows into government bond markets, with attendant implications for interest rates. The shift away from reserve assets could have the most significant effect on markets in the United States, if countries diversify away from dollar holdings.

- Estimates show that inflows into the United States could decline by $\frac{1}{2}$ –1 percent of U.S. GDP a year on average, depending on the number of countries in the sample and the assumption made regarding the currency composition of reserves for the 10 largest emerging economy reserve holders. The results also hinge on the asset-allocation strategy that is used to model investments by the prospective SWFs.
- Portfolios that are more weighted to emerging economies—such as the stylized diversified portfolio—would result in lower flows into both dollar and euro assets, whereas flows to emerging economies would tend to increase substantially. By contrast, a portfolio similar to Norway’s SWF—which is heavily weighted toward investments in Europe—would suggest somewhat lower investment in dollar assets and a less sizable, but still positive, inflow to emerging markets.
- To quantify the implications of the potential changes in the pattern of capital flows on interest rates and exchange rates relative to the baseline, simulations were undertaken using the IMF’s GIMF5 model.⁶ The results

⁶Simulations were performed on a five-region version of the Global Integrated Monetary and Fiscal

focus on the effects for the United States. They point to a 10–25 basis point increase in U.S. real interest rates and a 2–4 percent depreciation of the U.S. dollar in the long run. The model does predict a sharper depreciation of the dollar in the short run, of some 6–10 percent. The U.S. current account deficit could improve by $\frac{1}{2}$ –1 percentage point of U.S. GDP, a consequence of a higher country risk premium driven by lower demand for U.S. assets. In the rest of the world, higher capital inflows would lead to lower real interest rates (and thus a larger interest rate differential with the United States) and more appreciated currencies (in real effective terms), and domestic demand would be boosted.

The model estimates do not suggest a disorderly depreciation of the U.S. dollar, nor a disorderly unwinding of global imbalances. In fact, they suggest that the effect of gradual portfolio shifts would be modest in the long run. However, the model estimates do not take into account possible second-round effects, as other investors react to the change in the behavior of SWFs. Overall, the results suggest that lower demand for U.S. assets would help lower the U.S. current account deficit and lower the value of the dollar.

Model (GIMF5). GIMF5 is an extended version of the Kumhof and Laxton model and includes separate models for the United States, euro area, Japan, emerging Asia, and “remaining countries.” See Kumhof and Laxton (2007).

ing Asia remains a net importer of FDI, but net FDI inflows (in percent of GDP) are small compared with inflows to emerging economies in other regions, and they have not changed much since the beginning of the 1990s. In emerging Europe, the increasing current account deficits are covered to a large extent by net FDI, a relatively stable source of financing, although

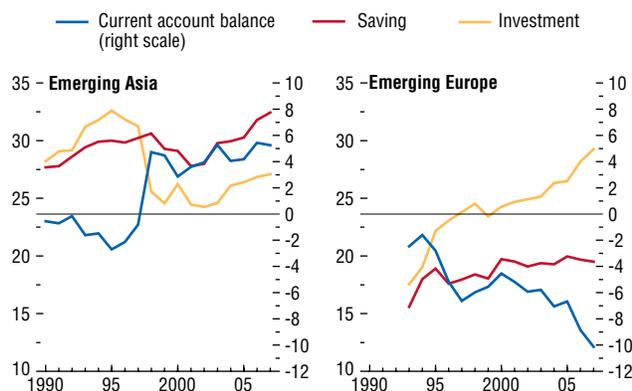
increases in deficits have outpaced net FDI during the past few years. Emerging Europe is also a large importer of non-FDI capital, including both bond-related and equity inflows. Overall reserves have accumulated at a rate of 2–3 percent of GDP a year.

Another way to understand changes in the current account balance is to look at develop-

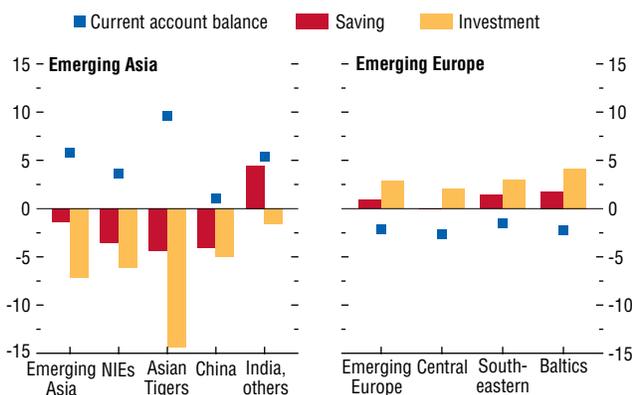
Figure 6.3. Current Account Balance, Saving, and Investment¹

(Percent of GDP; simple average)

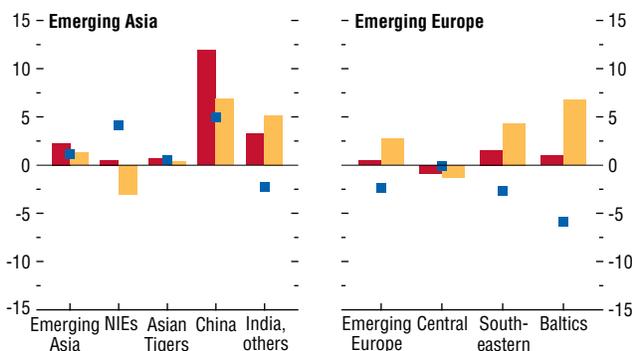
In Asia saving and investment declined after 1997, the latter abruptly in the Tigers. Although investment remained below pre-crisis levels, saving and investment were driven up recently by increases in China, India, and others. In contrast, investment grew rapidly in emerging Europe, especially in the lower-income countries, and was coupled with modest gains in saving.



Change in Current Account Balance, Saving, and Investment: 1999–2002 versus 1994–96



2003–07 versus 1999–2002



Sources: CEIC Data Company Limited; UN National Account Statistics; and IMF staff calculations.

¹See footnotes 1 and 2 in Figure 6.1 for regional breakdowns.

ments in saving and investment (Figures 6.3 and 6.4).⁴ In emerging Asia, the 1997–98 crisis led to a drastic drop in (mostly) private investment in Korea and the Asian Tigers. Saving also declined, especially public saving, but the decline was much smaller. In contrast, the rising surplus in China during the latter period (2003–06) was driven by a large rebound in private (mostly corporate) saving and a continued increase in public saving.⁵ Private and public investment also increased, although by smaller amounts. In emerging Europe, the current account deficits reflected a surge in private investment (mirroring a rise in FDI) and, to a lesser extent, in public investment, especially in the Baltics and southeastern Europe. Public saving also increased modestly in these countries (with the exception of central Europe), whereas private saving was relatively flat. As in emerging Asia, household dissaving has been offset by increased corporate saving, although in recent years, there has been some private dissaving on net.

Compared with other episodes of growth takeoffs, recent current account deficits in emerging Europe are quite large (Figure 6.5).⁶ Economies that experienced a growth takeoff at some point during the past 35 years had current account deficits of about 3 percent of GDP on average during the first eight years following the growth takeoff, compared with deficits averaging 6–7 percent of GDP in emerging Europe over the equivalent period. A similar pattern, albeit with a smaller difference, was also observed during the growth takeoffs of a number of countries

⁴The current account balance is the difference between national savings and gross investment.

⁵An argument that has been advanced to explain China’s surplus is a high household saving rate, reflecting the lack of social safety nets or habit-based consumption. However, the recent rise in China’s current account was associated with an increase in the corporate saving rate and not the household saving rate. Aziz and Cui (2007) argue that a declining labor income share—rather than an increasing household saving rate—has been the main factor behind the declining consumption share of GDP in China.

⁶Appendix 6.1 presents in more detail the criteria used to identify growth takeoffs and the countries and years during which these occurred.

in emerging Asia, with the exception of China.⁷ In general, across growth takeoffs, the deepening of the current account deficit was associated with a surge in investment and a small offsetting increase in saving. By comparison, the takeoff in emerging Europe brought a larger acceleration in investment, an experience matched previously only by the takeoffs in the Asian Tigers during the early 1970s. Where emerging Europe stands out from the typical growth takeoff is with respect to the larger net inflows of FDI and the longer duration of deficit episodes.

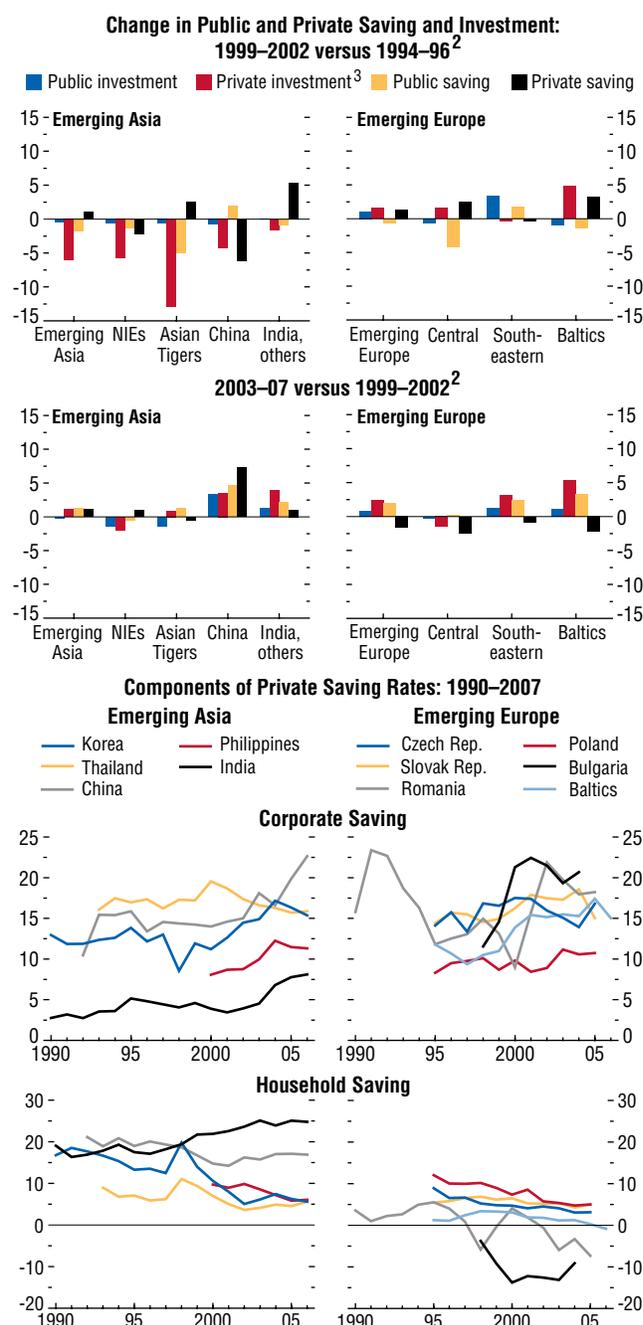
Interestingly, the growth takeoffs identified here include a number of western European countries with earlier EU entry. These also experienced substantial current account deficits and net inflows of FDI, but on a much smaller scale than emerging Europe. This could partly reflect the fact that their capital accounts were only fully opened in the early 1990s, in most cases after their growth takeoffs.

The current account reversals in emerging Asia during the 1997–98 crisis also stand out relative to experiences in other crisis episodes. Compared with currency and banking crises that occurred since 1980, emerging Asian economies started from bigger deficits on average, and the adjustments in their current accounts and investment levels were much larger and much more abrupt (Figure 6.6).⁸ Part of these large reversals were subsequently undone. However, five years after the crisis, surpluses remained higher than in the aftermath of other crisis episodes.

One common characteristic of both emerging Asian and emerging European economies is their high growth rates. Figure 6.7 suggests, consistent with theory, that among high-growth countries (that is, with growth in per capita GDP above 2 percent a year), those countries with higher growth rates tend to have lower current account balances. This negative correlation holds true across all economies, but also

Figure 6.4. Saving and Investment by Components¹
(Percent of GDP; simple average)

The emergence of a large current account surplus in China in recent years is the result of a sharp increase in corporate saving. Household saving declined in both regions throughout the past decade and is especially low in emerging Europe.



Sources: CEIC Data Company Limited; IMF, *Balance of Payments Statistics*; UN National Account Statistics; and IMF staff calculations.

¹See footnotes 1 and 2 in Figure 6.1 for regional breakdowns.

²Indonesia, Poland, and Slovenia are excluded from group averages because of missing data. As a result, data in Figure 6.4 do not add up to the levels in Figure 6.3.

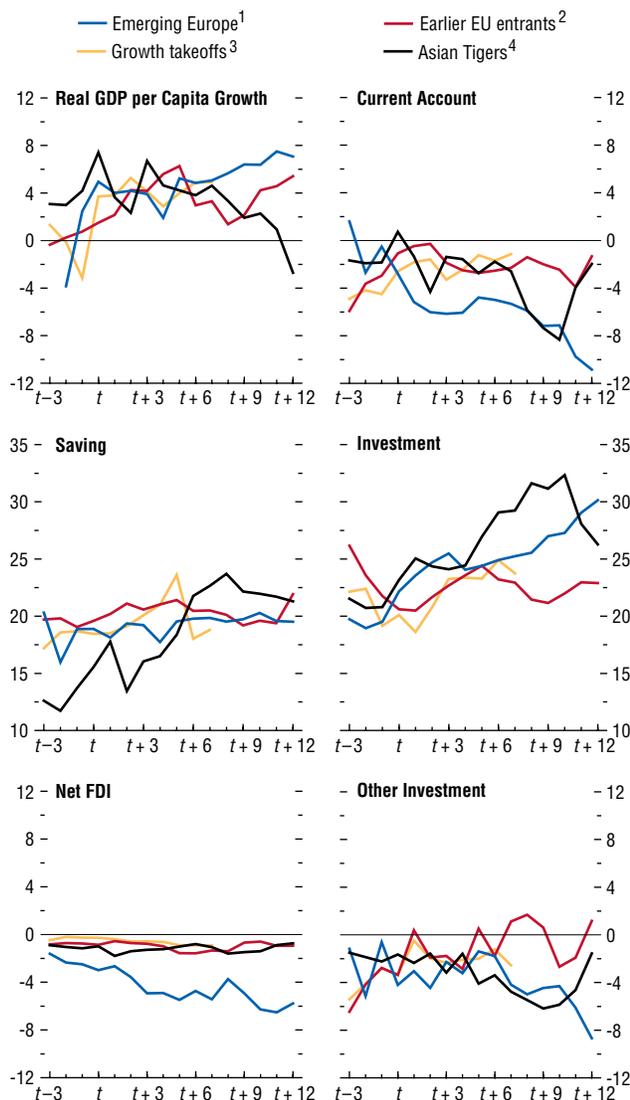
³Private investment includes changes in inventories.

