Appendix for

Catching Up by 'Deglobalizing': Capital Account Policy and Economic Growth

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A.1 Model equilibrium with no reserve accumulation or capital control

To establish a benchmark, consider a case with no capital account policy: suppose there is no reserve accumulation (with government choosing $RSRV_1^* = 0$), and suppose there is no capital control preventing private agents from purchasing foreign assets. The logic for the equilibrium under this policy configuration will be similar to that for the case in section 2.3 of the main text, where there likewise was no capital control restriction.

Given household access to the global financial market, traded good consumption follows the intertemporal Euler equation (5), which indicates intertemporal smoothing:

$$C_0^T = C_1^T.$$

Apply this conclusion to set equal to each other the right-hand sides of the resource constraints for each period (14) and (15), in the case where $RSRV_1^* = 0$:

$$Y_0^T + D_1^* = Y_1^T - \ (1 + r^*)D_1^*,$$

and solve for D_1^*:

$$D_1^* = -(Y_0^T - Y_1^T)/(2 + r^*).$$

This condition indicates that if traded goods output were constant across periods, then private foreign borrowing and trade balance in the initial period would be 0: $D_1^* = 0$ and $C_0^T = Y_0^T$.

We now verify this is an equilibrium allocation, by confirming the converse is also true: if $D_1^* = 0$ and the trade balance is zero, then there is no learning-by-doing, so traded goods output will be constant across periods.

The household intratemporal optimality condition (4) implies that traded goods consumption will be:

$$C_0^T = P_0^N C_0^N.$$

Use the firm optimality condition (9) indicating that $P_0^N = \bar{A}_0$,

$$C_0^T = \bar{A}_0 C_0^N.$$

Use the market clearing conditions for nontraded goods (13) and labor (16) to write:

$$C_0^T = \bar{A}_0 L_0^N = \bar{A}_0(1 - L_0^T).$$

Substitute this into the traded goods resource constraint (14):

$$\bar{A}_0(1 - L_0^T) = \bar{A}_0 L_0^T + D_1^*.$$

Under the conjecture that $D_1^* = 0$, we solve for labor: $L_0^T = \frac{1}{2}$. This implies that productivity in the next period is:

$$A_1 = \bar{A}_0(2L_0^T)^{\vartheta} \quad = \bar{A}_0,$$

so there is no productivity change between periods.

Since the productivity is constant across periods, the equilibrium conditions for period 1 are the same as those for period 0 above. So we know that the labor allocation will be $L_1^T = \frac{1}{2}$. This is easily verified below.

Just as in period 0, the household intratemporal optimality condition (4) implies that traded goods consumption in period 1 will be:

$$C_1^T = P_1^N C_1^N.$$

Use the firm optimality condition (9) indicating that $P_1^N = W_1 = A_1$, and since here $A_1 = \bar{A}_0$,

$$C_1^T = \bar{A}_0 C_1^N.$$

Use the market clearing conditions for nontraded goods (13) and labor (16) to write:

$$C_1^T = \bar{A}_0 L_1^N = \bar{A}_0(1 - L_1^T).$$

Substitute this into the traded goods resource constraint (14) under the condition above that $D_1^* = 0$:

$$\bar{A}_0(1 - L_1^T) = \bar{A}_0 L_0^T.$$

Solve for labor: $L_1^T = \frac{1}{2}$. So $Y_1^T = \frac{\bar{A}_0}{2} = Y_0^T$. This confirms that output is the same across periods. And it confirms our conjectured solution, with $D_1^* = 0$ and $L_0^T = L_1^T = \frac{1}{2}$.

A.2 Deriving traded goods labor assuming reserve accumulation but no capital control

Steps to derive equilibrium labor allocated to the traded goods sector in period 1 mirrors those followed in the text for period 0. The household intratemporal optimality condition (4) implies that traded goods consumption in period 1 will be: $C_1^T = P_1^N C_1^N$. Use the firm optimality condition (9) indicating that $P_1^N = A_1$, and the fact that $A_1 = \bar{A}_0$ to conclude $C_1^T = \bar{A}_0 C_1^N$. Use the market clearing conditions for nontraded goods (13) and labor (16) to write: $C_1^T = \bar{A}_0 L_1^N = \bar{A}_0(1 - L_1^T)$. Substitute this into the traded goods resource constraint (14) under the condition above that $RSRV_1^* - D_1^* = 0$: $\bar{A}_0(1 - L_1^T) = \bar{A}_0 L_0^T$. Solve for labor: $L_1^T = \frac{1}{2}$.

