

Current Account Assessments: Methodologies and Issues

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June 2012

The views expressed here do not necessarily reflect those of the IMF, its board of directors, or management. Much of the material in this presentation draws on work by the open economy division of the research department of the IMF. Thanks to Olivier Blanchard, Jonathan Ostry, Steve Phillips, Luca Ricci, Mitali Das, Jungjin Lee, and IMF seminar attendants for many valuable comments. All errors are mine.

I. Aim of the Presentation

- To provide a encompassing framework that nests existing current account empirical models.
- Distinguish them, with special focus on extensions underpinning the external balance assessment (EBA) methodology recently developed by IMF staff.
- Evaluation of these extensions, esp. the interpretation of regression residuals and the role of policy “gaps”.
- Discuss further extensions.

Presentation's Road Map

I. The S-I Framework:

Bare-Bone Models (IMF's CGER) &
Extensions (inc. EBA pilot model)

II. Data and Estimation Approach

III. Gap Estimates and Robustness

IV. Interpreting Residuals

V. Road Ahead

II. The S-I Model

- Long-standing work-horse, in the IMF and elsewhere (Isard and Faruquee, 1998; Isard et al.; 2001; Chinn & Prasad, 2003; Bussière et al., 2004; Lee et al., 2008; Christiansen et al, 2009; Brissimis et al., 2010; Cheung et al., 2010)
- Used in its bare-bone form in the IMF CGER assessments; variants in recent work on imbalances (Chinn et al, 2011; Lane and Milesi-Ferretti, 2012)
- EBA: extends CGER to take into account global capital market cycles and the role of policy in current account (CA) “gaps”.

- **All** these models can be nested in 1 behavioral equation, 3 accounting constraints, and 1 policy rule equation:

I-S:
$$\frac{CA}{Y}(reer, \tilde{y}^{wo}) = \frac{S}{Y}(nfa, r, x_s) - \frac{I}{Y}(r, reer, x_I) \quad (1)$$

BOP constraint:
$$\frac{CA}{Y}(reer, \tilde{y}^{wo}) + \frac{FA}{Y}(r - r^{wo}, x_{CF}) = \Delta Res \quad (2)$$

Solvency constraint:
$$nfa_t = -E_t \sum_{j=1}^{\infty} \prod_{k=1}^{\infty} \rho_{t+k} \left[tb_{t+j} + \frac{s_{t+j} a_{t+j}}{\rho_{t+j} (1 + r_{t+j}^*)} \right] \quad (3)$$

Multilateral Constraint:
$$\sum_{i=1}^N CA_i = \sum_{i=1}^N \frac{CA_i}{Y_i} \omega_i = 0 \quad (4)$$

where $\sum_{j=1}^N \omega_j^i = 1, \quad \forall i$

Policy rule:

If IT:
$$r_t = r^N + (\alpha_y + \lambda) \tilde{y}_t + \zeta_t \quad (5a)$$

If peg:
$$\begin{aligned} r_t &= i_t^{wo} - E(\pi_{t+1}) = r_t^{wo} - E(\pi_{t+1} - \pi_{t+1}^{wo}) \\ &= r_t^{wo} - f(\tilde{y}_t, \tilde{y}_t^{wo}) \end{aligned} \quad (5b)$$

--> So, the output gap enters via the policy rule.

Without the multilateral constraint, the model solves for 4 variables: CA, REER, NFA, and r .

The reduced-form CA equation is:

$$ca_t = f(nfa_t, \tilde{y}_t, \tilde{y}_t^{wo}, r_t^{wo}, \mathbf{X}_{I_t}, \mathbf{X}_{S_t}, \mathbf{X}_{CF_t}, \Delta res_t) \quad (6)$$

- The model closes with the zero global CA constraint which is applied by setting the weights in equation (4) to $\omega_i = \frac{Y_i}{\sum Y_i}$.
- It can be shown that this constraint is met once all variables that don't up to zero globally (like NFA and TOT) are measured relative to their respective (US\$) weighed global average.
- Then variables like the world output gap and real world interest rate drop out from (6).

Two important things to note:

- One is that the global average counterpart includes the own country. So, variables are NOT measured relative to ROW.

E.g. if country A accounts for 20% of world GDP, the effects of its fiscal balance on the current account will be dampened accordingly: $\gamma[X - (0.2X_{wo} + 0.8X_{ROW})]$

- Still, what typically ROW does matters. So, your policies may be at desirable levels and you may still have a CA gap due to “mis-behavior” elsewhere.

- This general set-up allows us to see the critical difference between models.
- One is the choice of x_I, x_S, x_{CF_t}
- In CGER (as well as Chinn and Prasad, 2003; Chinn et al. 2011; Lane and Milesi-Ferretti, 2012) capital account shifters (x_{CF_t}) had no role.
- The policy “gaps” that enter as I or S shifters (such as capital controls, too little or too much social protection) were not explicitly controlled for.
- They would all go into the residual.

