



# Restarting Sub-Saharan Africa's Growth Engine

## *Regional Economic Outlook*

**Montfort Mlachila**

Senior Resident Representative, South Africa

International Monetary Fund

September 2017

# Motivation



- ❑ After 15 years of strong growth, average activity decelerated in sub-Saharan African (SSA)
- ❑ Significant differences across the region
- ❑ Key policy questions
  - For the hardest-hit countries, how to *revive* growth?
  - For countries still growing fast, how to *sustain* growth?
- ❑ Literature investigating frequency and duration of growth episodes:
  - Hausmann, Pritchett, and Rodrik (2005); Jones and Olken (2008); Berg, Ostry, and Zettelmeyer (2012); Tsangarides (2012).
  - Chapter examines in the context of sub-Saharan Africa.

# Outline



- ❑ Experience with growth turning points and sustained growth episodes in SSA
- ❑ How do external and domestic factors or policies behave around turning points?
- ❑ What extends the duration of sustained growth episodes?
- ❑ Policy implications



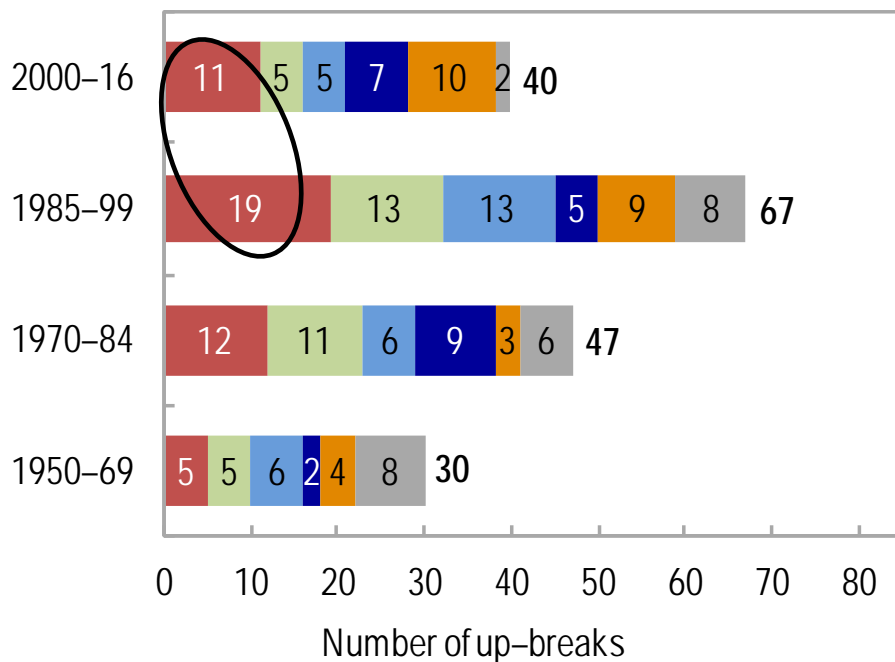
# The setup

- Breaks
  - Variant of Bai and Perron (1998) procedure to test for structural breaks.
  - Minimum possible number of years between breaks and statistical significance of those structural breaks.
  - 184 up-breaks and 185-down breaks in 146 countries over 1950-2016.
- Growth spells
  - Using the identified breaks and following Berg et al. (2012).
  - *Complete growth spells:* (i) start with up-break followed by a period of at least 2 percent average p.c. income growth; and (ii) end with a down-break followed by a period of less than 2 percent average p.c. income growth.
  - *Incomplete growth spells: condition* (i); and end at the end of the sample.
  - 80 complete and 67 incomplete spells in the full sample.

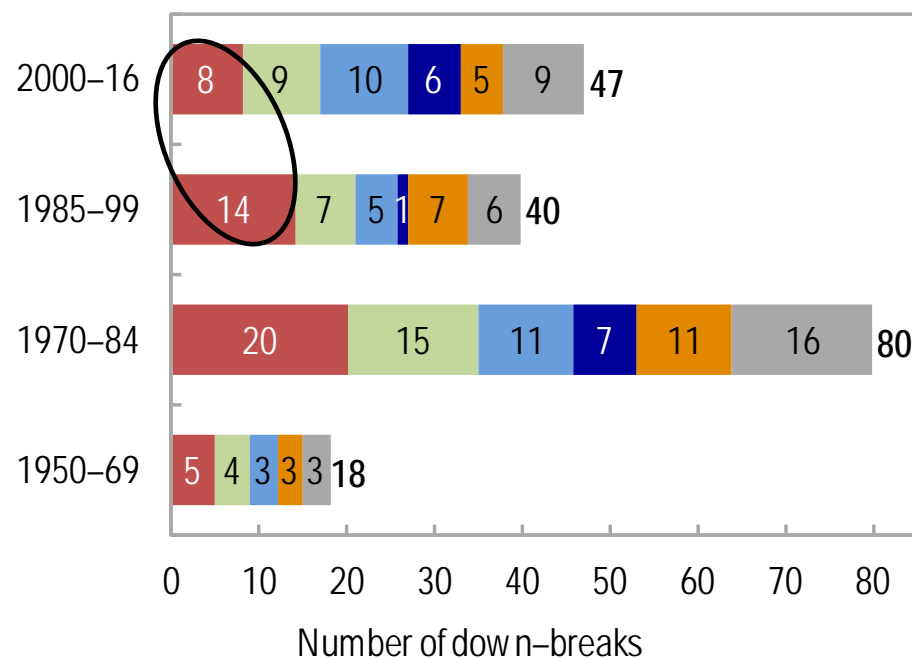
# Many growth breaks in SSA and fewer down-breaks post 2000...