A.3 Data Construction

For real GDP, TFP growth and real undervaluation, we incorporate *Penn World Table* 10. More specifically, we use *rgdpo* as our baseline gdp measure and use *rtfpna* for tfp measure. For the real exchange rate, we incorporate *PL_CON* divided by the nominal exchange rate to USD as our baseline measure.

For sectoral value added, price index, and labor, we construct our data from multiple different sources; Groningen Growth and Development Centre (GGDC) 10-sector, Economic Transformation Database (ETD), EU KLEMS, KLEMS (WIWW), World Input Output Database (WIOD), and OECD structural Analysis Database (STAN). In general, there are slight discrepancies between data, possibly due to different revisions (for example, ISIC Rev.3 and ISIC Rev.4) or accounting norms. Thus, we construct the series by its growth rate while merging series from different sources. We calculate real value added by deflating nominal value added by price indices (except for Groningen Growth and Development Centre (GGDC) 10-sector, Economic Transformation Database). To aggregate price indices from the disaggregate sector, we utilize the weights of nominal value added. And to maximize our coverage, we directly incorporate nominal value added and the deflator, instead of incorporating gross output and intermediate input using respective price indices. We note that nominal value added is denominated in current national currencies (millions). Price deflator index is re-anchored at 1995=100. For labor, we use the number of employees or the number of employment engaged (thousands), depending on the data availability.

For EU KLEMS, we take EU KLEMS Growth and Productivity Accounts, March 2007 Release as our benchmark, and update the data with The Vienna Institute for International Economics Studies (WIIW) Productivity data 2022.[23][24] The sectoral data is constructed based on ISIC Rev.3. For the manufacturing sector, we aggregate the industries of 15t16 to 36t37, or industry C.

Groningen Growth and Development Centre (GGDC) 10-sector data (2014 release) comes with three variables, VA, QVA, and EME, which stands for value-added, value added at constant 2005 prices, and persons engaged.[25,26] We supplement the data with Economic Transformation

[23] http://www.euklems.net/.
[24] https://euklems.eu/archive-history/download-archive/?doing_wp_cron=1674302780.6924459934234619140625
[25] https://www.wider.unu.edu/project/etd-economic-transformation-database
[26] https://www.rug.nl/ggdc/productivity/10-sector.

Database (ETD), which is the successor of the Groningen Growth and Development Centre (GGDC) 10-sector data. The data disaggregates business service sector into business services, financial services, and real estate services. So we aggregate these sectors into business service to make the series consistent with the predecessor. Sectoral deflator is calculated by dividing VA with QVA. We use persons engaged (EME) for our measure for labor.

We take November 2016 release of World Input Output Database(WIOD) as our baseline benchmark, and then supplement the WIOD July 2014 release.[27,28] For the manufacturing sector, we aggregate C10-C12 to C33 of ISIC Rev.4 code; and 15t16 to 36t37 of ISIC Rev.3 code.

Lastly, we combine STAN from the OECD data for Norway, Switzerland, New Zealand, Iceland, and Israel.[29] We use SNA08, ISIC Rev.4 data as our benchmark data and supplement with SNA93, ISIC Rev.3 data if needed. For the manufacturing sector, we aggregate D10T33 of ISIC Rev.4 code; and 15tt37 of ISIC Rev.3 code. Table A1 shows the list of the countries.

[27] http://www.wiod.org/home.
[28] Please see Timmer et al. (2015) for further details.
[29] http://www.oecd.org/industry/ind/stanstructuralanalysisdatabase.