⁷See also Chapter 2 of the April 2004 *World Economic Outlook*.

⁸Dates for the start of currency and banking crises are from Laeven and Valencia (forthcoming).

Figure 6.5. Growth Takeoffs
(Percent of GDP, simple average; years before and after crisis on x-axis)

The growth takeoff in emerging Europe since 1995 was associated with larger current account deficits and significantly higher net FDI inflows relative to comparable growth takeoffs in other countries.



Sources: IMF, *Balance of Payments Statistics*; and IMF staff calculations.
 1The takeoff year for emerging Europe is assumed to be 1995.
 2For earlier EU entrants the takeoff years are as follows: Greece (1996), Ireland (1985), Portugal (1985), and Spain (1984).
 3Growth takeoff is defined as the onset of a growth acceleration characterized by an increase in the real per capita growth rate of at least 2 percent and an average growth rate of at least 3.5 percent sustained over an eight-year horizon based on Hausmann, Pritchett, and Rodrik (2005). The figure shows the median value for each variable across all growth accelerations (excluding those in emerging Europe).
 4Asian Tigers comprise Indonesia, Malaysia, Philippines, and Thailand, for which the takeoff year is 1973.

within each emerging region (China is again a clear exception).⁹ The available evidence about current account developments in the advanced economies when they were emerging in the late 19th and early 20th centuries indicates that capital flowed to high-growth countries (Box 6.3).

What Factors Have Contributed to Recent Current Account Patterns?

The current account balances of emerging economies are affected by multiple factors.¹⁰ This section looks closely at cross-country data relating the level of the current account balance to a broad set of variables that may be important in determining the current account balances of emerging Europe and emerging Asia. The empirical analysis first attempts to explain the current account developments solely based on standard factors that have been highlighted in the literature as important determinants of current account balances. These determinants include the government balance, youth and old-age dependency ratios, the net foreign asset position, and growth opportunities proxied by the initial income level and lagged growth.¹¹

⁹This finding holds also if all emerging economies are included rather than only high-growth emerging economies. Excluding China, capital was flowing in aggregate to emerging economies. This evidence contrasts with the recent literature, which has found a positive correlation between growth and the current account (see, for instance, Prasad, Rajan, and Subramanian, 2007; and Gourinchas and Jeanne, 2007). One possible explanation is that many of these studies do not include countries of emerging Europe and include a large number of African countries, for which most capital inflows are official aid inflows and not private capital inflows driven by market considerations. Recent research suggests that aid inflows can have an ambiguous or even negative impact on growth by raising the exchange rate and curbing growth prospects for the tradables sector (see, for example, Rajan and Subramanian, 2005).

¹⁰See for instance, Aristovnik (2006), Chinn and Ito (2006), Gruber and Kamin (2007, 2008), and Herrmann and Jochem (2005).

¹¹See Lee and others (2008). Growth opportunities are expected to lower the current account through higher investment and lower saving. Similarly, high dependency ratios will lower the current account by lowering saving. In contrast, a government surplus will raise the current

These variables explain a large share of current account patterns worldwide, but they are not able to account for the large surpluses in emerging Asia and the large deficits in emerging Europe. The empirical analysis then augments these standard factors with a set of additional variables that characterize financial sector developments that may have played a key role driving current account patterns during recent years.

Over the past 10 years, economies in emerging Europe have very rapidly liberalized their domestic financial systems and opened up their capital accounts (Figure 6.8).¹² The combination of these two liberalizations was reflected in a surge in the number of foreign banks in these countries.¹³ Although emerging Asia also made some progress toward domestic financial liberalization, the financial systems of these economies remain much less liberal, with the exception of the NIEs. During the Asian crisis, the Asian Tigers and the NIEs also introduced restrictions on capital account transactions. More than 10 years later, capital accounts remain generally

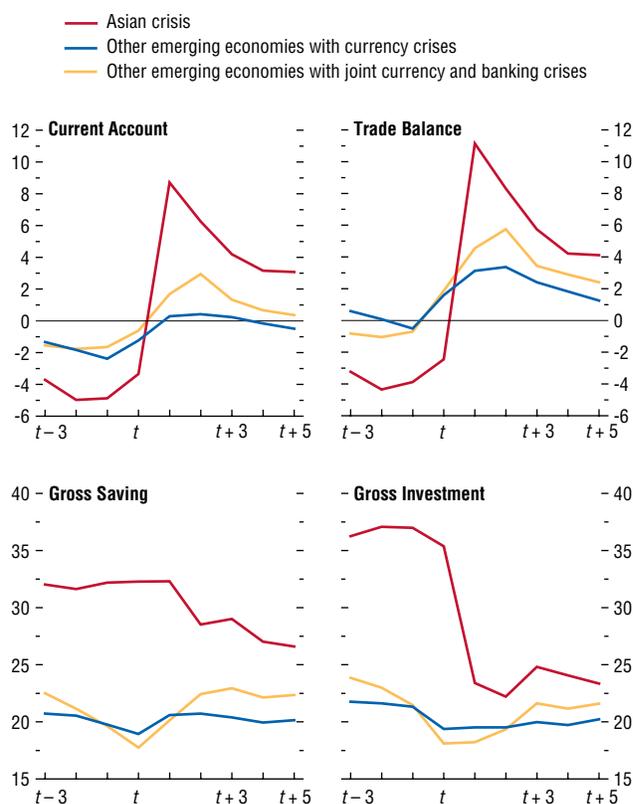
account if it is not fully offset by a decrease in private saving and/or a rise in private investment. Finally, higher net foreign assets are expected to raise the current account by increasing net investment income. The analysis also includes a dummy variable for financial centers as these typically export capital, the oil balance, and time effects to capture developments that affect similarly all countries in a given time period.

¹²This chapter uses an index of domestic financial liberalization that combines information on interest rate controls, credit controls, competition restrictions, state ownership, quality of the banking supervision and regulation, policies to encourage the development of bond and equity markets, and policies to permit access by foreigners to the domestic stock market (Abiad, Detragiache, and Tressel, forthcoming). The capital account openness index is from Chinn and Ito (2006). These two indices are highly correlated, in part because domestic financial liberalization includes a measure of entry barriers to foreign investors. The significance of these variables is thus tested jointly in the regressions.

¹³Another reason for the increase in foreign bank ownership is comparatively better growth opportunities for parent banks, which face tighter income conditions in their home markets. Ayden (forthcoming) finds that tight spreads—the difference between lending and deposit rates—for parent banks in their home markets are associated with an increase of lending by their subsidiaries operating in central and eastern Europe.

Figure 6.6. Current Account Reversals around Crises¹
(Percent of GDP, simple average; years before and after crisis on x-axis)

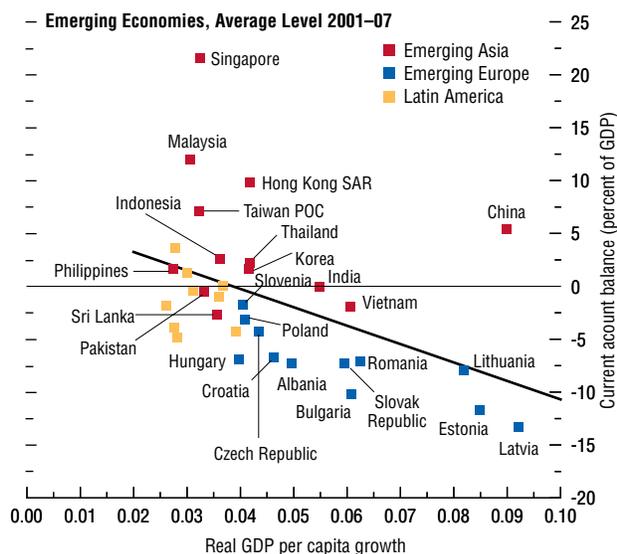
The adjustment of the current account during the Asian crisis was more abrupt compared with other crisis episodes. Five years after the crisis, a larger surplus remained in Asia than elsewhere.



Sources: IMF, *Balance of Payments Statistics*; and IMF staff calculations.
¹Asian crisis countries include Indonesia, Korea, Malaysia, Philippines, and Thailand. Other crises comprise Argentina, Brazil, Mexico, Russia, and Turkey, for which 15 crisis episodes were identified based on Laeven and Valencia (forthcoming) over the period 1980–2007.

Figure 6.7. Current Account Balance and Real GDP per Capita Growth¹

Fast-growing emerging economies tend to have lower current account balances.



Sources: IMF, *Balance of Payments Statistics*; and IMF staff calculations.
¹Countries with less than 2 percent real GDP per capita growth are not shown.

very closed in these economies, with the exception of the NIEs.

Theory does not provide clear guidance on the sign of the net effect of financial sector liberalization and capital account openness on the current account. A more open capital account and a more developed financial system are likely to improve access to foreign capital for financing domestic investment, thereby lowering the current account.¹⁴ However, a more liberalized domestic financial system with greater intermediation opportunities may also encourage domestic saving, with an opposite effect on the current account. On the other hand, domestic financial liberalization can also imply better access to credit and new financial products, which tends to reduce both domestic saving and the current account. Hence, the net effect of financial sector liberalization and capital account openness on the current account is uncertain and remains an empirical question.

Another financial factor that may affect the current account is the financial depth of the economy, measured by the share of credit to the private sector and stock market capitalization in GDP.¹⁵ Greater financial depth could be a sign of a developed financial system, which would raise the current account if it stimulated domestic saving but could lower the current account if it attracts more foreign savings and thereby fuels domestic investment. Financial depth appears much greater in emerging Asia than in emerging Europe, although it has been increasing in both regions (with the exception of the Asian Tigers).

A factor that has received a lot of attention in the context of the Asian current account surpluses is exchange rate policy and preferences for accumulating reserves. However, it is difficult to find an exogenous measure of these policies, because the exchange rate and

¹⁴In case of a crisis or if the country is not well managed, a more open capital account could also be associated with more capital outflows.

¹⁵See Chinn and Prasad (2003), Gruber and Kamin (2007, 2008), and Chinn and Ito (2006) for analyses that include this measure (and capital account openness).

reserves are simultaneously determined with the current account balance. Hence, these factors are not part of this formal analysis, although some evidence is provided about their potential role in determining the size of emerging Asia's surpluses. Finally, the exchange rate regime itself (fixed versus flexible) could also affect the current account balance, with fixed exchange rate regimes potentially leading to (temporarily) larger imbalances in response to economic shocks. However, the direction of the effect is unclear, depending on the nature of the initial shock to the current account balance.

Empirical Analysis

The empirical analysis focuses on determinants of the medium-run current account balance (averaging data over four-year periods) and covers a panel of 58 (non-oil-exporting) advanced and emerging economies during 1983–2006, including emerging Europe for the subperiod 1995–2006 (for data quality reasons; see Appendix 6.2 for more details).¹⁶ It starts by estimating a standard model of the current account and then augments it with a set of financial variables and a measure of political structure.¹⁷ Finally, special factors that have affected emerging Europe are introduced to reflect their specific circumstances.¹⁸

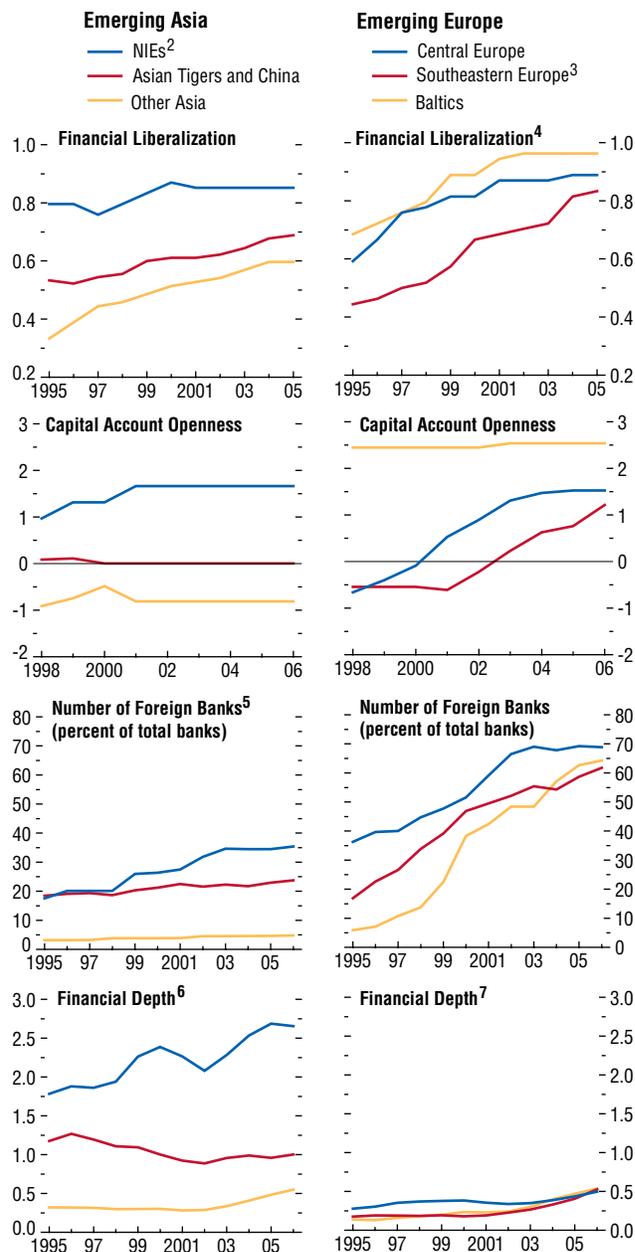
¹⁶The panel is unbalanced as the variables were not always available for all subperiods for all countries.

¹⁷The political structure index is the “Polity2” variable from the Polity IV Project (Marshall, Jaggers, and Gurr, 2004). It covers a number of dimensions, including the presence of institutions and procedures through which citizens can express effective preferences about alternative policies and leaders and the existence of institutionalized constraints on the exercise of power by the executive.

¹⁸First, since the collapse of the Council for Mutual Economic Assistance (COMECON), most of these countries embarked on a process of EU integration involving greater macroeconomic stability and improved policies. Hence, progress toward EU integration may have given these countries privileged access to foreign capital. Second, investment needs in emerging Europe may have been especially large as the collapse of the COMECON led to a substantial depreciation of capital stocks while the labor force is well educated.

Figure 6.8. Patterns of Financial Development¹

In emerging Europe domestic financial market liberalization proceeded faster than in emerging Asia (except for the newly industrialized Asian economies (NIEs), which were already at a more advanced stage). The opening up of capital accounts was associated with a rapid influx of foreign banks.