Selected Groups: Growth Up-Breaks  
1950–2016



Selected Groups: Growth Down-Breaks  
1950–2016

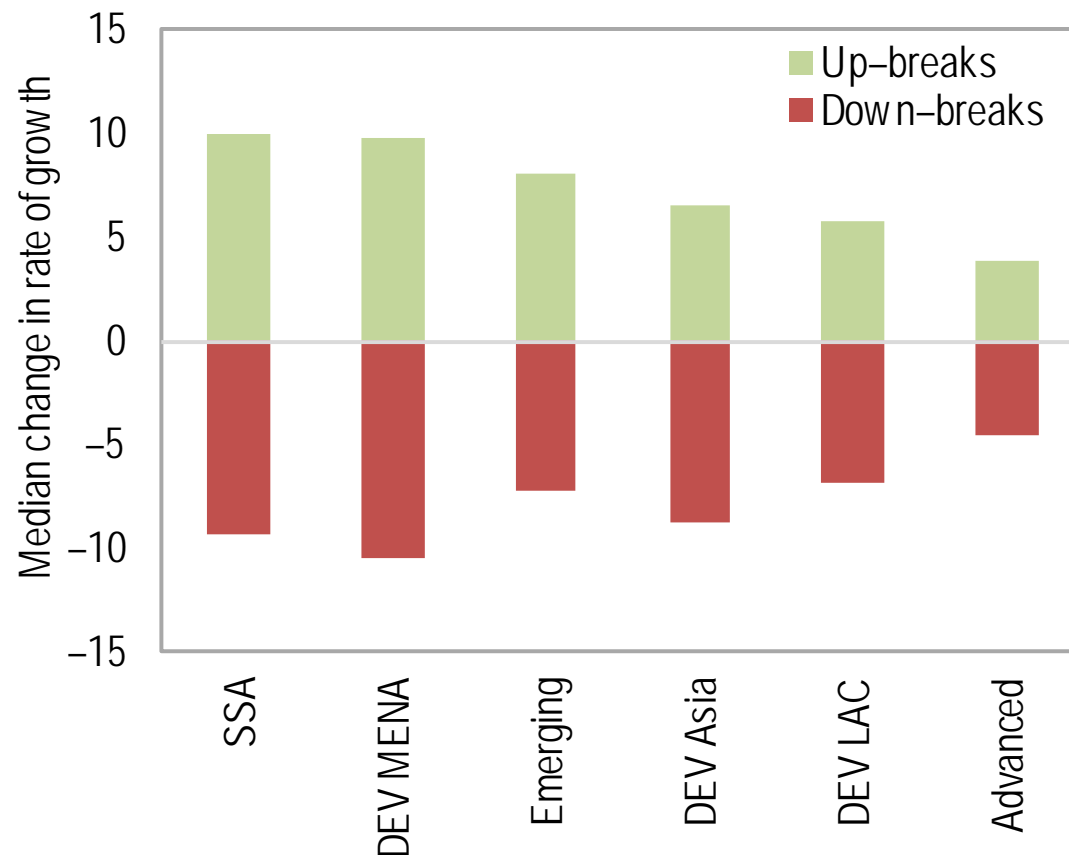


■ SSA ■ DEV LAC ■ DEV MENA ■ DEV Asia ■ Emerging ■ Advanced

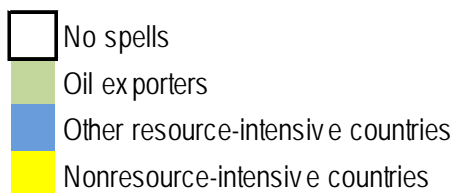
...but also more dramatic shifts in growth.



Selected Groups: Change in Median Annual Per Capita Growth During Up-Breaks and Down-Breaks (Percentage points)



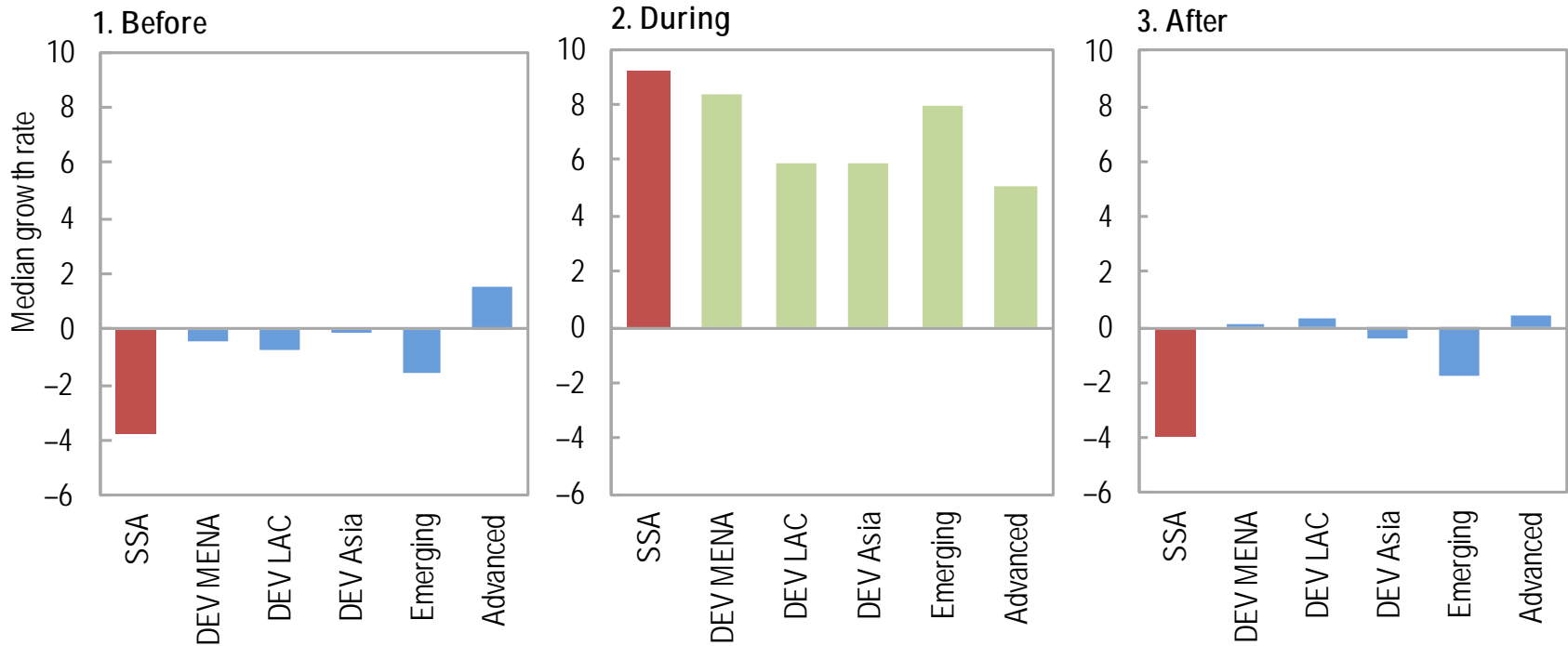
# Growth spells are frequent in the region and more concentrated after 1995...