Table A1. Sample countries

Advanced countries		Emerging market countries	
Country	Data Source (WDI, PWT for growth, WIOD, KLEMS for Sectoral Data)	Country	Data Source (WDI, PWT for growth, WIOD, KLEMS for Sectoral Data)
	WDI, PWT (1985-2019)		WDI, PWT (1985-2019)
Australia	WIOD (1995-2014)	Argentina	GGDC (1985-2004), GGDC (ETD) (2005-2018)
Austria	KLEMS (1985-2004), KLEMS (WIIW) (2005-2019)	Bolivia	GGDC (1985-2004), GGDC (ETD) (2005-2018)
Belgium	KLEMS (1985-2004), KLEMS (WIIW) (2005-2018)	Brazil	GGDC (1990-2004), GGDC (ETD) (2005-2018)
Canada	WIOD (1995-2014)	Chile	GGDC (1985-2004), GGDC (ETD) (2005-2018)
Denmark	KLEMS (1985-2004), KLEMS (WIIW) (2005-2018)	China	GGDC (1985-2004), GGDC (ETD) (2005-2018)
Finland	KLEMS (1985-2004), KLEMS (WIIW) (2005-2019)	Colombia	GGDC (1985-2004), GGDC (ETD) (2005-2018)
France	KLEMS (1985-2004), KLEMS (WIIW) (2005-2019)	Costa Rica	GGDC (1985-2004), GGDC (ETD) (2005-2018)
Germany	KLEMS (1985-2004), KLEMS (WIIW) (2005-2019)	Cyprus	KLEMS(WIWW) (1995-2019)
Greece	KLEMS (1985-2004), KLEMS (WIIW) (2005-2019)	Egypt	GGDC (1985-2004), GGDC (ETD) (2005-2018)
Iceland	STAN (1991-2019)	Hong Kong	GGDC (1985-2004), GGDC (ETD) (2005-2018)
Ireland	KLEMS (1985-2004), KLEMS (WIIW) (2005-2019)	India	GGDC (1985-2004), GGDC (ETD) (2005-2018)
Italy	KLEMS (1985-2004), KLEMS (WIIW) (2005-2019)	Indonesia	GGDC (1985-2004), GGDC (ETD) (2005-2018)
Japan	KLEMS (1985-2004), KLEMS (WIIW) (2005-2018)	Israel	STAN (1995-2018)
Netherlands	KLEMS (1985-2004), KLEMS (WIIW) (2005-2019)	Korea	GGDC (1985-2004), GGDC (ETD) (2005-2018)
New Zealand	STAN (1989-2018)	Malaysia	GGDC (1985-2004), GGDC (ETD) (2005-2018)
Norway	STAN (1985-2018)	Mexico	GGDC (1985-2004), GGDC (ETD) (2005-2018)
Portugal	KLEMS (1985-2004), KLEMS (WIIW) (2005-2019)	Peru	GGDC (1985-2004), GGDC (ETD) (2005-2018)
Spain	KLEMS (1985-2004), KLEMS (WIIW) (2005-2019)	Philippines	GGDC (1985-2004), GGDC (ETD) (2005-2018)
Sweden	KLEMS (1985-2004), KLEMS (WIIW) (2005-2019)	Russia	WIOD (1995-2014)
Switzerland	STAN (1991-2018)	Singapore	GGDC (1985-2004), GGDC (ETD) (2005-2011)
United Kingdom	KLEMS (1985-2004), KLEMS (WIIW) (2005-2019)	Thailand	GGDC (1985-2004), GGDC (ETD) (2005-2018)
United States	KLEMS (1985-2004), KLEMS (WIIW) (2005-2019)	Turkiye	GGDC (1990-2004), GGDC (ETD) (2005-2018)
		Venezuela	GGDC (1985-2004), GGDC (ETD) (2005-2010)

Notes: We utilize Penn World Table for GDP, TFP, and population; World Development Indicator or Global Financial Development, World Bank for private credit, and terms of trade. We exclude extreme outliers, such as Venezuela having more than 70% drops in *gdpo*. However, our results are broadly robust with these outliers included.