Table 1

	CGER	EBA
Saving shifters (Xs)		
per capita income	X	X
demographics	X	X
oil balance	X	X
actual or expected growth	X	X
financial deepening		
social protection		X
fiscal policy	X	X
Commodity TOT gap		X
Investment Shifters (Xi)		
per capita income	X	X
actual or expected growth	X	X
governance		X
Public Investment Share		
Capital Account Shifters (XCF)		
Global Risk Aversion (VIX)		X
Share in world reserves		X
Capital Controls		X
Output Gap		X
Total No of variables	5	12

- Another “distortion” that would go into the residual – both in CGER and other work – is excessive reserve accumulation.
- But can drive the current account if there is sufficient asset non-substitutability and/or non-trivial capital controls (Reinhardt et al, 2010; Gagnon, 2011; Bayoumi and Saborowski, 2012).
- For they limit the private sector offset of reserve accumulation policies
- Hence there is a case to interact Δr with K_{con} , and measured viz. world averages – as EBA does.

- Another key distinction pertains to the role of actual policies vs. sustainable/desirable policies in (6).
- In CGER (as well as several other studies), the only policy variable (fiscal) was entered as actual rather than the sustainable policy (P^*).
- But relevant policies are more than just fiscal policy.
- And besides including a host of actual policy variables in the regression, *these need not be their desirable/sustainable levels*. Hence some adjustment must be made for that.
- This is what EBA does.

- In EBA, the inclusion of actual NFA in the regression also allows for the inter-temporal budget constraint to play a role.
- From eq. 3.a, this term is positive if $r > a$, but should be unambiguously negative in the **tb** equation.
- We show that this holds true in the estimates below.
- But including actual policies in the regression raises the question of how to interpret the regression residual and issue of positive vs normative interpretation thereof. This is discussed below.

II. Data and Estimation

❑ Initial Sample of 58 Countries (vs. CGER=54), including

- Major emerging markets
- Individual euro area countries
- Five financial centers (Bel, HK, Netherlands, SG, SWZ)

❑ For estimation purposes, we:

- Lose Hong-Kong and 7 EMs for which we do not (yet) have some series (e.g. “social variables” and inflow capital control series)

➔ Final Estimation Sample: 50 countries.

- ❑ Estimation Period: 1986-2010, annual data
(CGER as well as Chinn et al., use of 4-year averages)
- ❑ Panel Regressions with no fixed effects and homogenous slope coefficients (we check that).
- ❑ GLS Estimates with country-specific AR1 correction and heteroskedastic residuals that are cross-country correlated.
- ❑ Relevant variables measured viz foreign counterparts to facilitate global consistency, as discussed.

Table 2. EBA Model: Current Account Regression Results 1/

(Estimation Period: 1986-2010)

L. NFA/GDP	0.04 ***
L. (NFA/GDP)*(dum=1 if NFA/GDP < -60%)	-0.03 **
Financial Center Dummy	0.03 ***
L. Own per capita GDP/US per capita GDP (PPP)	0.04 ***
Oil Trade Balance/GDP (if >10%)	0.48 ***
Dependency Ratio	0.00
Population Growth	0.04
Aging Speed	0.13 ***
Real GDP growth, 5-year ahead forecast	-0.40 ***
L.Public Health Spending/GDP	-0.57 ***
L.VOX*(1-Kcontrol)	0.06 ***
L.VOX*(1-Kcontrol)*(currency's share in world reserves stock)	-0.16 ***
Own currency's share in world reserve stock	-0.004
Output Gap	-0.39 ***
Terms of Trade gap*Trade Openness	0.25 ***
Cyclically Adjusted Fiscal Balance, instrumented	0.42 ***
Capital Control Index ("Kcontrol")	0.03 ***
Kcontrol*(Changes in Reserves)/GDP, instrumented	0.48 **
Constant	0.009
Observations	1099
R-Squared	0.56
RMSE	3.4%
AR(1)	0.68
Number of countries	50

1/ GLS estimates with panel heteroskedasticity corrected standard errors.

"L" stands for one-year lag of the respective variable.

