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Global Current Account Imbalances: American Fiscal Policy versus East Asian Savings*

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Abstract

We consider the origins of global current account imbalances. We first discuss how the expansion of the US current account deficit and the decrease in global real interest rates can be reconciled with the widespread view that American expansionary fiscal policy is partly the source of current trends. We then investigate empirically the medium-term determinants of the current account using a model that controls for factors related to institutional development. In addition to the conventional macroeconomic factors, we examine a series of environmental factors, including the degree of financial openness and the extent of legal development. We find that for industrial countries, the government budget balance is an important determinant of the current account balance; the budget balance coefficient is 0.10 to 0.49 depending on model specifications. These varying estimates lead us to conclude that fiscal factors might be as important as excess savings arising from East Asia.

1. Introduction

A number of explanations have been forwarded for the widening of the US current account deficit over the past decade. Roughly speaking, the arguments can be categorized as either domestic or international in nature. Some argue that the main reason for the increase in US current account imbalances is the decline in US savings, especially public sector savings, since 2002. In this "twin deficits" argument, the current administration's expansionary fiscal policy bears the greatest blame. Ferguson (2004), Greenspan (2005a,b), and others have, on the other hand, argued that the impact of fiscal policy on the current account balance is small.

The "global saving glut" explanation, most closely associated with Bernanke (2005), views excess savings from Asian emerging market countries, driven by rising savings and collapsing investment in the aftermath of the financial crisis, as the cause of the US current account deficit (although the current account surpluses of the oil-exporting countries have taken on a heightened prominence in recent years). From Bernanke's perspective, the US current account deficit is caused by forces abroad, and amenable to a solution only in the longer term, as better developed financial systems mitigate this excess savings problem. Low real interest rates are consistent with this excess savings view.

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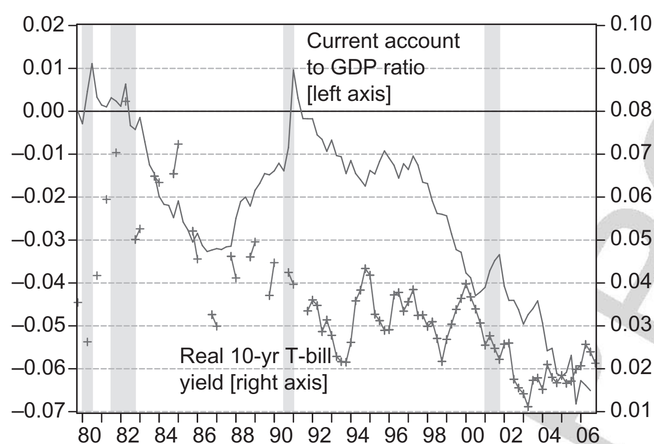

Figure 1. US Current Account Balance and Real Interest Rate, 1979–2006

For two reasons, we believe that the Bernanke thesis demands closer examination, despite the surface appeal of the argument. First, in a counterpoint to his previous argument, Bernanke recently re-affirmed his view that one way to reduce the US current account deficit is by increasing public sector saving (Bernanke, 2005, 2007). Secondly, as shown in Figure 1, the current account deficit remains entrenched at about 6.4 percentage points despite the upward movement in real ten-year interest rates.[1]

This paper updates and extends Chinn and Prasad's (2003) empirical study of current account behavior in several important respects. First, we focus on a potentially important factor identified by Bernanke (2005), namely the effect of financial development in the context of the legal system and institutions. Secondly, we allow for nonlinearities via interaction terms. Thirdly, we analyze the determinants of the current account components, namely saving and investment.[2]

Whether one takes the twin deficits or global saving glut argument, the effect of legal and institutional development cannot be dismissed *a priori*, although it clearly matters more in the latter case. In addition to macroeconomic attributes such as the stage of development, demographic profile, and the government budget balance, the legal environment and the level of institutional development should be important control variables. After all, the extent of private saving and investment should depend on how the returns from those activities are protected by these factors.

The extent of institutional development should enhance the effectiveness of financial development and other policy measures such as financial opening. Hence, this paper also devotes special attention to the effect of financial development and examines whether the "financial deepening" argument (Edwards, 1996) or the saving glut argument is applicable for sample countries' saving behavior.

The main findings are as follows. The budget balance is an important determinant of the current account balance for industrial countries; the coefficient for the budget balance variable is 0.15 in a model controlling for institutional variables. A series of robustness checks yield the finding that a 1 percentage point increase in the ratio of budget balance to GDP relative to the weighted world average should lead to a 0.10 to 0.49 percentage point increase in the current account to GDP ratio. We also find that institutional development is an important determinant for the current account balance mainly for higher-income countries, although it is important for both saving and investment determination in all country groupings. More importantly, our empirical findings

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are *not* consistent with the argument that the more developed financial markets are, the less saving a country undertakes. Especially for most of the East Asian emerging market countries, we find that more financial development leads to *higher* saving. Furthermore, there is no evidence of East Asian "excess domestic saving." Rather, countries of this region have experienced depressed investment during the post-crisis period. For the United States, our analysis confirms the view that it is a saving drought—not investment boom—that is driving to the enlargement of the current account deficit, although there is some evidence of anomalous behaviour in the latest four-year period.

2. Competing Views on the Sources of the Global Imbalances

As noted above, several commentators have argued that the large current account surpluses in the rest of the world, specifically in East Asia, and more recently the oil-exporting countries, are at the heart of the pattern of global imbalances. In this view, these current account surpluses have to be offset somewhere, and that somewhere is in the United States, largely because of the greater attractiveness of American assets. It is a line of reasoning that leads to the conclusion that the current account deficit will continue as long as the phenomenon of excess savings in the rest of the world persists. And, in one interpretation, the end could be years away. Dooley et al. (2003, 2007) view the US current account deficit as the outcome of concerted mercantilist efforts by East Asian state actors. In this context, the financing of America's trade (and budget) deficit is an explicit quid pro quo for continued access to American markets.[3]

While the saving glut view has a seed of truth to it, particularly for the last couple of years or so, there are some problems with the story. First, the argument that fiscal policy cannot really have an impact on the current account deficit is subject to debate. Federal Reserve Board research indicating that one dollar's worth of budget-deficit reduction will only induce a 20-cent decrease in the trade deficit has been cited in support of this perspective.[4] However, these results are based on calibrated model simulations. The IMF's calibrated model yields estimates closer to 50 cents in the dollar (Faruqee et al., 2007). Furthermore, it is important to realize that there is some disagreement on the econometrically measured size of the effect. The OECD's macroeconometric model implies something around a 40-cent impact on the current account for each dollar's worth of fiscal consolidation (OECD, 2005); this larger-point estimate is not atypical of macroeconometric models.