Sources: Abiad, Detragiache, and Tressel (forthcoming); Beck, Demirgüç-Kunt, and Levine (2000, updated); Chinn and Ito (2006, updated); Claessens and others (2008); and IMF staff calculations.

¹See Appendix 6.1 for a definition of variables. See footnotes 1 and 2 in Figure 6.1 for regional breakdowns.

²Excludes Taiwan POC.

³Excludes Macedonia, FYR.

⁴Excludes Croatia, Slovak Republic, and Slovenia.

⁵Excludes Pakistan and Sri Lanka.

⁶Excludes Vietnam.

⁷Excludes Albania.

Box 6.3. Historical Perspective on Growth and the Current Account

Current Accounts and Capital Flows: Sources, Size, and Persistence

The global economy experienced a golden age of integration from the middle of the 19th century until World War I. Numerous factors underpinned the changes: better communications due to the diffusion of the telegraph and the railroad, massive declines in shipping costs, unparalleled mass migrations, the spread of the gold standard, the consolidation of the British Empire, and increasing sophistication of London’s financial markets. The largest supplier of funds was Great Britain, which accounted for well over 50 percent of all capital outflows from the surplus countries.¹ Other capital exporters were France, Germany, and the Netherlands.

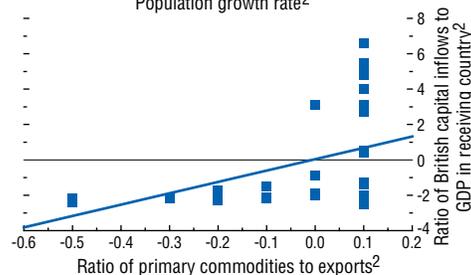
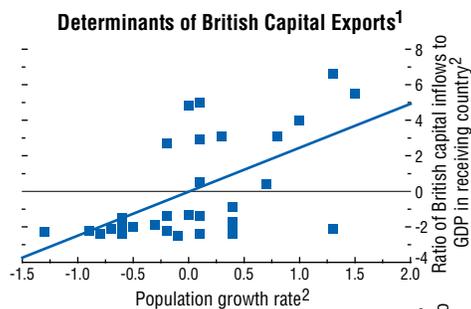
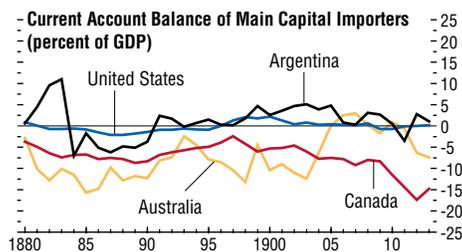
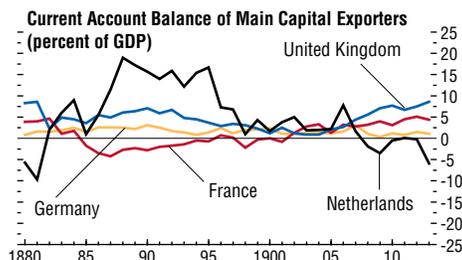
Controls on inflows had yet to be established. And investors were largely left alone to decide where to send their capital, although in some cases political aims in the surplus countries determined the direction of capital flows. The panels of the figure show the current account for surplus countries (or gross capital outflows) between 1870 and 1913 and for the principal capital importers: Argentina, Australia, Canada, and the United States (see Stone, 1999).

Capital inflows were often very persistent. Many of the important capital-importing countries sustained current account deficits for a decade or longer. Other countries that were on more fragile financial footing experienced more short-lived deficits. Meissner and Taylor (2006) estimate that extensive capital importers, such as Argentina, Australia, Canada, and the United States, sustained deficits for long periods, with half-lives for current account deficits of about three years compared with half-lives of roughly three-fourths of a year in

The main author of this box is Christopher M. Meissner.

¹See Obstfeld and Taylor (2004) for a long-run overview of capital markets; O’Rourke and Williamson (1999) for a historical examination of the first period of globalization; López Córdova and Meissner (2003) on the gold standard and trade, and Mitchener and Weidenmier (forthcoming) on the British Empire and trade.

Capital Flows and Motivations for Capital Exports, 1865–1913



Sources: Clemens and Williamson (2004); and Bordo, Cavallo, and Meissner (2007).

¹Includes Argentina, Australia, Austria, Brazil, Canada, Chile, Denmark, Egypt, Finland, Greece, Italy, India, Japan, Netherlands, New Zealand, Norway, Portugal, Russia, South Africa, Spain, Sweden, the United States, and Uruguay.
²Difference from mean.

smaller recipient countries (such as Chile, Finland, Japan, and Uruguay).

Determinants of Capital Flows

Argentina, Australia, Canada, and the United States were the main recipients of British capital flows. Capital from France and Germany went primarily to Russia, Turkey, and other European countries. Recent research by Clemens and Williamson (2004) on the motivations for British capital outflows finds that long-term growth prospects mattered most to investors. Capital was most likely to flow toward areas with high population growth rates and high rates of net immigration, areas that focused on exports of commodities based on significant natural resource endowments, and where the population was better educated (see bottom figure panels). Imperial relations, default history, and monetary stability were additional factors that accounted for a small fraction of the observed inflows. Similar economic motivations also played a dominant role for other capital exporters, such as Germany (Esteves, 2008).²

In the major recipients such as Canada, Argentina, and Australia, inflows supplemented low rates of domestic saving. Investment was predominantly directed toward key infrastructure projects (railroads, harbors, municipal services) and helped raise productive capacity. Countries with smaller inflows tended to use foreign capital for consumption purposes and to supplement or smooth low government revenues.³ Many of these countries also had

²This finding challenges a long-held conviction that French and German capital flows were significantly determined by the political exigencies of Paris or Berlin.

³Investors in the first wave of globalization used many public sources to gain information about the quality of their investments. The *Fenn on the Funds* investors' manual provided short excerpts from past bond prospectuses for each and every sovereign borrower on the London market. Examples of such excerpts from countries that borrowed to plug revenue gaps or to fund costly wars included Russia (an issue to strengthen the special reserve fund), Japan (to pay charges on pensions), Egypt (Pasha loan for

considerable amounts of bond issues dedicated to unspecified purposes.

Sustainability of Capital Flows and Financial Crises

Some of these large capital inflows ended abruptly with financial crises that temporarily brought growth below long-run trend rates (Catão, 2007). Bordo, Cavallo, and Meissner (2007) show that sudden stops or turnarounds in capital flows are associated with previously high levels of capital inflows and foreign currency exposure. By contrast, strong reserve positions, high export growth, and close political ties with the lender lower the likelihood of a sudden stop in capital inflows in any given year. In particular, larger borrowers with financial credibility or ties to the British Empire (such as Canada) were able to sustain capital inflows even at times of low international liquidity.

Experiences after a crisis differ significantly, but were more severe in less open economies and in countries with underdeveloped financial sectors. The experiences of Argentina and Australia in the early 1890s exemplify this. Argentina had a major banking, currency, and debt crisis in 1890 known as the Baring crisis.⁴ Default settlement was not concluded for several years, and a weak financial system and low credibility with international investors suppressed foreign investment for another decade. Around the same time, Australia also had a major banking crisis that lasted for several years.⁵ Nevertheless, the component colonies never defaulted on their external obligations, and their credibility as borrowers helped them avoid a currency crisis.⁶

repayment of existing debt), and Austria (an issue in 1851 to improve the value of the paper florin).

⁴The crisis started because of overly optimistic investment by the Baring Brothers Bank based in London, but it also witnessed an early credit boom generated by a small and poorly regulated domestic banking sector. It ended with a major banking crisis, a currency crash, and a debt default.

⁵The crisis in Australia was triggered by a drought, coupled with an earlier credit boom.

⁶Australia did not issue its own currency at that time, but private bank notes were allowed to become

Box 6.3 (concluded)

Although the Australian economy recovered only slowly, a rise in domestic saving was able to repay previous debts and stimulate investment.

Conclusions

The period between 1870 and 1913 witnessed historically unprecedented levels of international capital flows. These flows were often

legal tender during the crisis.

long-lasting and financed key infrastructure projects in many large and credible borrowing countries. They were for the most part driven by the desire of investors in industrial countries to invest in fast-growing countries with strong growth prospects, and there were no examples of capital flowing uphill. There were several episodes of disastrous financial crises, in the wake of sudden stops of capital, especially when financial development was weak and countries were less open to trade.

The standard model fits the data well overall but explains only a small part of the pattern of current account balances in emerging Asia and emerging Europe (Table 6.1, column a).¹⁹ In emerging Asia for the subperiod 2003–06, it would predict a current account balance below the sample average by 1.4 percentage points of GDP, whereas the current account balance was actually above the sample average by 3.3 percentage points.²⁰ Similarly, in emerging Europe, the model would predict a current account balance only moderately below the sample average, by 1.8 percentage points of GDP, whereas the actual current account balance over the subperiod 2003–06 was 7.4 percentage points of GDP below the sample average.

The preferred model, including the financial factors and special effects for emerging Europe, has a much better fit, especially for emerging Europe.²¹ Based on the preferred model (shown in column e of Table 6.1), the main contributing factors to the large deficits in emerging Europe have been the financial variables, accounting

for 4.6 percentage points (about 60 percent) of the 7.4 percentage point deficit (deviation from sample average) (Figure 6.9). Among these variables, domestic financial liberalization is the factor with the largest impact by far.²² Growth opportunities—defined as the scope for convergence through a low initial per capita income level and a high recent growth performance—contributed a further percentage point to the deficit. Other minor factors included low net foreign assets, the fiscal balance, and a negative oil balance. After allowing for special European effects (described below), the unexplained residual for the region as a whole is less than half a percentage point.

In emerging Asia, structural factors are found to have helped raise the current account, but the impact is offset by other factors (in particular high growth opportunities). Thus, about 75 percent of the current account surplus remains unexplained. Structural factors that have contributed to the current account surplus include the lack of financial liberalization, younger populations, and lower values for the

¹⁹The dummy variables for post-crisis emerging Asia and emerging Europe remain large and highly significant.

²⁰This calculation is based on the final model reported in column e of Table 6.1 and sums the contributions of the standard structural factors.

²¹There remains a large and statistically significant dummy variable for emerging Asia in the aftermath of the 1997–98 crisis.

²²The effect of domestic financial liberalization also captures the removal of entry barriers to foreign capital. The high openness of the capital account also lowers the current account, as does the relatively low level of financial development in emerging Europe (presumably by depressing saving). However, the magnitudes of these two other effects are very small.

Table 6.1. Determinants of the Current Account Balance¹*(Percent of GDP)*

	Standard Model (a)	Standard Plus Financial Factors (b)	Standard Plus Financial Factors and Emerging Europe Factors		
			(c)	(d)	(e)
Standard variables					
Net foreign assets (percent of GDP, lagged)	0.040 (5.29) ^{***}	0.035 (4.37) ^{***}	0.036 (4.47) ^{***}	0.035 (4.32) ^{***}	0.035 (4.45) ^{***}
General government balance (percent of GDP)	0.055 (0.87)	0.07 (1.08)	0.108 (1.59)	0.115 (1.66) [*]	0.118 (1.77) [*]
Oil balance	0.247 (3.17) ^{***}	0.226 (3.07) ^{***}	0.229 (3.11) ^{***}	0.232 (3.13) ^{***}	0.231 (3.16) ^{***}
Old-age dependency ratio	-0.234 (-3.04) ^{***}	-0.178 (-2.27) ^{**}	-0.143 (-1.80) [*]	-0.136 (-1.69) [*]	-0.134 (-1.68) [*]
Population growth	-0.755 (-1.77) [*]	-0.755 (-1.88) [*]	-0.727 (-1.80) [*]	-0.682 (-1.65)	-0.681 (-1.69) [*]
Growth opportunities:					
Relative income per capita (lagged)	5.162 (3.33) ^{***}	6.693 (3.69) ^{***}	5.679 (3.06) ^{***}	5.622 (3.00) ^{***}	5.582 (3.03) ^{***}
Growth of GDP per capita (lagged)	-0.135 (-1.89) [*]	-0.181 (-2.64) ^{**}	-0.173 (-2.58) ^{**}	-0.162 (-2.25) ^{**}	-0.167 (-2.59) ^{**}
Financial factors and political structure					
Financial depth (percent of GDP, lagged)		0.839 (1.66) [*]	0.795 (1.58)	0.804 (1.59)	0.820 (1.64)
Financial liberalization		-3.034 (-1.85) [*]	-2.699 (-1.64)	-2.719 (-1.65)	-2.743 (-1.68) [*]
Capital account openness		-0.278 (-1.49)	-0.239 (-1.24)	-0.233 (-1.20)	-0.229 (-1.25)
Joint significance of financial variables (<i>p</i> -value)		0.01 ^{**}	0.04 ^{**}	0.04 ^{**}	0.03 ^{**}
Political structure		-0.140 (-3.45) ^{***}	-0.145 (-3.55) ^{***}	-0.145 (-3.50) ^{***}	-0.146 (-3.54) ^{***}
Emerging Europe factors					
General government balance interacted with emerging Europe dummy variable			-0.642 (-4.58) ^{***}	-0.108 (-0.28)	
Financial liberalization interacted with emerging Europe dummy variable			-4.739 (-0.82) ²	-3.883 (-1.54)	-4.484 (-4.47) ^{***}
General government balance interacted with EU integration				-1.123 (-1.62)	-1.319 (-5.32) ^{***}
Financial liberalization interacted with EU integration				-0.077 (-0.01)	
EU integration				-1.182 (-0.09)	
Regional factors (unexplained effects)					
Emerging Europe dummy variable	-4.096 (-4.45) ^{***}	-3.515 (-3.94) ^{***}	0.074 (0.01) ²		
Asian crisis shift	2.921 (3.66) ^{***}	2.352 (2.79) ^{***}	2.430 (2.90) ^{***}	2.479 (2.89) ^{***}	2.518 (3.03) ^{***}
Observations	215	215	215	215	215
Adjusted <i>R</i> -squared	0.54	0.57	0.58	0.58	0.59

Source: IMF staff calculations.