...but spells in SSA are shorter than elsewhere and often end in “rough landings”.



Selected Groups: Median Annual Per Capita Growth Before, During, and After Completed Spells (Percentage points)





# Outline



- ❑ Experience with growth turning points and sustained growth episodes in SSA
- ❑ **How do external and domestic factors or policies behave around turning points?**
- ❑ What extends the duration of sustained growth episodes?
- ❑ Policy implications



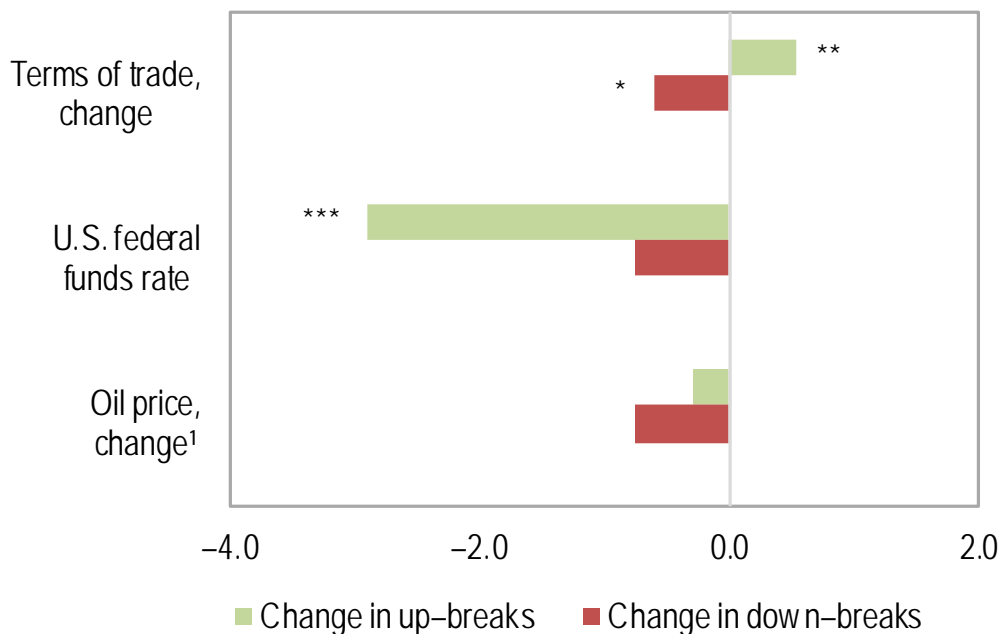
# Coincident changes during turning points

- Examine what happens in an economy that experiences transitions between periods of strong and weak growth.
- Relate incidence of growth up-breaks and down-breaks to changes in external and domestic factors and policies.
- Methodology
  - Statistical tests on the changes observed in the mean values of each of the variables of interest at the time of structural breaks in growth.
  - No causal relationships between changes and the incidence of the breaks.
  - Not controlling for other factors that may influence the break incidence.

# Growth turning points coincide with significant changes in key exogenous factors...



Sub-Saharan Africa: Change in External Shocks Variables Associated with Growth Breaks (Percentage points)



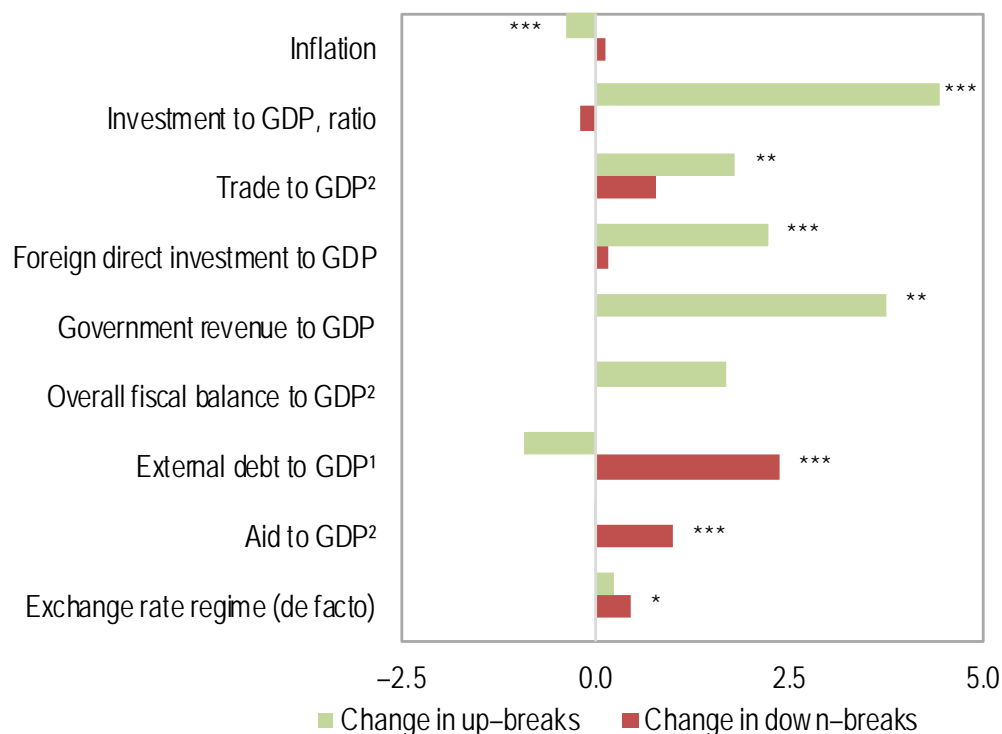
<sup>1</sup> Changes divided by 5.

Note: \*, \*\*, and \*\*\* indicate that the changes in means are significant at the 10, 5 and 1 percent levels.

... but also in the macroeconomic environment.



### Sub-Saharan Africa: Change in Macroeconomic Variables Associated with Growth Breaks (percentage points)



<sup>1</sup> Changes divided by 10. <sup>2</sup> Changes divided by 5.

Note: \*, \*\*, and \*\*\* indicate that the changes in means are significant at the 10, 5 and 1 percent levels.