Secondly, it is somewhat odd to think of the East Asian countries driving the United States to consumption and saving behavior, especially when the US economy is approximately three times the size of developing and industrializing East Asia. The conventional wisdom is more plausible: there is a saving *scarcity* in the United States, driven largely by the Federal budget deficit, and it is this saving drought in the United States that has been sucking in excess savings from the rest of the world for most of the past five years.

The strongest point in favor of the saving glut hypothesis is the observation of a widening current account deficit in the United States, combined with low real-world interest rates. However, the saving glut versus twin deficits view is not an either–or proposition. Figure 2 depicts how it is possible for both motivations to coexist. Two regions are graphed—East Asia and the United States. The National Savings (NS) schedules are functions of fiscal policy, demographics, and the real interest rate. The Investment schedules (I) are functions of the interest rate and many other factors. In

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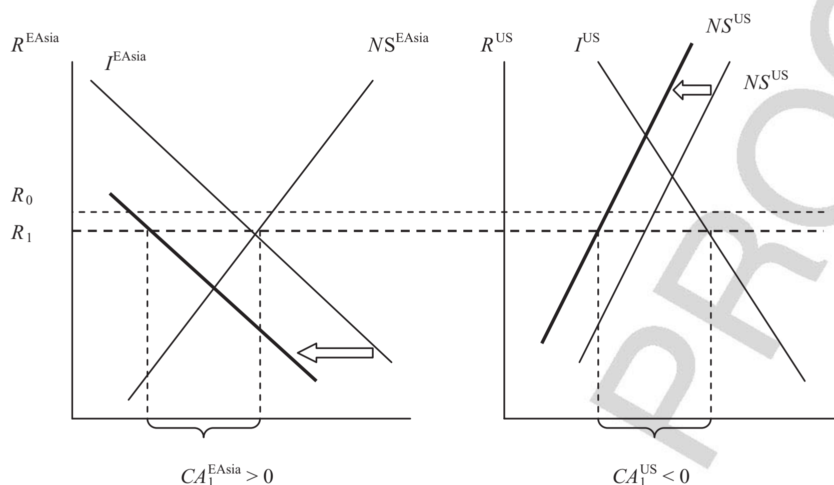

Figure 2. National Saving, Investment, and Current Account Balances

this model, the real interest rate is assumed to be equalized, such that international capital markets would clear, i.e. the current account imbalances between the two economies balance out each other.[5]

In period 0, the world interest rate is r_0, and the US runs a current account deficit, while East Asia runs a corresponding current account surplus.[6] In period 1, the US undertakes an expansionary fiscal policy that pulls in the NS schedule. At the same time, the investment schedule shifts inward in East Asia (e.g. as a result of a financial crisis). This confluence of events drives down the real-world interest rate to r_1. Thus, using a simple open macro model, we can explain the recent rise in US current account deficits, East Asian current account surpluses, and the recent fall in global interest rates by both deficit spending by the US and investment draught in East Asia. However, also note that in the absence of a change in fiscal policy, the US current account imbalance would have been much smaller.

3. Measuring the Fiscal Effect

Specification

We base the choice of macroeconomic variables for this exercise on the discussion in Chinn and Prasad (2003):

$$CAGDP_t = \beta_0 + \beta_1 BUSGDP_t + \beta_2 NFA_{t-1} + X_t\Gamma + Z_t\Xi + \varepsilon_t,$$

where *CAGDP* is the current account balance to GDP ratio, *BUSGDP* is the budget surplus to GDP ratio, *NFA* is net foreign assets to GDP ratio, and *X* includes a set of structural and other macroeconomic variables, and *Z* includes institutional and policy factors.[7]

We deal with the two key variables and the macro variables first. A variety of models predict a positive relationship between government budget balances (*BUSGDP*) and current accounts over the medium term. In the absence of a full Ricardian offset via private saving, an increase in the government budget balance could lead to an increase in national saving. In developing economies, where a greater proportion of agents may be liquidity constrained, this relationship might be expected to be more pronounced.

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From an intertemporal perspective, the stock of net foreign assets (*NFA*) serves as an important initial condition, given that the current account is the sum of the trade balance and the return on a country's stock of NFA (or payment on its net foreign liabilities position). Alternatively, from a buffer stock savings perspective, higher levels of initial net foreign assets should be associated with subsequent lower current account balances.

Among the macroeconomic variables (included in *X*), we include the variable for relative income levels (to the US; *RELY*) and their square terms in the model specification. The "stages of development" hypothesis for the balance of payments suggests that countries, as they move from a low to an intermediate stage of development, typically import capital and, therefore, run current account deficits. As they reach an advanced stage of development, countries run current account surpluses in order to pay off accumulated external liabilities and also to export capital to less advanced economies.

The literature on the determinants of national saving has pointed to a number of additional "structural" determinants such as demographics (*YOUNG* and *OLD*; see Masson et al., 1998). Terms-of-trade volatility (*TOTSD*) is another potential determinant of medium-term fluctuations in current accounts. Agents in economies that face more volatile terms of trade might save more for precautionary reasons in order to smooth their consumption streams in the face of volatile income flows. The degree of openness to international trade (*OPEN*) is also included since it could reflect policy choices, including tariff regimes.[8]

One of the innovations in this study is that we focus on potential effects of other factors than conventional macroeconomic variables on the saving and investment determination. These factors are specifically financial development/deepening, financial (capital account) openness, and legal/institutional development, all of which are included in *Z* in the above specification.

"Financial development" or "financial deepening" is often identified as a determinant for saving and investment. While the effect of financial development on investment is unambiguous (i.e. positive), that on saving is not, because higher returns and lower risk of financial investment create effects on saving akin to income and substitution effects. The traditional interpretation of this variable as a measure of the depth and sophistication of the financial system suggests that financial deepening could induce more saving, although a contrasting view holds that more developed financial markets might lessen the need for precautionary saving, and thus have an opposite effect. Bernanke (2005) argues that greater financial development will remedy the global saving glut in the long run by inducing a decline in the savings rate in the emerging Asia. Relatedly, Clarida (2005a,b) argues that the sophisticated equity markets in the US absorb excess saving from all over the world, leading to higher current account deficits. To measure financial development, we use private credit to GDP (*PCGDP*). The *PCGDP* data are drawn from Beck et al. (2001b and subsequent updates).

How open a country is for cross-border financial transactions should also affect capital flows across countries, and thus the current account. According to the global saving glut view, comprehensive financial liberalization policies in East Asia have allowed excess saving to flow into the US and other countries with developed financial markets. Our metric of financial openness is the Chinn–Ito (2006) index (*KAOPEN*). This index is based upon the IMF's categorical enumeration pertaining to cross-border financial transactions reported in *Annual Report on Exchange Arrangements and Exchange Restrictions* (*AREAER*). Higher values of this index indicate greater financial openness.[9]

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A society's legal foundations and institutions define the context wherein financial transactions and economic decisions are made. Levine et al. (2000), Johnson et al. (2002), and Beck and Levine (2004) find that the cross-country differences in legal and regulatory systems influence the development of the financial intermediary.

