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A Dissection of the Current Account Persistence Puzzle

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Abstract

Chinn and Wei (2013) show that the ratio of the current account balance to GDP is as persistent under floating rates as under pegged rates. This result contradicts economists' widely held belief that current account imbalances should be corrected more quickly under floating. This belief consists of three elements: (a) imbalances will induce corrective real exchange rate movements; (b) real exchange rates move further under floating; and (c) larger real exchange rate movements will induce bigger shifts in the current account balance. It is shown that the data support (b) and (c) but not (a): the real effective exchange rate does not respond significantly to the current account balance. The results are robust to the choice of regime classification scheme, time variation of equilibrium values using a Hodrick-Prescott filter, and to recent regime switches. The implication is that the failure of real exchange rates to react as expected to current account imbalances is the main source of the puzzle.

Keywords: current account, exchange rates, trade balance

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I Introduction

Chinn and Wei (2013) [CW] use a large data set of over 3,500 country-year observations for the period 1971-2005 to show that the ratio of the current account balance to GDP is as persistent under floating rates as under pegged rates. We call this the current account persistence puzzle. Chinn and Wei show that this finding is robust to alternative exchange rate regime classifications, inclusion of control variables, different assumptions about the equilibrium current account balance, and allowing for non-linearities.

As they point out, this result contradicts economists' widely held belief that current account imbalances should be corrected more quickly under floating. Why is this belief widespread? The argument underlying it rests on three apparently reasonable propositions: (a) imbalances will induce corrective real exchange rate movements; (b) real exchange rate movements tend to be larger under floating; and (c) larger real exchange rate movements will induce bigger shifts in the current account balance. Although in Section IV of their paper CW ask how the persistence puzzle arises, they do not directly address propositions (a), (b) or (c); instead they examine real effective exchange rate *persistence*, and whether this varies by exchange rate regime, rather than the relationship between real exchange rates and current account balances. Real exchange rate persistence is relevant when the current account imbalance arises from a real exchange rate shock, but not if its source is a different type of shock.

The current account persistence puzzle must result from the incorrectness of at least one of (a), (b) and (c). The contribution of this note is to investigate which. It is shown that the data support (b) and (c) but not (a): the real effective exchange rate has its own dynamics and it does not respond significantly to the current account balance. The results suggest that the

failure of real exchange rates to react as expected to current account imbalances is the main source of the puzzle.

II Data

Data on the current account and trade balance as a ratio of overall trade (exports plus imports) are taken from the World Bank World Development Indicators (WDI) dataset. Since real exchange rate adjustment is critical, we prefer to take the current account as a ratio of total trade rather than GDP, because a 1 % real exchange rate change should produce quantitatively similar changes across countries to the current account balance as a ratio of total trade (and therefore varying changes as a ratio of GDP). Episodes of countries exhibiting high inflation (CPI inflation >50%) have been excluded. Both the CPI and the real effective exchange rate indices are also taken from the WDI dataset. We show that results are similar for six different exchange rate regime classification schemes: those of (1) the IMF (*de facto*); (2) Bleaney and Tian (2014) [BT], which uses regression methods to separate pegs from floats; (3) Reinhart and Rogoff (2004) [RR]; (4) Shambaugh (2004) [JS]; (5) a hybrid of BT and RR described in Bleaney *et al*. (2015); and (6) a hybrid of BT and JS also described in Bleaney *et al*. (2015).[1] For each classification we use only two categories (pegs and floats), even when a finer breakdown is available. Floats are independent floats and managed floats; all other regimes are treated as a form of peg.

[1] These classifications are denoted RR24 and JS24 respectively in Bleaney *et al*. (2015); they apply the statistical approach of RR (or JS) to BT-type regression residuals, with some adjustment to the classification algorithms used by RR (or JS) for reasons explained therein.

III The Puzzle

Table 1 shows regressions of the change in the current account on its lagged level, and the interaction of the lagged level with a dummy for a floating regime for each of these six classifications; the less persistent the current account is, the more negative will be the coefficient of the lagged level. Table 1 demonstrates CW's point: the insignificance of the interaction term indicates that the current account balance is no more strongly mean-reverting under floating than under pegging.