Turning points are also associated with changes in institutional, social, and structural indicators.



- ❑ Growth up-breaks in the region coincide with improvements in the institutional environment and fewer conflicts
- ❑ Improvements in structural factors are also associated with growth up-breaks
  - Total factor productivity, diversification, technology adoption
- ❑ Market distortions associated with down-breaks

# Outline



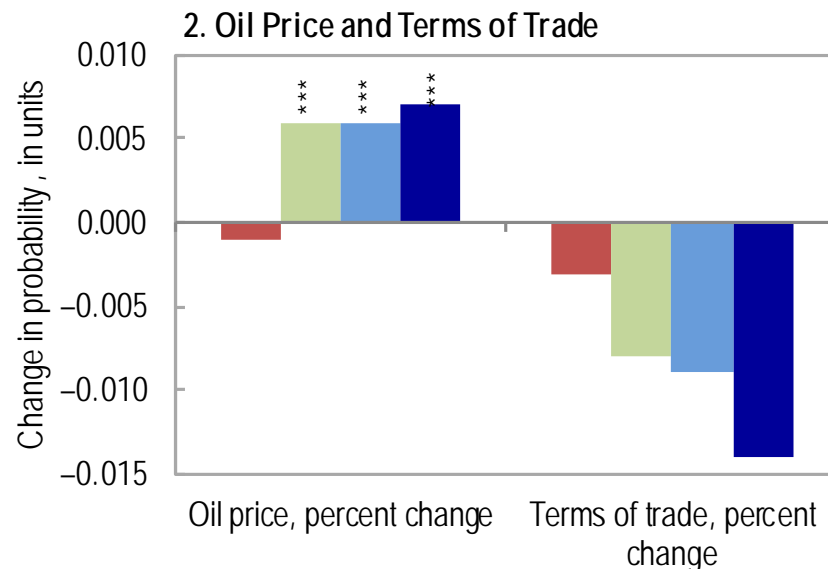
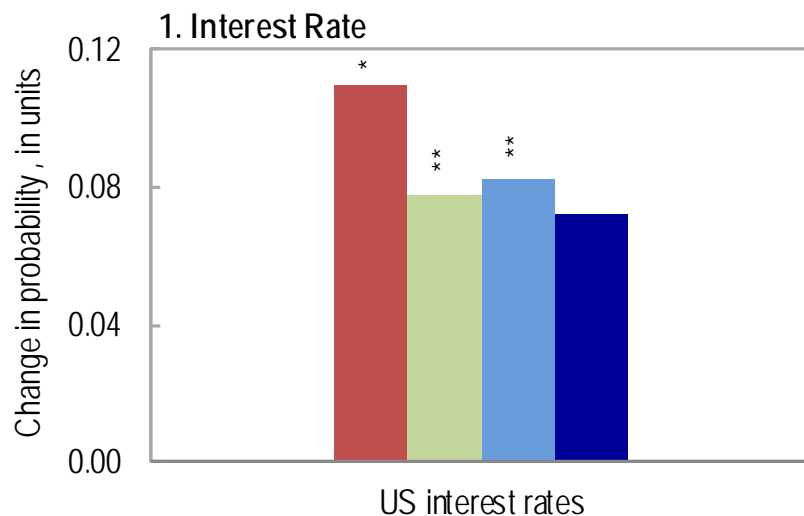
- ❑ Experience with growth turning points and sustained growth episodes in SSA
- ❑ How do external and domestic factors or policies behave around turning points?
- ❑ **What influences the duration of sustained growth episodes?**
- ❑ Policy implications

Tighter global financial conditions and, to some extent, deteriorating terms of trade reduce the length of the growth spell.



### External Shocks

Increased risk that the spell will end



■ SSA ■ World ■ EMEDEV ■ EMEDEVxSSA

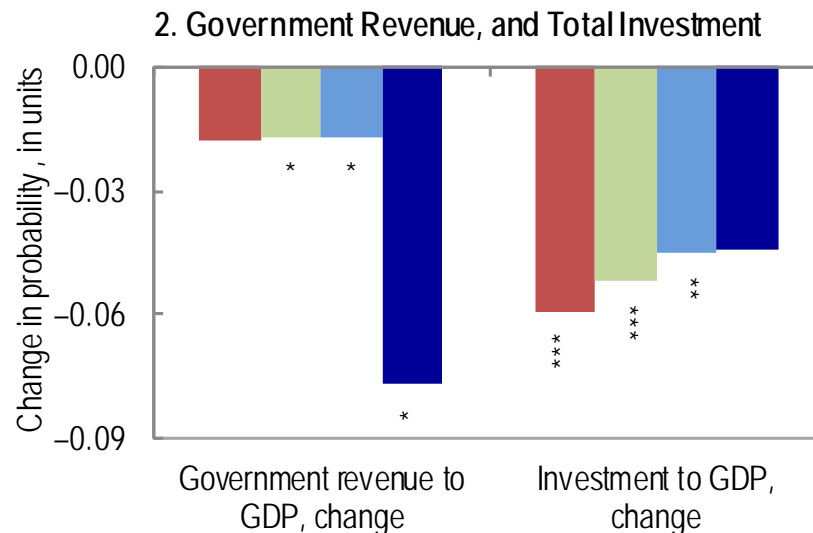
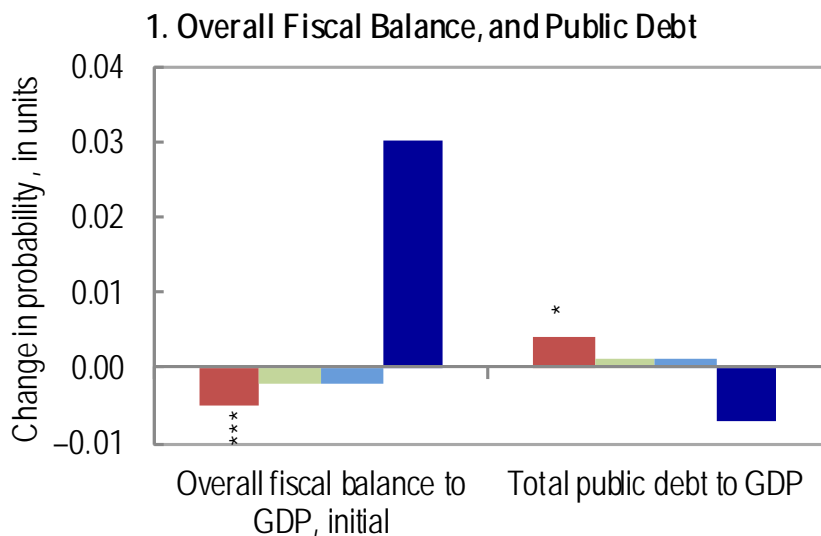
EMEDEV = all emerging and developing economies; EMEDEVxSSA = all emerging and developing economies excluding sub-Saharan Africa