We incorporate the effect of legal and institutional development by inclusion of the variable *LEGAL*, calculated as the first principal component of law and order (*LAO*), corruption (*CORRUPT*), and bureaucracy quality (*BQ*).[10] The data series are available for the period of 1984 through 2004, but are included in the regression as the period-average.

Estimating the Basic Model

The sample for our analysis covers 19 industrial and 69 developing countries for the period of 1971–2004. We examine three variables—the current account balance, and its constituents, national saving, and investment, all expressed as a ratio to GDP.

One potential problem with developing-country data is the possibility of significant measurement error in annual data. To mitigate these concerns, and to focus our interest in medium-term rather than short-term variations in current accounts, we construct a panel that contains non-overlapping five-year averages of the data for each country.[11] Furthermore, all the variables, except for net foreign assets to GDP, are converted into the deviations from their GDP-weighted world mean prior to the calculation of five-year averages. The use of demeaned series controls for the rest-of-world effects. In other words, a country's current account balance is determined by developments at home as well as abroad.

Because the economic environment may affect the way in which financial development might affect saving and investment we include interaction terms between the financial development and legal variables ($PCGDP \times LEGAL$), interaction terms between the financial development and financial openness variables ($PCGDP \times KAOPEN$), and interaction terms between legal development and financial openness ($LEGAL \times KAOPEN$). The financial and legal interaction effect is motivated by the conjecture that deepening financial markets might lead to higher savings rates, but the effect might be magnified under conditions of better developed legal institutions. Alternatively, if greater financial deepening leads to a lower saving rate or a lower investment rate, that effect could be mitigated when financial markets are equipped with highly developed legal systems. A similar argument can be applied to the effect of financial openness on current account balances.

We begin our investigation with a basic specification that excludes institutional variables. The estimation results are reported in Table 1.[12] One interesting result shown in the table is the significantly positive relationship between current account and government budget balances found for the industrialized countries group.[13] This result differs from the results obtained in Chinn and Prasad (2003), who examined a shorter sample from 1971 to 1995. A 1 percentage point increase in the budget balance would lead to a 0.16 percentage point increase in the current account balance for industrialized countries and 0.24 for less-developed countries except for African countries. While significant, this is substantially less than the estimate obtained by Chinn and Prasad. We attribute this result partly to the differing sample (the estimate is also lower in the 1971–95 sample), but also to the difference in behavior of current account balances in recent years.

One more noteworthy aspect of Table 1 relates to the financial deepening variable. Only in the industrial countries' current account regressions does it exhibit a negative

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Table 1. Current Account Regression without *Institutions Variable*

Dependent variable: five-year average of current account (% of GDP): 1971–2004					
	(1) Full	*(2) IDC*	*(3) LDC*	*(4) LDC w/o Africa*	*(5) EMG*
Gov't budget balance	0.15	0.16	0.15	0.242	0.219
	[0.068]**	[0.086]*	[0.081]*	[0.092]***	[0.076]***
Lane's NFA (initial)	0.049	0.063	0.047	0.05	0.043
	[0.005]***	[0.011]***	[0.005]***	[0.006]***	[0.009]***
Relative income	0.027	0.059	0.032	0.09	0.1
	[0.019]	[0.025]**	[0.085]	[0.090]	[0.082]
Relative income squared	0.016	–0.212	0.008	0.118	0.073
	[0.029]	[0.080]***	[0.096]	[0.105]	[0.092]
Rel. dependency ratio (young)	–0.06	0.021	–0.071	–0.075	–0.013
	[0.020]***	[0.073]	[0.025]***	[0.025]***	[0.022]
Rel. dependency ratio (old)	–0.205	0.001	–0.313	–0.241	–0.347
	[0.061]***	[0.081]	[0.093]***	[0.098]**	[0.106]***
Financial deepening (*PCGDP*)	0.001	–0.006	0.005	0.013	0.003
	[0.008]	[0.010]	[0.013]	[0.014]	[0.013]
TOT volatility	–0.013	0.063	–0.017	–0.006	–0.016
	[0.019]	[0.058]	[0.020]	[0.018]	[0.019]
Avg. GDP growth	–0.151	–0.101	–0.161	–0.145	–0.187
	[0.141]	[0.207]	[0.155]	[0.117]	[0.115]
Trade openness	0.003	0.037	–0.003	–0.008	–0.005
	[0.009]	[0.011]***	[0.010]	[0.011]	[0.010]
Oil-exporting countries	0.046	—	0.047	0.039	0.028
	[0.013]***	—	[0.013]***	[0.011]***	[0.013]**
Observations	502	132	370	235	210
Adjusted R-squared	0.42	0.50	0.39	0.53	0.49

Notes: Robust standard errors in brackets. * Significant at 10%; ** significant at 5%; *** significant at 1%. The estimated coefficients for the time-fixed dummies and constant are not shown.

coefficient, though statistically insignificantly. With these results, one may not be able to conclude that more developed financial markets lead to decreased current account balances, as posited by the adherents of the global saving glut thesis.[14]

As we discussed in a previous section, we also suspect that the omission of other factors such as institutional infrastructure and legal systems may have induced omitted variable bias. As a first step toward addressing this issue, we re-estimated the regressions including country and time fixed effects and dropping those regressors that, by construction, have no time variation—terms-of-trade volatility and the openness indicator. Once the fixed-effects model is estimated, the null hypothesis that country fixed effects are joint zero is rejected for all three models and subsamples at conventional levels of significance.[15]

In this exercise, the most interesting result is the finding that the coefficient on the government surplus rises to 0.38, and is significant at the 1% marginal significance level. From the national saving and investment regressions (not reported), the positive impact of budget balances on current account balances is detected only in industrial

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and emerging market countries, and comes mainly from an improvement in the level of national saving.

The Implications of Institutional Development

Given that fixed effects are difficult to interpret in an economically meaningful way, we return to the pooled OLS specification, but augment our basic model specification with variables aimed at capturing institutional factors, namely the legal development variable (*LEGAL*), financial openness (*KAOPEN*), and associated interaction terms (including those with *PCGDP*). Table 2 displays results from panel OLS regressions with institutional variables. We obtain several notable results.