Table 2 uses the BT classification but incorporates some further robustness tests. Results are similar for the trade balance (Column 2), and also when the data are detrended using a Hodrick-Prescott filter (Columns 3 & 4). Columns 5 and 6 of Table 1 shows the results for a much smaller sample for which real effective exchange rate data are available, which we use for the rest of this note. These last two columns display somewhat less mean reversion; to the extent that these are likely to be the countries with better data, this suggests that serially uncorrelated measurement error may be artificially raising the mean-reversion rate in the full sample.

Table 1. Current Account Persistence

	(1)	(2)	(3)	(4)	(5)	(6)
Classification:	IMF	BT	RR	JS	BTRR	BTJS
Dep. variable	*Δ*CA	*Δ*CA	*Δ*CA	*Δ*CA	*Δ*CA	*Δ*CA
Float	0.015***	0.011**	-0.001	0.009**	0.003	0.008*
	(2.69)	(2.53)	(-0.05)	(2.12)	(0.74)	(1.91)
CA (-1)	-0.471***	-0.446***	-0.427***	-0.429***	-0.430***	-0.450***
	(-6.73)	(-7.09)	(-6.24)	(-8.82)	(-6.38)	(-7.19)
Float * CA (-1)	0.113*	0.059	-0.055	-0.009	-0.020	0.078
	(1.68)	(1.06)	(-0.32)	(-0.13)	(-0.29)	(1.45)
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
No. Economies.	162	164	163	161	163	163
No. Obs.	3694	4043	3539	4012	4002	4002
R2 Overall	0.14	0.14	0.13	0.14	0.14	0.14
R2 Within	0.25	0.25	0.24	0.25	0.25	0.25
R2 Between	0.00	0.00	0.03	0.00	0.00	0.00
RMSE	0.070	0.070	0.068	0.071	0.071	0.071

Notes. Asterisks, ***, **, *, denote the significance level at 1%, 5% and 10% respectively. Heteroscedasticity-robust t-statistics are presented in parentheses. RMSE - the root mean square error of the regression. CA (current account balance) is a ratio of total trade (X+M). *Δ* is the first-difference operator.

Table 2. Current Account and Trade Balance Persistence

	(1)	(2)	(3)	(4)	(5)	(6)
Classification:	BT	BT	BT	BT	BT	BT
	Fixed Effects Regressions		OLS Regressions H-P Filtered		Fixed Effects Regressions: REER data not missing	
Dependent variable:	*Δ*CA	*Δ*TB	*Δ*CA	*Δ*TB	*Δ*CA	*Δ*TB
Float	0.011**	0.007*	0.001	0.002	0.007**	0.004
	(2.53)	(1.95)	(0.45)	(0.90)	(2.10)	(1.08)
CA (-1) or TB (-1)	-0.446***	-0.323***	-0.679***	-0.582***	-0.330***	-0.287***
	(-7.09)	(-6.27)	(-11.98)	(-9.11)	(-7.76)	(-8.27)
Float *	0.059	0.057*	0.097	0.102	-0.037	0.020
CA (-1) or TB (-1)	(1.06)	(1.91)	(1.30)	(0.98)	(-0.71)	(0.67)
Constant			-0.001	-0.001		
			(-1.02)	(-0.87)		
Country Dummies	Yes	Yes			Yes	Yes
Year Dummies	Yes	Yes			Yes	Yes
No. Economies.	164	172			90	91
No. Obs.	4043	4784	3890	4733	2291	2477
R2 Overall	0.14	0.06	0.34	0.29	0.10	0.05
R2 Within	0.25	0.19			0.20	0.18
R2 Between	0.00	0.01			0.12	0.00
RMSE	0.070	0.073	0.066	0.067	0.056	0.058

Notes. Asterisks, ***, **, *, denote the significance level at 1%, 5% and 10% respectively. Heteroscedasticity-robust t-statistics are presented in parentheses. RMSE - the root mean square error of the regression. CA (current account) and TB (trade balance) variables are ratios of total trade (X+M). *Δ* is the first-difference operator. Classification scheme: Bleaney and Tian (2014).

IV Dissection of the Puzzle

We start by examining proposition (b): that real effective exchange rate movements tend to be larger under floating. Table 3 shows that the average absolute year-to-year change in the logarithm of the real effective exchange rate is consistently smaller for pegs than for floats. The mean absolute change for pegs lies in the range 0.043 to 0.051, depending on the classification scheme, whereas for floats it ranges from 0.065 to 0.094. This is quite a substantial difference, with the mean for floats exceeding that for pegs for the same classification by at least 37 % (BTJS), ranging up to 102 % (BTRR). This strongly suggests that proposition (b) holds. Only in the case of parity changes, as identified in the Bleaney-Tian (2014) data set, do pegs have real exchange rate movements similar to floats (0.0669). Note that the RR and JS classifications are outliers (in opposite directions) in terms of the overall regime distribution, for reasons discussed in Bleaney *et al*. (2015).