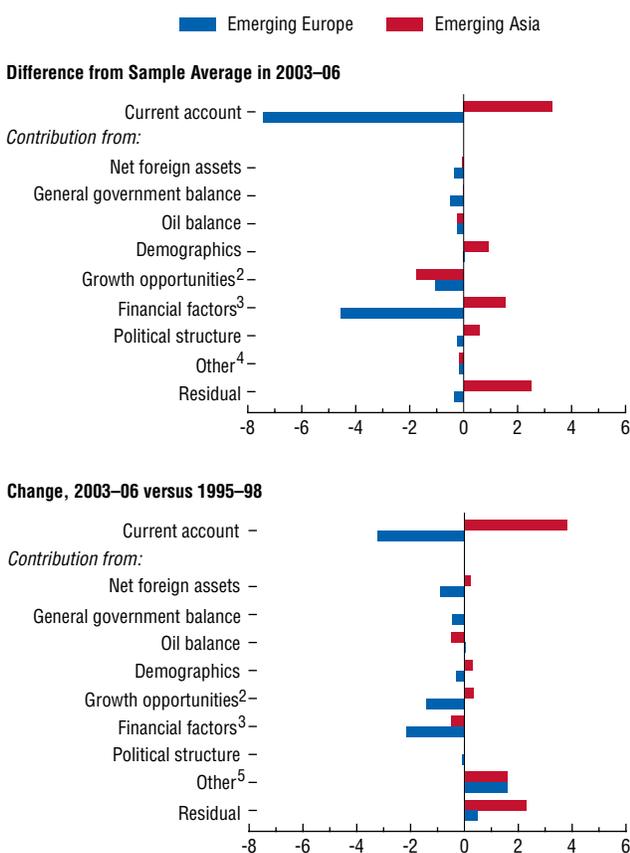
¹Robust *t* statistics are in parentheses; *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively. All regressions include a constant, a dummy variable for financial-center and time-fixed effects. The regressions are estimated by ordinary least squares.

²Jointly significant at the 1 percent level.

Figure 6.9. Explaining the Current Account Balances of Emerging Asia and Emerging Europe¹

(Percent of GDP)

The current account deficits of emerging Europe are mainly explained by financial factors, whereas a large portion of the surpluses in Asia remains unexplained by standard factors.



Source: IMF staff calculations.

¹The contribution of each variable in the top (bottom) panel is computed as the deviation of the variable from the sample average (the change in the variable between 1995-98 and 2003-06) times the regression coefficient of the variable from column e of Table 6.1. See Appendix 6.2 for countries included in regional breakdowns.

²The contribution of growth opportunities is the sum of the contributions of relative per capita income and growth of per capita GDP.

³The contribution of financial factors is the sum of the contributions of financial liberalization, capital account openness, and financial depth.

⁴"Other" is the contribution of a dummy variable for financial centers.

⁵"Other" is the contribution of time-fixed effects.

political structure index, with respective contributions at 1.6, 0.9, and 0.6 points. These factors were partly offset by high growth opportunities, which contributed to lower the current account balance by 1.8 points, and a negative oil balance (as well as a number of other minor factors).

The decomposition of the change in current accounts over time reveals a similar picture: financial liberalization and growth opportunities largely explain the widening of current account deficits in emerging Europe, but the increase in the current account surplus in emerging Asia remains largely unexplained. For both regions, developments in the rest of the world contributed to raise the current account balance.

Special Factors in Emerging Europe

What are the special factors at work in emerging Europe? To explore this, the preferred model allows for separate regression coefficients for emerging Europe, thereby reducing the emerging Europe dummy to zero (see Table 6.1, column c). The main differentiated effects stem from the fiscal balance and financial liberalization. First, financial liberalization is found to have a more pronounced impact on current account balances in emerging Europe than in the rest of the sample. Therefore, the large contribution of financial liberalization to the current account deficits in emerging Europe reflects both a higher level of financial liberalization and a more pronounced impact on the current account of a given degree of financial liberalization. Second, although a government surplus raises the current account for the sample as a whole (although not very significantly in a statistical sense), it lowers the current account in emerging Europe.

One possible explanation for these differentiated effects is the process of EU integration that most countries in emerging Europe undertook after the collapse of their trade ties with the former Soviet Union.²³ EU integration

²³See Herrmann and Winkler (2008) for a discussion of the role of European economic integration in current

was a major factor behind financial liberalization, as reflected in the large and rising western European ownership of banks in the region. Progress toward EU integration also involved greater fiscal discipline—one of the Maastricht criteria—which may have given these countries privileged access to foreign capital by signaling greater macroeconomic stability and improved policies. In order to test this hypothesis, a measure of the degree of European integration is built as a score for achieving different stages of the formal integration process, namely EU membership application, initiation of negotiation for EU membership, EU accession, entry into ERM II, and euro adoption.

Interacting the government balance variable with this measure of progress toward EU integration supports this interpretation: the negative impact of a fiscal surplus on the current account is stronger the closer the country is to EU accession (it makes the interaction with the simple dummy variable for emerging Europe insignificant) (see Table 6.1, column d). A smaller government deficit provides confidence to foreign investors of progress toward EU accession and lowers the risk premium as the integration process advances.²⁴ The divergent fiscal performance between the Baltics and southeastern Europe, which have improved their fiscal position, and central Europe, where the fiscal position has deteriorated, explains much of the current account variation within emerging Europe (Figure 6.10).²⁵

In contrast, the differentiated effect of financial liberalization on the current account balance of emerging Europe is not directly related to the institutional measure of European inte-

account deficits in emerging Europe. As in this analysis, they identify region-specific effects that have led to the emergence of what they refer to as “convergence clubs.”

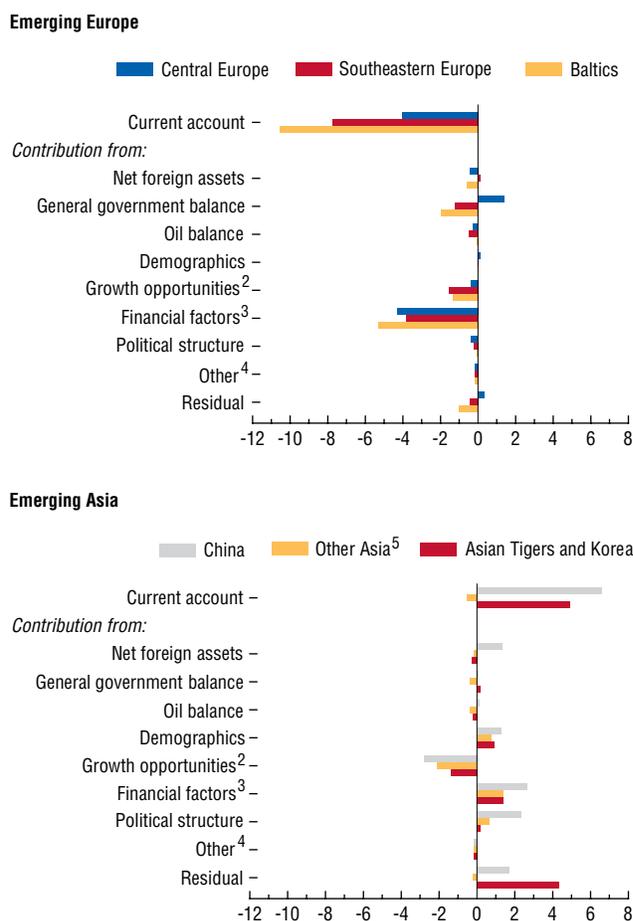
²⁴Another possible explanation is a procyclical response of the fiscal balance to the economic boom fueled by foreign capital inflows, which may be especially large in emerging Europe.

²⁵Because opposite fiscal developments occurred in the various subregions of emerging Europe, this factor is however not a main contributor to the aggregate deficit position of emerging Europe.

Figure 6.10. Explaining Current Account Balances: Results by Subregion¹

(Percent of GDP; difference from sample average in 2003–06)

Within emerging Europe regional differences are explained mainly by diverging fiscal performances. In emerging Asia, regional differences are largely unexplained by structural factors.



Source: IMF staff calculations.

¹The contribution of each variable is computed as the deviation of the variable from the sample average times the regression coefficient of the variable from column e of Table 6.1. See Appendix 6.2 for countries included in regional breakdowns.

²The contribution of growth opportunities is the sum of the contributions of relative income per capita and of per capita GDP growth.

³The contribution of financial factors is the sum of the contributions of financial liberalization, capital account openness, and financial depth.

⁴“Other” is the contribution of a dummy variable for financial centers.

⁵Excludes Vietnam due to data availability.

gration. However, there is some evidence that the broad entry of foreign banks, which characterized the process of financial liberalization in these countries, may account for the more pronounced impact on the current account, because foreign banks may have drawn more foreign capital with them and, more generally, may have facilitated better access to foreign capital (see Appendix 6.2).²⁶

Explaining the Residual Current Account Surplus in Emerging Asia

Although the model achieves some success in explaining the current account deficits of emerging Europe with structural factors, in particular domestic financial liberalization, the surpluses in post-crisis emerging Asia remain largely unexplained, even after augmenting standard structural factors by financial variables.²⁷ Within emerging Asia, most of the structural factors, including growth opportunities, financial liberalization, political structure, and demography, had a similar impact on the current account balances of the various sub-regions, though they had a somewhat larger impact on China's current account balance (see Figure 6.10). However, a large fraction of

the current account surplus in the Asian Tigers (including Korea) and, to a lesser extent, in China is left unexplained by the structural factors. One factor often mentioned to explain the large surpluses in emerging Asia is the valuation of exchange rates. A measure of the deviation of the real effective exchange rate from its predicted level suggests that, since the Asian crisis, the Asian Tigers and China have had declining or low exchange rates relative to the predicted levels, although some correction has taken place since 2003 (Figure 6.11).²⁸ Low-income Asian countries, on the other hand, have had low but appreciating exchange rates during most of the period. Various reasons for the low and/or declining exchange rates have been advanced, such as a desire to accumulate large reserves for precautionary motives, which may have been relevant for the crisis countries for some time following the Asian crisis, and a growth model based on exports (Aizenman, 2006, 2007; Becker and others, 2007; Cheung and Qian, 2007; and Jeanne, 2007).²⁹

There is a clear negative correlation between the unexplained component of the current

²⁶Abiad, Leigh, and Mody (2007) find that financial integration played an important role in explaining the current account deficits in emerging Europe. Herrmann and Winkler (2008) also find evidence that the presence of foreign banks was an important contributor in explaining the difference between the current account balances of emerging Asia and emerging Europe. Mihaljek (2007) finds that foreign banks played an important role in the rising credit growth in central and eastern European economies by introducing new products, improving financial sector efficiency, and strengthening risk management.

²⁷Additional variables were tested but were not statistically significant. These included the share of employment in agriculture and the productivity differential between agriculture and the rest of the economy (to capture the large pool of underemployed labor in emerging Asia), the share of subsidies and social transfers in GDP (as a proxy for social safety nets), an index of terms of trade and the standard deviation of this index (as a motive for precautionary saving), a measure of trade openness, the exchange rate regime, and a variable indicating the start of banking crises.

²⁸The real effective exchange rate deviation is based on the equilibrium real exchange rate approach developed as part of the IMF Consultative Group on Exchange Rate Issues (CGER) assessment and is calculated as the residual from a regression of the consumer price index (CPI)-based real effective exchange rate on the productivity differential between tradables and nontradables (to capture the Balassa-Samuelson effect), other factors affecting relative prices (government consumption, trade restriction index, price controls, and commodity terms of trade), and net foreign assets (see Lee and others, 2008). The advantage of using the residual from the equilibrium real exchange rate approach is that, unlike a quantity-based measure of deviation from equilibrium, it does not use information about the size of the current account.

²⁹Cheung and Qian (2007) find evidence of competitive hoarding of reserves in emerging Asia aimed at preventing a real exchange rate appreciation and hence a loss in competitiveness. Controlling for conventional variables, they estimate that a \$1 increase in international reserves by one country has been associated with an increase of about \$0.6 by the other countries in the region. Zhang (forthcoming) argues that the increase in the Chinese current account and, in particular, in corporate saving partly reflects disguised capital inflows (through over-invoicing for exports) in anticipation of an appreciation of the currency.

account balance—after structural factors have been taken into account—and the deviation of the exchange rate from its predicted level, suggesting that a low exchange rate is associated with a higher current account balance (Figure 6.12).³⁰ There is also a positive but weaker correlation between the stock of reserves (a proxy of preferences for reserve accumulation) and the current account balance. A simple regression (not shown) confirms that the deviation of the exchange rate from its predicted level and (to a lesser extent) the high stock of reserves cut the unexplained current account surplus in emerging Asia in half, to about 1 percentage point of GDP.

However, such simple regressions do not give reliable results on causality because the deviation of the exchange rate from its predicted value is not truly exogenous, but is rather jointly determined with the current account. Therefore, it is hard to discern whether the low and/or declining exchange rates in emerging Asia were the result of deliberate policy action or the endogenous outcome of unidentified fundamental factors which are omitted from the current account model and which impacted both the current account and the exchange rate. An exogenous measure of exchange rate policy is difficult to obtain.

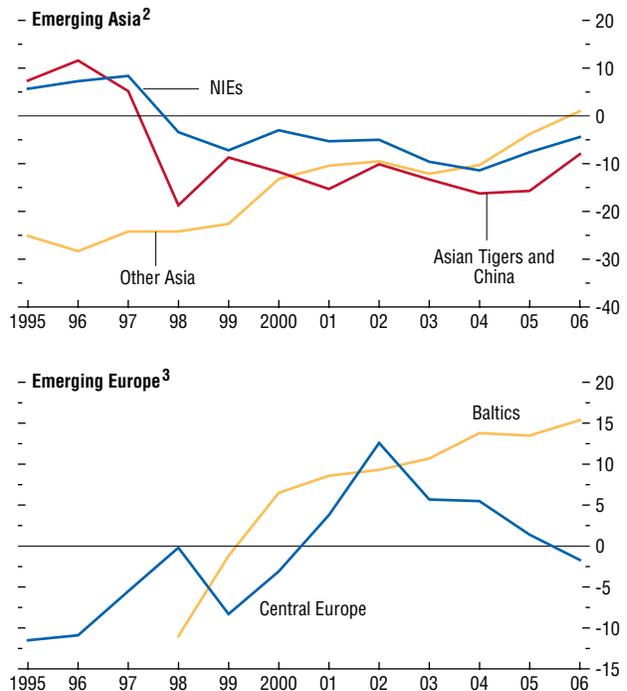
Sustainability of Current Account Imbalances

The large and long-lasting current account imbalances in emerging Europe and emerging Asia prompt two questions: How long can these imbalances be sustained? And are they likely to end abruptly or be resolved smoothly? The current account deficits of emerging Europe can largely be explained by structural and financial variables, but this does not mean that the defi-

³⁰The semi-elasticity of the current-account-to-GDP ratio to the exchange rate is proportional to the country's trade openness (Lee and others, 2008). Therefore, the measure of exchange rate deviation was interacted with the ratio of the sum of exports and imports (adjusted for trade in intermediate goods) to GDP.

Figure 6.11. Deviation from Predicted Real Effective Exchange Rates¹
(Percent)

Relative to predicted levels, exchange rates in emerging Asia were undervalued in recent years, while they were overvalued in emerging Europe. More recently, exchange rates returned to equilibrium levels in central Europe, while the deviation from predicted levels increased in the Baltics.



