Medium-term determinants of current accounts in industrial and developing countries: an empirical exploration

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Abstract

This paper provides an empirical investigation of the medium-term determinants of current accounts for a large sample of industrial and developing countries, utilizing an approach that highlights macroeconomic determinants of longer-term saving and investment balances. Cross-section and panel regression techniques are used to characterize the variation of the current account across countries and over time. We find that current account balances are positively correlated with government budget balances and initial stocks of net foreign assets. Among developing countries, measures of financial deepening are positively associated with current account balances while indicators of openness to international trade are negatively correlated with current account balances.
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1. Introduction

The determinants of the levels and dynamics of current account balances

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constitute an important topic in open economy macroeconomics. Alternative theoretical models have different predictions about the factors underlying current account dynamics and about the signs and magnitudes of the relationships between current account fluctuations and these determinants. Different approaches to testing the empirical implications of these theories, either directly or indirectly, are therefore of considerable interest.

The objective of this paper is to provide a broad empirical characterization of the determinants of current account balances for a large sample of industrial and developing countries. Our approach views the current account from the perspective of longer-run saving–investment balances. Thus, the roles of the medium-term determinants of saving and investment levels are emphasized, rather than factors influencing the short-run dynamics of the current account. Using both cross-section and panel data estimation techniques and an extensive dataset that covers industrial and developing countries, we characterize the main determinants of medium-term current account variation across countries and over time.

Understanding the factors that influence medium-term fluctuations in the current account could have important policy implications as well (see e.g. Isard and Faruqee, 1998). In particular, the notion of current account sustainability has come to be of considerable interest in the context of recent episodes of macroeconomic turbulence in many emerging markets. Although this paper does not directly address the question of current account sustainability, the analysis does provide an indication of the levels of current accounts that may be considered 'normal' for a country, based on a number of its macroeconomic attributes, including stage of development, demographic profile, the government budget balance etc.

We use a uniform framework in analyzing the determinants of current account balances for industrial and developing countries, while empirically allowing for differences in results across groups of countries. However, rather than merely positing that these differences exist, we relate them to observed attributes of these countries. Our dataset is well suited for such an analysis since it covers a large and heterogeneous group of countries (18 industrial, 71 developing) over a relatively long time span (1971–1995). The empirical analysis in the paper also involves a rich set of potential determinants of current account variation—drawn from the literatures on the cross-country determinants of growth, saving, and investment—and an extensive battery of robustness tests for the main results.

Our focus is primarily on medium-term fluctuations in current accounts. In this paper, we take that to mean current account variations that are not driven purely by cyclical influences, by shocks that should have temporary real effects, or that reflect the effects of nominal rigidities. Isolating specific frequencies is, of course, a difficult matter. Hence, to test the sensitivity of our results, we examine the determinants of current account fluctuations at different frequencies (using annual data, 5-year averaged data and 25-year cross-sectional averages) to see if they provide a reasonably consistent story.

This paper is related to a number of different strands of literature. One set of papers has explored the determinants of saving for both industrial and developing

countries (e.g., Schmidt-Hebbel et al., 1992; Edwards, 1995; Masson et al., 1998). Many of these papers have attempted to link national and private saving to structural determinants including levels of economic development, demographic profiles etc., although several of these studies include the current account as an *independent* variable. A much smaller set of papers has examined the macro-economic determinants of investment in developing countries (e.g., Serven, 1998).

Current accounts have themselves, of course, been the subject of considerable research. One recent approach, represented by papers such as Ghosh (1995) and Ghosh and Ostry (1995), is the application of insights derived from the consumption-smoothing literature to the modeling of current account dynamics. Glick and Rogoff (1995) and Nason and Rogers (2002) model the joint dynamics of investment and current accounts in response to productivity shocks. These papers, however, focus largely on the short-run dynamics of the current account. The more ambitious intertemporal approach to current account determination, as typified by the work of Razin (1995) and Obstfeld and Rogoff (1998), has attempted to extend dynamic optimizing models to the open economy context. An alternative approach to empirically analyze current account determination is adopted by Debelle and Faruqee (1996), who use a saving-investment perspective to motivate empirical specifications that contain the 'structural' determinants of current accounts.

We build upon the work of the authors cited above and, in particular, generalize the work of Debelle and Faruqee (1996) by extending the analysis to developing countries and by exploring a wider range of specifications. Although we use a variety of theoretical models to understand and interpret our results, we do not test any of these models or their predictions formally. Hence, the paper's objective is primarily to provide an empirical, but not entirely atheoretical, characterization of current account determinants that will be helpful for constructing more formal theoretical models. Our work is similar in some respects to that of Calderon et al. (1999) but our focus, unlike theirs, is on medium-term current account determination and our econometric methodologies are, therefore, quite different.

The next section of the paper contains a discussion of some theoretical issues germane to the empirical modeling of current account dynamics. Section 3 discusses the dataset and some of the econometric issues. Results from cross-section regressions are presented in Section 4 and results from panel estimation are presented in Section 5. A variety of robustness tests for the main results are discussed in Section 6. Concluding remarks are in Section 7.

2. Theoretical issues

No single theoretical model can capture the entire range of empirical relation-ships that are analyzed in this paper; it is nevertheless useful to examine the predictions of different theoretical models about some of those relationships.

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). However, since the current account is just the change in NFA, one apparent implication is that the current account should be zero for all countries in steady state, with interest payments (negative or positive) on NFA offsetting the trade balance. In other words, there would be no cross-country relationship between the current account (CA) and the stock of NFA in the long run. However, for growing economies, the existence of perpetual non-zero current account balances is consistent with a stable NFA/GDP ratio. The steady-state relationship is then given by $CA = g*NFA$, where g is the rate of growth of nominal GDP. During the transition to this 'long run,' various other factors could influence this relationship (see, e.g., Calderon et al., 2000). Furthermore, as noted by Debelle and Faruqee (1996), trends in real exchange rates could further complicate matters if there were differing valuation effects on NFA and GDP.

There could also be systematic differences between debtor and creditor countries in the relationship between current accounts and NFA. Kraay and Ventura (2000) argue that the sign of the current account response to transitory income shocks depends on the share of foreign assets in a country's total assets. Under some plausible assumptions, they show that the current account response to a transitory income shock is equal to the increase in savings generated by the shock times the share of foreign assets in the country's total assets. This 'rule' implies that favorable income shocks lead to current account deficits in debtor countries and current account surpluses in creditor countries. Obstfeld and Rogoff (1998, pp. 76–78) note that, if the world real interest rate were above its 'permanent' level, the current account surplus would be higher than usual for creditor countries as agents in those countries saved more to smooth into the future their unusually high income. The effect would be reversed for debtor countries.

A variety of models predict a positive relationship between government budget balances and current accounts over the medium term. Overlapping generations models suggest that government budget deficits tend to induce current account deficits by redistributing income from future to present generations (see Obstfeld and Rogoff, 1998). Furthermore, 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 more agents may be liquidity constrained, this relationship might be expected to be stronger. The relationship between the government budget balance and investment is less clear. The view that private and public investment are complementary suggests that an increase in public investment could stimulate private investment. On the other hand, an increase in public dissaving and, hence, in public borrowing, could crowd out private investment.

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 (Roldos, 1996,

surveys this literature). 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. Using a cross-section of countries distributed over a wide range in terms of stages of development provides an indirect test of the empirical validity of this hypothesis.

The literature on the determinants of national saving has pointed to a number of additional 'structural' determinants such as demographics. From the perspective of current account determination, however, demographic profiles should be important only insofar as they differ across countries and, thereby, influence cross-country differences in saving. There could also be differences in saving patterns of working-age cohorts depending on the fractions of the dependent population that are comprised of young and old dependents. To capture these differences in our empirical work, we construct young and old dependency ratios and express these ratios relative to their respective sample averages across all countries.