Table 3. The Volatility of Real Exchange Rates Under Pegs and Floats

Abs_dlnREER

	(1)	(2)	(3)	(4)	(5)	(6)
Classification:	IMF	BT	RR	JS	BTRR	BTJS
Pegs						
Mean	0.048	0.047	0.050	0.045	0.043	0.051
Obs.	1453	1577	1914	981	1593	1609
Floats						
Mean	0.069	0.077	0.094	0.065	0.087	0.070
Obs.	738	714	133	1310	662	646
Float mean/ peg mean	1.43	1.64	1.88	1.44	2.02	1.37

Notes. The figures refer to the absolute value of year-to-year changes in the logarithm of the real effective exchange rate index.

What about proposition (c): that larger real exchange rate movements will induce bigger shifts in the current account balance? To examine this, we test whether the current account balance is more strongly mean-reverting when real exchange rate movements are larger. We estimate the following regression:

$$\Delta CA_{it} = a + b\Delta lnR_{it} - cCA_{it-1} - e(abs(\Delta lnR_{it}) * CA_{it-1}) + u_{it} \quad (1)$$

where *CA* and *R* are respectively the current account balance and the real effective exchange rate index for country *i* at time *t*, *Δ* is the first-difference operator, *u* is a random error and *a*, *b*, *c* and *e* are parameters to be estimated. For the current account balance to be more strongly mean-reverting when real exchange rate movements are larger requires $e>0$. Since the real exchange rate is expected to appreciate to correct a positive imbalance and to depreciate to correct a negative imbalance, but in each case a larger movement is expected to make the current account balance less persistent, the absolute value of the real exchange rate change has to appear in the interaction term. The results are shown in Table 4.

Table 4. The Size of Real Exchange Rate Movements and Current Account Persistence

	(1) All	(2) All Excl. Oil	(3) IND	(4) FIN	(5) OIL	(6) EM	(7) DEV
ΔlnR	-0.004	-0.017	-0.001	0.132**	-0.001	-0.062*	0.000
	(-0.20)	(-0.72)	(-0.04)	(2.49)	(-0.03)	(-1.75)	(0.00)
CA(-1)	-0.286***	-0.282***	-0.170***	-0.324***	-0.351**	-0.259***	-0.356***
	(-7.63)	(-6.84)	(-5.93)	(-4.12)	(-3.19)	(-7.40)	(-4.93)
Abs(ΔlnR) *	-0.591***	-0.463***	-0.491	-0.225	-0.583	-1.514***	-0.373***
CA(-1)	(-3.57)	(-5.01)	(-1.49)	(-0.15)	(-1.71)	(-3.75)	(-3.70)
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. Economies	91	81	22	11	10	17	30
No. Obs.	2317	2096	667	311	221	407	696
R2 Overall	0.13	0.13	0.10	0.13	0.50	0.33	0.20
R2 Within	0.23	0.23	0.20	0.27	0.56	0.40	0.30
R2 Between	0.09	0.10	0.06	0.09	0.62	0.05	0.24
RMSE	0.056	0.048	0.030	0.046	0.086	0.040	0.061

Notes. See notes to Table 1. *R* – real effective exchange rate. IND – industrial countries; FIN – financial centres; OIL – oil exporters; EM – emerging markets; DEV – developing countries.

It can be seen that the interaction term is negative and significant at the 1 % level for the full sample, so proposition (c) appears to be supported by the data.

We turn now to proposition (a): that current account imbalances affect the real effective exchange rate. Table 5 shows some real exchange rate regressions for all regimes, and for pegs and floats separately, using the BT classification to maximize the sample size. The change in the logarithm of the real effective exchange rate is regressed on one lag of itself, the lagged *level* of the same variable, and the lagged current account balance. In Column (1) of Table 5, the lagged change (+) and the lagged level of the real exchange rate (-) are both statistically significant at the 1 % level, indicating significant dynamics quite independent of the current account. The lagged current account balance is nowhere near statistical significance, and even has an unexpected negative sign.