Source: IMF staff calculations.

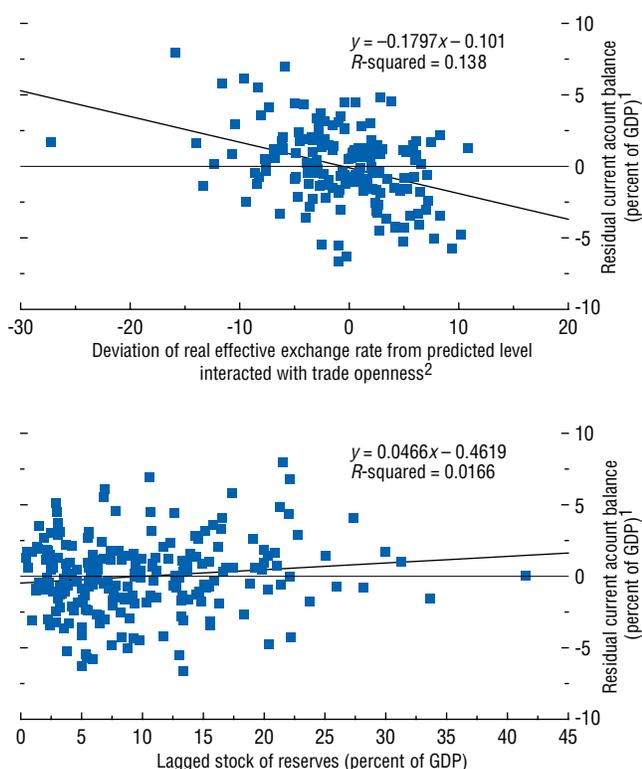
¹Based on the equilibrium real exchange rate approach developed as part of the IMF CGER assessment (Lee and others, 2008).

²NIEs are Hong Kong SAR, Korea, and Singapore. Asian Tigers are Indonesia, Malaysia, Philippines, and Thailand. Other Asia includes India and Pakistan.

³Central Europe includes Czech Republic, Hungary, Poland, and Slovak Republic. Comparable data were not available for southeastern Europe.

Figure 6.12. Residual Current Account Balance, Deviation of Real Effective Exchange Rate from Predicted Level and Stock of Reserves
(Percent of GDP unless noted otherwise)

A low exchange rate and a high stock of reserves, possibly reflecting preferences for reserve accumulation, are associated with a higher residual current account balance.



Sources: IMF, *Balance of Payments Statistics*; IMF, *International Financial Statistics*; Lee and others (2008); and IMF staff calculations.

¹The residual current account balance is the unexplained current account balance once structural factors are accounted for, based on the regression in column e of Table 6.1.

²Trade openness is measured as the ratio of the sum of exports and imports (adjusted for trade in intermediates) to GDP.

cits are sustainable indefinitely. The rapid opening of the financial sector in emerging Europe has not only accelerated access to capital, it has also facilitated a credit boom, with the attendant risk that funds are being channeled to less productive uses (Duenwald, Gueorguiev, and Schaechter, 2005; and Rioja and Valev, 2004). The chapter identifies and analyzes a number of historical episodes of large, persistent surpluses and deficits in order to draw lessons as to the likely persistence of the current imbalances in emerging Europe and emerging Asia.³¹

Large, persistent current account imbalances are defined as current account deficits or surpluses that exceed 3 percent of GDP for at least three years, provided that no large reversal occurs during that period.³² Using this criterion, there were 69 deficit episodes and 15 surplus episodes during 1960–2007, with a higher incidence during 1990–2005 (Figure 6.13; see Appendix 6.2 for a list of all episodes). Interestingly, while the vast majority of current account deficits in emerging Europe qualify as large and persistent imbalances, only Malaysia and China meet the criteria for a large and persistent surplus in the aftermath of the Asian crisis.³³ Deficit episodes are further separated according to whether or not they were resolved abruptly, with abrupt endings characterized by an improvement of the current account of 4 percentage points of GDP in the year following the end of

³¹There are few empirical studies of the persistence of current account imbalance episodes in emerging economies. Edwards (2007) reports that large current account surpluses exhibit little persistence. Aizenman and Sun (2008) find that the length of current account deficits is negatively related to the relative size of the deficit.

³²See Appendix 6.2 for a detailed description of the methodology, which is based on the adjustment algorithm developed in Chapter 3 of the April 2007 *World Economic Outlook*. The criteria are similar to the ones used to define large reversals in the literature (see, for example, Freund and Warnock, 2005).

³³Large, persistent surpluses are also identified for some of the NIEs. However, these are no longer considered emerging economies, and Singapore and Hong Kong SAR differ because they are financial centers.

the episode.³⁴ About one-third of the completed deficit episodes ended abruptly.

The surplus episodes in China and Malaysia are historically atypical. There have been few large, persistent current account surpluses—they account for only one-quarter of all persistent imbalance episodes—and they occurred primarily in advanced economies. Earlier studies also find abrupt adjustments of surplus episodes to be rare (Edwards, 2007).³⁵ The remainder of this section therefore focuses on deficit episodes, which are by far the most common type of large, persistent imbalances, especially in emerging economies.³⁶

The ongoing deficits in emerging Europe stand out, because of both their length and their magnitude (Figure 6.14). On average, current account deficits in emerging Europe have lasted 9½ years, about 3 years longer than in other emerging economies, and most of these episodes are still ongoing. Interestingly, the historical evidence shows that longer deficits are not necessarily more shallow than shorter ones (with the ongoing episodes in emerging European countries clearly fitting this pattern); they also are no more likely to end abruptly.³⁷ This may reflect the fact that persistent deficits can also be a sign of economic strength, reflecting an abundance of investment opportunities or a catch-up in productivity, which attract larger inflows of foreign capital and lead ultimately to a smooth resolution.³⁸

³⁴For a similar definition, see Edwards (2007).

³⁵Chapter 3 of the April 2007 *World Economic Outlook* finds that surplus reversals in advanced and emerging economies were associated with accelerations in GDP growth and with real exchange rate appreciations.

³⁶This pattern is consistent with the notion of capital flowing downhill to countries with greater growth opportunities and with recent findings in the literature (see *World Economic Outlook*, April 2007, and Edwards, 2007).

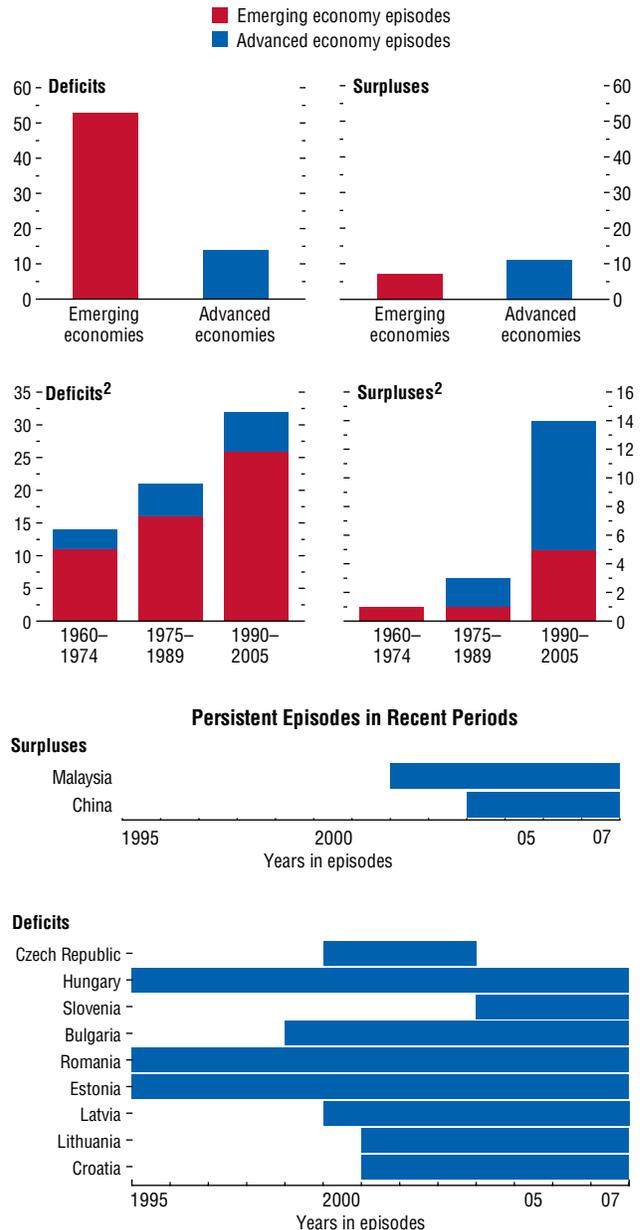
³⁷The finding is robust to variations in the size of the adjustment, using either 2 or 3 percent of GDP as a threshold for identifying an abrupt adjustment.

³⁸Another potential reason for a positive correlation between the length and depth of episodes is that longer periods of foreign borrowing tend to weaken net foreign asset positions, which in turn weigh negatively on the net

Figure 6.13. Persistently Large Current Account Deficit and Surplus Episodes, 1960–2007¹

(Number of episodes unless noted otherwise)

The majority of imbalance episodes in emerging economies are deficits and they have become more common since the 1990s.



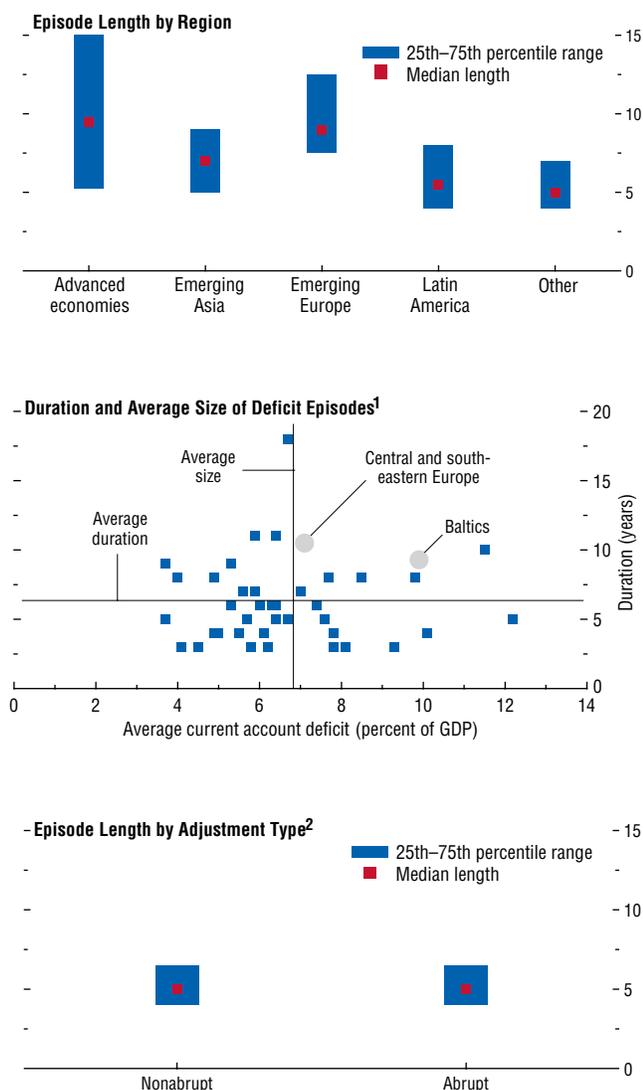
Sources: IMF, *Balance of Payments Statistics*; and IMF staff estimates.

¹Persistently large deficit and surplus episodes are defined as consecutive current account balances exceeding 3 percent of GDP for a minimum of three years, with no large adjustment (improvement or deterioration) during the episode, as defined in Chapter 3 of the April 2007 *World Economic Outlook*.

²Start year of episodes.

Figure 6.14. Duration of Large, Persistent Current Account Deficits, 1960–2007
(Years)

Episodes in emerging Europe tend to be longer than in other emerging economies. Longer episodes are not more shallow measured by the average current account deficit, nor do they end more abruptly.



Sources: IMF, *Balance of Payments Statistics*; and IMF staff estimates.

¹Sample comprises only complete episodes in emerging economies. Incomplete episodes from emerging Europe are included for comparison. Duration and size of deficit are not correlated.

²Abrupt adjustment is defined as an improvement of the current account balance by more than 4 percent of GDP in the year after the episode ends.

The regional variations in the length of imbalances comes out clearly in survival functions from duration analysis (Figure 6.15), which report the estimated likelihood that a large deficit will continue at a given duration, based on a statistical analysis of observations following the Kaplan-Meier estimation for survival curves. The flatter curve for emerging Europe (top left panel) indicates higher likelihoods of remaining in a large deficit and hence implies longer durations than for other regions.³⁹ A comparison of survival functions by different subgroups and characteristics shows that deficits last longer when the economy has a high initial net foreign asset position, a more open capital account, lower real per capita income, and higher GDP growth. There appears to be little direct evidence that the type of exchange rate regime influences the length of deficit episodes.

A more formal analysis of the duration of imbalances suggests that growth opportunities, the opening of the capital account, liberalization of the financial system, and initially high net foreign assets are important in explaining the length of deficit episodes in emerging Europe (Table 6.2; see Appendix 6.2 for more details).⁴⁰ These are broadly the same factors that explain the greater magnitude of these economies' deficits (see Figures 6.9 and 6.10). Higher growth opportunities, measured by a low initial level of income per capita and high growth observed during deficit episodes, offer more

income component of the current account. See also Lane and Milesi-Feretti (2007).

³⁹Berg, Ostry, and Zettelmeyer (2008) use a similar empirical approach, but analyze the duration and survival rates of growth upbreaks.

⁴⁰The model does a good job at predicting that episodes will be longer in emerging Europe, on average two to three years longer than for other emerging economies, which is in line with current observations. Moreover, once structural factors are taken into account, regional factors are no longer significant (see Table 6.2, columns a and e). The regression analysis confirms that the depth of the current account deficit during the episode does not influence its length. Other factors that increase the length of deficits include slow activity in advanced economies, which frees capital to flow to emerging economies, and a higher score on the political structure index.

productive investment opportunities and hence tend to prolong the economy’s access to foreign capital. The openness of the capital account eases access to foreign capital, and financial liberalization may improve the intermediation of funds and hence make the deficit more sustainable.⁴¹ The empirical analysis also indicates that a weak contribution of net exports to real GDP growth tends to reduce the length of imbalance episodes.⁴²

The estimated model and observed fundamentals can be used to predict the length of deficit episodes in emerging Europe. The forecasts suggest that most of these deficits have persisted longer than expected (Figure 6.16).⁴³ Because most deficit episodes in emerging Europe are still ongoing, the specification used for predicting the duration is based on parameters excluding these countries (see Table 6.2, column f); this also ensures that their specific characteristics do not determine the results. The longest spells are predicted for Estonia, Romania, and Slovak Republic, with an average duration of 8.9 years. The deficits in the remaining two Baltic countries (Latvia and Lithuania) are forecast to last 7.8 years, whereas significantly shorter spells (4.2 years) are predicted for Bulgaria and Hungary.⁴⁴

⁴¹Three noteworthy factors do not empirically correlate with the duration of large deficits: (1) the depth of the current account deficits during the episode, although lower payment obligations on foreign liabilities—measured by the average net income balance—improve the ability to continue foreign borrowing; (2) the type of capital inflows, in particular, the average size of FDI inflows; and (3) the type of exchange rate regime (fixed versus flexible), although the latter does help explain how the imbalance episodes are resolved (see further below). See Appendix 6.2 for details on results related to domestic financial liberalization.