* significant at 10%; ** significant at 5%; *** significant at 1%

Comparison with Stripped-down CGER

EBA

(no dummies)

$R^2=0.56$

$R^2_{adj}=0.54$

$\rho =.68$

CGER

(no dummies)

$R^2=0.40$

$R^2_{adj}=0.39$

$\rho =.74$

Figure 1. Actual VS Fitted CA/GDP for 2008-2010

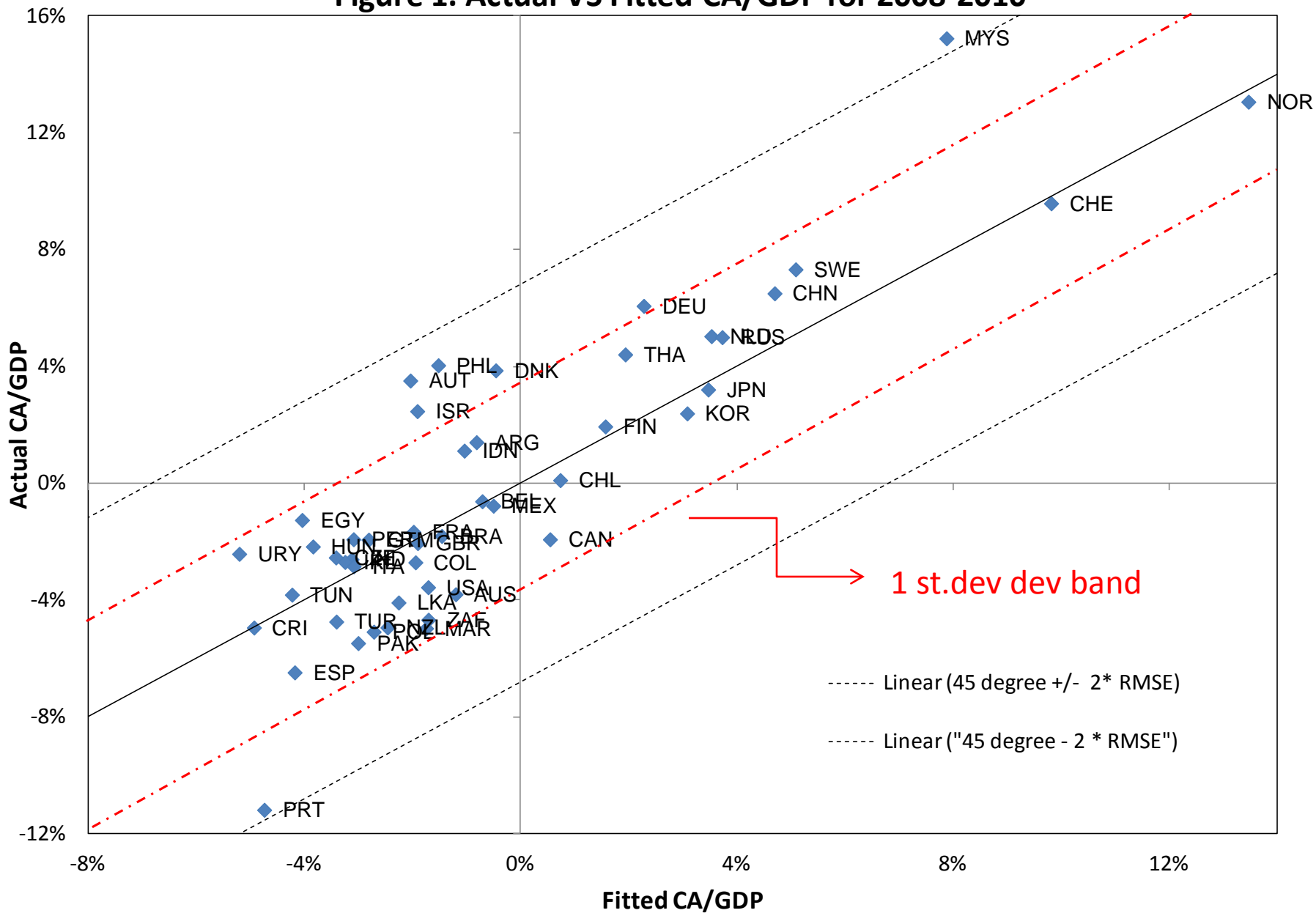
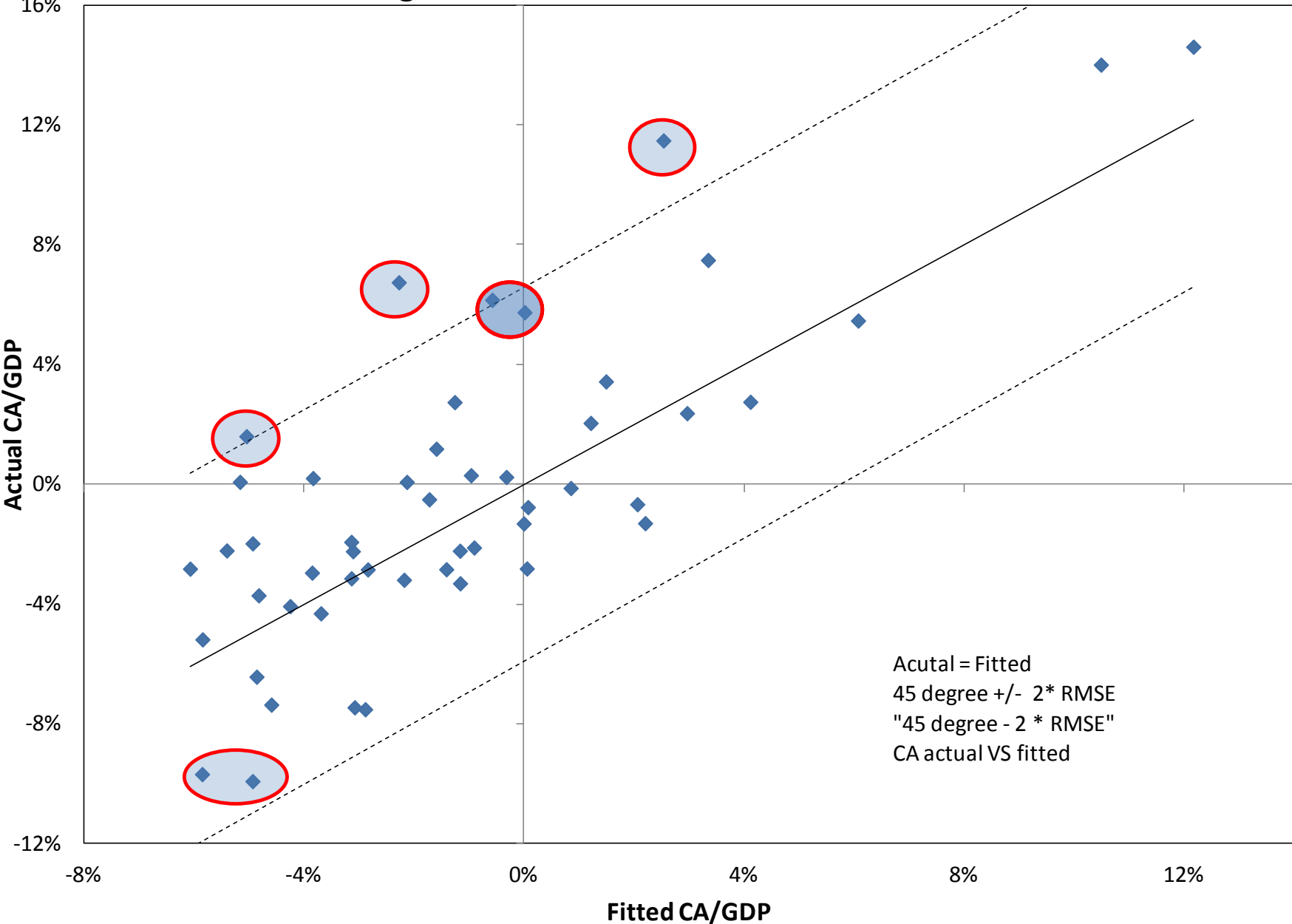