In Columns (2) and (3) the same regression is estimated separately for pegs and floats. The mean-reversion coefficient is more than twice as large for floats as for pegs, but the coefficient of the lagged dependent variable is smaller for floats, suggesting less persistence. One would expect persistence in real exchange rate movements under pegs if inflation differentials relative to the anchor currency are significant and persistent, but parity changes are rather infrequent. The current account coefficient is at least positive for floats, although it is not statistically significant. In results not shown, we have confirmed that we get similar results to Table 5 (and also Table 1) if we discard observations with regime switches in any of the last three years, and also if we use Hodrick-Prescott filters for both the current account and the real effective exchange rate.[2]

[2] Apart from the fact that applying an HP filter always increases the rate of mean-reversion in a series.

Table 5. The Real Exchange Rate Response to Current Account Imbalances

	(1)	(2)	(3)
Classification:	BT	BT	BT
Dep. Variable:	ΔlnR	ΔlnR	ΔlnR
Sample:	All	Pegs only	Floats only
ΔlnR (-1)	0.153***	0.130***	0.094
	(3.71)	(3.01)	(0.84)
lnR (-1)	-0.197***	-0.118***	-0.285***
	(-5.64)	(-6.33)	(-4.25)
CA (-1)	-0.020	-0.020	0.075
	(-0.42)	(-0.52)	(0.044)
Country Dummies	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes
No. Economies	91	88	64
No. Obs.	2295	1556	714
R2 Overall	0.22	0.18	0.39
R2 Within	0.24	0.20	0.36
R2 Between	0.39	0.21	0.74
RMSE	0.087	0.070	0.103

Notes. Asterisks, ***, **, *, denote the significance level at 1%, 5% and 10% respectively. Heteroscedasticity-robust t-statistics are presented in parentheses. RMSE - the root mean square error of the regression. R is the real effective exchange rate index. CA (current account balance) is a ratio of total trade (X+M). Δ is the first-difference operator.

Thus proposition (a) appears not to be supported by the data. What this implies is that, although there are larger movements in the real effective exchange rate under floating, and these tend to trigger bigger current account adjustments (propositions (b) and (c)), such movements are not particularly associated with current account imbalances, as proposition (a) predicts: hence the current account persistence puzzle.

V Conclusions

The current account persistence puzzle can arise for one or more of three reasons: (a) current account imbalances do not induce corrective real exchange rate movements; (b) real exchange rates do not move further under floating; and (c) larger real exchange rate movements do not induce bigger shifts in the current account balance. We have shown that (a) is primarily responsible for the puzzle: our results suggest that real exchange rates do move further under floating, and that current account imbalances are less persistent when real exchange rate movements are larger, so (b) and (c) hold. It is true that real exchange rates show evidence of mean reversion, particularly under floating, so that a real exchange rate shock should ultimately correct itself (although not immediately, because real exchange rate movements are persistent); but current account imbalances can arise from a variety of other types of shock, and our evidence suggests that the real effective exchange rate is not particularly sensitive to current account imbalances. Our results are robust to the choice of regime classification scheme, allowing time variation of equilibrium values using a Hodrick-Prescott filter, and to recent regime switches.

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Appendix

Table A. Country List

Industrial

Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, United Kingdom, United States

Financial Offshore

Antigua and Barbuda, Bahamas, Belize, Cyprus, Grenada, Malta, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Samoa, Singapore

Oil Exporting

Algeria, Bahrain, Ecuador, Equatorial Guinea, Gabon, Iran, Nigeria, Saudi Arabia, Trinidad and Tobago, Venezuela

Emerging Markets

Bulgaria, Chile, China, Colombia, Czech Republic, Hungary, Israel, Malaysia, Mexico, Morocco, Pakistan, Philippines, Poland, Russia, South Africa, Ukraine, Uruguay

Other Developing

Armenia, Bolivia, Burundi, Cameroon, Central African Republic, Costa Rica, Cote d'Ivoire, Croatia, Dominica, Dominican Republic, Fiji, Gambia, Georgia, Ghana, Guyana, Lesotho, Macedonia, Malawi, Moldova, Nicaragua, Papua New Guinea, Paraguay, Sierra Leone, Slovak Republic, Solomon Islands, Togo, Tonga, Tunisia, Uganda, Zambia