⁴²Data limitations made it difficult to build a large enough sample to test directly for the impact of deviations of the real exchange rate from its predicted value. The results over a small sample suggest that an exchange rate overvaluation tends to shorten deficit episodes, but the coefficient was not statistically significant.

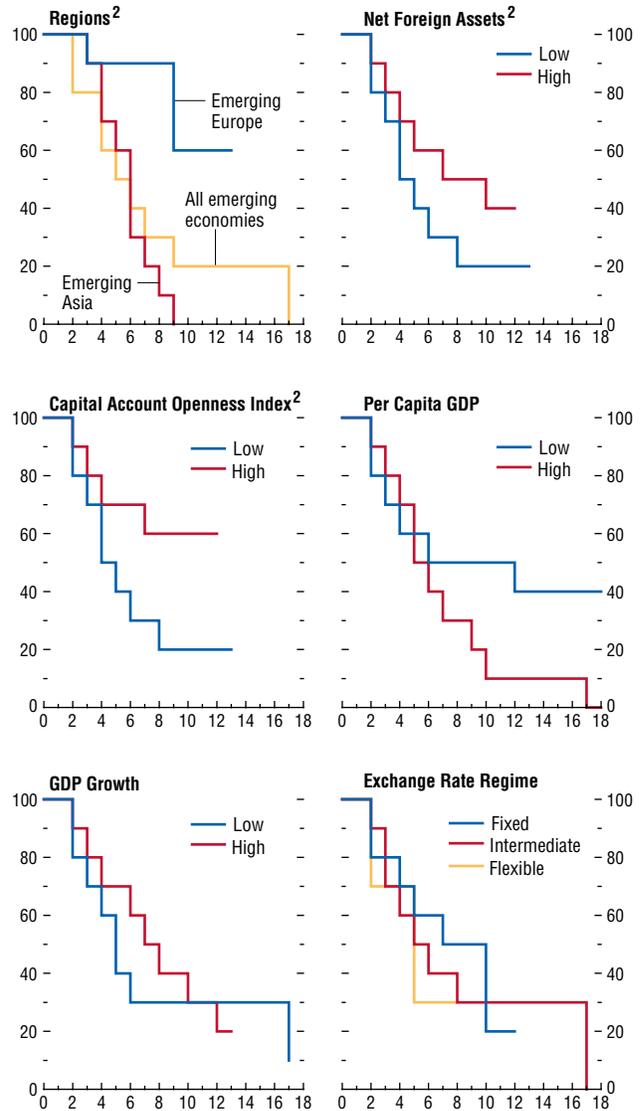
⁴³Financial globalization, through its positive effect on the availability of external financing, could also explain the longer-than-expected borrowing episodes.

⁴⁴If predictions were made “in sample,” that is, based on an estimated model also including data from emerg-

Figure 6.15. Survival Functions of Deficit Episodes¹

(Number of years on x-axis, percent on y-axis)

The main factors associated with prolonged foreign borrowing (that is, high survival rates) are high initial net foreign asset positions, capital account openness, and favorable growth opportunities.



Source: IMF staff estimates.

¹Kaplan-Meier survival function estimates. High and low levels are defined relative to the median level.

²Difference in survival functions is statistically significant at the 10 percent level or less (log-rank test).

ing Europe, expected deficit lengths would be significantly larger and more than double for the Baltics.

Table 6.2. Duration Regressions of Persistent and Large Current Account Deficits¹

	Regional Factors Only (a)	Regional and Standard Factors (b)	Regional, Standard, and Other Factors (c)	Regional, Standard, and Other Factors (d)	Baseline with Standard and Other Factors (e)	Baseline with Standard and Other Factors, Excluding Emerging Europe (f)
Standard variables						
Net foreign assets (percent of GDP) initial level		1.00	0.98	0.98	0.98*	0.96**
		(-0.16)	(-1.02)	(-1.37)	(-1.79)	(-2.21)
Log of per capita GDP initial level		1.08	1.96	8.33***	3.13***	4.84***
		(0.16)	(1.13)	(2.86)	(2.74)	(3.24)
Average current account balance		0.97	1.03	1.09	1.17	1.02
		(-0.25)	(0.29)	(0.70)	(1.23)	(0.13)
Average net income account balance		0.67*	0.68*	0.74	0.83	0.83
		(-1.89)	(-1.68)	(-1.60)	(-1.22)	(-1.01)
Average output gap (advanced economies)		1.01**	1.01***	1.01***	1.02***	1.01***
		(2.33)	(3.18)	(3.16)	(4.07)	(3.42)
Financial factors and political structure²						
Average capital account openness			0.62***	0.52***	0.58***	0.47***
			(-2.68)	(-3.58)	(-3.14)	(-3.91)
Average political structure			0.92**	0.93	0.89***	0.92**
			(-1.99)	(-1.61)	(-2.90)	(-2.13)
Growth performance factors						
Average real GDP per capita growth				0.84	0.77**	1.01
				(-1.15)	(-2.11)	(0.11)
Average net export growth contribution ³				0.58**	0.75*	0.67**
				(-2.99)	(-1.94)	(-2.51)
Regional factors						
Emerging Europe ⁴	0.13*	0.07**	0.04**	0.13		
	(-1.87)	(-2.26)	(-2.48)	(-1.41)		
Emerging Asia ⁴	2.72*	2.34	0.9	11.2		
	(1.70)	(0.89)	(-0.09)	(1.58)		
Latin America	2.35*	1.28	0.57	3.49		
	(1.66)	(0.29)	(-0.53)	(0.96)		
Other emerging markets	5.49**	6.13**	2.03	4.52		
	(1.98)	(2.04)	(0.74)	(1.50)		
Episodes	48	48	48	48	48	49
Number of failures	31	31	31	31	31	30
Mean squared error ⁵	22.3	12.7	14.4	6.8	7.3	3.3

Source: IMF staff calculations.

¹Note: *t* statistics are in parentheses; *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively.

Averages are computed as mean values over the deficit episode. Weibull regression. Coefficients report odds ratio with values smaller (larger) than 1 measuring lower (higher) risks of an episode ending, implying longer (shorter) durations of persistent deficits.

²The effect of domestic financial sector liberalization is explored in Appendix 6.2.

³Net export growth contribution is defined as the average annual real GDP growth rate during the episode attributable to changes in net export balance.

⁴See Table 6.4 in Appendix 6.2 for countries included in regional breakdowns.

⁵Mean squared forecast error for episode length of complete episodes.

Economies in emerging Europe have been able to attract foreign capital for sustained periods in part because of favorable initial conditions (for example, high net foreign assets compared to other persistent deficit episodes) and, in most countries, a rapid opening of capital accounts. However, the average growth

contribution from net exports has been low compared to sustained borrowing episodes in other emerging economies. This is likely related to strong exchange rates in several of these countries and may also reflect low productivity growth in the tradables sector, as a large share of investment has been going into the nontrad-

ables sector (see Figure 6.11).⁴⁵ There are some warning signs in the Baltics and Bulgaria that productivity growth has slowed (albeit from high levels) and has been especially low in industry since 2003 (Figure 6.17).

An extension of the empirical model examining how imbalance episodes have been resolved in the past suggests that the Baltics and Bulgaria are at a higher risk of an abrupt ending of their deficits because of the very high openness of their capital accounts and their fixed exchange rate regimes.⁴⁶ This vulnerability is heightened by their strong exchange rates, especially for the Baltics. In general, a more open capital account has been associated with prolonged deficit episodes that tend to end abruptly. Fixed exchange rate regimes are also associated with abrupt endings, but these episodes tend to be shorter (see Appendix 6.2 for details).⁴⁷ Among the countries that had very open capital accounts and experienced an abrupt ending of their deficit is Malaysia (1995), whereas Thailand (1982) experienced an abrupt ending under a fixed exchange rate regime. On the other hand, a higher value on the political structure index is associated with longer-lasting and more smoothly ending episodes.

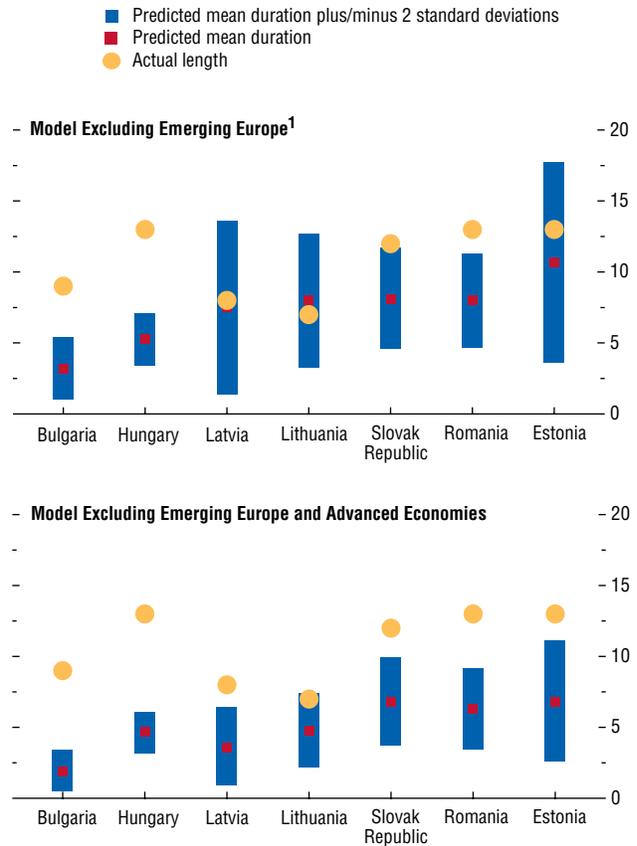
⁴⁵While it is true that improvements in transportation, financial services, and utility sectors enhance productivity, a significant amount of investment is taking place in real estate and retail trade, with less clear productivity-enhancing benefits (Rahman, 2008). See also Bems and Schellekens (2007).

⁴⁶Determinants and implications of current account reversals were discussed in Chapter 3 of the April 2007 *World Economic Outlook*. This analysis finds that current account reversals were preceded by a positive output gap and had varied implications for output growth: contractionary reversals were associated with low openness to trade and large initial deficits. In contrast, expansionary reversals were associated with larger-than-average total real depreciations and increases in savings rates (mainly public), which allowed investment rates to be sustained.

⁴⁷This finding complements recent empirical findings on the persistence of current account imbalances under different exchange rate regimes. Chinn and Wei (2008) find no direct link between exchange rate regimes and current account persistence. This result is qualified by Ghosh, Terrones, and Zettelmeyer (2008), who report that large reversals appear correlated with fixed exchange rate regimes.

Figure 6.16. Predicted Duration and Actual Length of Ongoing Deficit Episodes (Years)

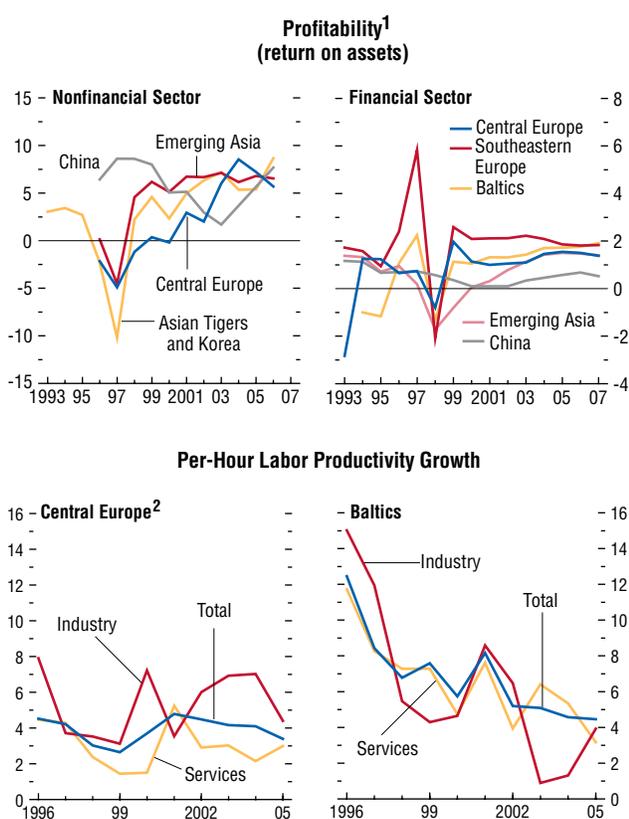
Relative to a fundamentals-based model prediction, the ongoing episodes in emerging Europe appear quite long, especially in comparison with data from other emerging economies.



Source: IMF staff estimates.
¹Based on column f of Table 6.2.

Figure 6.17. Corporate Profitability and Productivity Growth
(Percent)

Corporate profitability is robust in emerging Asia and emerging Europe. However, productivity growth shows signs of slowing in the Baltics.



Sources: Brooks and Ueda (2005, updated July 2008); and Groningen Growth and Development Centre, 60-industry database, September 2006.
¹Central Europe includes Czech Republic, Hungary, Poland, and Slovak Republic. Southeastern Europe includes Albania, Bulgaria, Croatia, Macedonia, FYR, and Romania. Baltics are Estonia, Latvia, and Lithuania. Emerging Asia includes China, India, Indonesia, Korea, Malaysia, Pakistan, Philippines, and Thailand. Asian Tigers are Malaysia, Indonesia, Philippines, and Thailand.
²Central Europe includes Czech Republic, Hungary, Poland, Slovak Republic, and Slovenia.

Conclusions and Policy Implications

The growing divergence of current account imbalances in emerging economies has led to much discussion about the underlying causes and the implications for growth and sustainability. Some suggest that large surpluses in emerging Asia could imply that income convergence can be achieved without a need to borrow large amounts of foreign capital and therefore without the associated vulnerabilities to external stability. By contrast, emerging Europe's ability to borrow foreign capital for long periods suggests that the standard growth model, with capital flowing downhill, remains relevant. This chapter explores the reasons for these diverging trends and assesses the sustainability of the growing current account imbalances.