Another determinant of saving (emphasized by Edwards, 1995) is 'financial deepening,' usually proxied by the ratio of a monetary aggregate such as M2 to GDP. 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. But this variable could also be viewed as a proxy for borrowing constraints faced by individual agents and could, therefore, actually be associated with lower levels of private saving. The effects of financial deepening on domestic investment are even less obvious from a theoretical perspective. Similarly, the effects of current GDP growth rates on low-frequency saving behavior could depend on the implications, as perceived by households, for their permanent income. The net effects of these influences on current account balances can only be resolved empirically.

Terms of trade volatility is another potential determinant of medium-term fluctuations in current accounts.[1] 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. Countries with more volatile terms of trade may also be less attractive for international capital. However, Aizenman (1994) and others have argued that multinationals tend to diversify their production base across countries with volatile terms of trade in order to have the flexibility to exploit terms of trade movements that are favorable to them.

Country characteristics that reflect macroeconomic policies could also be relevant for current account determination. For instance, the degree of openness to international trade could reflect policy choices, including tariff regimes. It could also be correlated with other attributes that make a country attractive to foreign

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[1] The *level* of the terms of trade would also be expected to influence the evolution of the trade balance and the current account. However, since the terms of trade variable is available only as an index, we do not consider this variable in our cross-country analysis.

capital. In particular, the capacity that more open economies have to generate foreign exchange earnings through exports might signal a better ability to service external debt.

A policy variable that is relevant in this context is a measure of capital controls. Capital controls are often viewed as a negative indicator of a country's ability to manage its external balance. The introduction of capital controls might result from a desire to prevent capital flight triggered by past current account deficits. However, the imposition of such controls could result in smaller current account deficits since external financing for subsequent current account deficits may be limited. Hence, issues of causality and timing complicate the analysis of the relationship between capital controls and current accounts.

3. Data and empirical framework

The benchmark sample for our analysis covers both industrial and developing countries. The basic data set has annual data for 18 industrial and 71 developing countries and, for most countries in the sample, covers the period 1971–95. Variable definitions and data sources, along with the list of countries in the sample and country groupings, are presented in Appendix A. The dependent variable in most of the analysis is the current account balance, expressed as a ratio to GDP. A negative value of the dependent variable represents a current account deficit.

One potential problem with developing country data is the possibility of significant measurement error in annual data. To mitigate these concerns, and since our interest is primarily in medium-term rather than short-term variations in current accounts, we construct a panel that contains non-overlapping 5-year averages of the data for each country. So, for instance, 25 annual observations for a particular country over the 1971–95 period would be compressed into 5 observations. This procedure also has the advantage of abstracting from short-run variations in current accounts and related variables, which are of lesser interest for the purposes of the analysis in this paper. We later test the robustness of our results to this compression of the data by recomputing all of the estimates using the underlying annual data.

Table 1 presents a variance decomposition for this panel data set that indicates how much of the variation in the relevant variables is attributable to variation across countries and over time, respectively. Certain variables such as current account balances and government budget balances vary substantially across countries and, within each country, over time. In contrast, other variables including relative income and net foreign asset positions vary markedly across countries but are relatively more stable over time within countries. There are some differences in the contributions of within- and between-country effects across the industrial and developing country samples, but the relative importance of these two effects for the total variation in each variable is quite similar across the two samples. The

Table 1
Decomposition of variance into cross section and time series components (in percent)

	Industrial countries		Developing countries	
	Across countries	Over time	Across countries	Over time
Current account				
to GDP ratio	39.05	60.95	43.56	56.44
Govt. budget balance				
to GDP ratio	41.31	58.69	46.94	53.06
NFA to GDP ratio	80.07	19.93	67.37	32.63
Relative income	93.21	6.79	90.92	9.08
Relative income squared	92.43	7.57	76.88	23.12
Relative dependency ratio (young)	61.59	38.41	88.82	11.18
Relative dependency ratio (old)	75.22	24.78	94.26	5.74
Financial deepening	83.36	16.64	84.36	15.64
Terms of trade volatility	23.49	76.51	35.69	64.31
GDP growth	9.07	90.93	9.91	90.09
Openness ratio	85.58	14.42	90.78	9.22
Capital controls (current account)	64.83	35.17	60.95	39.05
Capital controls (capital account)	50.25	49.75	70.43	29.57

Notes: This table shows the proportion of the total variance (of 5-year nonoverlapping averages) of each variable that is attributable to variation across countries and over time, respectively. For four of the variables—NFA to GDP ratio; terms of trade volatility; GDP growth; and the openness ratio—the variance decomposition is for the underlying (5 year averaged) data, rather than the transformations that are used in the regressions (e.g. average GDP growth over the full sample).

main result to be taken from this table is that many of the dependent and independent variables of interest for this study vary quite markedly in both the cross-section and time-series dimensions.

An important point to note here is that our primary interest is in low-frequency current account variation. Hence, we do not distinguish between the effects of transitory and permanent shocks and among different sources of shocks. These distinctions are important for modeling short-run dynamics and for disentangling short-run and long-run dynamics of the current account.[2] Given the frequency of the data that we work with, the interpretation of our results is less influenced by issues concerning the sources and persistence of the underlying shocks.

Although the focus of this paper is on current accounts, the medium-term saving-investment balance perspective suggests that the correlations of our set of dependent variables with saving and investment are also of independent interest. As noted earlier, numerous authors have already explored the determinants of saving and investment from different perspectives. Although we rely on this

[2] Glick and Rogoff (1995), Lee and Chinn (1998) and Prasad (1999) show how the sources of shocks and their persistence can affect the dynamics of trade and current account balances. Calderon et al. (1999) attempt to differentiate between the effects of permanent and transitory shocks on current account variation in developing countries at the annual frequency.

literature in interpreting our results, we did estimate regressions analogous to those for the current account but with saving and investment, respectively, as the dependent variable (of course, there are only two independent equations here). We also ran analogous regressions using private saving as the dependent variable. We do not report these auxiliary results in detail but discuss them below where relevant.

4. Cross-section results

We first examine the results from OLS regressions using the full-sample averages of the dependent and independent variables for each country. The first column of Table 2 shows the results for all countries, while the remaining columns show the results from regressions run separately for industrial and developing countries, respectively. Since many of the results were sensitive to the inclusion of African countries, we also report results for the full sample and for the developing country sample excluding the African countries.

A result that appears to be relatively robust across country groupings is that the government budget balance is positively related to the current account balance. This is an interesting result but, since budget balances vary quite substantially over time within countries, we merely note the robustness of this result here and investigate it further in the next section.

Next, we examine the cross-sectional relationship between current accounts and the beginning-of-sample stock of net foreign assets (NFA). In order to mitigate the effects of measurement error, we use the average value of the NFA to GDP ratio in the first 5 years of the sample for each country.[3] Fig. 1, which plots initial NFA/GDP ratios versus average current account balances, hints at a positive relationship between these two variables, especially among the industrial countries. The results in the first column of Table 2 do reveal a strong positive conditional relationship between the stock of NFA and the current account for the full sample. An examination of the other columns of this table shows that, in the cross section, this result is driven largely by industrial countries. In other words, industrial countries that have a relatively large stock of NFA to begin with tend to run larger current account surpluses. While the coefficient is also positive for developing countries, it is much smaller and not significant.

To capture stage of development effects, we include relative per capita income

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[3] As a robustness check, we also repeated the analysis replacing the NFA variable with a measure of net external debt taken from the World Bank saving database. However, the correlation between these two variables turned out to be small and, perhaps because of greater measurement error in the debt variable, the coefficient on the external debt to GDP ratio was not significant in some specifications (in addition, the sample sizes were smaller since data on debt were not available for all countries in our sample).