First, despite inclusion of institutional variables and their interactions, the significantly positive relationship between current account and government budget balances is detected in almost all sample groups, as in Table 1 from the previous analysis. The point estimate on budget balances is a statistically significant 0.15 for the industrialized countries group, about the same as in the previous estimation, implying that the coefficient on the budget balance for the IDC group is robust to inclusion of institutional variables (note that a ±2 standard error confidence interval encompasses values as high as 0.34). The estimated coefficients on budget balances remain close to what we found in Table 1, the other sample groups.[16]

Secondly, different components of the institutional variable have different effects. We re-estimate the same regressions using each of the components of the *LEGAL* variable—*CORRUPT*, *BQ*, and *LAO*—in order to isolate which variable drives the results. The test results (not reported) suggest that the inverse corruption index is found to enter the estimation most significantly among the three institutions variables, followed by law and order and the bureaucracy quality index in the order of significance. When the inverse-corruption index is used, the estimated coefficient on the budget balance for the industrial countries group becomes as high as 0.24. Also, the estimated coefficient on the inverse-corruption index is insignificantly negative for the IDC group and significantly negative for the LDC and ex-Africa LCD groups, suggesting that countries with lower degrees of corruption may experience capital inflows (see e.g. Wei, 2000).[17]

Thirdly, financial development has different, and nonlinear, effects on saving and investment. Since the financial development variable (*PCGDP*) is interacted with other institutional variables (*LEGAL* and *KAOPEN*), however, we must be careful about interpretation of the effect of financial development. In Table 3, we examine the nonlinearities implicit in our estimates from Table 2. Each of the sub-tables displays the implied response coefficients for differing levels of financial development and capital account openness. Table 3 shows the total effect of a 10 percentage point increase in the relative *PCGDP* conditional on the levels of *LEGAL* and *KAOPEN* (the latter as of the 1996–2004 period)—whether their levels are low 10 percentile, mean, or high 10 percentile in each subsample, IDC, LDC, and EMG (Panels A, B, and C, respectively).[18]

Panel D of Table 3 categorizes emerging market countries in East Asia depending on the level of legal development and financial openness. The matrix shows that only Hong Kong and Singapore are categorized as countries with highest 10th percentile legal development and highest 10th percentile financial openness, while many Asian emerging market countries are categorized in the groups with the middle or lower level of legal development and financial openness, and hence likely to exhibit close to zero responsiveness of the current account.[19] Figure 3 reports the total effects of a 10 percentage point increase in *PCGDP* on current account, national savings, and invest-

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Table 2. Current Account Regression with *Legal Development (LEGAL)*

	Dependent variable: five-year average of current account (% of GDP): 1971–2004				
	(1) Full	*(2) IDC*	*(3) LDC*	*(4) LDC w/o Africa*	*(5) EMG*
Gov't budget balance	0.159	0.154	0.168	0.251	0.23
	[0.065]**	[0.095]*	[0.079]**	[0.091]***	[0.075]***
Lane's NFA (initial)	0.049	0.069	0.047	0.051	0.041
	[0.005]***	[0.011]***	[0.005]***	[0.006]***	[0.009]***
Relative income	0.062	0.058	0.115	0.16	0.216
	[0.028]**	[0.028]**	[0.096]	[0.106]	[0.103]**
Relative income squared	0.032	–0.097	0.057	0.157	0.166
	[0.038]	[0.120]	[0.102]	[0.121]	[0.111]
Rel. dependency ratio (young)	–0.061	–0.027	–0.076	–0.099	–0.044
	[0.018]***	[0.082]	[0.022]***	[0.030]***	[0.023]*
Rel. dependency ratio (old)	–0.2	0.099	–0.368	–0.331	–0.529
	[0.058]***	[0.098]	[0.096]***	[0.114]***	[0.127]***
Financial development (*PCGDP*)	–0.008	0.01	–0.043	–0.038	–0.082
	[0.009]	[0.012]	[0.032]	[0.040]	[0.038]**
Legal development (*LEGAL*)	–0.003	0.002	–0.017	–0.02	–0.018
	[0.004]	[0.007]	[0.008]**	[0.009]**	[0.010]*
PCGDP × *LEGAL*	–0.003	–0.035	–0.021	–0.025	–0.037
	[0.004]	[0.015]**	[0.011]*	[0.012]**	[0.016]**
Financial openness (*KAOPEN*)	–0.001	–0.002	0.002	0.005	0.008
	[0.003]	[0.003]	[0.007]	[0.008]	[0.010]
KAOPEN × *LEGAL*	0.002	0.012	0.002	0.002	0.005
	[0.001]*	[0.003]***	[0.002]	[0.002]	[0.003]
KAOPEN × *PCGDP*	–0.003	0.002	0	0.002	–0.002
	[0.005]	[0.009]	[0.007]	[0.008]	[0.009]
TOT volatility	–0.013	0.1	–0.015	–0.002	–0.003
	[0.017]	[0.054]*	[0.018]	[0.019]	[0.022]
Avg. GDP growth	–0.123	–0.036	–0.09	–0.107	–0.132
	[0.087]	[0.243]	[0.096]	[0.124]	[0.118]
Trade openness	0.006	0.046	0.005	0	0.004
	[0.009]	[0.014]***	[0.013]	[0.014]	[0.014]
Oil-exporting countries	0.041	—	0.04	0.035	0.025
	[0.013]***	—	[0.013]***	[0.012]***	[0.013]*
Observations	471	126	345	234	203
Adjusted *R*-squared	0.47	0.55	0.46	0.54	0.51

Notes: Robust standard errors in brackets. * Significant at 10%; ** significant at 5%; *** significant at 1%. The estimated coefficients for the time-fixed dummies and constant are not shown.

ment for Asian emerging market countries, using specific values for each country's legal development and financial openness measures.[20] The chart indicates that Hong Kong and Singapore are the only countries for which financial development will cause a negative impact on national savings. Other countries will experience an *increase* in the ratio of national savings to GDP if financial markets develop further. Interestingly, for all the countries, financial development leads to expansion of investment, presumably

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Table 3. Total Effects on Current Account of a 10% Increase in Financial Development Conditional on Legal Development and Financial Openness

Panel A: Industrialized countries		*KAOPEN* [0, 4.38]		
		Low 10 percentile (3.55)	*Mean (4.22)*	*High 10 percentile (4.38)*
LEGAL [0, 6.51]	Low 10 percentile (4.37)	0.365	0.379	0.382
	Mean (5.69)	–0.095	–0.082	–0.079
	High 10 percentile (6.47)	–0.370	–0.357	–0.354
Panel B: Less developed countries		*KAOPEN* [0, 4.38]		
		Low 10 percentile (0.66)	*Mean (1.82)*	*High 10 percentile (4.08)*
LEGAL [0, 6.51]	Low 10 percentile (1.15)	0.408	0.408	0.408
	Mean (2.48)	0.127	0.127	0.127
	High 10 percentile (3.89)	–0.167	–0.167	–0.167
Panel C: Emerging market countries		*KAOPEN* [0, 4.38]		
		Low 10 percentile (0.66)	*Mean (1.90)*	*High 10 percentile (3.96)*
LEGAL [0, 6.51]	Low 10 percentile (1.66)	0.528	0.503	0.462
	Mean (2.96)	0.058	0.033	–0.008
	High 10 percentile (4.50)	–0.523	–0.548	–0.589
Panel D: Matrix for Emerging Asia		*KAOPEN*		
		Low 10 percentile (0.66)	*Mean (1.90)*	*High 10 percentile (3.96)*
LEGAL	Low 10 percentile (1.66)	Bangladesh	Indonesia, Philippines, Sri Lanka	
	Mean (2.93)	China	India, Korea, Malaysia, Thailand, ex-China EA	
	High 10 percentile (4.50)			Hong Kong, Singapore