Table A2. Summary statistics data for 45 countries, 1985-2019

Variable	Obs.	Mean	Std. Dev.	Min	Max
Growth Regression (5 year Averaged)					
Real GDP growth (average)	305	4.0001	3.0783	-5.0538	19.9268
TFP growth (average)	305	0.4023	1.2910	-4.2204	6.1972
Capital controls	305	0.3099	0.3368	0.0000	1.0000
d.Reserves to GDP	305	0.2517	1.5835	-6.0133	10.0421
Private credit to GDP growth	305	1.4071	5.1397	-27.4674	29.4000
Terms of trade growth	305	0.2165	3.1718	-11.4654	26.9232
Population growth	305	1.0418	0.7362	-0.4970	3.4619
Human capital	305	9.4606	2.2427	3.0290	13.2750
Institutional quality	305	1.8722	0.2942	0.6710	2.2116
Crisis	305	0.1532	0.2776	0.0000	1.0000
Manufacturing Share Regression (5 year Averaged)					
Labor Share of Manufacturing (%)	291	14.751	4.464	2.988	28.222
rVA Share of Manufacturing (%)	290	20.754	7.040	1.991	45.492

Notes: GDP and TFP are from Penn World Table (gdpo, rtfpna). Capital control index is from Chinn-Ito measures. All other variables are from IMF *International Financial Statistics* (IFS), World Bank *World Development Indicator* (WDI), or *Global Financial Development Database*. The quality of institutions is constructed based on the Economic Freedom in the World database, following Estevadeordal and Taylor (2013). Human capital index is from Barro and Lee (2013), and Crisis index is from Laeven and Valencia (2020).

Table A3. Robustness check for Table 1

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	RGDP growth					
Method	Panel Within	Panel Within	Panel Within	System GMM	System GMM	System GMM
Sample	Sparse controls	w/ private credit and TOT growth only	Excluding insignificant controls from Table 1	Sparse controls	w/ private credit and TOT growth only	Excluding insignificant controls from Table 1
Initial GDP	-0.0156	-0.0133	-0.0161	-0.0855	-0.0159	0.0016
	(0.0096)	(0.0087)	(0.0100)	(0.1142)	(0.0122)	(0.0159)
Capital controls	0.0058	-0.0016	0.0073	0.0093	0.0124	0.0078
	(0.0134)	(0.0090)	(0.0086)	(0.0440)	(0.0109)	(0.0086)
d.Reserves to GDP	-0.4025*	-0.3544*	-0.4048*	-0.6071***	-0.5660**	-0.4210**
	(0.2356)	(0.2023)	(0.2233)	(0.2314)	(0.2412)	(0.1817)
Capital controls	0.5620	0.7150*	0.8363**	1.4246**	1.2803***	1.1035***
× d.Reserves to GDP	(0.5744)	(0.3835)	(0.3924)	(0.6717)	(0.4225)	(0.3963)
Private credit/GDP growth		0.0320	--		-0.0208	--
		(0.0267)			(0.0961)	
Terms of trade growth		0.4455***	0.3850***		0.5823***	0.4105***
		(0.0688)	(0.0650)		(0.1383)	(0.1496)
Population growth			--			--
Human capital			--			--
Institution quality			-0.0465*			-0.0292**
			(0.0262)			(0.0142)
Crisis			-0.0295***			-0.0330***
			(0.0065)			(0.0063)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Period FE	Yes	Yes	Yes	Yes	Yes	Yes
AR(1) (p-value)				0.694	0.001	0.000
AR(2) (p-value)				0.496	0.470	0.586
Weak IV (p-value)				0.53	0.42/0.03/ 0.32	0.22/0.12
Over-id test (p-value)				0.338	0.176	0.682
# of instruments				16	28	24
# of countries	45	45	45	45	45	45
Observations	308	305	308	308	305	308
R-squared	0.309	0.484	0.535	--	--	--

Notes: Panel FE estimation results are reported in columns (1)-(3). Two-step system GMM results are reported in columns (4)-(6). Initial GDP, the terms of trade (TOT) growth, and private credit to GDP growth are considered endogenous or predetermined in columns (4)-(6). Weak IV test reports Sanderson-Windmeijer multivariate F test of excluded instruments for initial GDP, TOT growth, and growth of Prv. Credit/GDP, respectively. Clustered robust standard errors at the country level are reported in parentheses. *, ** and *** are the significance level at 10%, 5% and 1%.