Table 2
Cross section regressions (dependent variable—current account to GDP ratio)

	Full sample	Full sample excluding Africa	Industrial countries	Developing countries	Developing countries excluding Africa
Govt. budget balance	0.375***	0.153**	0.340***	0.458***	0.246**
(ratio to GDP)	(0.120)	(0.068)	(0.078)	(0.146)	(0.103)
NFA to GDP ratio	0.046**	0.051***	0.127***	0.038	0.024
	(0.023)	(0.016)	(0.023)	(0.026)	(0.027)
Relative income	0.119**	0.097***	0.174*	0.013	0.046
	(0.056)	(0.036)	(0.085)	(0.106)	(0.055)
Relative income	− 0.096**	0.070**	− 0.176*	0.117	0.042
squared	(0.039)	(0.031)	(0.072)	(0.150)	(0.086)
Relative dependency ratio	− 0.054*	− 0.029	− 0.057	− 0.060*	− 0.057
(young)	(0.031)	(0.027)	(0.060)	(0.035)	(0.040)
Relative dependency ratio	− 0.173	− 0.097	0.195	0.156	− 0.211
(old)	(0.138)	(0.107)	(0.124)	(0.195)	(0.174)
Financial deepening	0.031**	0.023*	0.001	0.045**	0.044*
(M2/GDP)	(0.011)	(0.012)	(0.014)	(0.018)	(0.023)
Terms of trade	0.022	0.053**	− 0.092**	0.027	0.052**
volatility	(0.028)	(0.021)	(0.034)	(0.028)	(0.026)
Average GDP growth	− 0.152	− 0.099	2.409***	− 0.184	− 0.180
	(0.184)	(0.169)	(0.364)	(0.185)	(0.168)
Openness ratio	− 0.010	0.006	− 0.040	− 0.024**	− 0.017
	(0.008)	(0.008)	(0.030)	(0.012)	(0.015)
Capital controls	0.011	0.006	0.016**	0.010	0.005
(current account)	(0.011)	(0.008)	(0.006)	(0.014)	(0.011)
Capital controls	0.001	− 0.002	− 0.027	− 0.005	− 0.008
(capital account)	(0.012)	(0.008)	(0.010)	(0.017)	(0.013)
Dummy for oil-	0.023***	0.023***	–	0.017*	0.016**
exporting countries	(0.008)	(0.006)	–	(0.009)	(0.013)
Adjusted R squared	0.51	0.64	0.94	0.46	0.57
Number of observations	89	56	18	71	48

Notes: The dependent and independent variables are the full sample averages of the corresponding annual variables for each country. Robust standard errors are reported in parentheses. The symbols *, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

and its square in the regressions. In each year, relative per capita income is measured as the ratio of domestic per capita income to U.S. per capita income. Incomes for countries other than the U.S. are converted into U.S. dollars using purchasing power parity exchange rates. The squared term allows for possible nonlinearities in the relationship between relative per capita income and current account positions. In particular, this term captures the empirical relevance of the stages of development hypothesis that predicts a U-shaped relationship between the current account balance and the stage of development, as measured by relative per capita output.

Fig. 1. Current accounts and net foreign assets, cross section.

For the full sample, the coefficient on the relative income term is positive and the coefficient on the quadratic term is negative, with both coefficients being strongly statistically significant. Taken together, these coefficients suggest a pattern that is the opposite of that predicted by the stage of development hypothesis. This pattern, however, appears to be driven mainly by the industrial countries in the sample (column 3). The coefficients on the relative income terms are not significant for the developing country sample (columns 4 and 5). Fig. 2 provides a graphical representation of the cross-sectional relationship between current accounts and relative income. The developing and industrial country groups (the latter set of countries labeled with upper case letters) form two clusters (partly overlapping) on this scatter plot. Mechanically, it is easy to see from this figure why a regression that attempts to fit points in both clusters yields the signs it does on the level and quadratic relative income terms. Thus, in our sample, the cross section regressions do not provide evidence in favor of the stages of development hypothesis for explaining levels of current account positions across countries.[4]

As predicted by various models, relative dependency ratios are indeed associated with smaller current account surpluses (or larger deficits) for some of the
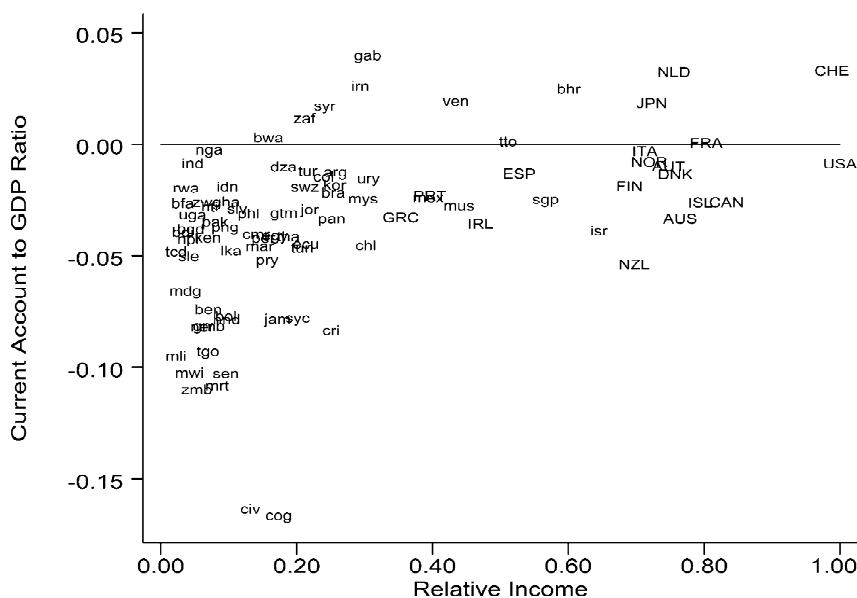

Fig. 2. Current accounts and relative income, cross section.

[4]Debelle and Faruqee (1996) report similar results. We tried including higher order polynomials of relative income, but the coefficients were not statistically significant and did not affect the other results.

country groups. There are differences in the magnitudes of the effects of dependency ratios for the young and the old; only the youth dependency ratio has a significant negative effect on current accounts among developing countries. The average level of financial deepening does have a significant and robustly positive effect on the current account in developing countries but not in industrial countries.

The cross-country results reveal a significant role for terms of trade volatility in current account determination for developing countries excluding Africa. For these countries, higher terms of trade volatility are associated with larger current account balances, consistent with the notion of this volatility inducing more precautionary saving and/or lower investment. For industrial countries, on the other hand, terms of trade volatility appears to be negatively correlated with current account balances. There is no clear relationship between average output growth and current account balances for the full sample. There is, however, a strong positive relationship between these variables for the industrial countries in our sample, consistent with the observation that advanced countries that had relatively high growth rates over the last three decades have generally been net providers of capital to other economies.

Among developing countries, there appears to be a negative relationship between the openness ratio, measured as the sum of exports and imports to GDP, and current account balances. Except in the case of the industrial country sample, we do not find a statistically significant association between capital controls and current accounts.

To summarize the key results from this section, government budget balances and indicators of financial deepening are positively correlated with current account balances in the cross section for developing countries. Dependency ratios and indicators of openness to international trade, on the other hand, appear to be negatively correlated with average current account positions. For industrial countries, initial NFA positions and average output growth rates have positive cross-sectional correlations with current account balances. However, since several of these variables—including the degree of financial deepening, trade openness and extent of capital controls—have changed considerably over time for many countries, we investigate these relationships in more detail in the next section.

5. Panel estimates

We now turn to a panel approach that allows us to characterize higher frequency variations in current account balances. As discussed earlier, we work with a panel data set that contains non-overlapping 5-year averages of the data for each country and use OLS specifications for our baseline results. We later test the robustness of our results to this compression of the data and to the choice of empirical specification.