Figure 2. 2011: Actual VS Fitted CA/GDP



Robustness

- Endogeneity/Instrumenting
- Homogeneity Assumptions
- Feedback of lagged NFA on TB
- Multilateral Consistency

- Two ways of relaxing the (potential) straightjacket of coefficient homogeneity across countries.

1) through variable interaction. E.g.: $VIX * Kcon$ and $VIX * Reserve\ currency$, $TOT * openness$, etc.

→ Good results there.

2) Relax the assumption that the AR1 coefficient is the same.

→ Gains seem meagre enough.

Table 3.a Group Specific AR(1) Estimates	
Advanced Countries	0.69
Euroarea	0.74
Non-euro Advanced	0.68
Emerging Markets	0.62
Overall Mean	0.66

Table 2. EBA Model: Trade Balance Regression Results 1/

(Estimation Period: 1986-2010)

L. NFA/GDP	0.01
L. (NFA/GDP)*(dum=1 if NFA/GDP < -60%)	-0.04 **
Financial Center Dummy	0.03 ***
L. Own per capita GDP/US per capita GDP (PPP)	0.08 ***
Oil Trade Balance/GDP (if >10%)	0.37 ***
Dependency Ratio	-0.14 **
Population Growth	0.05
Aging Speed	0.13 ***
Real GDP growth, 5-year ahead forecast	-0.30 ***
L.Public Health Spending/GDP	-0.11
L.VOX*(1-Kcontrol)	0.06 ***
L.VOX*(1-Kcontrol)*(currency's share in world reserves stock)	-0.18 ***
Own currency's share in world reserve stock	-0.01
Output Gap	-0.39 ***
Terms of Trade gap*Trade Openness	0.28 ***
Cyclically Adjusted Fiscal Balance, instrumented	0.80 ***
Capital Control Index ("Kcontrol")	0.03 ***
Kcontrol*(Changes in Reserves)/GDP, instrumented	0.32 *
Constant	0.009
Observations	1099
R-Squared	0.43
RMSE	3.8%
AR(1)	0.78
Number of countries	50

1/ GLS estimates with panel heteroskedasticity corrected standard errors.