The empirical analysis suggests that structural changes have been a main factor explaining the different regional trends. In emerging Europe, the large current account deficits are related to a rapid liberalization of domestic financial markets and open capital accounts, which attracted large capital inflows and prompted a rapid rise of foreign bank ownership. The process of integration into the EU also enhanced foreign capital inflows by improving prospects for economic and policy stability.

Economies in emerging Asia typically have less open capital accounts, and liberalization of domestic financial markets lags other regions. Several countries in emerging Asia also have different political structures and younger populations. These factors, and in particular the lack of financial liberalization, explain a substantial part of the current account surpluses in the region. As these countries move toward more financial liberalization in the future, this may help lower the surpluses by both raising consumption and increasing foreign financing of investment. However, a large fraction of the persistent current account surpluses in these economies remains unexplained. One candidate explanation is the undervaluation of their exchange rates. However, it is difficult to establish definitively whether the low exchange

rate levels reflect deliberate policy action—for example, an attempt by some countries to build high levels of international reserves after the Asian crisis—or other unidentified factors that moved current accounts decisively into surplus after 1997–98.

As current account imbalances have increased, the duration of imbalance episodes has also lengthened, raising concerns about their sustainability. Indeed, the number of large, persistent current account deficits has risen rapidly since the 1990s, with many of these located in emerging Europe. The main economic factors that explain prolonged deficits are favorable initial net foreign asset positions, growth opportunities, and open capital accounts. By contrast, prolonged surpluses are rare among emerging economies.

Based on an analysis of historical patterns, ongoing deficits in emerging Europe are expected to last longer than in other regions, although most are already at or beyond the upper end of their expected duration. The basic characteristics of emerging European economies explain the prolonged length of their deficits, but this is no safeguard against hard landings. Risk factors for abrupt endings to deficits identified in the empirical analysis include fixed exchange rate regimes and open capital accounts, which are characteristic of many of these economies. These countries' choice of a fixed exchange rate regime may be motivated by many factors, in particular, the desire to enter the euro area, but having made this choice, these countries need to protect themselves against external vulnerabilities by ensuring that product and labor markets are flexible, that strong financial regulatory and supervisory frameworks are in place, and that macroeconomic policies are consistent with domestic and external balance (see IMF, 2007).

The large surpluses in emerging Asia may be safer from the point of view of external vulnerability. However, they may also entail lower-than-desirable consumption over the near term and a less efficient allocation of capital, given that saving and investment choices are made within

financial and corporate governance systems that need to be more responsive to market forces.⁴⁸ A gradual return to equilibrium exchange rate levels would help address these concerns and help forestall the type of negative effects on productivity and growth that have been experienced in other countries that have grown rapidly over extended periods with high rates of investment. At the same time, as emphasized in the IMF-led Multilateral Consultation on Global Imbalances, a broader set of policies would help smooth the adjustment process, including rebalancing the components of aggregate demand and further financial liberalization to improve both access to credit and the quality of financial intermediation.

Appendix 6.1. Variable Definitions and Data Source

The main authors of this appendix are Stephan Danninger and Florence Jaumotte.

This appendix provides further details on the construction of the variables used in Chapter 6 and the sources of the data. The analysis is based on annual data from 1980 until most current. It covers countries with a 2006 level of real GDP per capita above \$2,000 and a population of at least 2 million and excludes oil exporters (according to the IMF *World Economic Outlook* definition).

Balance of Payments Data

The main source for balance of payments data is the IMF *Balance of Payments Statistics*, complemented by data from the IMF World Economic Outlook (WEO) database and the External Wealth of Nations Mark II database created by Lane and Milesi-Ferretti (2006) (for stock data on foreign assets and liabilities).

⁴⁸See Box 3.2 in the September 2006 *World Economic Outlook* and Box 2.3 in the April 2007 *World Economic Outlook*.

Saving and Investment

Saving and investment data are taken from the IMF WEO database. The breakdown of saving and investment into their public and private components is from the United Nations National Accounts Statistics database and IMF WEO database. Private saving is further disaggregated into corporate and household savings rates using the United Nations National Accounts Statistics database and, where necessary, the CEIC Asia database. Post-2003 data for China's corporate and household saving rates are based on staff estimates.

Standard Determinants

The general government balance, the oil balance (defined as the difference between oil exports and imports), and real GDP per capita growth are from the IMF WEO database, whereas output per capita in constant purchasing-power-parity (PPP) terms is taken from the World Bank's *World Development Indicators*. The latter is divided by the level in the United States to generate relative income per capita. Finally, population growth and the old-age dependency ratio are from the World Bank's *World Development Indicators*.

Additional Factors

Financial factors

Financial depth is measured by the sum of credit to the private sector by deposit money banks and other financial institutions and stock market capitalization, divided by GDP. The source is a 2007 update of the Financial Structure Database prepared by Beck, Demirgüç-Kunt, and Levine (2000). Data for China are based on IMF staff calculations. The capital account openness index is taken from an update of Chinn and Ito (2006) and is based on principal components extracted from disaggregated capital and current account restriction measures in the IMF *Annual Report on Exchange Arrangements and Exchange Restrictions*. Financial

liberalization is an index combining information on interest rate controls, credit controls, competition restrictions, state ownership, quality of the banking supervision and regulation, policies to encourage the development of bond and equity markets, and policies to permit access by foreigners to the domestic stock market. The index is from Abiad, Detragiache, and Tressel (forthcoming). Finally, the fraction of foreign banks is taken from Claessens and others (2008). A bank is considered foreign-owned if at least 50 percent of its shares are held by foreign nationals in a given year (only direct ownership is considered).

Exchange rate

The deviation of the real effective exchange rate from its predicted value is based on the equilibrium real exchange rate approach developed as part of the IMF CGER assessment and is calculated as the residual from a regression of the CPI-based real effective exchange rate on the productivity differential between tradables and nontradables (the so-called Balassa-Samuelson effect), other factors affecting relative prices (government consumption, trade restriction index, price controls, and commodity terms of trade), and net foreign assets (see Lee and others, 2008). Exchange rate deviation measures for the Baltics not available through the IMF CGER assessment are staff estimates based on a similar methodology. The classification of exchange rate regimes into fixed, intermediate, and flexible is a "de facto" IMF exchange rate regime index kindly provided by IMF staff member Harald Anderson.

Political factors

The political structure index is the "Polity2" variable from the Polity IV Project (Marshall, Jaggers, and Gurr, 2004). It covers a number of dimensions, including the presence of institutions and procedures through which citizens can express effective preferences about alternative policies and leaders and the existence of institutionalized constraints on the exercise of power by the executive.

The EU integration measure captures how far countries in emerging Europe (and Turkey) are along the different stages of the formal integration process, namely, EU membership application, initiation of negotiation for EU membership, EU accession, entry into ERM II, and euro adoption. A score of 0.2 is given for each stage; hence the maximum score is 1.

Vulnerability Indicators

Profitability of the nonfinancial sector is calculated as net income plus interest expense to last year's assets, adjusted for CPI inflation. Profitability of the financial sector is earnings before extraordinary items and taxes in percent of total assets. The data are from a July 2008 update of Brooks and Ueda (2005) based on data from Worldscope and Datastream.

Data on hourly labor productivity growth in industry, services, and the aggregate economy for the Baltics and central Europe are from the Groningen Growth and Development Centre, 60-industry database, September 2006.

Event Study: Growth Accelerations and Current Account Developments

To compare current account developments in emerging Europe with experiences from past growth accelerations, an event study analysis was conducted based on the definition of growth accelerations proposed by Hausmann, Pritchett, and Rodrik (2005). An event is defined as the onset of an acceleration in growth with the start date identified by two criteria:

- growth is rapid: $g_{t,t+8} \geq 3.5$ percent per year, with $g_{t,t+8} = \ln(y_{t+8}) - \ln(y_t)$ being the real per capita GDP growth rate at time t over an eight-year horizon, and
- growth accelerates: $\Delta(g_t) = (g_{t,t+8}) - (g_{t-8,t}) \geq 2.0$ percent with $\Delta(g_t)$ being the change in the growth rate at time t .

Once an acceleration in growth is under way, identification of the end of an acceleration is based on two criteria: the average growth rate declines below 2 percent, and growth in the

year following the end of the event dips below 3 percent.

These criteria were applied to the sample of non-oil-exporting emerging and advanced economies of this chapter between 1960 and 2007.⁴⁹ A total of 63 episodes were identified, of which 10 episodes from emerging Europe were dropped due to their overlap with the comparator countries. Data limitations excluded the use of another 38 episodes—29 accelerations had start dates prior to 1970—so that the final group of episodes comprised 15 growth accelerations including the following countries: Cameroon, China, Chile, Dominican Republic, Egypt, Finland, Greece, India, Indonesia, Ireland, Lao P.D.R., and Portugal. The average growth rate prior to the onset of the identified accelerations is -1.1 percent.

Appendix 6.2. Econometric Approach

The main authors of this Appendix are Stephan Danninger and Florence Jaumotte.

This appendix describes in greater detail the model underlying the econometric analysis of the determinants of the current account balances and its estimation. It also presents some additional results on the heterogeneity of coefficients across regions. Finally, it provides technical details of the duration analysis.

Determinants of the Current Account Balance

The model used in the empirical analysis relates the current account balance (expressed in percent of GDP) to a number of standard determinants and a range of new factors. The following equation is adopted as the specification for the analysis:

$$\frac{CA}{Y} = \alpha_1 + \alpha_2 \left(\frac{NFA}{Y} \right) + \alpha_3 \left(\frac{GGB}{Y} \right) + \alpha_4 \left(\frac{NX_{oil}}{Y} \right)$$

⁴⁹The algorithm for identifying growth accelerations was generously provided by Jeromin Zettelmeyer and Jean Salvati.

$$\begin{aligned}
& + \alpha_5 \left(\frac{Pop_{old}}{Pop_{wa}} \right) + \alpha_6 g_{pop} + \alpha_7 \left(\frac{y}{y_{US}} \right) + \alpha_8 (g_y) \\
& + \sum_k \beta_k X_k + \gamma_1 EE + \gamma_2 APC + \gamma_3 FC \\
& + \sum_t \delta t_l + \varepsilon, \tag{1}
\end{aligned}$$

where CA is the current account balance, Y is nominal GDP, NFA is net foreign assets, GGB is the general government balance, NX_{oil} is the oil balance, Pop_{old} is the population ages 65 and over, Pop_{wa} is the working-age population, g_{pop} is the population growth rate, y is GDP per capita in constant PPP terms, g_y is the growth rate of real per capita income, EE is a dummy variable taking the value 1 for emerging Europe and zero otherwise, APC is a dummy variable taking the value 1 for emerging Asia starting in 1999 (after the Asian crisis years), FC is a dummy variable taking the value 1 for financial centers, t is time-fixed effects, and X denotes a range of new factors added to the standard model in several stages (see main text). These are financial structure variables (financial depth, domestic financial liberalization, capital account openness) and a measure of political structure.

Following the literature (see, for example, Lee and others, 2008), a number of variables are calculated as deviations from the average for the rest of the world. These are the ratio of the general government balance to GDP, the demographic variables, the growth of GDP per capita, and the measure of political structure. Data are averaged over four years to focus on determinants of medium-term movements in the current account. In order to minimize endogeneity problems, net foreign assets, relative income per capita, and financial depth are measured in the year preceding the four-year period under consideration; the growth rate of real GDP per capita is measured over the four years preceding the current four-year period. The equations do not include country-fixed effects and retain the cross-sectional information since they will be used to explain differences between countries. Time-fixed effects are included to capture developments that affect similarly all countries

in a given year (for example, the aggregate balance of savings and investment). The model is estimated using ordinary least squares and heteroscedasticity-robust standard errors.⁵⁰

The sample of countries for which all variables used in the regressions were available consists of 58 advanced and emerging economies, of which 21 are advanced economies and 37 are emerging economies. Based on data availability, the following countries are included:

- Advanced economies: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and United States.
- Emerging economies: Argentina, Bolivia, Brazil, Bulgaria, Chile, China, Colombia, Costa Rica, Czech Republic, Egypt, El Salvador, Estonia, Georgia, Hungary, India, Indonesia, Israel, Jamaica, Jordan, Korea, Latvia, Lithuania, Malaysia, Mexico, Morocco, Pakistan, Paraguay, Peru, Philippines, Poland, Romania, South Africa, Sri Lanka, Thailand, Tunisia, Turkey, and Uruguay.

The results of the estimations are reported in the text.

Additional Results: Heterogeneity between Regions

Reflecting emerging Europe's special circumstances, the empirical analysis allowed and tested for different coefficients for this group of countries relative to the rest of the sample. Equation (1) was extended to include interaction terms between each of its variables and a dummy variable for countries of emerging Europe. The hypothesis that the dummy variable for emerging Europe and all the interaction terms are zero (that is, that the effects of the variables are similar for emerging Europe and other sample countries) could

⁵⁰Results are robust to including the capital account-to-GDP ratio as an explanatory variable, to control for changes over time in the classification of capital transfers.

Table 6.3. Explaining Differentiated Effects in Emerging Europe

	Full Sample	Restricted Sample	Plus Foreign Bank Presence	
	(a)	(b)	(c)	(d)
Financial factors and political structure				
Financial depth (percent of GDP, lagged)	0.82 (1.64)	0.217 (0.27)	0.207 (0.25)	0.186 (0.21)
Financial liberalization	-2.743 (-1.68)*	-3.757 (-0.64)	-3.823 (-0.64)	-6.186 (-1.17)
Capital account openness	-0.229 (-1.25)	-0.435 (-1.07)	-0.444 (-1.11)	-0.423 (-1.05)
Joint significance of financial variables (<i>p</i> -value)	0.03**	0.23	0.22	0.1
Political structure	-0.146 (-3.54)***	-0.033 (-0.36)	-0.03 (-0.32)	-0.038 (-0.39)
Emerging Europe factors				
General government balance interacted with EU integration	-1.319 (-5.32)***	-1.348 (-3.43)***	-1.371 (-3.33)***	-1.443 (-3.35)***
Financial liberalization interacted with emerging Europe dummy	-4.484 (-4.47)***	-3.533 (-1.85)*	-3.287 (-1.35)	
Fraction of foreign banks			-0.476 (-0.26)	-3.128 (-2.27)**
Regional factors (unexplained effects)				
Asian crisis shift	2.518 (3.03)***	4.2 (3.21)***	4.192 (3.19)***	4.509 (3.76)***
Observations	215	77	77	77
Adjusted <i>R</i> -squared	0.59	0.66	0.65	0.64

Source: IMF staff calculations.