Table 3
Panel regressions, OLS specification with time effects (dependent variable—current account to GDP ratio)

	Full sample	Full sample excluding Africa	Industrial countries	Developing countries	Developing countries excluding Africa
Govt. budget balance	0.306***	0.195***	0.131	0.389***	0.259***
(ratio to GDP)	(0.065)	(0.059)	(0.079)	(0.071)	(0.062)
NFA to GDP ratio	0.048***	0.047***	0.074***	0.043***	0.039***
	(0.012)	(0.015)	(0.016)	(0.011)	(0.013)
Relative income	0.042	0.041	− 0.038	0.088	0.103
	(0.037)	(0.034)	(0.096)	(0.063)	(0.066)
Relative income	− 0.018	− 0.013	0.031	0.250**	0.268**
squared	(0.034)	(0.032)	(0.075)	(0.098)	(0.107)
Relative dependency ratio	− 0.025	− 0.023	− 0.108*	− 0.039	− 0.055*
(young)	(0.024)	(0.018)	(0.063)	(0.032)	(0.030)
Relative dependency ratio	− 0.051	− 0.010	− 0.109	− 0.138	− 0.156
(old)	(0.086)	(0.082)	(0.120)	(0.156)	(0.169)
Financial deepening	0.026**	0.020**	0.018	0.039***	0.037**
	(0.008)	(0.008)	(0.013)	(0.013)	(0.017)
Terms of trade	0.018	0.044**	0.007	0.022	0.034*
volatility	(0.022)	(0.020)	(0.057)	(0.021)	(0.022)
Average GDP growth	− 0.052	0.020	0.727	− 0.071	− 0.087
	(0.151)	(0.143)	(0.512)	(0.157)	(0.154)
Openness ratio	− 0.008	0.001	0.023	− 0.027**	− 0.024
	(0.010)	(0.011)	(0.018)	(0.012)	(0.015)
Capital controls	0.010	0.010	0.002	0.010	0.011
(current account)	(0.006)	(0.006)	(0.009)	(0.008)	(0.007)
Capital controls	0.001	− 0.002	0.004	− 0.004	− 0.011
(capital account)	(0.007)	(0.006)	(0.007)	(0.011)	(0.012)
Dummy for oil-	0.020**	0.020**	–	0.012	0.011
exporting countries	(0.010)	(0.008)	–	(0.010)	(0.010)
Significant time	86–90	86–90	91–95	81–85	81–85
dummies					
Adjusted R squared	0.42	0.43	0.58	0.44	0.45
Number of observations	305	237	82	223	155

Notes: The dependent and independent variables are non-overlapping 5-year averages of the corresponding annual variables. Robust standard errors are reported in parentheses. The symbols *, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Table 3 shows results from panel OLS regressions for different groupings of countries. Since we found some of these panel results also to be sensitive to the inclusion of the African countries, we report separate sets of results with and without the African countries included, both for the full sample and for the developing country sample.[5] We also experimented with the inclusion of other regional indicator variables (for continents as well as for specific groups such as East Asian countries). These indicator variables were generally neither individually nor jointly significant for most of the specifications discussed below. One exception was the dummy for oil-exporting countries, which was generally positive and significant, reflecting the fact that oil-exporting countries typically have more favorable current account positions on average. Hence, the results reported in Table 3 are from regressions that include this indicator variable.

An important consideration in understanding current account dynamics is the role of international capital flows. Especially for developing countries, the ability to run current account deficits could well be affected by industrial countries' willingness to finance those deficits through capital flows. These patterns of capital flows could be influenced by a number of factors including macroeconomic conditions in industrial countries and have indeed fluctuated significantly over time (see, e.g., Bosworth and Collins, 1999). We return to a more detailed examination of this issue later. As a practical matter, however, we need to address this issue in our estimation and do so by including time dummies for each 5-year period in our regressions. These time dummies were jointly significant in all of the regressions discussed in this section. We report the specific time dummies that were individually significant.

One of the striking results that carries over from the cross-sectional regressions is the strong positive relationship between current account and government budget balances. However, the coefficient is no longer statistically significant for industrial countries. The estimated coefficient for developing countries (column 4) suggests that a 1 percentage point increase in the government budget balance is associated with about a 0.4 percentage point increase in the current account to GDP ratio. One interpretation of the coefficient estimates is that, in developing countries, private saving provides a significant but not complete Ricardian offset to changes in public saving. This is consistent with Edwards's (1995) result that in developing countries private saving, as a ratio to GDP, declines by about 0.6 percentage points when the ratio of government saving to GDP increases by 1 percentage point.

When we regress national saving on the same set of regressors, we find that the saving channel does indeed appear to be important in the sense that national saving and public saving are positively correlated. For comparison, we report below the relevant estimates from Table 3 and the coefficient on the government budget

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[5]Wald tests confirmed that the hypothesis of homogeneity of coefficients across the different groupings of countries shown in the Table could be rejected.

balance in a set of regressions with national saving as the dependent variable and the same set of regressors as in Table 3:

Estimated coefficients on the ratio of the government budget balance to GDP

Dependent variable:	All countries	All excl. Africa	Industrial	Developing	Developing excl. Africa
Current account	0.306	0.195	0.131	0.389	0.259
National saving	0.356	0.345	0.437	0.234	0.169

Interestingly, the correlation between public saving and national saving appears to be higher for industrial than for developing countries. Despite this, however, the effect of public saving on the current account is greater (and statistically significant) only for developing countries.

Next, we examine the relationship between current accounts and a key initial condition—the existing stock of net foreign assets (or liabilities). For the panel regressions, the initial stock of NFA refers to the NFA/GDP ratio in the first year of the 5-year period over which the dependent and independent variables are averaged. The results indicate a robust positive association between initial NFA to GDP ratios and current account balances. For the combined sample of industrial and developing countries, this result is as strong as in the cross-section regressions. In the sub-sample panel regressions, however, the result comes through strongly for the developing countries as well. Among the industrial countries, this result reflects the fact that countries with large NFA positions over the sample period, such as Japan and Switzerland, have tended to run current account surpluses while, for countries like the U.S., there appears to have been a negative relationship between existing NFA stocks and current account positions.[6]

As discussed above, certain theoretical models suggest that there could be differences between debtor and creditor countries in the responses of the current account to similar shocks. We can not address this directly in our framework since we do not identify different sources of shocks. Nevertheless, it is of interest to examine if the relationships we find differ across debtor and creditor countries. We investigated this in two ways. First, we estimated the equations separately for debtor countries (NFA/GDP ratio < 0) and creditor countries (NFA/GDP ≥ 0).[7] Since the number of observations with positive NFA/GDP ratios was small, we

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[6]When we replaced the initial NFA/GDP ratio variable used here with that used in the cross-section regressions (the average NFA/GDP ratio in the first five years of the full sample for each country), the results were similar, but only when the African countries were excluded. For the full developing country sample, the other coefficients did not change much but the coefficient on the initial NFA to GDP ratio, although still positive, was less strongly significant.

[7]Observations with NFA/GDP < 0 account for 264 of 305 observations in the full sample and 200 of 233 in the developing country sample.

also tried using a dummy variable for creditor countries, along with an interaction term of this dummy with the NFA/GDP variable. With either approach (results not reported here), it was clear that the strong positive relationship between the initial NFA/GDP ratio and current accounts is primarily a feature of debtor countries and that this result is particularly strong for developing countries.

We conjecture that, among developing countries, this result indicates that countries that have tended to run current account deficits, and that have consequently built up a stock of net foreign liabilities (NFL), tend to be countries that have better access to capital markets and that are favored by international investors for a variety of reasons. Hence, despite their existing stock of NFL, international investors are more willing to finance larger current account deficits for these countries. This, in turn, could reflect the fact that these countries have higher levels of productivity and, consequently, higher rates of return to capital.[8] Furthermore, large flows of capital from industrial to developing countries are a relatively recent phenomenon. Therefore, in our limited sample, this effect could dominate the fact that, from a longer-term perspective, a net outflow of capital from developing countries could eventually be required to pay off (or, at least, stabilize as a ratio to GDP) the stock of external liabilities.

In the first three columns of the table, the coefficients on the relative income terms are not significant. For developing countries, the relative income effect is negative and the coefficient on the relative income quadratic term is positive, consistent with the implications of the stages of development hypothesis. However, only the coefficients on the quadratic terms in columns 4 and 5 are significant, yielding but limited support for this hypothesis.

