Debt Reduction, Fiscal Adjustment and Growth in Credit-Constrained Economies

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I. Motivation of the Paper

- The literature is not abundant regarding the interactions between fiscal policy, financial conditions and growth. Recent studies in this area have focused on:
  - **The reaction of financial markets to fiscal policy** (e.g: Ardagna, 2004; Alesina &Ardagna,2010, Cotarelli and Jaramillo, 2012; Corsetti et al, 2012).
  - **The effect of financial crises on fiscal policy** (e.g: Reinhart &Rogoff, 2009; Baldacci et al. 2009; Laeven&Valencia, 2008, 2012; Barrios et al.,2010).
  - **The impact of financial crises on fiscal multipliers** (e.g.; IMF, 2012; Cotarelli and Jaramillo, 2012; Corsetti, Meier and Mueller, 2012; Buam et al, 2012; Guajardo, et al, 2012; Blanchard and Leigh, 2013).

I. Motivation of the Paper

- At the same time, the preoccupation with debt accumulation and debt reduction has fostered new work in this area.

  – **Factors that help shorten debt reduction episodes**: (e.g: Baldacci et al, 2011, 2012; Eyraud and Weber, 2013)

  – **Factors that help reduce debt ratios**: (e.g: Escolano, 2010; IMF, 2012; IMF, 2013)

- We build on this work and tackle these issues from a different angle: **How does fiscal policy contribute to medium term growth, in a context of debt deleveraging and credit constraints?**

II. Paper's Contribution:

- **We work with a new sample**: the paper is based on public debt reduction episodes (driven by fiscal adjustments) in 107 countries during 1980-2012.

- **We focus on medium term growth**: the paper assesses fiscal consolidation effects on medium-term growth (3 and 5 years after the end of debt reduction episodes).

- **We confirm previous findings**: the paper shows that sizable deficit cuts harm subsequent growth. And gradual adjustments are better for medium term growth.

- **And we identify new interactions**: the paper demonstrates that in the presence of credit constraints, fiscal adjustments have to rely on a mix of revenue and expenditure measures to support growth.

III. Data and Descriptive Analysis

- Sample of **107 advanced and emerging economies**. Identified **160 episodes of debt reduction**.

- We excluded countries which benefitted from debt relief, and **selected only those episodes driven by improvements in the CAPB**.

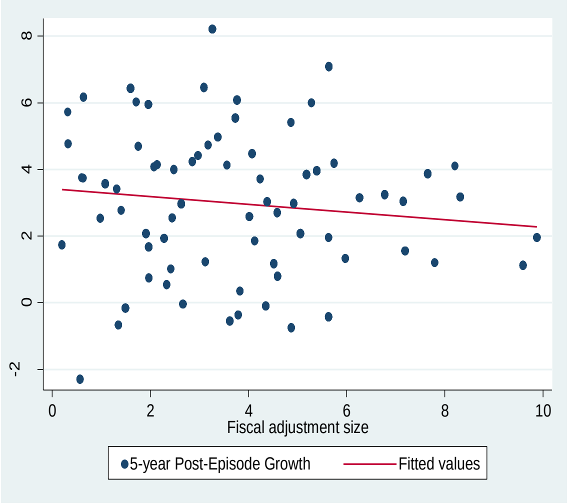
- **Final sample covered 79 episodes**, with an average duration of about 3.5 years.

- **Average fiscal consolidation during the episode was 3.9 percent** of GDP; mostly owing to expenditure based adjustments (53 percent).