# But sound macroeconomic policies prolong spells...



## Macroeconomic Indicators

Increased risk that the spell will end



■ SSA ■ EMEDEV ■ World ■ EMEDEVxSSA

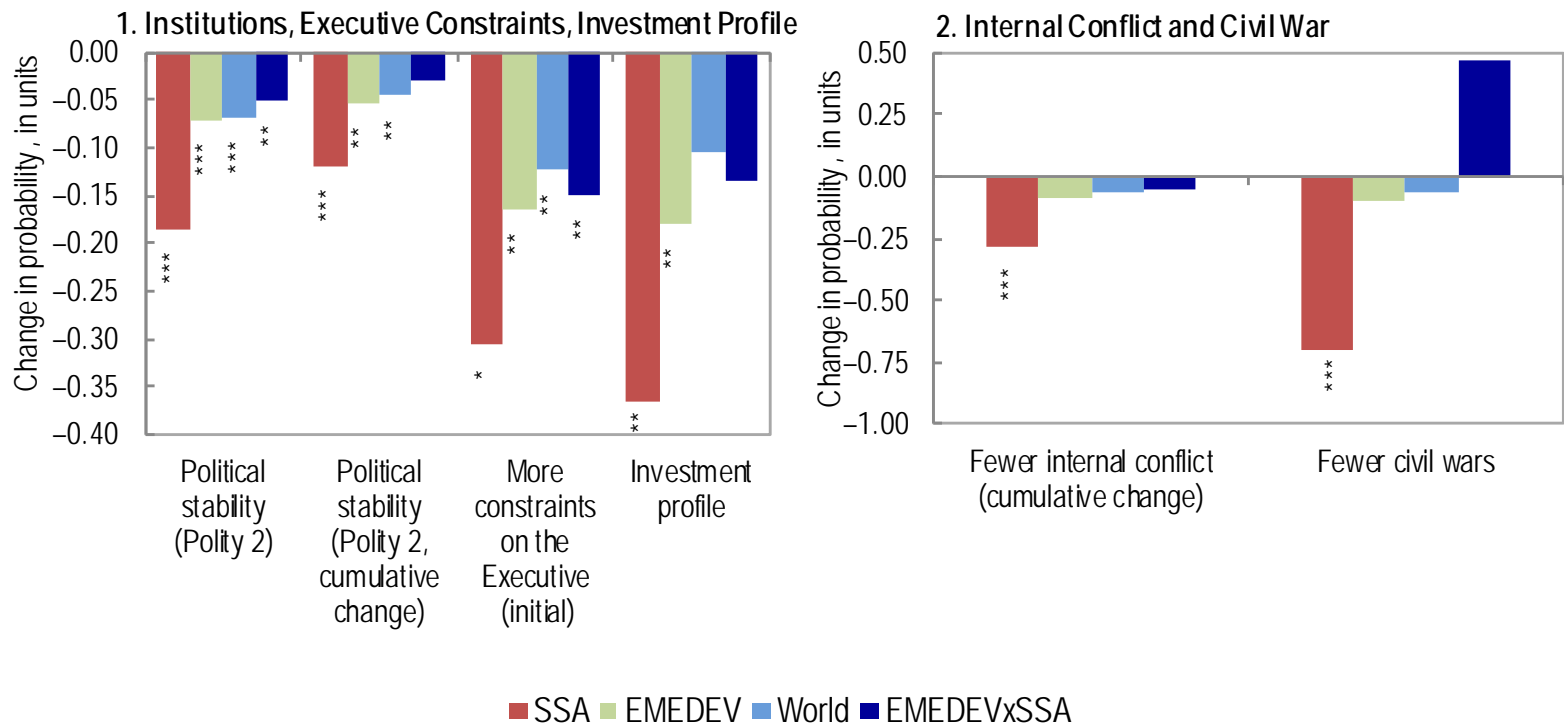
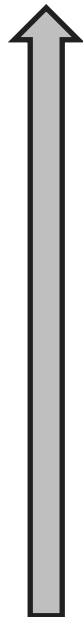


...as do good institutions and a peaceful environment.