The coefficients on the dependency ratios indicate that higher relative dependency ratios are associated with lower current account balances. The effect is stronger for industrial countries. Among developing countries, the coefficient on the relative youth dependency ratio is significant, but only when we exclude African countries from the sample. When we examined the relationship between relative dependency ratios and national saving, we did find an unambiguously negative relationship, especially for developing countries. The net effect of demographics on current accounts appears more muted. It is also worth noting that the estimated coefficients are generally smaller in absolute value in the panel regressions compared to the cross-section regressions. This suggests that, as seems plausible, demographic factors play a more important role in low-frequency rather than high-frequency current account variation. Cross-section regressions for national saving confirmed that the effect of dependency ratios on saving is slightly stronger at lower frequencies, i.e., over longer time spans.

In the panel regressions for the full sample, the financial deepening variable has

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[8] An alternative explanation is that the perception among international investors of implicit guarantees of bailouts for certain countries could result in perverse feedback effects, whereby countries with high external debt get further access to international capital.

a clear positive association with current account balances. This result comes through strongly for all samples that include developing countries. Interestingly, we find that, in our sample of developing countries, financial deepening is in fact negatively correlated with both private and national saving. However, for this group of countries, financial deepening is even more strongly negatively correlated with investment, perhaps because this variable proxies for the absence of well-developed capital markets.

Terms of trade volatility is positively related to current account balances in the developing country sample that excludes Africa. This result comes through as strongly as in the cross-section regressions and is strongly suggestive of the effect of overall macroeconomic uncertainty on private saving in developing countries. Indeed, we find evidence of a strong relationship between terms of trade volatility and both private and national saving in our saving regressions. Furthermore, there is also some evidence that investment in developing countries is negatively affected by terms of trade volatility (also see Serven, 1998). Average income growth, on the other hand, appears to bear little relationship to the current account. Among developing countries, we found that both saving and investment were strongly positively correlated with average GDP growth, but these effects largely offset each other.[9]

We find that the degree of openness of an economy is negatively related to its current account position, although this result is driven largely by the developing countries. The openness variable could be indicative of attributes such as liberalized trade, receptiveness to technology transfers, and the ability to service external debt through export earnings. Thus, countries with more exposure to international trade tend to be relatively more attractive to foreign capital. When we examined the results separately for saving and investment, we did find that openness is strongly positively related to national investment in developing countries. The relationship between openness and national saving is, however, generally insignificant.[10]

Capital controls do not appear to have played a major role in current account determination (conditional on other variables examined here). The coefficients on the indicator variables for capital controls are generally not statistically significant.[11] This could reflect two opposing effects. On the one hand, one would expect countries with capital controls to have relatively limited access to international capital and, therefore, to perforce run smaller current account deficits.

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[9] We also tried including other macroeconomic variables such as average inflation rates and inflation volatility, but they did not enter significantly into any of these regressions.

[10] Consistent with this set of results, Lane (1998) reports a positive association between trade openness and the level of external debt among developing countries.

[11] To check if any of the other variables in the regressions could be picking up the effects of the capital controls, we tried a variety of specifications that excluded various combinations of the openness indicators, financial deepening variables etc. None of these specifications yielded a statistically significant coefficient on either of the indicators of capital controls.

An alternative possibility is that capital controls could reflect attempts to stave off the consequences of a legacy of chronic current deficits. Interestingly, although the net effect on current accounts is small, capital controls on capital account transactions do seem to have a negative effect on both saving and investment in developing countries.

The balance of payments identity implies that current account deficits must be offset by inflows on the capital account. Over the last three decades, developing countries as a block have generally run net aggregate current account deficits, which are then financed by industrial countries.[12] However, patterns of capital flows from industrial to developing countries have fluctuated considerably over time. In our estimation framework, including time dummies in the regression for developing countries is roughly analogous to including an aggregate measure of net capital flows to these countries (although the time dummies also capture effects of other aggregate factors common to these countries). When we reestimated the panel regression for developing countries without the time dummies, the adjusted R^2 dropped from 0.44 to 0.36, indicating the importance of aggregate time effects that influence current account variations across all developing countries.

We also examine how well our equation works in replicating a summary measure of the current account across all developing countries. To construct an aggregate developing country measure of the current account, we sum up the levels of the current account balances of developing countries and express this as a ratio of the sum of GDPs for this group of countries, with both variables measured in constant U.S. dollars and averaged over 5-year periods. Predicted current accounts are then aggregated across developing countries in a similar manner. Fig. 3 (first panel) shows an aggregate measure of current accounts as a ratio to GDP for developing countries and predicted values for this variable from two OLS regressions—one with and the other without the time dummies. The estimated model with time effects tracks the aggregate current account variations for developing countries as a group rather well, and better than the model without time effects. The remaining panels of this figure show that a similar conclusion applies to the regional groupings of Asia, Africa, and to a lesser extent, Latin America.

6. Robustness tests

6.1. Outliers and threshold effects

To check if our baseline results are sensitive to outliers, we performed a variety

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[12]Bosworth and Collins (1999) find that a large proportion of capital inflows into developing countries is indeed used to finance current account deficits. Countries could also temporarily finance current account deficits by running down their reserve positions. Since our focus is on current account determination at relatively low frequencies, we ignore the role of fluctuations in reserves in our analysis.
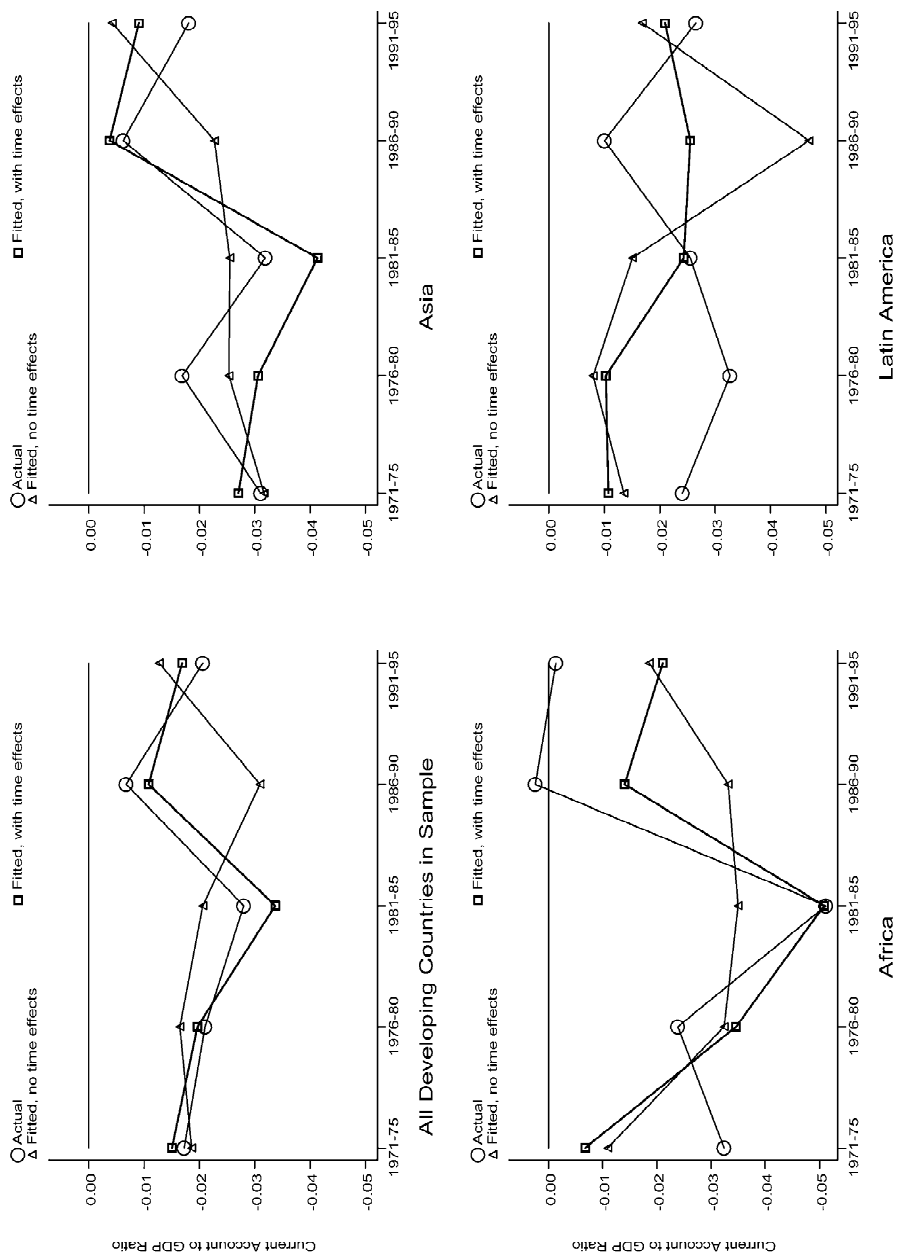
Fig. 3. Actual, fitted current accounts: developing country blocks.