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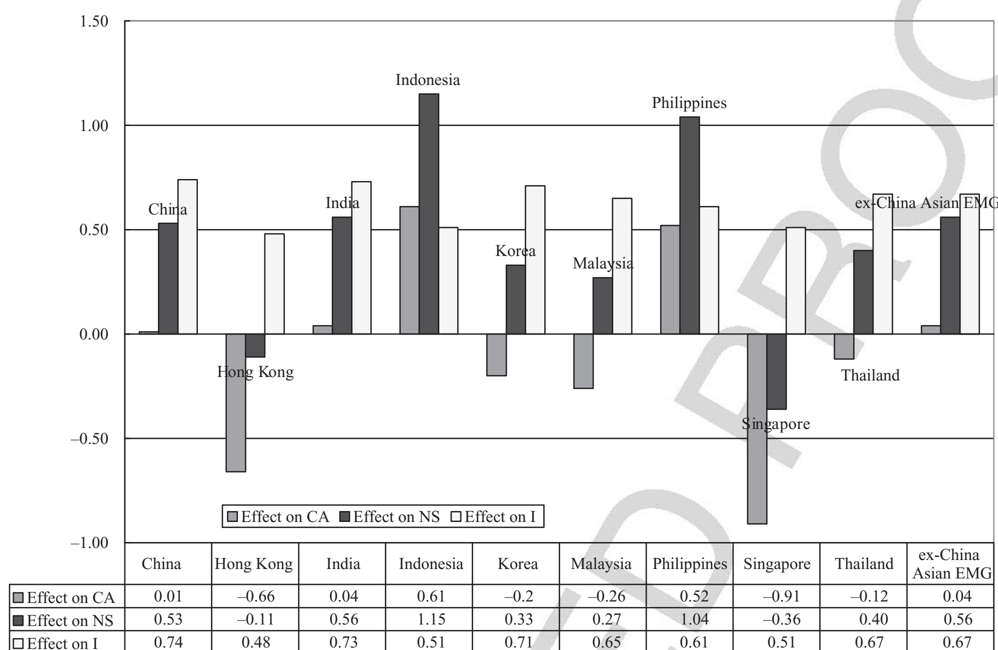

	China	Hong Kong	India	Indonesia	Korea	Malaysia	Philippines	Singapore	Thailand	ex-China Asian EMG
Effect on CA	0.01	–0.66	0.04	0.61	–0.2	–0.26	0.52	–0.91	–0.12	0.04
Effect on NS	0.53	–0.11	0.56	1.15	0.33	0.27	1.04	–0.36	0.40	0.56
Effect on I	0.74	0.48	0.73	0.51	0.71	0.65	0.61	0.51	0.67	0.67

Figure 3. Effects of a 10% Change in Financial Development (PCGDP) on Current Accounts, Saving, and Investment in Emerging Asia

because of improved credit conditions and financial intermediation. Furthermore, in terms of the effect on net saving, only Hong Kong and Singapore will experience a substantial deterioration in net savings as a result of further financial deepening because the magnitude of the effect on investment exceeds that on national savings. In the case of Singapore, the current account deteriorates by almost a percentage point in response to a 10 percentage point increase in the private credit to GDP ratio. The effect in Korea, Malaysia, and Thailand is much more muted, while the China effect is essentially zero.

The Chinese case merits some discussion. China experienced a remarkable 32.4 percentage point increase in private credit creation (net of change in the world weighted average). This financial development *alone* implied a national savings increase of 1.7 percentage points, but also an investment increase of 2.4 percentage points, suggesting a negative effect of financial development on net saving; the directly estimated zero net effect on the current account reflects the uncertainty surrounding these point estimates.

In sum, these results present evidence against part of the argument that emerging market countries, especially those in East Asia, will experience lower rates of saving once these countries achieve higher levels of financial development and better developed legal infrastructure. More open financial markets do not appear to have any impact on current account balances for this group of countries, either. If anything, arguments based on this thesis have inappropriately extended a characterization applicable to industrialized countries to less developed countries.

Figure 4 reports how well our models predict current account balances in key economies. The actual current account series for these countries fall in the 95 confidence intervals, though the US seems to be falling out of the interval. However, Figure 5,

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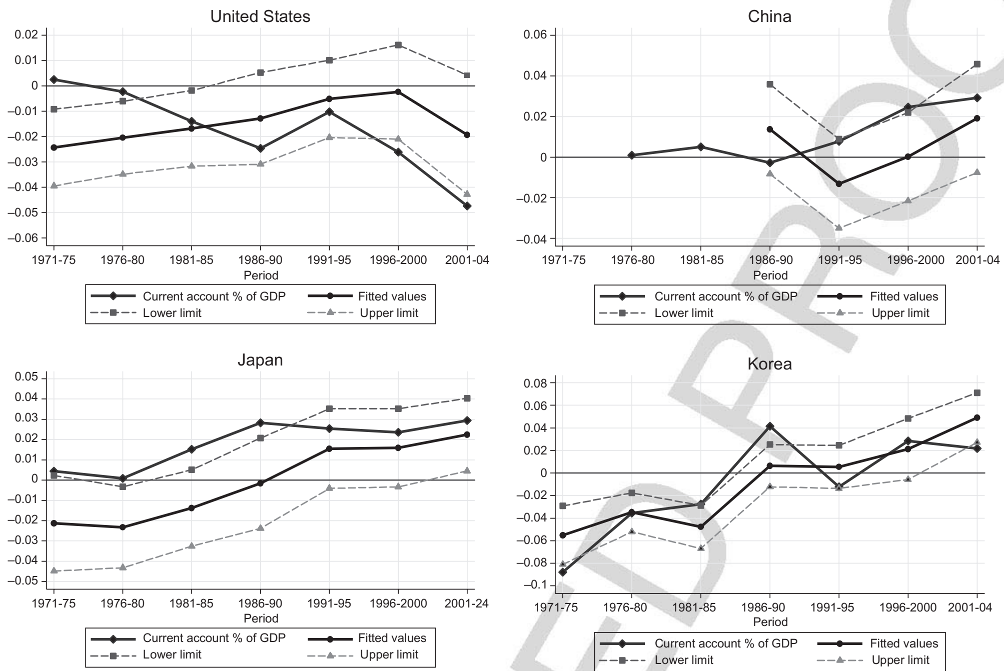