## Institutions and Conflict

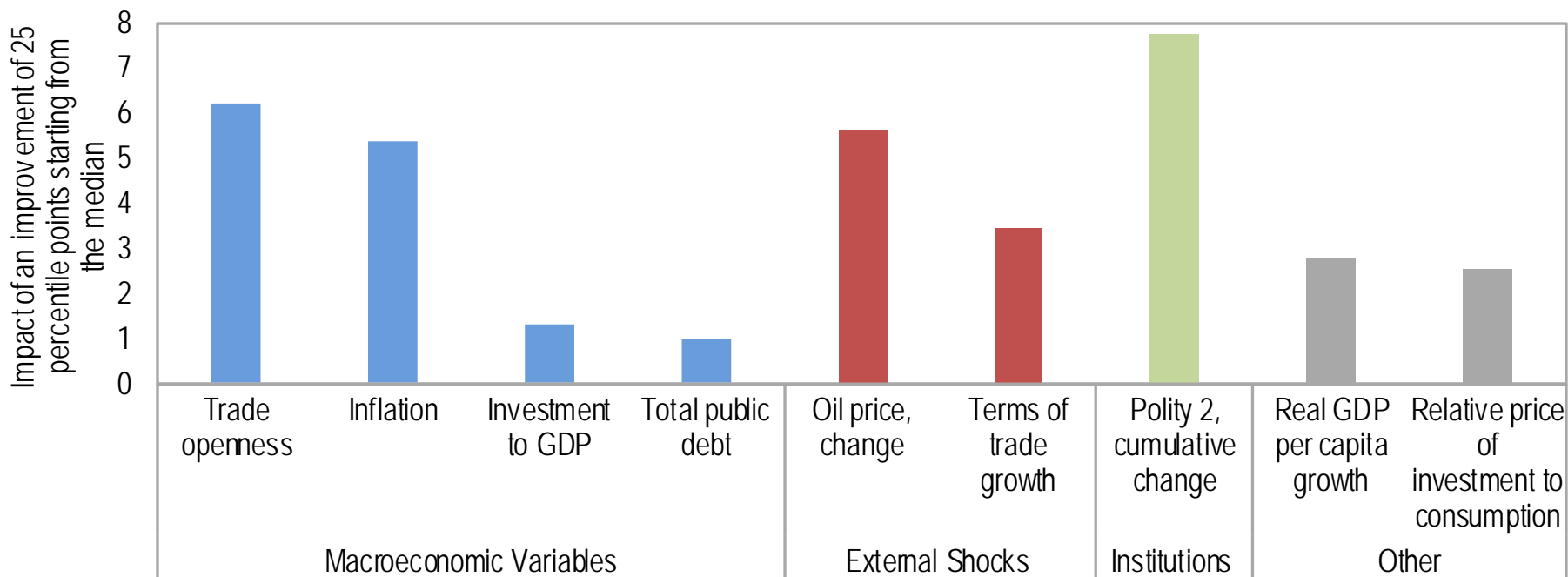
Increased risk that the spell will end



Putting it all together: improved policies, better institutions, fewer market distortions, and a better external environment support growth spells.



Sub-Saharan Africa: Impact on Spell Duration (Years)



Note: Each bar shows the change in the expected duration of a growth spell (in numbers of years) if a variable improves by 25 percentile points from the median value in the sample of sub-Saharan African countries, while holding other variables constant.

# Outline



- ❑ Experience with growth turning points and sustained growth episodes in SSA
- ❑ How do external and domestic factors or policies behave around turning points?
- ❑ What influences the duration of sustained growth episodes?
- ❑ **Policy implications**



# Summary of Results

- Growth spells in sub-Saharan Africa are sustained by improved monetary and fiscal policies, better political institutions, less market distortions, and better external environment.
  - Increases in the investment rate, more trade openness, lower inflation, more exchange rate flexibility, and lower debt to GDP ratio tend to prolong spells in the region.
  - Higher growth rate in the previous period increases the probability that a spell comes to an end—pointing to the risks associated with an overheated economy.
- Confirm the “Africa-rising” narrative: accommodative global conditions, high commodity prices, and improvements in policies implemented have sustained spells so far.
- Additional benefits from improvements in the political environment and reducing distortions associated with high relative price of investment.



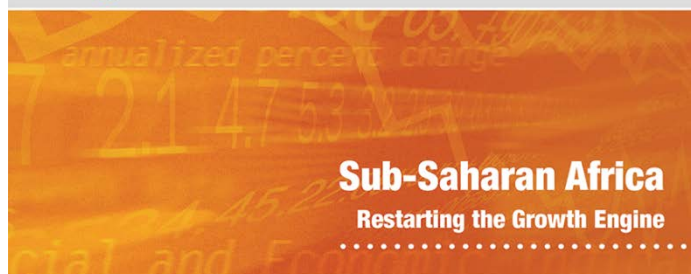
# Conclusions and Policy Considerations

- ❑ Strong domestic policy response to revive growth
- ❑ Macroeconomic and structural policies
  - Countries where growth has slowed → focus on macroeconomic stability to set the stage for a growth turnaround that can be sustained
  - Countries enjoying a growth spell → address emerging vulnerabilities and focus on prolonging growth
  - All countries → complementing efforts to unlock growth potential



World Economic and Financial Surveys

## Regional Economic Outlook



## Thank You

The online edition of the  
*Regional Economic Outlook  
for sub-Saharan Africa*  
is now available at  
[www.imf.org](http://www.imf.org)

Also check:

Arizala, *et al.* 2017. “Growth Breaks and Growth Spells in Sub-Saharan Africa,” IMF Working Paper 17/202.

# Additional material



# Breaks procedure

- Berg et al. (2012) apply a variant of Bai-Perron (1998, 2003) to test for multiple structural breaks in time series when both the number and location are unknown.
  - Sample-specific critical values, heteroskedasticity and sample size (rather than asymptotic).
  - Details in Antoshin et al. (2008).
- Identify structural breaks in each country's per capita growth (rgdpch, PPP Converted GDP Per Capita (chain series), at 2005 constant prices in Penn Tables 7.1).

## Process

- Minimum years between breaks  $h$ ; total breaks  $b = \text{int}(T/h)-1$ ; so for  $T = 50$ ,  $b = 9$ .
- Algorithm tests for the presence of up to  $b$  breaks in the growth series.
  - Test null hypothesis of zero structural breaks against the alternative of 1 or more (up to  $b$ ).
  - The location of potential breaks is decided by minimizing the sum of squared residuals between the actual data and the average growth rate before and after the break(s).

For example, let  $h = 5, T = 30$ . Discard the first  $h$  periods.

-Test for 1 break:

$$\text{Min}\{RSS_{t=11}, RSS_{t=12}, RSS_{t=13}, RSS_{t=14}, \dots, RSS_{t=25}\}$$

-Test for 2 breaks:

$$\text{Min}\{RSS_{t=11,t=16}, RSS_{t=11,t=17}, \dots, RSS_{t=11,t=25}, RSS_{t=12,t=17}, \dots, RSS_{t=12,t=25}, \dots, RSS_{t=20,t=25}\}$$

-Test for 3 breaks, etc:

$$\text{Min}\{RSS_{t=11,t=16,t=21}, \dots, RSS_{t=11,t=20,t=25}, \dots, RSS_{t=11,t=16,t=22}, \dots, RSS_{t=11,t=16,t=25}\}$$

- Critical values generated through Monte Carlo simulations.