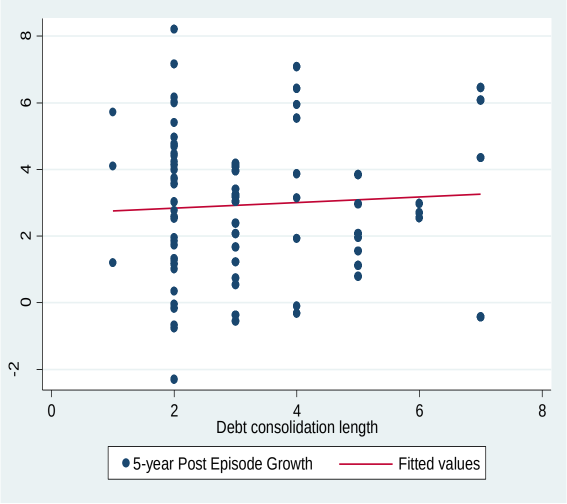
- **The average GDP growth was around 3 percent five years** following the end of the debt-reduction episode.

III. Data and Descriptive Analysis

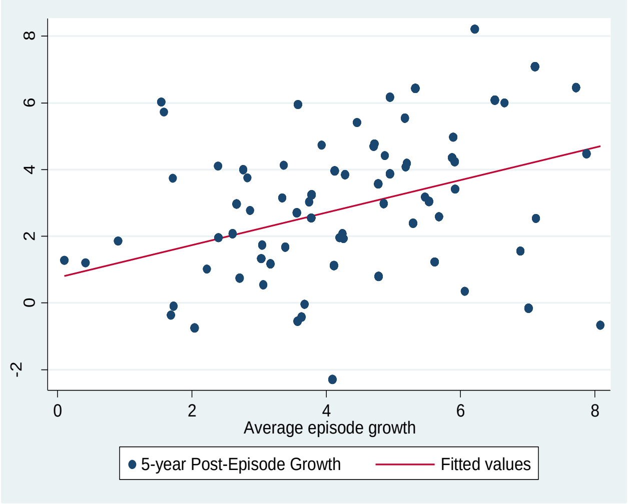
- Fiscal adjustment size is negatively associated with post-episode output growth, but gradualism and contemporaneous growth are positively related with subsequent output performance.



Size and growth (-)



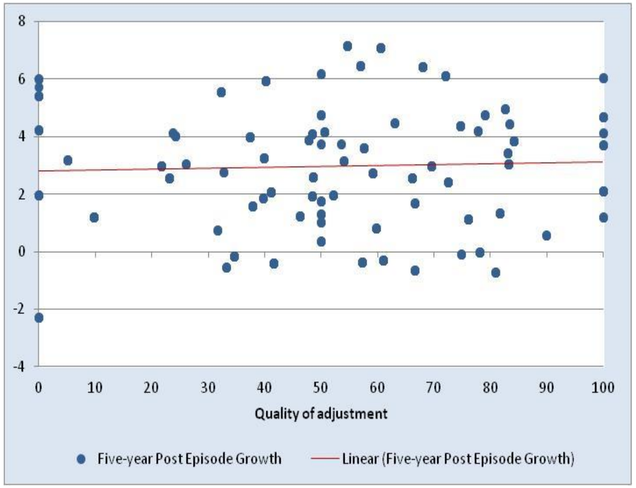
Duration and growth (+)



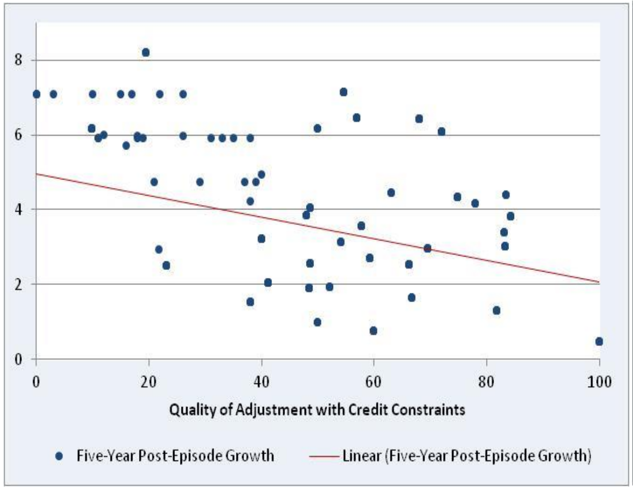
Episode GDP and growth (+)