"L" stands for one-year lag of the respective variable.

* significant at 10%; ** significant at 5%; *** significant at 1%

IV. Interpreting Residuals

- Depends on the Model Set-up

- One approach:
$$\frac{CA_t}{Y_t} = \alpha + \beta F_t + e_t \quad (8)$$

e_t = omitted fundamentals and policy variables + private sector excesses + other errors. So **all bad stuff** (as in CGER)!

CGER: $F_t \subseteq \{x_s, x_I\}$; adds P = only actual T-G.

- EBA approach:

$$\frac{CA_t}{Y_t} = \alpha + \beta F_t + \gamma P_t + u_t \quad (10)$$

$$= \alpha + \beta F_t + \gamma P_t^* + \underbrace{u_t + \gamma(P_t - P_t^*)}_{\text{EBA gap}}$$

EBA gap

- So, you proceed in three steps:
 - 1) Estimate (10) to get u , where $\mathbf{F} \subseteq \{nfa, \mathbf{x}_s, \mathbf{x}_I, \mathbf{x}_{CF}\}$
& \mathbf{P} encompasses more than just T-G.
 - 2) Get P^* (e.g. from IMF country teams).
 - 3) Then add $\hat{\gamma} (P - P^*)$ to in order to obtain the **EBA gap**.