Figure 4. Implied Current Accounts

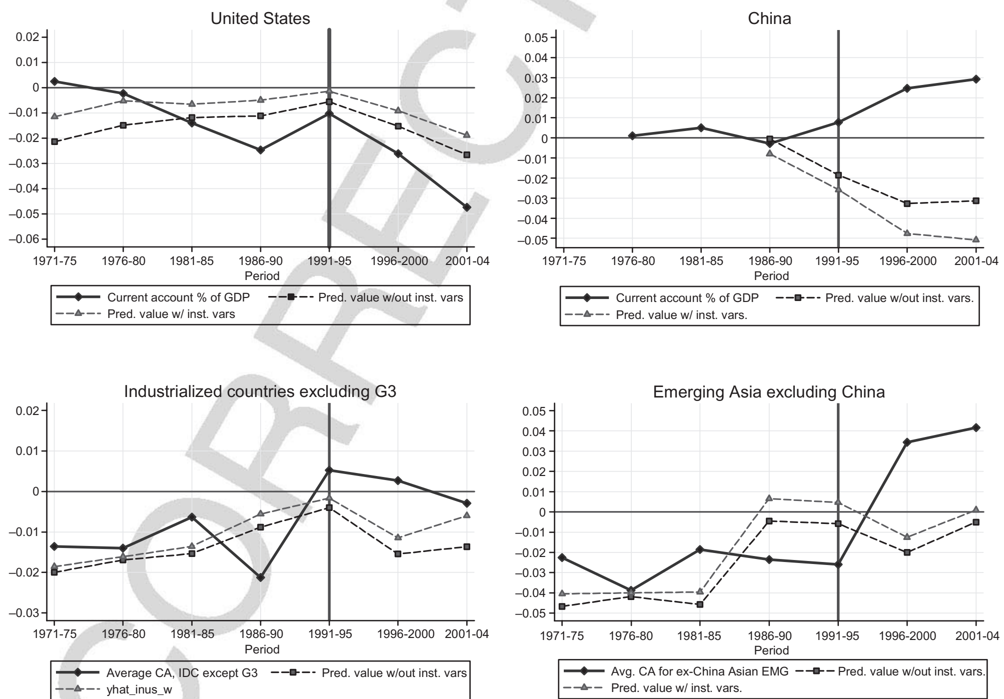

Figure 5. Out-of-Sample Predictions of Current Accounts with and without Institutional Variables, Industrialized Countries

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Figure 6-1. Out-of-Sample Predictions for US National Saving and Investment

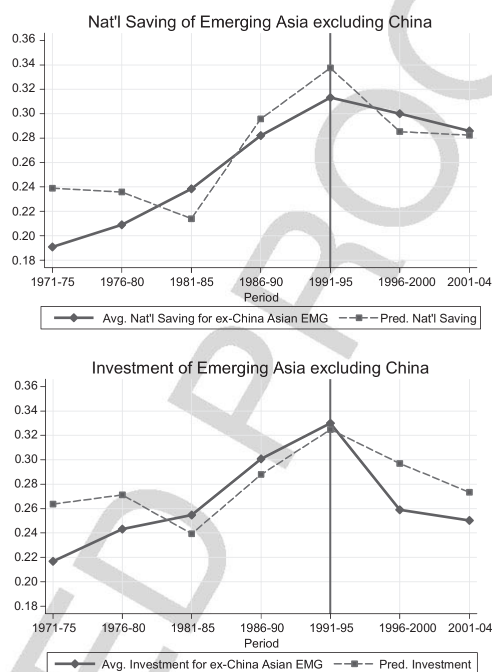

Figure 6-2. Out-of-Sample Predictions for Emerging Asia's National Saving and Investment (excluding China)

which shows out-of-sample predictions for the 1995–2000 and 2001–04 periods using the estimated coefficients from the regressions—with and without institutional variables—implemented over the 1971–95 time periods, illustrates that recent development in current imbalances were somewhat unexpected for the US and Asian countries.

Last, we examine what has contributed to the unexpected changes in current account balances for the US and emerging East Asia. The framework we rely on allows us to examine the determinants of current account balances from the perspective of saving–investment balances. Figure 6-1 shows the out-of-sample predictions for US national saving and investment using the estimation model with the institutional variables, and Figure 6-2 shows those for emerging East Asia excluding China. The figures for US national saving and investment show that while the US current account deficit is driven by more-than-expected performance in investment in the 1996–2000 period, in contrast the deficit during the 2001–04 period is driven by a "saving drought," rather than "investment boom." Interestingly, however, the under-prediction of Asian emerging market group ex-China current account balances is a result of the collapse of investment in the aftermath of the Asian crisis.[21] These observations are consistent with the situation depicted in Figure 2. In sum, we have shown that, from the perspective of the data up to 1995, the larger-than-predicted current account balance East Asia is running is more consistent with an unexpected fall in investment than with the "excess saving" in the region while the current account imbalance for the US is more consistent with a saving drought than with an investment boom.

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Robustness Checks

In our framework, simultaneity is of concern: government budget balances could involve bi-directional causality with the dependent variables. Furthermore, the budget balance variable and other right-hand-side variables may be subject to business cycles effects despite our use of time-averaged data.

Here, we examine the robustness of the estimated coefficient on the budget balance in several ways. First, we implement two-stage least squares (2SLS) estimation, instrumenting the budget balance variable with several candidate variables. The instruments we try include a dummy for the left-wing government (*LEFT*); political constraint (democracy) index (*POLCONV*); military spending as a ratio to GDP (*MILEXP*); yearly changes in unemployment rates (*D_U*); and regional dummies.[22]

The estimation results are shown in Table 4, in which we only show estimated coefficients on budget balances for different model specifications and different dependent variables. Rows (1) and (2) show the results from the 2SLS estimation with and without institutional variables. When compared to the results in Table 2, we can see that, for industrialized countries, the estimated coefficients are consistently significant and their magnitudes are higher than those in the previous analysis.[23]

Secondly, we re-estimate with data sampled at an annual frequency, but use HP-detrended series for the variables that exhibit business cycle variation—namely, the budget balance, net foreign asset, relative income, output growth, and financial deepening (*PCGDP*). While sampling five-year period averages should mitigate the effect of business cycles, that method may not be sufficient to completely remove business cycle effects. We apply pooled OLS and the fixed-effects specification to obtain the results

Table 4. Estimated Coefficients on the Government Budget Balance on Current Account Balance (% of GDP) in Different Model Specifications