III. Data and Descriptive Analysis

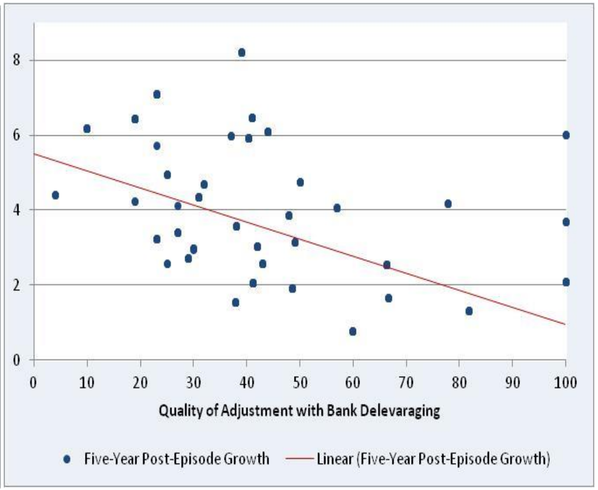
•The quality of fiscal adjustments and the growth of credit are positively associated with medium term output performance. This relationship is reversed in the presence of credit constraints.



Quality and growth (=)



Quality, credit constraints and growth (-)



Quality, bank deleveraging and growth (-)

IV. The Model

$$g_{i,t} = \alpha + \sum_{l=1}^{k} \beta_l CON_{ilt} + \sum_{h=1}^{q} \beta_h ADJ_{iht} + \sum_{j=1}^{m} \beta_j FIN_{ijt} + \delta \; FIN_{it} ADJ_{it} + \sum_{n=1}^{p} \beta_n BUD_{\text{int}} + u_{it}$$

- **Control variables :** debt distance from target; average annual GDP growth.

- **Adjustment variables:** episode duration; size of deficit cut; quality of fiscal adjustment.

- **Financial variables:** domestic credit growth; bank deleveraging.

- **Interactions:** quality of fiscal adjustment (x) financial variables.

- **Budget composition variables:** change in budget mix during the episode.

V. Key Results –*Baseline model*

- **Size is negative:** A 1-percent of GDP reduction in fiscal deficit during the episode reduces average medium-term growth by 0.27 percentage points.

- **Gradualism seems better:** However, one more year in the duration of the debt consolidation episode raises average growth by 0.22 percentage points in the subsequent five-year period.

- **Quality shows a mixed result**: A 1 percent increase in the quality of the adjustment, increases medium term growth by 0.32 percentage points. **But this effect can turn negative in the presence of credit constraints.**

V. Key Results –*Baseline model*

	Model 1	Model 2	Model 3	Model 4
Initial distance from debt target	0.00730	0.00383	0.0142**	0.0113*
	(1.312)	(0.747)	(2.082)	(1.771)
Duration of debt consolidation	0.228***	0.330***	0.175**	0.272***
	(3.495)	(5.386)	(2.365)	(3.841)
Size of deficit cut	-0.276***	-0.278***	-0.282***	-0.300***
	(-5.903)	(-6.488)	(-4.996)	(-5.674)
Contemporaneous Growth	0.491***	0.516***	0.513***	0.536***
	(8.188)	(9.370)	(7.050)	(7.869)
Quality of fiscal adjustment	0.0329***	0.0295***	0.0298***	0.0384***
	(3.247)	(6.033)	(3.758)	(6.587)
Quality* Credit constraints		-0.0342***		-0.0249***
		(-7.834)		(-5.961)
Quality* Bank deleveraging			-0.0241***	-0.0193***
			(-3.146)	(-2.789)
Constant		0.523	0.347	-0.00887
		(1.379)	(0.618)	(-0.0168)
Number of obs.	330	330	245	245
R-squared	0.299	0.411	0.406	0.484
Prob > F	0.0000	0.0000	0.0000	0.0000

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

V. Key Results – *Augmented model*

- **Increasing direct tax collection** as a percentage of total revenue is positive for medium term growth.