A.4. Robustness: considering endogeneity

We further check the robustness of our results by incorporating an instrumental variable for reserve changes. Table A4 helps address endogeneity by pursuing a more flexible specification for the system GMM by considering not only initial GDP, the terms of trade growth, and growth of private credit to GDP, but also changes in reserves to GDP and its interaction term with capital controls as endogenous or predetermined. Here we simply use the lagged values of each endogenous variable as IVs. Table A4 includes real GDP and TFP growth as the dependent variable. In column (1) of Table A4, the estimated coefficients on the interaction terms of capital control and changes in reserves to GDP are significantly positive. Column (2) shows results for emerging market countries. Although our capital control index is persistent and (exogenously) shaped by policy regulation, we attempt to consider a possible endogeneity of capital controls for the sample. Again the results for the emerging market sample in column (2) are consistent with those in column (1). Columns (3) and (4) show the similar results for TFP growth.

Table A4. Robustness: System GMM considering d.(Res./GDP) as an endogenous variable

	(1)	(2)	(3)	(4)
Dependent variable	rGDP Growth		TFP Growth	
Specifications	Full	Emerging mkt.	Full	Emerging mkt.
Endogenous vars.	Initial GDP/TFP, TOT growth, Prv. credit/GDP growth, CC, d.(Res./GDP), and CC×d.(Res./GDP)			
Initial GDP/TFP	-0.0049	0.0047	-0.0352**	-0.0121
	(0.0061)	(0.0149)	(0.0141)	(0.0289)
Capital Controls	0.0226	0.0661*	0.0165*	0.0134
	(0.0147)	(0.0388)	(0.0085)	(0.0091)
d.Reserves to GDP	-0.2470	-0.7379***	-0.1201	-0.2745
	(0.2511)	(0.2008)	(0.1327)	(0.2051)
Capital controls	0.6268*	1.0695**	0.3004*	0.8484*
× d.Reserves to GDP	(0.3754)	(0.4337)	(0.1549)	(0.4629)
Private Credit to GDP	0.0058	-0.0300	-0.0308	0.0165
Growth	(0.0355)	(0.0782)	(0.0523)	(0.0494)
TOT growth	0.3173***	0.3101**	-0.0757	0.0213
	(0.0802)	(0.1513)	(0.0699)	(0.1265)
Population Growth	0.0607	1.0234	-0.4070***	0.2797
	(0.3828)	(1.0136)	(0.1489)	(0.8486)
Human Capital	-0.0011	0.0050	0.0014	0.0027*
	(0.0023)	(0.0053)	(0.0010)	(0.0015)
Institutional Quality	-0.0240**	-0.0137	0.0005	0.0029
	(0.0096)	(0.0236)	(0.0054)	(0.0074)
Crisis	-0.0395***	-0.0506***	-0.0128***	-0.0138**
	(0.0077)	(0.0143)	(0.0050)	(0.0068)
Country FE	Yes	Yes	Yes	Yes
Period FE	Yes	Yes	Yes	Yes
AR(1) (p-value)	0.001	0.01	0.000	0.002
AR(2) (p-value)	0.672	0.415	0.685	0.202
Weak IV (p-value)	0.74/0.74/0.6/ 0.008/0.45/0.6	0.21/0.18/0.04/ 0.00/0.07/0.00	0.44/0.44/0.01/ 0.29/0.28/0.02	0.01/0.00/0.22/ 0.1/0.22/0.27
Over-id test (p-value)	0.523	0.1	0.1	0.845
# of instruments	41	23	39	29
# of countries	45	23	45	23
Observations	305	155	305	155

Notes: Two-step system GMM results are reported in columns (1)-(4). Initial GDP, the terms of trade growth and private credit to GDP growth, capital controls, d.(Res./GDP) and their interaction term are considered endogenous or predetermined in columns (1)-(4). Weak IV test reports Sanderson-Windmeijer multivariate F test of excluded instruments for initial GDP, TOT growth, growth of Prv. Credit/GDP, CC, d.(Res./GDP), and d.(Res./GDP)×CC, respectively. Clustered robust standard errors at the country level are reported in parentheses. *, ** and *** are the significance level at 10%, 5% and 1%.