Note: Robust *t* statistics are in parentheses; *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively. All regressions control for net foreign assets, the general government balance, the oil balance, the old-age dependency ratio, population growth, the relative income per capita, growth of GDP per capita, a dummy for financial centers, a constant, and time-fixed effects. The regressions are estimated by ordinary least squares. See footnotes 1 and 2 in Figure 6.1 for regional breakdowns.

not be rejected except for the interaction terms involving the general government balance and domestic financial liberalization.⁵¹

While the text shows that the differentiated effect of the fiscal balance can be directly attributed to the EU integration process, this section provides more evidence on the reason for the differentiated impact of financial liberalization. Financial liberalization has a stronger negative impact on the current account in emerging Europe than in the rest of the sample. This likely reflects the much stronger presence of foreign banks. Some supportive evidence for this hypothesis was found using available data on the fraction of foreign banks from Claessens and others (2008) (the sample size falls to 77 observations). While domestic financial liberalization

(interacted with the emerging Europe dummy) dominates the fraction of foreign banks when they are entered jointly, the fraction of foreign banks has a coefficient of a magnitude and significance similar to that of domestic financial liberalization (interacted with the emerging Europe dummy) when it is entered on its own (Table 6.3, columns c and d). This provides some supportive evidence that the stronger presence of foreign banks in emerging Europe may have contributed to the stronger impact of domestic financial liberalization on the current account.

Duration Analysis and Current Account Imbalances

This part provides greater detail on the identification of large, persistent current account

⁵¹The *p*-value for this test is 11 percent.

imbalances and describes the econometric methodology and additional results from the duration analysis discussed in the main text.

The method for identifying large, persistent current account imbalances is based on the approach developed in Chapter 3 of the April 2007 *World Economic Outlook* but with modified parameters. For this chapter, the cutoff values for large current account imbalance episodes are a deficit or surplus of 3 percent of GDP or larger for at least three years and during which no current account reversal occurs.⁵² The latter criterion ensures that the end of an episode is dated at the onset of any large adjustments, regardless of whether the imbalance crosses the 3 percent of GDP threshold. Table 6.4 lists all large, persistent current account imbalance episodes that meet these criteria.

Duration Analysis

A duration analysis was performed to relate different fundamental determinants to the length of current account imbalances. Due to the small number of persistent surpluses, the analysis was limited to deficits.

The empirical approach models the hazard rate of the duration of an imbalance episode, which is equivalent to the conditional probability that an episode ends in the next period, given a set of determinants x :

$$\lambda(t, x(t)) = \lim_{h \rightarrow 0} F(t \leq T < t+h \mid x) / h = f(t, x) / (1 - F(t, x)).$$

Formally, the hazard rate is defined as the ratio of the density function $f(t, x)$ of the duration T , and the survival function $1 - F(t, x)$, where $F(t, x)$ is the cumulative distribution function of T .⁵³ The empirical implementation for estimating the hazard rate is based on a proportional hazard rate model:

$$\lambda(t, x(t)) = \exp(\beta x(t)) \lambda_0(t),$$

with a Weibull specification for the baseline hazard rate $\lambda_0 = p t^{p-1}$. The parameters p and β are estimated via maximum likelihood and determine the shape of the baseline hazard rate function λ_0 and the size of proportional shifts in the baseline hazard rate related to determinants $x(t)$. Due to concerns about endogeneity of fundamental factors with respect to the length of an episode, the model uses time-invariant controls x .⁵⁴

The empirical analysis is based on 48 large, persistent current account deficits and covers episodes from both advanced (35 percent) and emerging economies (65 percent). The main results are reported in the text. Other explanatory variables and specifications were explored—for instance capital account openness has a larger effect at higher levels of per capita income—but did not improve the model's fit. Additional results in Table 6.5 pertain to the role of domestic financial liberalization on the duration of episodes, which were omitted in the main text due to reduced country coverage. The analysis shows that domestic financial sector liberalization increases the length of an episode (column a), but that this effect disappears once measures of political structure and capital account openness are included (column b). There is however evidence that the speed of liberalization adds to the episode length (column c), but the same is not true for the speed of capital account liberalization and change in political institutions (not shown). This finding is consistent with the interpretation of panel regression results presented in the main text, which highlight the large effect of domestic financial sector liberalization on capital inflows in the past decade.

Deficit Episodes and Resolution of Imbalances

To explore the link between duration of persistent deficits and their resolution, a compet-

⁵²A description of the method used for identifying current account reversals and persistent imbalances can be found in Appendix 3.1 of the April 2007 *World Economic Outlook*.

⁵³For details on duration analysis concepts, see Kiefer (1988) and Wooldridge (2002).

⁵⁴A specification using time-varying controls was estimated and generated similar results to the ones reported in the main body of the chapter.

Table 6.4. List of Persistently Large Current Account Imbalance Episodes

Country	Start Year	End Year	Length in Years	Average Current Account Balance (percent of GDP)	Country	Start Year	End Year	Length in Years	Average Current Account Balance (percent of GDP)
Advanced economies					Emerging economies (continued)				
<i>Deficit Episodes</i>					<i>Deficit Episodes (continued)</i>				
United States	1999	2007	9	-4.8	Israel	1978	1982	5	-5.7
Denmark	1979	1986	8	-3.7	Egypt	1970	1975	6	-5.3
Norway	1974	1977	4	-8.8	Sri Lanka	1986	1994	9	-5.3
Canada	1989	1993	5	-3.7	Indonesia	1967	1971	5	-3.7
Greece	1979	1985	7	-4.6	Korea	1965	1974	10	-11.5
Greece	1996	2007	12	-6.8	Malaysia	1991	1995	5	-6.4
Ireland	1969	1981	13	-6.2	Pakistan	1988	1996	9	-3.7
Portugal	1996	2007	12	-8.0	Philippines	1976	1982	7	-5.6
Spain	1974	1976	3	-3.8	Singapore	1977	1980	4	-7.8
Spain	1990	1992	3	-3.5	Thailand	1977	1981	5	-6.4
Spain	2000	2007	8	-5.8	Thailand	1990	1996	7	-7.0
Australia	1981	2007	27	-4.6	Tunisia	1980	1984	5	-6.7
New Zealand	1979	1984	6	-6.4	Albania	1999	2007	9	-6.6
New Zealand	1992	2007	16	-5.4	Bulgaria	1999	2007	9	-9.1
Emerging economies					<i>Surplus Episodes</i>				
Bolivia	1983	1987	5	-7.6	Advanced economies				
Bolivia	1990	1992	3	-6.2	Belgium	2001	2007	7	3.5
Bolivia	1995	1998	4	-6.1	Denmark	2001	2007	7	2.8
Brazil	1971	1974	4	-4.9	Netherlands	1988	1997	10	4.1
Brazil	1977	1982	6	-6.4	Netherlands	2001	2007	7	5.7
Brazil	1999	2001	3	-4.1	Norway	1991	1997	7	4.3
Chile	1981	1984	4	-10.1	Norway	2001	2007	7	14.7
Chile	1996	1998	3	-4.5	Sweden	1999	2007	9	5.4
Costa Rica	1967	1974	8	-8.5	Switzerland	1984	2007	24	8.3
Costa Rica	1977	1981	5	-12.2	Japan	1991	2007	17	2.9
Costa Rica	1987	1989	3	-5.8	Finland	2005	2007	3	4.3
Costa Rica	1997	2007	11	-4.5	Emerging economies				
Dominican Republic	1967	1973	7	-5.9	Argentina	2004	2007	4	2.8
Dominican Republic	1978	1980	3	-7.8	Egypt	2004	2007	4	3.2
El Salvador	2003	2007	5	-4.8	Hong Kong SAR	1967	1975	9	11.9
Guatemala	1987	1990	4	-5.0	Hong Kong SAR	1985	1989	5	7.4
Guatemala	1996	2007	12	-5.3	Malaysia	2002	2007	6	12.7
Honduras	1975	1980	6	-7.4	Singapore	1998	2007	10	20.2
Honduras	1991	1996	6	-6.3	Namibia	1993	2007	15	5.7
Honduras	1999	2007	9	-3.9	China	2002	2007	6	6.1
Mexico	1974	1981	8	-4.0					
Panama	1997	1999	3	-8.1					
Panama	2003	2007	5	-5.6					
Paraguay	1967	1974	8	-9.8					
Paraguay	1977	1987	11	-6.4					
Peru	1990	1995	6	-6.0					
Jamaica	1967	1984	18	-6.7					
Jamaica	2002	2007	6	-11.0					
Israel	1962	1964	3	-9.3					
Israel	1968	1975	8	-7.7					

Source: IMF staff calculations.

Note: Large, persistent imbalances defined as a current account imbalance of at least 3 percent of GDP lasting for a minimum of three years based on method reported in Appendix 3.1 in the April 2007 *World Economic Outlook*.

Table 6.5 Duration Analysis and Domestic Financial Sector Liberalization¹

	Standard and Other Factors (a)	Standard and Other Factors (b)	Standard and Other Factors (c)
Standard factors			
Net financial assets initial level (percent of GDP)	0.97* (-1.80)	0.97* (-1.92)	0.97* (-1.90)
Log of per capita GDP initial level	2.44** (2.12)	3.47*** (2.65)	3.19** (2.36)
Current account balance average	1.16 (1.47)	1.22 (1.53)	1.11 (0.76)
Net income account balance average	0.96 (-0.26)	0.9 (-0.62)	0.8 (-1.19)
Output gap average (advanced economies)	1.01*** (2.92)	1.01*** (3.66)	1.01*** (3.47)
Financial factors and political structure			
Domestic financial sector liberalization average	0.03*** (-3.35)	0.26 (-1.02)	2.61 (0.59)
Change in domestic financial sector liberalization			0.02*** (-2.59)
Capital account openness average		0.63** (-2.18)	0.48** (-2.85)
Political structure average		0.92** (-2.16)	0.92** (-1.98)
Growth performance factors			
Real GDP per capital growth average	0.9 (-0.90)	0.83 (-1.39)	1.00 (0.01)
Real export growth average	0.81 (-1.34)	0.78 (-1.58)	0.76* (-1.69)
Observations	43	43	43

Source: IMF staff calculations.

Note: Z statistics are in parentheses; *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively. Averages computed as mean values over the deficit episode, changes are computed as the average difference of variable value between the beginning and end of the episode. Coefficients indicate odds ratio with smaller (larger) values than one measuring lower (higher) risk of an episode completion implying longer (shorter) expected durations of episodes.

ing risks model was estimated using the same set of determinants as in Table 6.2. The empirical specification follows an approach proposed by Lunn and McNeil (1995) and explores the hazard rates for different exit types (abrupt and non-abrupt endings). The model assumes that in each period the total exit risk can be separated into two additively separable risks for abrupt and non-abrupt endings. The approach adds interaction terms between fundamental determinants

Table 6.6. Duration Analysis and Risk of Abrupt and Non-Abrupt Endings

	Standard Model (a)	Competing Risks Model	
		(b)	(c)
Factors for common hazard			
Net financial assets initial level (percent of GDP)	0.98 (-1.38)	0.97** (-2.03)	0.98 (-1.10)
Log of per capita GDP initial level	2.16** (2.27)	2.48** (2.28)	2.14* (1.72)
Net income account balance average	0.85 (-1.19)	0.94 (-0.36)	0.81 (-1.12)
Output gap average (advanced economies)	1.01*** (4.22)	1.01*** (3.37)	1.01*** (3.11)
Capital account openness average	0.66*** (-3.00)	0.80 (-1.42)	0.78 (-1.58)
Political structure average	0.92** (-2.55)	0.88*** (-3.22)	0.89*** (-3.02)
Real GDP per capita growth average	0.84 (-1.62)	0.77*** (-2.85)	0.79** (-2.23)
Real export growth average	0.86 (-1.57)	0.93 (-0.51)	0.8 (-1.25)
Flexibility of exchange rate regime average			3.50*** (2.70)
Factors of hazard with abrupt endings			
Net financial assets initial level (percent of GDP)		1.05** (2.19)	1.04 (1.54)
Log of per capita GDP initial level		0.37 (-1.04)	0.41 (-0.93)
Net income account balance average		0.64 (-1.21)	0.74 (-0.84)
Output gap average (advanced economies)		0.99 (-1.20)	0.99 (-1.41)
Capital account openness average		0.39* (-1.79)	0.38* (-1.74)
Political structure average		1.15* (1.65)	1.17 (1.52)
Real GDP per capita growth average		1.58 (1.12)	1.54 (1.05)
Real export growth average		0.84 (-0.71)	1.17 (0.41)
Flexibility of exchange rate regime average			0.077* (-1.71)
Observations	96	96	96
Episodes	48	48	48

Source: IMF staff calculations.

Note: Z statistics are in parentheses; *, **, and *** denote significance at the 10 percent, 5 percent, and 1 percent level, respectively. Averages computed as mean value over the current account deficit episode. Coefficients report odds ratio with smaller (larger) values than 1, indicating decreased (increased) risk of an episode ending.

and an exit type variable, which allows estimation of differences in hazard rates by exit type. The model is implemented through a semiparametric Cox proportional hazard model.

Table 6.6 presents estimation results for a baseline and two competing risks model specifi-

cations. The coefficients of the standard determinants (column a) are similar to the ones presented in the main body of the chapter using a Weibull specification (see Table 6.2). Note however that the number of observations is twice as large compared to the original duration model specification since each observation is entered twice to allow for different (competing) risks' effects. The results in columns (b) and (c) report hazard rate models for a common baseline hazard rate (top panel) and differences for hazards with abrupt endings (lower panel). The interaction effects specification implies that the total hazard rate for abrupt endings is determined by the sum of the direct and the interaction effects.

The majority of explanatory variables do not have significant additive risk factors (lower panel) and hence do not indicate different hazard rates by exit types. Significant interaction effects are however found for net foreign assets, capital account openness, and political structure.⁵⁵ Combining the direct and interaction effects, the results indicate that longer spells due to greater capital account openness bear an increasing risk of abrupt endings (column b in Table 6.6). The results are different for net foreign assets and political structure due to the offsetting signs of the direct and interaction effects. They imply that higher values on both indicators increase the length of non-abrupt episodes, but there are no effects for abrupt endings.

In column c of Table 6.6, a variable capturing the flexibility of the exchange rate regime is introduced. The direct effect of this variable on the length of non-abrupt episodes is negative, whereas the interaction effect has the opposite sign and more than offsets the direct effect. This implies that a more flexible exchange rate regime reduces the length of episodes that end non-abruptly—supporting the view that flexibility reduces persistence—and that fixed regimes are linked to shorter episodes that end more abruptly.

⁵⁵For net foreign assets a test of the joint significance of the direct and interaction effects is rejected.

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