of experiments. To conserve space, we only summarize the main results here. First, we excluded all observations for which the dependent variable had a value lower than -0.10 (i.e., a current account deficit greater than 10 percent of GDP). This reduced the total sample from 305 to 269 observations (only 3 of the eliminated observations were for industrial countries). Virtually all of the coefficients that had been significant before retained their statistical significance, although the coefficients on the government budget balance and the NFA/GDP ratio were slightly smaller. The coefficients on the youth dependency ratio and terms of trade volatility became even more strongly significant for developing countries and there were more significant time dummies when this limited sample was used. Second, we imposed a tighter screen and excluded observations for which the dependent variable was lower than -0.05 (about a third of all observations). Even with this markedly smaller sample, the main results were preserved, although, as expected, the standard errors increased for most coefficients.

We also examined the possibility of the results being driven by outliers in key variables such as the government budget balance and the NFA/GDP ratio. We created a dummy variable that took the value 1 if the budget balance was smaller than -0.05 (i.e., a budget deficit greater than 5 percent of GDP). Neither this dummy nor its interaction with the government budget balance variable were statistically significant and the effects on the estimated coefficients on the budget balance and other variables were very small. Similarly, we created a dummy for values of the NFA/GDP ratio lower than -0.50 (50 percent of GDP). Interestingly, the coefficient on the interaction between this dummy and the NFA variable was positive and significant, although quite small, for developing countries. The coefficient on the NFA variable fell slightly but its statistical significance remained unaffected for the developing country sample. This indicates the possibility of threshold effects in the relationship between NFA stocks and the evolution of current accounts and bears further investigation in future work.

An alternative, less formal approach of examining robustness is to use scatter plots that show the conditional correlations between current accounts, on the one hand, and key variables such as the budget balance and NFA/GDP ratios on the other. These two sets of partial scatters for industrial and developing countries are shown in Fig. 4 and appear consistent with the strong positive relationships that we found earlier for the developing country sample.

6.2. Fixed effects

Many cross-country panel studies use fixed effects (FE) in order to soak up all country-specific effects. Our view is that, for understanding cross-country variation in current accounts, including fixed effects would detract from much of the economically meaningful parts of the analysis. As shown in Table 1, about 40 percent of the sample variation of the current account to GDP ratio is attributable
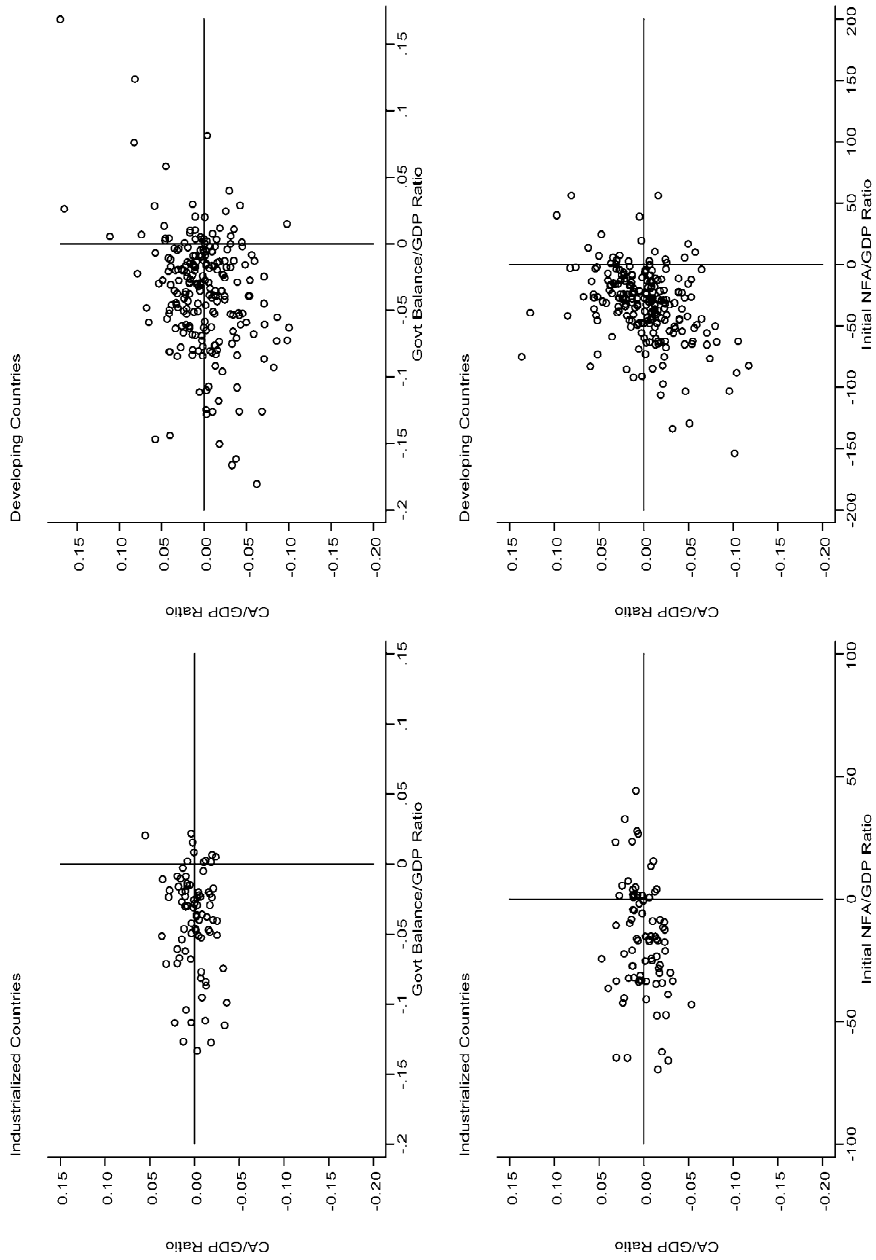
Fig. 4. Partial scatterplots.

to cross-section rather than time-series variation, for both industrial and developing countries. Thus, using FE estimators would abstract from much of the cross-country variation in current accounts that is, after all, the focus of this study.[13]

Nevertheless, as a robustness check, we redid the estimates including country fixed effects and dropping those regressors that, by construction, have no time variation—terms of trade volatility; average output growth; and the openness indicator. The results are reported in Table 4.[14] The government budget balance continues to be positively related to the current account balance for the full sample and for developing countries. The coefficients on the NFA to GDP ratio are smaller than the corresponding OLS coefficients, but are still significantly positive except in columns 3 and 5. This weaker result in the FE estimates is not unsurprising since this variable would be expected to be more important for understanding cross-country differences rather than within-country evolutions of current account balances. The youth dependency ratio is still negatively related to current account balances for the developing countries excluding Africa, although the financial deepening variable is no longer significant.

A notable difference between the OLS and FE estimates is that, for the developing countries, the FE specification yields statistically significant coefficients on the relative income and relative income squared terms that are more in line with the stages of development hypothesis. Since the OLS regressions included controls for average output growth, it is possible that the effects of relative income were masked by the systematic differences in growth rates associated with convergence effects. However, when we omitted average output growth from the OLS specifications, the coefficients and associated standard errors on the relative income terms were largely unchanged. Thus, only when we control for country characteristics using FE estimation do we find some evidence that current accounts in developing countries appear consistent with the stages of development hypothesis.[15]

Overall, we view the results from FE estimation as supportive of the main conclusions we derived from the basic OLS specifications. Nevertheless, for our purposes, OLS is preferable to FE estimation for the reasons cited earlier.