Table A5. Sectoral labor productivity growth (system GMM)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent variable	Sectoral labor productivity growth									
	Agriculture	Mining	Manufacturing	Utilities	Construction	Trade Services	Transportation Services	Business Services	Government Services	Personal Services
Initial productivity	0.0055	0.0047	0.0153	0.0176**	-0.0203*	0.0170	0.0136***	-0.0097	0.0097	-0.0001
	(0.0060)	(0.0115)	(0.0116)	(0.0070)	(0.0120)	(0.0104)	(0.0051)	(0.0379)	(0.0166)	(0.0108)
Capital controls (CC)	0.0075	0.0229	-0.0355	-0.0087	0.0430*	-0.0120	0.0104	0.0599	0.0179	0.0193
	(0.0103)	(0.0395)	(0.0272)	(0.0199)	(0.0236)	(0.0198)	(0.0202)	(0.0640)	(0.0234)	(0.0145)
d.Reserves to GDP	-0.3752	0.3520	-0.1246	-0.1298	-0.1421	-0.3863	-0.4066*	0.2360	-0.1931	-0.1310
	(0.5850)	(0.5273)	(0.2026)	(0.1976)	(0.3357)	(0.2410)	(0.2224)	(0.5827)	(0.4585)	(0.2845)
CC × d.Reserves to GDP	0.5737	-0.0917	0.7898**	0.2305	0.7489	0.7644*	0.2314	-0.2520	0.0591	0.2534
	(0.7976)	(0.9161)	(0.3395)	(0.3128)	(0.7148)	(0.4557)	(0.4134)	(0.8337)	(0.8207)	(0.9418)
Growth of Private credit/GDP	-0.0832	-0.1183	-0.0790	-0.0251	0.0765	-0.0031	-0.0352	0.1826**	0.0012	0.0307
	(0.0594)	(0.0850)	(0.0598)	(0.0359)	(0.0726)	(0.0352)	(0.0490)	(0.0796)	(0.0494)	(0.0611)
terms of trade growth	0.0093	0.0201	0.0669	-0.1058	0.1140	0.1370	0.0233	-0.0952	-0.0931	-0.3809
	(0.0817)	(0.1595)	(0.0832)	(0.0785)	(0.1286)	(0.0995)	(0.0745)	(0.1743)	(0.0813)	(0.5095)
Population growth	-1.0177***	-0.9336***	-0.4573***	-0.9793***	-0.2766***	-0.7114***	-0.7577***	-0.7742***	-0.6005***	-0.6693***
	(0.0475)	(0.0585)	(0.1433)	(0.0453)	(0.0926)	(0.1183)	(0.1552)	(0.1483)	(0.2029)	(0.2252)
Human capital	-0.0013	-0.0052	-0.0072	-0.0064**	0.0050	-0.0057	-0.0054**	-0.0017	-0.0046	-0.0026
	(0.0026)	(0.0070)	(0.0062)	(0.0029)	(0.0048)	(0.0044)	(0.0025)	(0.0080)	(0.0044)	(0.0044)
Institution quality	-0.0304*	-0.0166	-0.0218	-0.0455**	0.0260	-0.0374	-0.0263	-0.0011	-0.0161	0.0116
	(0.0179)	(0.0461)	(0.0302)	(0.0193)	(0.0439)	(0.0286)	(0.0224)	(0.0902)	(0.0372)	(0.0195)
Crisis	-0.0213***	-0.0272	-0.0178**	-0.0273***	-0.0437***	-0.0420***	-0.0305***	-0.0547**	-0.0203**	-0.0281**
	(0.0069)	(0.0189)	(0.0085)	(0.0080)	(0.0141)	(0.0107)	(0.0085)	(0.0259)	(0.0090)	(0.0119)
Country & Period FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AR(1)/ AR(2) (p-value)	0.003/0.44	0.003/0.74	0.000/0.5	0.011/0.920	0.001/0.564	0.000/0.06	0.002/0.52	0.23/0.12	0.089/0.83	0.38/0.601
Weak IV (# of valid instruments, p-val<0.1)	0.04/0.0/0.0	0.29/0.03/0.00	0.08/0.00/0.00	0.12/0.00/0.00	0.86/0.85/0.51	0.23/0.06/0.00	0.15/0.00/0.00	0.11/0.00/0.00	0.1/0.00/0.003	0.99/0.99/0.98
Over-id test (p-value)	0.142	0.178	0.203	0.953	0.2	0.139	0.19	0.342	0.35	0.08
# of instruments	26	26	26	26	26	26	26	26	26	26
# of countries	44	43	44	44	44	43	44	44	37	42
Observations	285	277	282	279	285	275	274	277	235	262

Notes: Two-step system GMM results are reported in all columns. Initial productivity, the terms of trade (TOT) growth, and growth of private credit to GDP are considered endogenous variables. Weak IV test reports Sanderson-Windmeijer multivariate F test of excluded instruments for initial productivity, TOT growth, and growth of Prv.credit/GDP, respectively. Clustered robust standard errors at the country level are reported in parentheses. *, ** and *** are the significance level at 10%, 5% and 1%.