Model specifications	*IDC*	*LDC*	*EMG*
(0) Pooled OLS w/inst. vars	**0.154**	**0.168**	**0.230**
(1) 2SLS—IV w/out inst. vars	**0.325**	−0.004	0.184
(2) 2SLS—IV w/inst. vars	**0.448**	0.209[17%]	**0.378**
(3) HP—OLS w/inst. vars	**0.095**	**0.103**	**0.178**
(4) HP—FE	**0.485**	**0.306**	**0.180**
(5) HP—GLS w/out inst. vars	**0.375**	**0.099**	**0.129**
(6) HP—GLS w/inst. vars	**0.326**	**0.166**	**0.229**

Notes: **Bold figures** denotes significant at the 10% level. (1) "2SLS—IV w/out inst. vars" refers to the 2SLS model applied to the five-year panel data, instrumented with the instrumental variables of the dummy for the left-wing government (*LEFT*) from the World Bank's Database of Political Institutions (DPI 2004); political constraint (democracy) index (*POLCONV*) from Henisz (2000); military spending as a ratio to GDP (*MILEXP*) from the Stockholm International Peace Research Institute (SIPRI); yearly changes in unemployment rates (*D_U*); and regional dummies, but does not include "institutional variables" mentioned in the text. (2) "2SLS—IV w/inst. vars" is a five-year panel model instrumented with the same IVs, but it includes the institutional variables. (3) "HP—OLS w/inst. vars" refers to the OLS model applied to a set of RHS variables that include variables detrended with HP-filter. (4) "HP—FE" refers to the fixed-effects model applied to a set of RHS variables that include variables annual HP-filtered data, but not institutional and interaction terms. (5) "HP—GLS w/out inst. vars" refers to the GLS model applied to a set of RHS variables that include HP-filtered variables, but no institutional variables and interaction terms. (6) "HP—GLS w/inst. vars" refers to the GLS model applied to a set of RHS variables that include HP-filtered variables, institutional variables, and their interaction terms.

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displayed in rows (3) and (4) of Table 4, respectively. In order to account for the possibility of serial correlation, we also estimate the model using feasible GLS. Those results, without and with institutional variables and interactions, are reported in rows (5) and (6), respectively.

The magnitude and statistical significance of the estimated coefficients across different subsamples and the three sets of regressions are quite consistent with what we have found in the previous subsections. The congruence with previous results is more evident for the industrial country group. A 1 percentage point increase in the budget balance leads to between a 10 and 49 percentage point increase in the current account balances, and between a 17 and 81 percentage point increase in national saving. With these results, we can safely conclude that an increase in the government budget balance does improve the current account balance in industrialized countries, and that effect is mainly achieved through an improvement in national saving.[24]

4. Concluding Remarks

In this paper we have investigated the medium-term determinants of the current account using a model that controls for institutional factors such as financial openness and legal development, in order to inform the recent debate over the source of and solution to the "global saving glut" that has thus far lacked empirical content. We focused our study on the behavior of current accounts for the United States and emerging market countries in East Asia.

We find that in an industrial country, a 1 percentage point increase in the budget balance–GDP ratio raises the current account balance by 0.15–0.16 percentage points. While smaller than the coefficient implied by some macro models, the standard errors on the point estimate are sufficiently large so that one cannot rule out a coefficient as high as 0.34 at conventional significance levels. Alternative specifications suggest that a 1 percentage point increase in the budget balance should lead to between a 0.10 and 0.49 percentage point increase in the ratio of the current account balance to GDP ratio. We also found evidence for a similar relationship for non-IDC countries. These findings are robust to inclusion of institutional variables, although incorporating financial factors seems to matter more (in a statistical sense) for industrialized countries than for less developed countries. Furthermore, we found evidence that the oft-cited effects of financial and legal development are only applicable to industrial countries. Consequently, policy recommendations made by the adherents of the global saving glut view have only tenuous empirical basis insofar as they relate to East Asia.

Finally, we have determined that saving per se is not excessive among the East Asian emerging market countries. Rather, these countries have experienced a shortfall in investment. The United States, on the other hand, is experiencing saving drought, driven in part by public sector dissaving.

Data Appendix

The data used in this paper were drawn from a number of different sources. We provide below a listing of the mnemonics for the variables used in the analysis, descriptions of these variables and the source(s) from which the primary data for constructing these variables were taken. A listing of the countries in the final sample, along with the country groupings used in the analysis, is provided in the working paper version of this paper. For most countries, data were available from 1971 through 2004.

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Mnemonic	*Source*[a]	*Variable description*
CAGDP	WDI	Current account to GDP ratio
NSGDP	WDI	National saving to GDP ratio
KFGDP	WDI	Capital formation to GDP ratio
BUSGDP	WDI, IFS	General government budget balance, ratio to GDP
NFA	LM	Stock of net foreign assets, ratio to GDP
RELY	WDI	Relative per capita income, adjusted by PPP exchange rates, measured relative to the US, range (0 to 1)
YOUNG	WDI	Youth dependency ratio (relative to mean across all countries), Population under 15/Population between 15 and 65
OLD	WDI	Old dependency ratio (relative to mean across all countries), Population over 65/Population between 15 and 65
YGRAVG	WDI	Average real GDP growth
TOTSD	WDI	Standard deviation of terms of trade
OPEN	WDI	Openness indicator: ratio of exports plus imports of goods and nonfactor services to GDP
PCGDP	BDL	Banking development, ratio of private credit to GDP
KAOPEN[b]	CI	Capital account openness
BQ	ICRG	Quality of bureaucracy
LAO	ICRG	Law and order
CORRUPT	ICRG	Corruption index
LEGAL[b]	Authors' calculations	General level of legal development, first principal component of *BQ*, *LAO*, and *CORRUPT*
LEFT	DPI2004	Dummy for left-wing government
PLURAL	DPI2004	Dummy for countries with plural political systems
MILEXP	SIPRI	Defense spending (as a ratio to GDP)
POLCONV	Henisz	Political Constraint (democracy) Index
POLITY	Polity IV	Polity (democracy) score
U	WDI	Unemployment rate

Notes:
[a] These are mnemonics for the sources used to construct the corresponding. BDL: Beck, Demirgüc-Kunt, and Levine (2001b, updated in following years); CI: Chinn and Ito (2006); DPI 2004: Database of Political Institutions, Beck et al. (2001a and updated); GM: Gian Maria Milesi-Ferretti (1998); Henisz: Henisz (2000); ICRG: *International Country Risk Guide*; IFS: IMF's *International Financial Statistics*; IMF: Other IMF databases; LM: Lane and Milesi-Ferretti (2006); Polity IV: Polity IV project (Marshall and Jaggers, 2002, updated in 2004); SIPRI: Stockholm International Peace Research Institute (personal correspondence), and WDI: *World Development Indicators* (2006).
[b] In the original series, *KAOPEN* and *LEGAL* series range between negative and positive values since they are the first principal components. However, in order to avoid the complexity of interpreting the estimated coefficients, these variables are adjusted such that the minimum value is zero, i.e. they range between zero and some positive value.