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[13] A similar point, in the context of cross-country growth regressions, is made forcefully by Quah (1996) and is echoed by Lane (1998) in his work on the determinants of external debt.

[14] The last row of Table 4 reports Hausman test statistics for the validity of random effects (RE) versus FE specifications. For the industrial countries and the full sample of developing countries, we could not reject the null hypothesis that the RE specification is appropriate. We estimated RE models for these two sub-samples but few of the main results were affected. Hence, to maintain consistency, we report only FE results in this table.

[15] To check if the East Asian countries in our sample could be driving the OLS and FE coefficients on the relative income terms in columns 4 and 5, we re-estimated the equations excluding them. The coefficient on the squared relative income term fell slightly in both cases but little else changed.

Table 4
Panel regressions, fixed effects specification with time effects (dependent variable—current account to GDP ratio)

	Full sample	Full sample excluding Africa	Industrial countries	Developing countries	Developing countries excluding Africa
Govt. budget balance	0.376***	0.187**	0.141	0.446***	0.209**
(ratio to GDP)	(0.076)	(0.076)	(0.113)	(0.096)	(0.098)
NFA to GDP ratio	0.018***	0.016**	0.015	0.017*	0.012
	(0.008)	(0.007)	(0.033)	(0.009)	(0.009)
Relative income	− 0.137	− 0.122	0.859**	− 0.322*	− 0.441**
	(0.144)	(0.133)	(0.434)	(0.186)	(0.171)
Relative income	0.237*	0.256**	− 0.511*	0.478**	0.624***
squared	(0.132)	(0.121)	(0.299)	(0.193)	(0.176)
Relative dependency ratio	− 0.053	− 0.151**	− 0.004	− 0.089	− 0.196***
(young)	(0.064)	(0.063)	(0.102)	(0.073)	(0.072)
Relative dependency ratio	− 0.063	0.199	− 0.261	0.579	1.758**
(old)	(0.335)	(0.307)	(0.256)	(0.627)	(0.614)
Financial deepening	− 0.017	− 0.001	0.030	− 0.039	− 0.025
	(0.025)	(0.024)	(0.024)	(0.036)	(0.037)
Terms of trade	–	–	–	–	–
volatility	–	–	–	–	–
Average GDP growth	–	–	–	–	–
	–	–	–	–	–
Openness ratio	–	–	–	–	–
	–	–	–	–	–
Capital controls	0.006	0.005	− 0.012	− 0.012	0.014
(current account)	(0.010)	(0.010)	(0.016)	(0.012)	(0.012)
Capital controls	− 0.013	− 0.014	0.004	− 0.016	− 0.017
(capital account)	(0.011)	(0.010)	(0.010)	(0.019)	(0.016)
Dummy for oil-	–	–	–	–	–
exporting countries	–	–	–	–	–
Significant time	None	81–85	None	81–85	76–80, 81–85
dummies		91–95			86–90, 91–95
R squared	0.21	0.12	0.22	0.14	0.20
Number of observations	317	249	82	235	167
Hausman test statistic	24.81	36.41	12.00	18.17	46.21
	[0.0245]	[0.0005]	[0.5274]	[0.1512]	[0.0000]

Notes: The dependent and independent variables are non-overlapping 5-year averages of the corresponding annual variables. Standard errors are reported in parentheses. The symbols *, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively. The last row shows Hausman test statistics for random effects versus fixed effects specifications. *P*-values are reported in square brackets.

6.3. Other econometric issues

A possible concern with our baseline estimates is the effect of serial correlation. Although the standard errors for the coefficient estimates are robust to serial

correlation (and heteroscedasticity), the coefficient estimates could themselves be contaminated by the presence of serial correlation. Since we use 5-year averaged data in the estimation, however, it is less likely that serial correlation is a problem. When we included the lagged (5-year average) level of the current account in the panel regressions, the coefficient on this variable was generally not economically or statistically significant and, in any case, did not have much effect on the point estimates of the other coefficients. More sophisticated attempts to identify and deal with serial correlation also did not make much difference.

Although we have been cautious about not assigning causal explanations to the conditional correlations that we have found, the issue of endogeneity in our specifications is another potential concern. Some of the right hand side variables in our specifications, such as government budget balances, could be influenced by current account developments. In addition, in a dynamic context, there is clearly a relationship between current accounts and NFA stocks. However, we faced two major problems with IV estimation. First, there is a lack of additional variables that could constitute good instruments. The low correlations between lagged and contemporaneous values of variables such as the government budget balance to GDP ratio meant that lagged values of the right hand side variables made for poor instruments. Second, given our use of 5-year averages, the sample size shrank considerably when we used lagged values of right hand side variables as instruments. Nevertheless, we experimented with using a set of instruments that included plausibly exogenous variables.

For instance, as instruments for the government budget balance and initial NFA, we used lagged values of these variables, contemporaneous values of all other independent variables (which we take to be exogenous), and lagged values of the time-varying exogenous variables. Numerous combinations of instruments were tried. In general, the coefficients on the instrumented variables were slightly smaller in absolute magnitude in the IV regressions compared with the OLS estimates. However, the standard errors on some of the coefficient estimates increased substantially, reflecting the problems with IV estimation discussed above. Overall, these results were broadly supportive of the conclusions obtained from the OLS estimates.

6.4. Foreign aid and the current account

An interesting question that is related to the discussion of causality is that of exogenous variations in developing country current accounts that are attributable to aid and other transfers from abroad. This could give rise to spurious correlations in our data among current account balances and macroeconomic variables. One transparent way to deal with this issue is to include aid and other official grants (expressed as a ratio to GDP) as an additional control. We re-estimated the OLS and FE specifications for developing countries including this variable as a regressor. To conserve space, we only summarize the main findings here (detailed

results are available in the working paper version). The coefficient on the aid variable was significantly negative in the OLS specification for all developing countries. This is the expected result, since inflows of aid should in principle allow a country to finance larger current account deficits. However, the estimated coefficients on this variable were not significant when the sample was limited to non-African developing countries or when country fixed effects were included. The coefficients on other variables—in particular, the government budget balance and the NFA/GDP ratio—were not much affected when the aid variable was added to the regressions.

6.5. Regressions with annual data

Finally, in order to examine the robustness of the results at higher frequencies, we reestimated the panel regressions using annual data. Although there could be considerable noise and measurement error in annual data for some developing countries, it is nevertheless useful to examine the sensitivity of the results to the choice of data frequency.

Using the annual data, we re-estimated the baseline OLS specifications with time effects (year dummies) and also included lagged values of the current account to GDP ratio and, in order to capture relative price effects, lagged changes of (the logarithms of) the real effective exchange rate. The results are reported in Table 5. The coefficients on the lagged current account to GDP ratio are in the range of 0.50–0.60 for both the industrial and developing country samples, indicating rather limited persistence in this variable even at an annual frequency. The estimated relative price effects on current accounts are negative, as would be expected, but are statistically significant only for industrial countries.[16]

Among developing countries, government budget balances remain positively associated with current account balances even at annual frequencies. Financial deepening and terms of trade volatility are also positively associated with current accounts for this group of countries. The coefficients on many of the other variables have the same sign and often similar magnitudes as in the regressions using the 5-year averaged data, but they are much less precisely estimated. This could in part be due to the greater amount of noise in annual data for developing countries but probably also reflects the fact that variables such as relative dependency ratios are far more important for explaining medium-term rather than short-term variations in current account balances.

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[16]These results are not surprising since one would expect relative price effects to be more relevant for variations in the trade balance rather than the current account. When we included the contemporaneous rather than lagged change in the real exchange rate in the regressions and instrumented this variable with its lags, the coefficients were negative and slightly larger, but were still not statistically significant.