A.5. Comparison with Real Exchange Rate Undervaluation

Rodrik (2008)'s index of under- or overvaluation uses a measure of the domestic price level adjusted for the Balassa-Samuelson effect—in practice, nontradable goods are cheaper in poorer countries. First, we collect data on exchange rates (*XR*) and purchasing power parity conversion factors (*PPP*) from the *Penn World Table (PWT)* to calculate a "real" exchange rate (*RER*) for country *i* in period t: $\ln(RER_{it}) = \ln\left(\frac{XR_{it}}{PPP_{it}}\right)$, where *XR* and *PPP* are expressed as national currency units per U.S. dollar. In the *Penn World Table (PWT)*, the consumption price level, equal to the PPP exchange rate divided by the nominal exchange rate (PL_CON), is available. Thus, *RER* is the inverse of PL_CON. For the robustness check, we also use the output price level (PL_GDP) to compute *RER*. A country *i*'s *RER* greater than one indicates that the currency value is lower (more depreciated) than indicated by PPP.

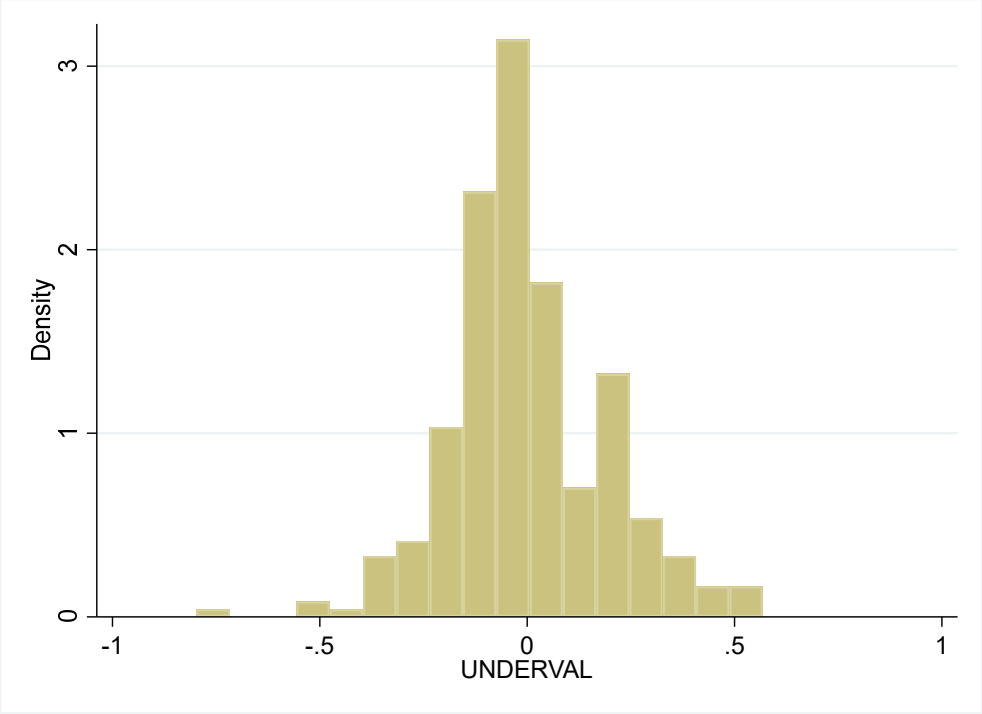
We then account for the Balassa-Samuelson effect by regressing log of *RER* on log of real GDP per capita (*RGDPPC*): $\ln(RER_{it}) = \alpha + \beta\ \ln(RGDPPC_{it}) + \rho_t + u_{it}$, where ρ_t is a period fixed effect and u_{it} is the error term. This regression yields an estimate of β ($\hat{\beta}$ of −0.42 with a high *t* statistic of around 43). Note that Rodrik (2008) gives the β coefficient, −0.24. Our results suggest a strong estimated Balassa-Samuelson effect: when incomes rise by 1 percent, the *RER* falls by around 0.42 percent. Finally, to obtain the index of undervaluation, we take the difference between the actual real exchange rate and the Balassa-Samuelson-adjusted rate, which is the predicted value of $\ln(\widehat{RER}_{it})$ from the above *RER* and *RDGPPC* regression:

$$UNDERVAL = \ln(RER_{it}) - \ln(\widehat{RER}_{it}).$$

UNDERVAL is comparable across countries and over time, which is centered at zero and has a standard deviation of 0.2 See Figure A1 below. *UNDERVAL* greater than zero indicates that the exchange rate is set such that goods produced at home are relatively cheap in dollar terms: the currency is undervalued.

Along with the results of GDP growth with real exchange rate undervaluation in Table 4, further evidence of a relative disadvantage of using currency undervaluation as a regressor comes from regressions with TFP. As shown in Table A6, we are not able to find little significant positive effect of currency undervaluation on TFP growth for any alternative measures or regression specifications. This result contrasts with our main results in Table 1.

Figure A1. Distribution of undervaluation measures



Notes: Undervaluation measure by Rodrik (2008) is calculated. Deviation of real exchange rate from Real GDP per capita and period fixed effects are calculated.

Table A6. Real exchange rate undervaluation and TFP growth

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable	TFP growth						
	Panel FE	Panel FE	Panel FE	Panel FE	System GMM	Panel FE	Panel FE
	Full	Emerging markets	1985-2007	Full	Full	Alternative Underval1 (5 yrs avg. of log RER)	Alternative Underval2 (using GDP deflator)
Initial value	-0.0545***	-0.0584***	-0.0810***	-0.0440***	-0.0395***	-0.0450***	-0.0434***
	(0.0087)	(0.0112)	(0.0130)	(0.0084)	(0.0107)	(0.0088)	(0.0084)
UNDERVAL	0.0064	0.0024	0.0091	0.0066	0.0083	0.0055	0.0046
	(0.0058)	(0.0070)	(0.0068)	(0.0061)	(0.0098)	(0.0046)	(0.0057)
Growth of Private credit/GDP				-0.0049	0.0117	-0.0060	-0.0049
				(0.0107)	(0.0122)	(0.0113)	(0.0109)
Terms of trade growth				0.0474*	0.0530	-0.0070	0.0469*
				(0.0276)	(0.0379)	(0.0369)	(0.0278)
Population growth				-0.5534***	-0.3269***	-0.5531***	-0.5591***
				(0.1815)	(0.0866)	(0.1788)	(0.1844)
Human capital				-0.0014	-0.0001	-0.0023	-0.0013
				(0.0017)	(0.0005)	(0.0016)	(0.0017)
Institution quality				0.0028	-0.0002	0.0092	0.0018
				(0.0141)	(0.0042)	(0.0111)	(0.0140)
Crisis				-0.0078**	-0.0076***	-0.0098***	-0.0078**
				(0.0031)	(0.0027)	(0.0035)	(0.0031)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Period FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AR(1) (p-value)					0.000		
AR(2) (p-value)					0.332		
Weak IV (p-value)					0.02/0.02/0.00/0.00		
Over-id test (p-value)					0.623		
# of instruments					19		
# of countries	44	22	44	44	44	45	44
Observations	300	150	212	297	297	309	297
R-squared	0.423	0.508	0.513	0.483	--	0.469	0.480

Notes: Two step system GMM results are reported in columns (5). Initial GDP, the terms of trade (TOT) growth, growth of private credit to GDP and UNDERVAL are considered endogenous or predetermined. Weak IV test reports Sanderson-Windmeijer multivariate F test of excluded instruments for initial GDP, TOT growth, growth of Prv. Credit/GDP, and UNDERVAL, respectively. Clustered robust standard errors at the country level are reported in parentheses. *, ** and *** are the significance level at 10%, 5% and 1%. Venezuela's UNDERVAL is missing.