- **Increasing the share of spending on wages, is harmful** for output expansion.

- **The share of transfers** has a positive effect on medium term growth (demand-side channel).

- **Tilting expenditure towards public investment** also spurs medium term output (supply-side channel).

V. Key Results –*Augmented model*

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Initial distance from debt target	0.0147**	0.0156**	0.00961	0.0121*	-0.0173*	0.0105
	(2.640)	(2.706)	(1.650)	(1.741)	(1.810)	(1.007)
Duration of deficit cut	0.286***	0.306***	0.232***	0.266***	0.187**	0.257***
	(4.699)	(4.747)	(4.746)	(3.798)	(2.892)	(3.789)
Size of deficit cut	-0.279***	-0.276***	-0.295***	-0.322***	-0.191***	-0.290***
	(3.525)	(3.554)	(3.537)	(3.531)	(3.671)	(3.605)
Contemporaneous Growth	0.479***	0.496***	0.545***	0.592***	0.532***	0.502***
	(3.696)	(3.733)	(3.687)	(3.704)	(3.763)	(3.823)
Quality of fiscal adjustment	0.0340***	0.0337***	0.0390***	0.0396***	0.0315***	0.0462***
	(3.603)	(3.689)	(3.592)	(3.584)	(3.770)	(3.848)
Quality* Credit growth	-0.0264***	-0.0288***	-0.0295***	-0.0299***	-0.0334***	-0.0307***
	(3.414)	(3.421)	(3.425)	(3.416)	(3.469)	(3.514)
Quality * Bank deleveraging	-0.0145**	-0.0111***	-0.0147**	-0.0112***	-0.0144**	-0.0182***
	(2.369)	(3.374)	(2.184)	(3.376)	(2.221)	(3.412)
Change in direct taxes (1)	0.0366***					
	(3.122)					
Change in taxes on goods and services (1)		-0.0298				
		(-0.809)				
Change in goods & services expenditures (1)			-0.0383			
			(-0.432)			
Change in wage expenditures (1)				-0.0756***		
				(3.264)		
Change in transfers expenditures (1)					0.014***	
					(3.352)	
Change in public investment expenditures (1)						0.0454**
						(2.209)
Constant	-0.385	-0.454	0.0930	-0.264	0.927	0.0652
	(0.534)	(0.611)	(0.535)	(0.541)	(0.688)	(0.549)
Number of obs.	245	245	240	240	190	212
R-squared	0.503	0.488	0.485	0.497	0.433	0.508
Prob > F						

VI. Robustness

- Different estimation methods (fixed and random effects; robust errors)
- High unemployment countries (durable cuts are more harmful)
- High-tax countries (high initial debt is more harmful)
- Non-debt reduction countries (weaker quality effect)
- **Post-crisis episodes** (higher effect of credit constraints)
- High-credit constraint episodes (size and quality are more harmful)
- **Countries that apply structural reforms** (adjustment not as important and the role of public investment is reinforced).
- Enlarged sample of debt-reduction episodes (main results hold)