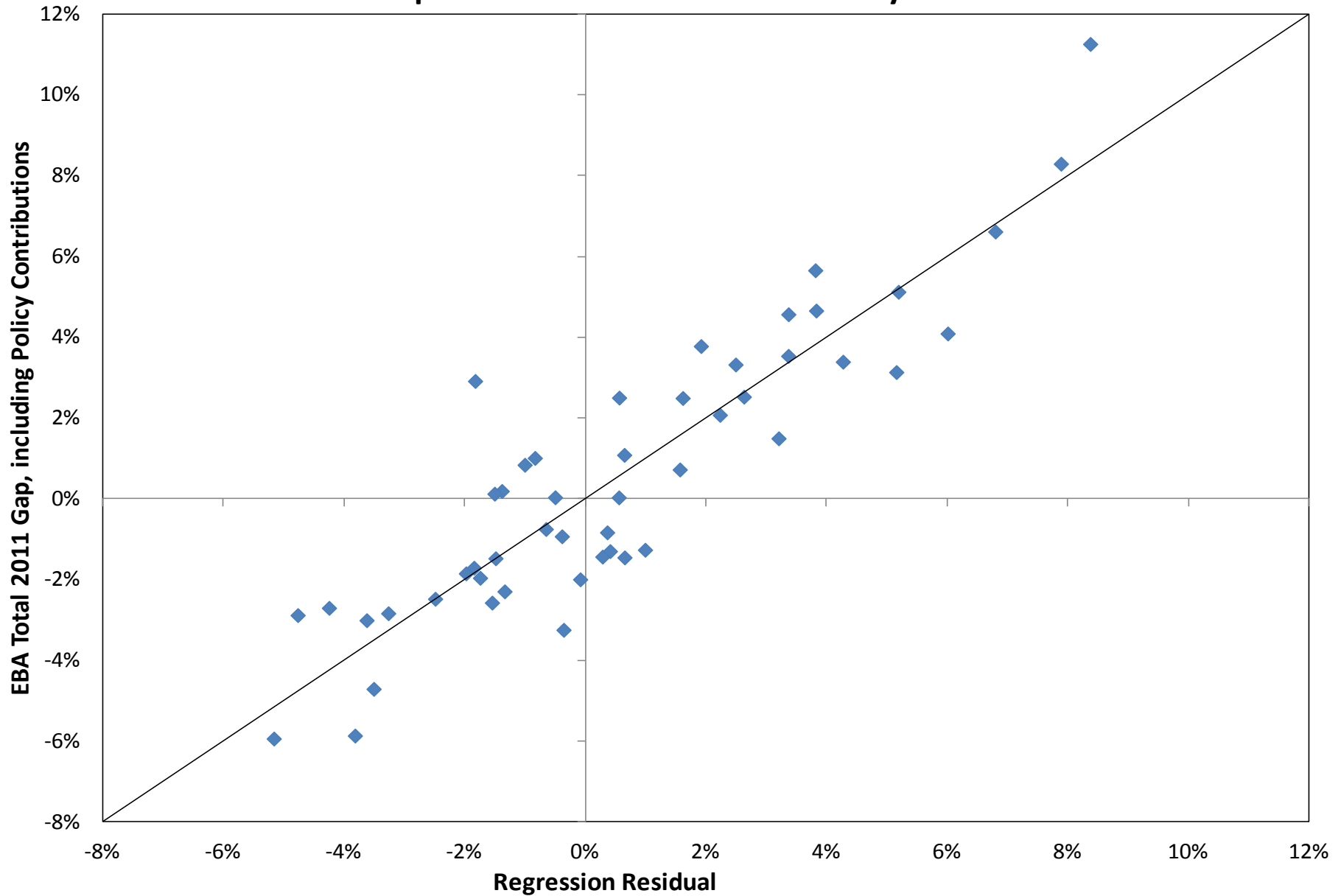
Four Important Points about EBA gaps

- If $u=0$ you don't necessarily give a country a pass if $P-P^* \neq 0$.
- P_t^* has a non-trivial normative content, i.e., means what a country's desired policy should be, in terms of mitigating/avoid distortions and be "sustainable".
- Because P^* is also measured relative to the world, what others do in terms of their own P^* will affect your CA.
- Because of the above and also because u contains our measure of ignorance and possible specification and/or measurement errors, a tolerance band must be allowed, including room for discussion/policy judgment as to the final assessment.

In short:

- The policy-adjusted EBA residual now becomes the relevant assessment metric, rather than u_t .
- As it turns out, often **the residual of the reg (10) is typically the dominant component in the EBA gap** when that gap is large.
- This again raises the stakes regarding the normative/positive issues in interpreting the residual.

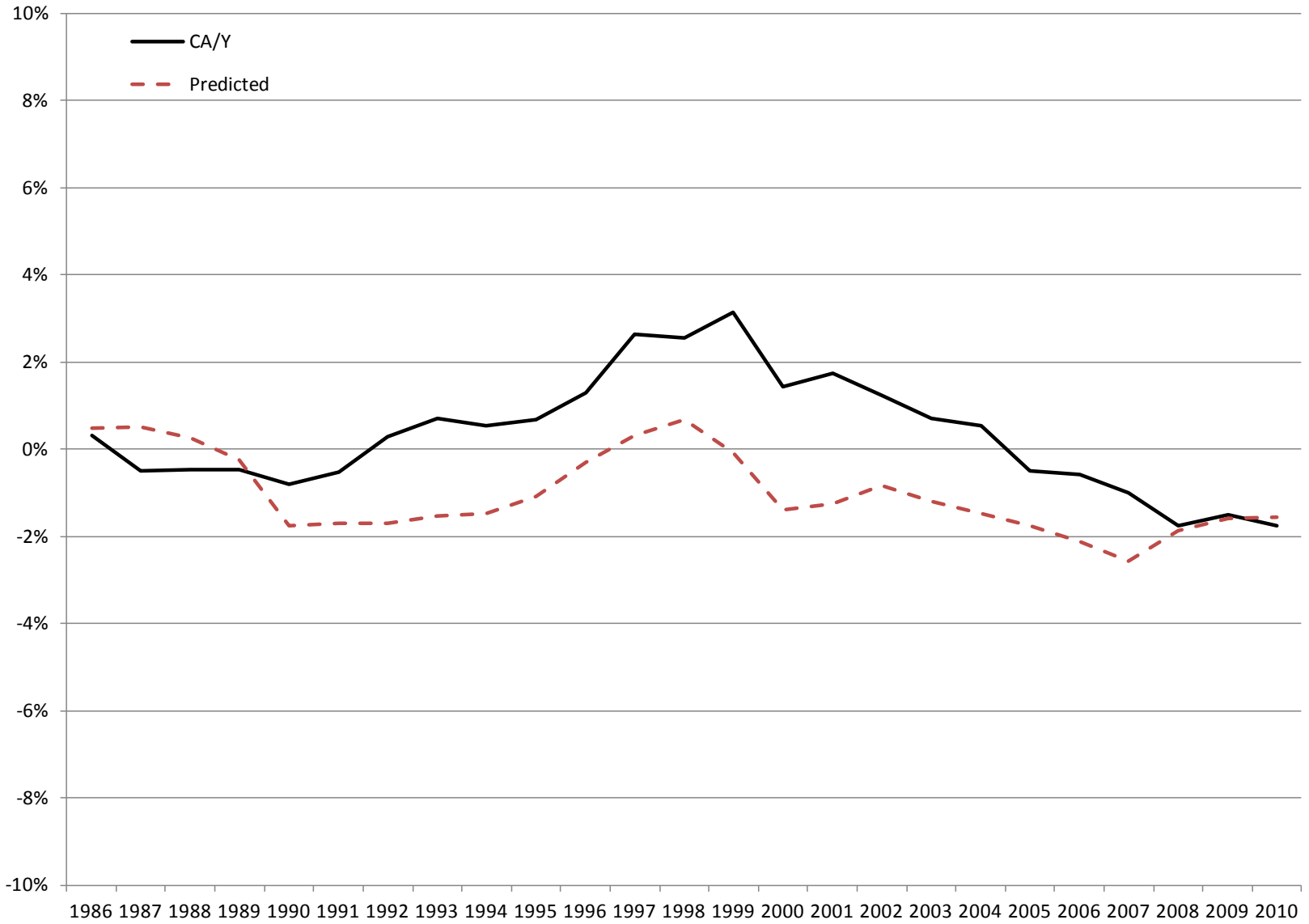
EBA 2011 Gaps : Actual Policies VS With Policy Contributions