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Notes

1. Ten-year interest rates (constant maturity) minus the 10-year expected inflation rate as proxied by Blue Chip forecasts up to 1991q1, and by the Society of Professional Forecasters-median forecasts thereafter. Inflation-indexed yields over the past eight years are consistent with this pattern.
2. Roughly contemporaneously with us, Gruber and Kamin (2005) have written a paper closely related to ours. However, they rely on financial crises and country dummies to soak up variation in current account balances, and do not include financial development and financial openness variables key to assessing the Bernanke conjecture.

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3. Most problematic for this approach is the mysterious aspect of timing: East Asian savings began flowing to the United States in 2003. Why not earlier, if the mercantilist impetus had been there all along? (And why not devalue the renminbi in 1997?) For a thorough critique, see Prasad and Wei (2005).
4. See Erceg et al. (2005). The effect of tax reductions arises from the rule-of-thumb consumers imbedded in a model otherwise characterized by Ricardian equivalence.
5. In practice, the real interest rate is not necessarily equalized; capital controls, risk premia, and expected real depreciation would be expected to drive a wedge between real rates of different countries.
6. The "world" in this model can be considered as one small closed economy composed of two large open economies, East Asia and the US Hence, the world real interest rate (R) is the real interest rate that equilibrates cross-border lending and borrowing between the two economies such that the world current account will be in balance. In this model, when shocks arise as they do in the text, the world real interest rate would vary so as to keep the absolute values of the current account balances of the two economies equal to each other. See Obstfeld and Rogoff (1996).
7. See the Data Appendix for details of variable definitions and sources.
8. Five-year averages of real GDP growth (*YGRAVG*) are also included to account for changes in productivity levels.
9. The data are updated to 2004 and cover more countries (163 countries) than what can be found in Chinn and Ito (2006). The updated data are available at http://www.ssc.wisc.edu/~mchinn/.
10. Higher values indicate better conditions. The choice of these variables is motivated by the literature on the finance and growth, as well as the wide coverage afforded by their use.
11. The 2001–04 period has been compressed into one observation, and so represents only four years instead of the standard five.
12. Since these results are sensitive to the inclusion of the African countries, we also report separate sets of results with and without the African countries included, for the developing country sample. We also report separate results for an emerging market group that differs somewhat from the developing country sample.
13. For the remainder of the paper, statistical significance denotes a p-value less than 10%.
14. In the saving regressions (not reported), all the sample groups except for the industrial country group have significantly *positive* coefficients for the financial deepening variable. This issue will be examined more carefully in a later section.
15. We also conducted the Hausman test for all regressions and subsamples to examine whether the distribution of the error terms can be systematically explained by country-specific characteristics. A series of tests indicate that the random-effects specification is rejected in favor of the fixed effects for all sample groups except for the developed countries (IDC) and emerging market countries (EMG) groups among the current account regressions; for all except for the IDC group (marginally rejected) among the national saving regressions; and for the full sample and the less developed countries group (LDC) among the investment regressions.
16. Gruber and Kamin (2005) report similar results.
17. We also tested the models using the time-varying institutional variables (i.e. five-year averages of *LEGAL* and other component variables instead of the cross-sectional variables). Although we find qualitatively similar results, we also find less significant results for the estimates on the legal variables and their interactions. This finding is not surprising considering that these institutional variables vary much less widely over time than across the countries. We also tested using the five-year averages of the Economic Freedom of the World index (Gwartney and Lawson, 2006). This is a composite index composed of five subcategories for the size of government; legal structure and intellectual property rights protection; sound monetary management; freer trade; and domestic regulations on credit, labor, and business. We found relatively significant results compared to those with the five-year averages of the *LEGAL* variable. However, it appears that the results are rather driven by components of the index that are not directly related to legal or institutional development.

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18. Between the 1991–95 and 2001–04 time periods, the (five-year average of *relative*) *PCGDP* level—the level of financial deepening above or below the weighted world average—increased by 20.6 percentage points for industrialized countries, 3.7 percentage points for less developed countries, 8.2 percentage points for Asian emerging market countries, and a stunning 32.4 percentage points for China.

19. It must be noted that most of these Asian emerging market countries comprise top 15 foreign reserves holding countries as of 2004.

20. The estimated effects on the national saving and investment regressions do not strictly add up to that of the current account regressions. At least two reasons can be identified for this outcome. First, while the current account regressions account for the covariance of national savings and investment, simply adding two coefficients does not. That is, if some change in the level of financial development (conditional on financial openness and institutional development) affects national saving and investment independently, as long as the changes in national saving and investment do not affect each other, the total effect would be the same as that of current account balances. However, if national saving and investment are highly correlated, as has been found in many studies such as Feldstein and Horioka (1980) and Frankel et al. (1987), simply adding two coefficients does not yield the coefficient in the current account regression. Second, due to differing data conventions (balance-of-payments accounting versus national income accounting definition), the flows may not add up exactly.

21. When the same exercise is conducted for China, we find (not reported) that, since the 1991–95 period, the country has run much better current account balances than the model predicts, and that the under-prediction of the country's current balances is driven by excess saving. More specifically, both national saving and investment are larger than model predictions, with the extent of the former larger than the latter. Despite these findings, although we find evidence of excess saving for China, we are unsure of the reliability of the estimates and uncertainty surrounding the country's saving data. For example, GDP was revised upward by 16.8% upward at the beginning of 2006.

22. The choice of these instruments is based on past findings in the literature on the determinants of budget balances such as Roubini and Sachs (1989a,b), Roubini (1991), Persson and Tabellini (2001), and Braconier and Holden (2004). Those variables that turned out to be insignificant in the first-stage regression are not included as instruments, however. The definitions and sources of the instruments can be found in Data Appendix. In addition to the variables mentioned in the text, we also tested other candidate instruments such as the dummy for countries with plural political systems; government fragmentation (both from DPI 2004); political constraint, or democracy, index (from Henisz, 2000); and the standard deviation of tax revenues (following Talvi and Vegh, 2005). We also conduct routine statistical tests on the relevance of instruments such as Anderson's (1984) canonical correlations and Cragg–Donald (1993) weak identification tests as well as those on over-identification of instruments using the Sargan (1958) *J*-statistic (for the 2SLS with heteroskedasticity standard errors).

23. For the 2SLS regressions with statistically significant coefficients on budget balances, both the Anderson canonical correlation statistic and the Cragg–Donald statistic significantly reject the null hypothesis of under-identification of the instruments. Furthermore, the Sargan *J*-test fails to reject the null hypothesis of the orthogonality conditions. Other results of the first-stage regressions are available from the authors on request.

24. The results of other variables of our focus, namely financial deepening, financial opening, institutional development, and these interactions, turned out to be qualitatively consistent, but more statistically significant compared to those in previous analyses. For IDC countries particularly, financial deepening and financial openness appear to contribute negatively to current account balances and national savings.

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