Table 5
Panel regressions for annual data, OLS specification with time effects (dependent variable—current account to GDP ratio)

	Full sample	Full sample excluding Africa	Industrial countries	Developing countries	Developing countries excluding Africa
Govt. budget balance	0.173***	0.121***	0.076**	0.213***	0.167***
(ratio to GDP)	(0.034)	(0.027)	(0.034)	(0.041)	(0.036)
NFA to GDP ratio	0.023***	0.024***	0.052**	0.020**	0.016*
	(0.007)	(0.007)	(0.012)	(0.009)	(0.010)
Relative income	0.004	0.010	0.012	− 0.054*	− 0.049*
	(0.022)	(0.020)	(0.049)	(0.031)	(0.031)
Relative income	− 0.001	− 0.001	− 0.017	0.114**	0.114**
squared	(0.018)	(0.017)	(0.038)	(0.045)	(0.047)
Relative dependency ratio	− 0.003	− 0.001	− 0.042	− 0.005	− 0.008
(young)	(0.012)	(0.012)	(0.033)	(0.014)	(0.017)
Relative dependency ratio	0.041	0.041	− 0.012	0.049	0.021
(old)	(0.045)	(0.045)	(0.061)	(0.080)	(0.093)
Financial deepening	0.010***	0.006	− 0.004	0.015**	0.012
(M2/GDP)	(0.005)	(0.005)	(0.007)	(0.007)	(0.010)
Terms of trade	0.015	0.019*	− 0.016	0.018*	0.018
volatility	(0.010)	(0.010)	(0.028)	(0.010)	(0.011)
Average GDP growth	0.047	0.045	0.793**	0.027	0.007
	(0.087)	(0.085)	(0.312)	(0.094)	(0.099)
Openness ratio	0.003	0.007*	− 0.006	− 0.003	− 0.002
	(0.004)	(0.004)	(0.010)	(0.005)	(0.005)
Capital controls	0.001	0.003	− 0.002	0.007	0.004
(current account)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)
Capital controls	− 0.003	− 0.003	0.002	− 0.005	− 0.006
(capital account)	(0.003)	(0.003)	(0.003)	(0.004)	(0.005)
Dummy for oil-	0.007	0.009	–	0.004	0.007
exporting countries	(0.007)	(0.007)	–	(0.007)	(0.007)
Lagged CA to GDP	0.566***	0.573***	0.642***	0.541***	0.536***
ratio	(0.032)	(0.035)	(0.048)	(0.035)	(0.040)
Lagged change in real	− 0.003	− 0.009	− 0.011**	− 0.003	− 0.011
exchange rate	(0.007)	(0.007)	(0.004)	(0.008)	(0.009)
R squared	0.54	0.53	0.69	0.53	0.51
Number of observations	1469	1081	378	1091	703

Notes: Robust standard errors are reported in parentheses. The symbols *, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

7. Concluding remarks

The aim of this paper was to investigate the medium-term empirical relationships between current account balances and a broad set of macroeconomic determinants. We found that government budget balances, initial net foreign asset positions and, for developing countries, indicators of financial deepening are

positively correlated with current account balances. Among developing countries, we also found that higher terms of trade volatility is associated with larger current account surpluses (or smaller deficits). Greater macroeconomic uncertainty apparently increases domestic saving and also has a slightly negative impact on investment. The degree of openness to international trade appears to be weakly associated with larger current account deficits among developing countries. In contrast, we found at best limited evidence to support the patterns of evolutions in current accounts predicted by the stages-of-development hypothesis. Moreover, other potentially important variables such as indicators of capital controls and average GDP growth, appear to bear little systematic relationship with current account balances.

The stylized facts presented in this paper have left a number of important questions open, presenting a fertile agenda for future work. For instance, from an intertemporal perspective, a better understanding of the dynamic effects on the current account of shocks with different degrees of persistence could have important theoretical as well as policy implications. Another important challenge is to identify the channels through which different shocks affect the current account. Do the effects propagate via the trade balance or other components of the current account? Hence, the empirical regularities documented in this paper point to some interesting directions for further work towards understanding the factors that ultimately determine sustainable current account balances in the medium term.

Acknowledgements

Appendix A

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 also provided below. For most countries, data were available from 1971 through 1995.

Mnemonic	Source*	Variable description
CAGDP	IFS	Current account to GDP ratio
GOVBGDP	WBSD	General government budget balance, ratio to GDP
NFAGDP	LM, Sinn	Stock of net foreign assets, ratio to GDP
RELY	WBSD	Relative per capita income, adjusted by PPP exchange rates Measured relative to the U.S., range (0 to 1)
RELDEPY	WBSD	Youth dependency ratio (relative to mean across all countries) Population under 15/Population between 15 and 65
RELDEPO	WBSD	Old dependency ratio (relative to mean across all countries) Population over 65/Population between 15 and 65
YGRAVG	WBSD	Average real GDP growth
YGRSD	WBSD	Standard deviation of GDP growth
TOTSD	WDI, IMF	Standard deviation of terms of trade
LREER	IFS, IMF	Logarithm of trade-weighted real exchange rate
OPEN	IFS	Openness indicator: ratio of exports plus imports of goods and nonfactor services to GDP
FDEEP	IFS	Financial deepening, ratio of M2 to GDP
KC2	GM	Capital controls on current account transactions
KC3	GM	Capital controls on capital account transactions
NSGDP	WBSD	National saving, ratio to GDP

* These are sources for basic data used to construct the corresponding variables. WBSD: World Bank Saving Database (see Loayza et al., 1998, for a description); WDI: World Development Indicators; IFS: IMF's International Financial Statistics; IMF: Other IMF databases; Sinn: Stefan Sinn (1990); GM: Gian Maria Milesi-Ferretti (1998); LM: Philip Lane and Gian Maria Milesi-Ferretti (2001).

We attempted to minimize the amount of preliminary screens on the data, choosing instead to check the sensitivity of each of our main results to the presence and effects of outliers. These are noted in the text of the paper. However, to maintain consistency in the set of countries used for the cross-section and panel analyses, we dropped those countries for which we had fewer than 10 full observations. We also dropped two countries—Kuwait and Nicaragua—that had average current account to GDP ratios considerably out of line with other countries in the sample. The final sample includes 18 industrial and 71 developing countries.

Industrial countries

Australia (AUS), Austria (AUT), Canada (CAN), Denmark (DNK), Finland (FIN), France (FRA), Greece (GRC), Iceland (ISL), Ireland (IRL), Italy (ITA), Japan (JPN), Netherlands (NLD), New Zealand (NZL), Norway (NOR), Portugal (PRT), Spain (ESP), Switzerland (CHE), United States (USA).

Developing countries

Algeria (DZA), Argentina (ARG), Bahrain (BHR), Bangladesh (BGD), Benin (BEN), Bolivia (BOL), Botswana (BWA), Brazil (BRA), Burkina Faso (BFA),

Burundi (BDI), Cameroon (CMR), Chad (TCD), Chile (CHL), Colombia (COL), Congo (COG), Costa Rica (CRI), Cote d'Ivoire (CIV), Dominica (DMA), Ecuador (ECU), Egypt (EGY), El Salvador (SLV), Gabon (GAB), Gambia (GMB), Ghana (GHA), Guatemala (GTM), Haiti (HTI), Honduras (HND), India (IND), Indonesia (IDN), Iran (IRN), Israel (ISR), Jamaica (JAM), Jordan (JOR), Kenya (KEN), Korea (KOR), Madagascar (MDG), Malawi (MWI), Malaysia (MYS), Mali (MLI), Mauritania (MRT), Mauritius (MUS), Mexico (MEX), Morocco (MAR), Nepal (NPL), Niger (NER), Nigeria (NGA), Pakistan (PAK), Panama (PAN), Papua New Guinea (PNG), Paraguay (PRY), Peru (PER), Philippines (PHL), Rwanda (RWA), Senegal (SEN), Seychelles (SYC), Sierra Leone (SLE), Singapore (SGP), South Africa (ZAF), Sri Lanka (LKA), Swaziland (SWZ), Syria (SYR), Thailand (THA), Togo (TGO), Trinidad & Tobago (TTO), Tunisia (TUN), Turkey (TUR), Uganda (UGA), Uruguay (URY), Venezuela (VEN), Zambia (ZMB), Zimbabwe (ZWE).

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