# Growth breaks



**Table 1. Growth Breaks by Decade and Country Group (h=5 and h=8) 1950-2016**

Region	No. of countries	Total	Average break size					Average break size					
			50s-60s	1970-84	1985-99	2000-16	Total	50s-60s	1970-84	1985-99	2000-16		
			h=5				h=8						
Total <i>upbreaks</i>	146	184	9	30	47	67	40	116	8	17	16	60	23
Advanced	30	24	5	8	6	8	2	9	5	4	2	3	0
Emerging	18	26	8	4	3	9	10	18	6	5	0	9	4
Developing	98	134	10	18	38	50	28	89	9	8	14	48	19
Sub-Saharan Africa	42	47	13	5	12	19	11	36	12	2	5	18	11
LAC	24	34	7	5	11	13	5	19	6	5	1	11	2
Asia	13	23	8	2	9	5	7	15	6	0	6	5	4
MENA	19	30	11	6	6	13	5	19	12	1	2	14	2
Total <i>downbreaks</i>	146	185	-9	18	80	40	47	120	-7	7	53	32	28
Advanced	30	34	-5	3	16	6	9	27	-4	2	11	5	9
Emerging	18	26	-8	3	11	7	5	15	-7	2	8	3	2
Developing	98	125	-10	12	53	27	33	78	3	3	34	24	17
Sub-Saharan Africa	42	47	-11	5	20	14	8	34	-9	1	16	12	5
LAC	24	35	-7	4	15	7	9	19	-6	1	10	4	4
Asia	13	14	-12	0	7	1	6	7	-10	0	2	2	3
MENA	19	29	-12	3	11	5	10	18	-12	1	6	6	5

# Growth spells: frequency and duration



**Table 2. Frequency and Duration of Growth Spells (h=5 and h=8) 1950-2016**

	No. of countries	h=5				h=8			
		No. of spells	Mean duration	% of spells lasting at 10 years	% of spells lasting at 16 years	No. of spells	Mean duration	% of spells lasting at 10 years	% of spells lasting at 16 years
<b>Complete spells</b>									
Advanced	30	13	17	77	31	6	15	100	17
Emerging	18	9	11	33	11	5	13	80	20
Developing	98	58	12	45	22	25	13	52	24
Sub-Saharan Africa	42	15	8	33	13	6	9	33	0
LAC	24	18	11	44	22	8	13	63	25
Asia	13	7	15	57	43	4	20	75	75
MENA	19	18	13	50	22	7	11	43	14
<b>Incomplete spells</b>									
Advanced	30	8	37	100	100	2	53	100	100
Emerging	18	13	27	100	62	11	27	100	73
Developing	98	46	22	87	63	50	21	88	68
Sub-Saharan Africa	42	25	22	76	60	25	20	76	64
LAC	24	9	22	100	67	10	24	100	80
Asia	13	8	23	100	63	8	19	100	63
MENA	19	4	24	100	75	7	21	100	71
<b>Total</b>									
Advanced	30	21	24	86	57	8	25	100	38
Emerging	18	22	20	73	41	16	23	94	56
Developing	98	104	16	64	40	75	18	76	53
Sub-Saharan Africa	42	40	17	60	43	31	18	68	52
LAC	24	27	15	63	37	18	19	83	56
Asia	13	15	20	80	53	12	19	92	67
MENA	19	22	15	59	32	14	16	71	43