VI. Robustness – *Subsample of Post-crisis episodes*

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Initial distance from debt target	0.0196***	0.00206	0.0182***	0.0153***	0.0197*	0.00862
	(3.204)	(0.311)	(3.187)	(2.609)	(1.891)	(1.386)
Duration of deficit cut	0.338***	0.164**	0.317***	0.312***	0.334***	0.338***
	(5.083)	(2.329)	(4.829)	(4.369)	(3.934)	(4.420)
Size of deficit cut	-0.331***	-0.373***	-0.296***	-0.328***	-0.294***	-0.290***
	(-6.252)	(-7.508)	(-6.351)	(-6.938)	(-3.775)	(-5.641)
Contemporaneous Growth	0.468***	0.685***	0.480***	0.489***	0.494***	0.361***
	(7.804)	(10.69)	(8.091)	(8.056)	(6.388)	(4.950)
Quality of fiscal adjustment	0.0513**	0.0326*	0.0520**	0.0461*	0.0552*	0.0567**
	(2.190)	(1.941)	(2.565)	(1.888)	(1.717)	(2.651)
Quality* Credit constraints	-0.493***	-0.437***	-0.394***	-0.315***	-0.306***	-0.396***
	(-9.521)	(-8.461)	(-9.199)	(-8.757)	(-8.696)	(-8.425)
Change in direct taxes (1)	0.0234**					
	(2.414)					
Change in taxes on goods and services (1)		-0.0484***				
		(-5.497)				
Change in goods & services expenditures (1)			0.0792***			
			(3.394)			
Change in wage expenditures (1)				-0.0130		
				(-0.519)		
Change in transfers expenditures (1)					0.0592*	
					(1.843)	
Change in public investment expenditures (1)						0.0798***
						(4.932)
Constant	-0.307	1.058**	-0.459	0.0966	-0.782	0.434
	(-0.701)	(2.166)	(-1.012)	(0.195)	(-1.225)	(0.936)
Number of obs.	223	221	219	223	158	197
R-squared	0.554	0.606	0.573	0.540	0.537	0.560

VI. Robustness – *Subsample of Structural reforms*

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Initial distance from debt target	-0.00714	-0.0127*	-0.00469	-0.00551	-0.0109	-0.000574
	(-1.007)	(-1.820)	(-0.722)	(-0.860)	(-1.214)	(-0.0714)
Duration of deficit cut	0.288***	0.189**	0.271***	0.307***	0.262***	0.358***
	(3.658)	(2.215)	(3.300)	(3.996)	(3.037)	(3.829)
Size of deficit cut	-0.166**	-0.187**	-0.156**	-0.169***	-0.263***	-0.258***
	(-2.033)	(-2.402)	(-2.572)	(-2.890)	(-3.017)	(-3.920)
Contemporaneous Growth	0.684***	0.737***	0.664***	0.678***	0.690***	0.455***
	(8.661)	(9.580)	(8.791)	(8.880)	(6.886)	(4.227)
Quality of fiscal adjustment	0.00704	0.00140	0.00902*	0.00992	0.0249*	0.00582
	(0.878)	(0.170)	(1.915)	(1.304)	(1.924)	(1.497)
Quality* Credit constraints	-0.0151***	-0.00935*	-0.0157***	-0.0166***	-0.00859*	-0.00683*
	(-2.651)	(-1.837)	(-2.922)	(-3.050)	(-1.736)	(-1.856)
Change in direct taxes (1)	-0.00725					
	(-0.650)					
Change in taxes on goods and services (1)		-0.0514***				
		(-2.959)				
Change in goods & services expenditures (1)			0.0241			
			(0.888)			
Change in wage expenditures (1)				-0.0194		
				(-0.873)		
Change in transfers expenditures (1)					0.0697**	
					(2.049)	
Change in public investment expenditures (1)						0.0937***
						(4.639)
Constant	0.147	0.826	0.103	-0.0795	-0.557	1.675**
	(0.254)	(1.181)	(0.187)	(-0.140)	(-0.763)	(2.269)
Number of obs.	159	157	165	165	120	135
R-squared	0.440	0.495	0.445	0.445	0.530	0.478

VII. Policy implications

- **Sizeable and expenditure based adjustments are harmful in the presence of credit constraints**, when the reduction of public sector activity cannot be substituted by a crowding-in of the private sector.

- **Therefore, deficit cuts should be gradual, and balanced**. Focus on cutting non-priority spending and protecting pro-growth public investment is even more important.

- **Increase in direct tax collection is also needed**. It can help reduce debt and thus boost subsequent growth. Focus on removing tax exemptions, lowering incentives for tax avoidance and evasion, and shifting tax pressure away from labor.

- **Structural reforms are also crucial**. They reduce the importance of the adjustment strategy and help medium term growth.

Thank you!

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