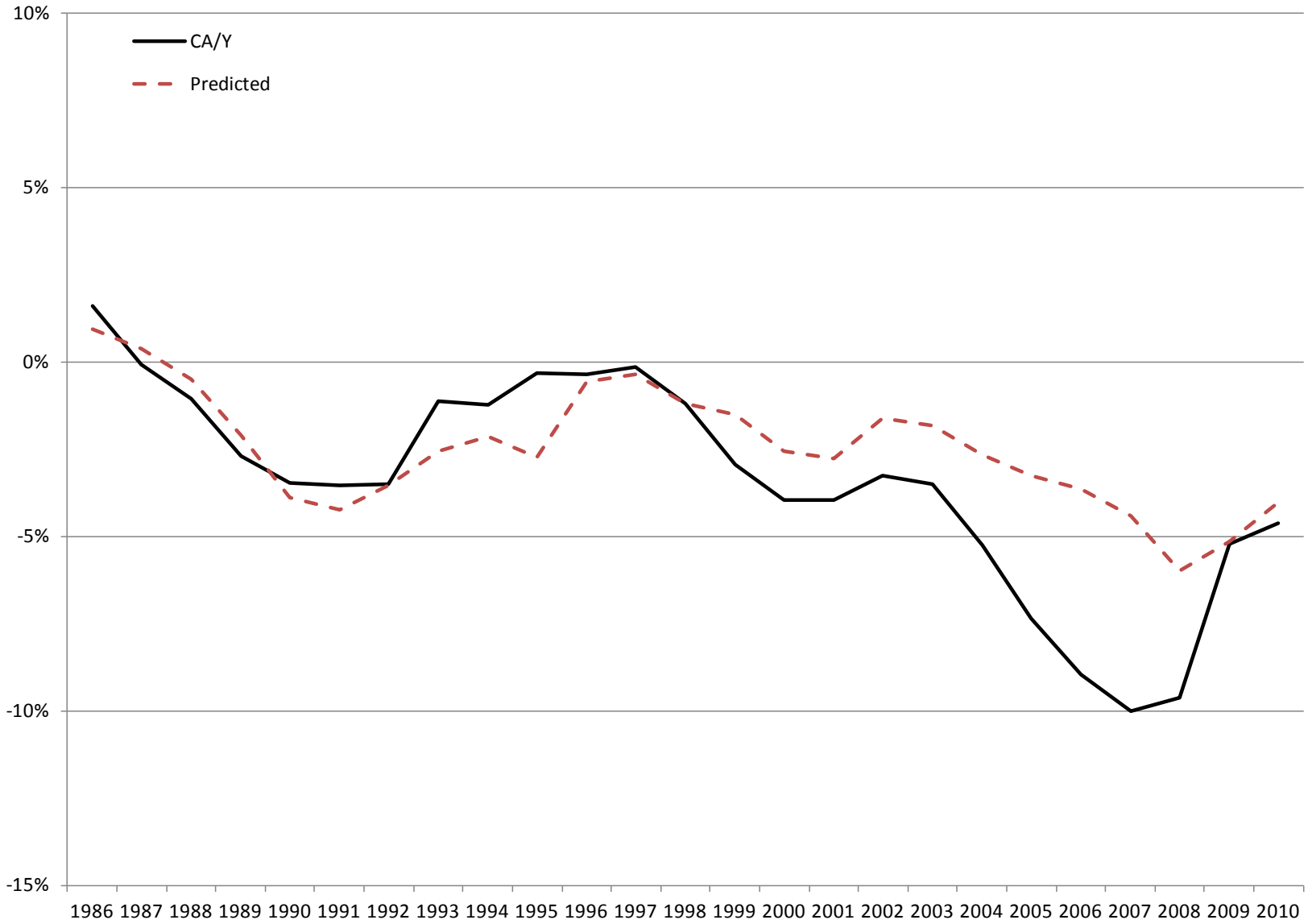
V. Road Ahead

- Fit of extended CA model is generally good, also relative to others (e.g.. Cheung et al., 2010; Chinn et al., 2011)
- Also reg. residuals appear to have some good predictive power over crises (ongoing work)
- Yet, for a handful of countries, the fit could probably be improved.
- Let's look at a handful of cases.
- Recall: no country or crisis dummies, and no LDV.

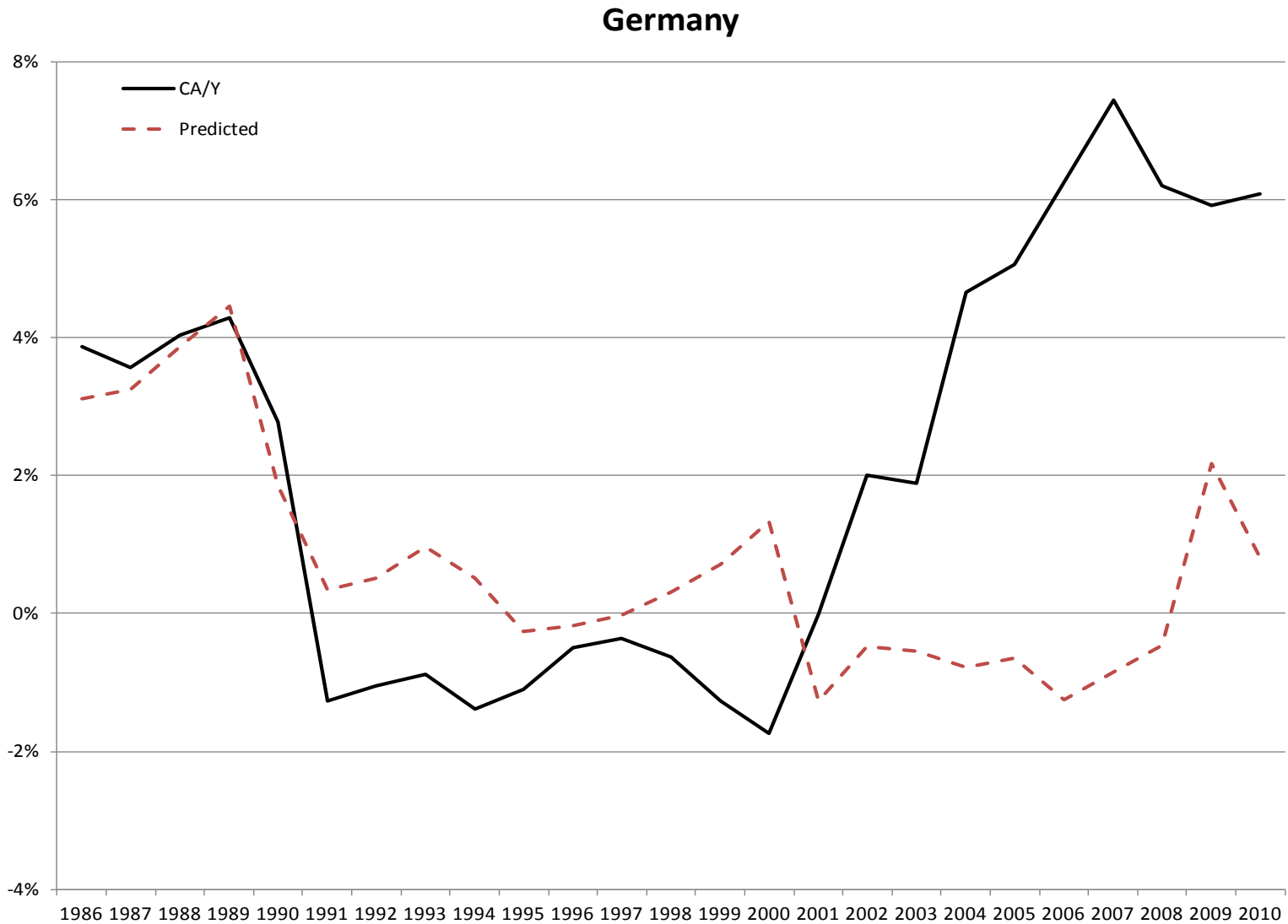
France



Spain



Yet, a case where the fit deteriorates half-way



- There are also cases where the mean fitted CA is substantially lower than actual CA throughout 1986-2010.
- The regression also tends to have a harder time in predicting the large (and sometimes long-lasting) current account surpluses that follow some financial crises, and crisis dummies seem to do a paltry job at that.
- But some good news even there: regression residuals do point to an over-valuation in the run-up to most (if not all) of these crises!

How about some “fixes”?

- Adding the LDV is one and there is some theory in support. But without fixed effects is problematic because soaks in FEs.
- On the other hand, adding the LDV with FE’s just throws the baby out with the water.
- So, the way to go seem to look for economically sensible quasi-fixed effects in some cases; and better controls for time variations in others.

- Post-financial crisis mis-fits do suggest that controls for overshooting and undershooting of domestic credit may be an important future add-on.
- Other quasi-fixed effects may also be worth exploring given very long-run patterns.
- For instance, Germany's century-long surpluses, Australia's century-long deficits, etc.

Thanks.