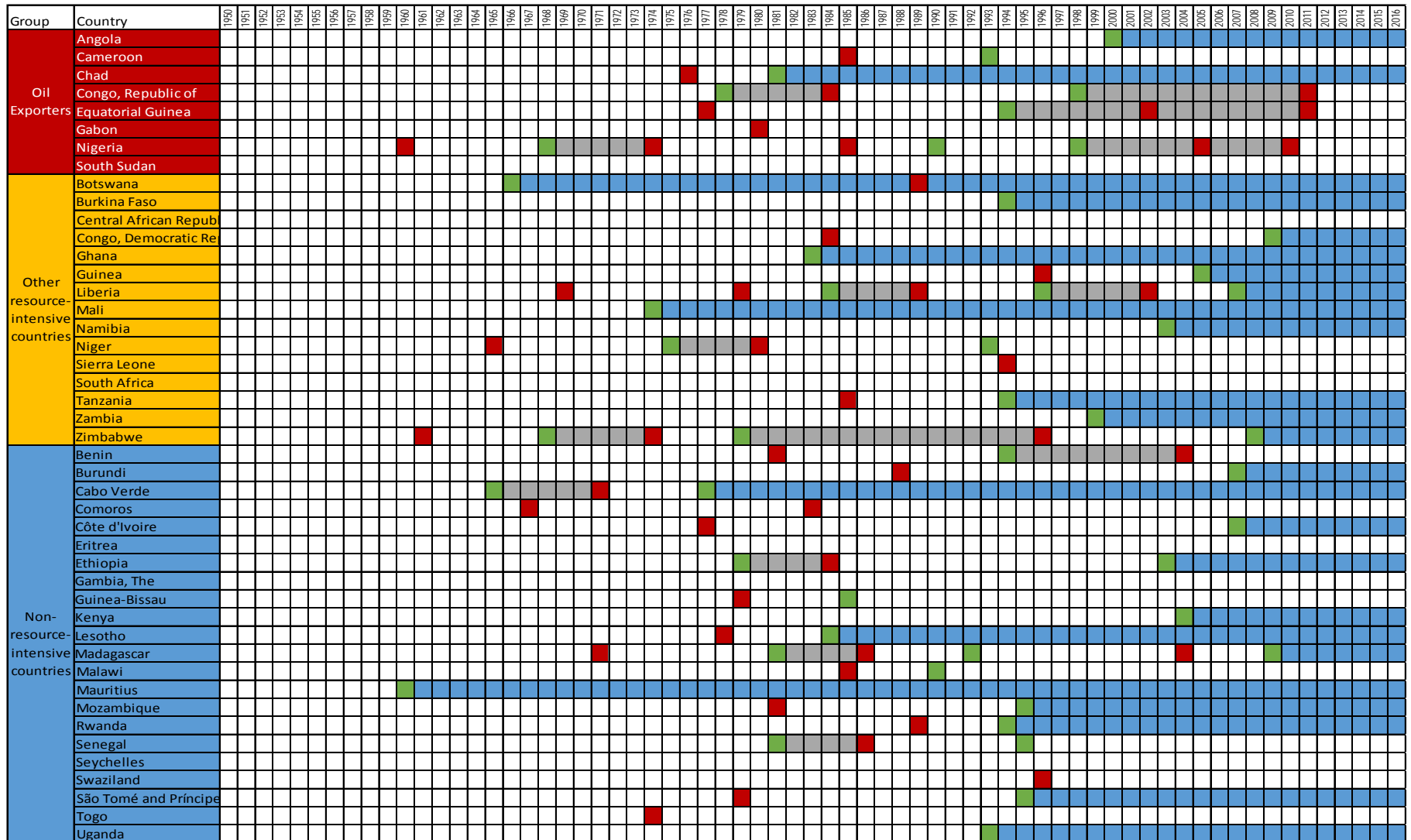
# Growth spells: before, during, after



**Table 3. Average Growth Before, During and After Contraction Spells (h=5 and h=8) 1950-2016**

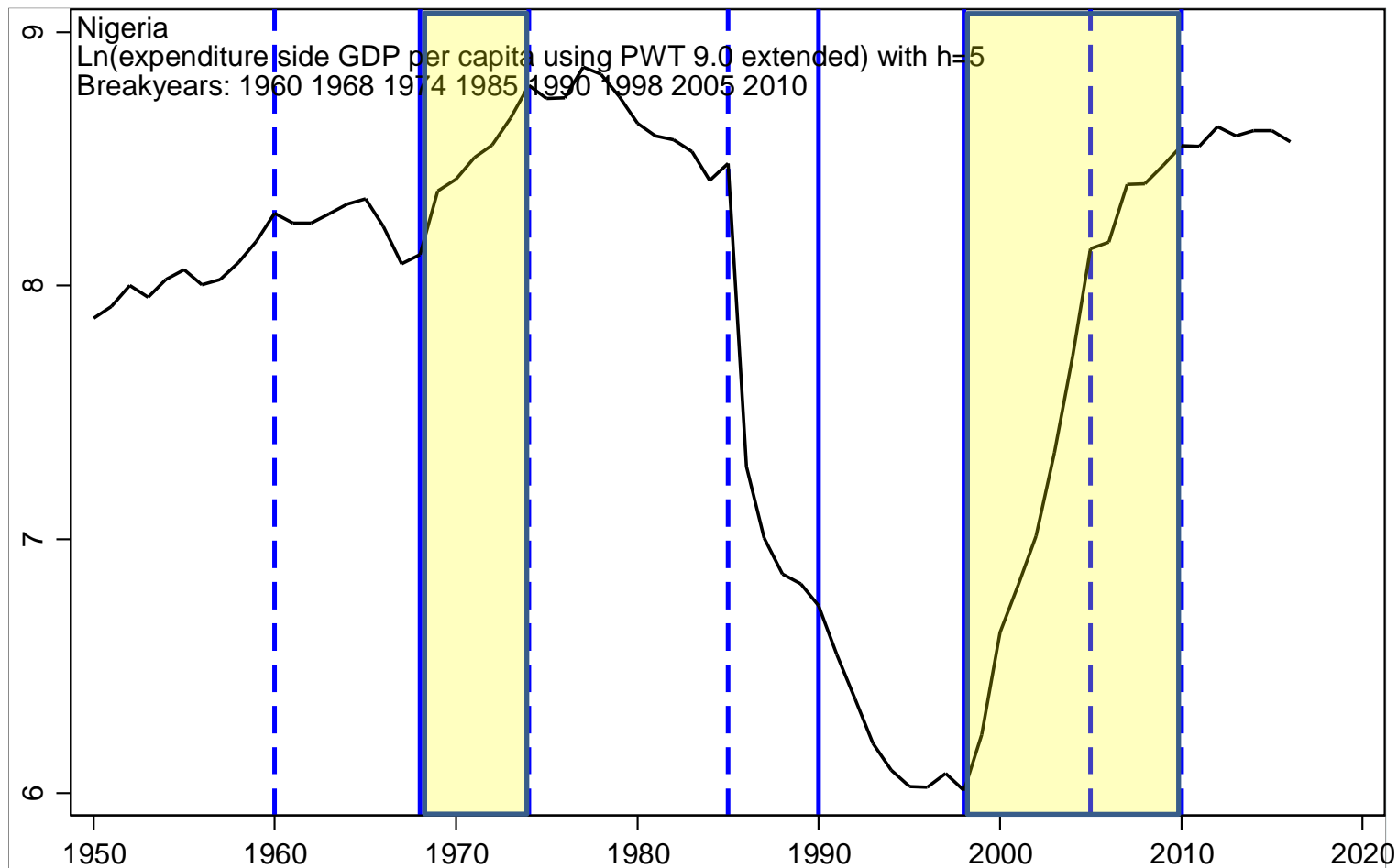
	h=5					h=8				
	Average growth			3 years ...		Average growth			3 years ...	
	before	during	after	before	after	before	during	after	before	after
				start	end				start	end
	<b>Complete spells</b>									
Advanced	1.2	5.4	-0.1	0.0	0.1	1.4	5.3	0.6	1.1	1.1
Emerging	-1.1	9.1	-1.9	-1.5	-0.8	-0.3	6.0	-1.4	-0.8	0.4
Developing	-2.8	8.5	-2.0	-3.1	-1.7	-1.6	7.8	-0.5	-0.5	0.1
Sub-Saharan Africa	-5.6	9.6	-6.0	-4.6	-6.0	-3.9	8.7	-1.5	-2.3	-0.3
LAC	-1.2	6.7	-0.3	-2.5	0.0	-0.8	5.0	-0.1	-0.2	0.1
Asia	-0.1	9.1	-1.2	-2.8	-3.0	0.7	6.2	-0.6	1.0	-1.2
MENA	-3.0	9.2	-0.7	-2.4	0.6	-1.8	11.3	-0.3	-0.1	1.2
	<b>Incomplete spells</b>									
Advanced	0.2	4.4		-0.2		2.3	9.2		0.8	
Emerging	-1.9	5.7		-1.7		-0.4	5.3		-0.7	
Developing	-3.9	5.7		-5.3		-3.1	6.4		-5.4	
Sub-Saharan Africa	-4.8	5.8		-5.5		-4.6	7.0		-6.4	
LAC	-1.8	4.8		-3.1		-0.5	4.9		-2.6	
Asia	-1.5	6.5		-1.3		-0.7	6.3		-1.3	
MENA	-8.3	5.7		-16.6		-4.0	6.3		-11.0	

# SSA breaks and spells heat map

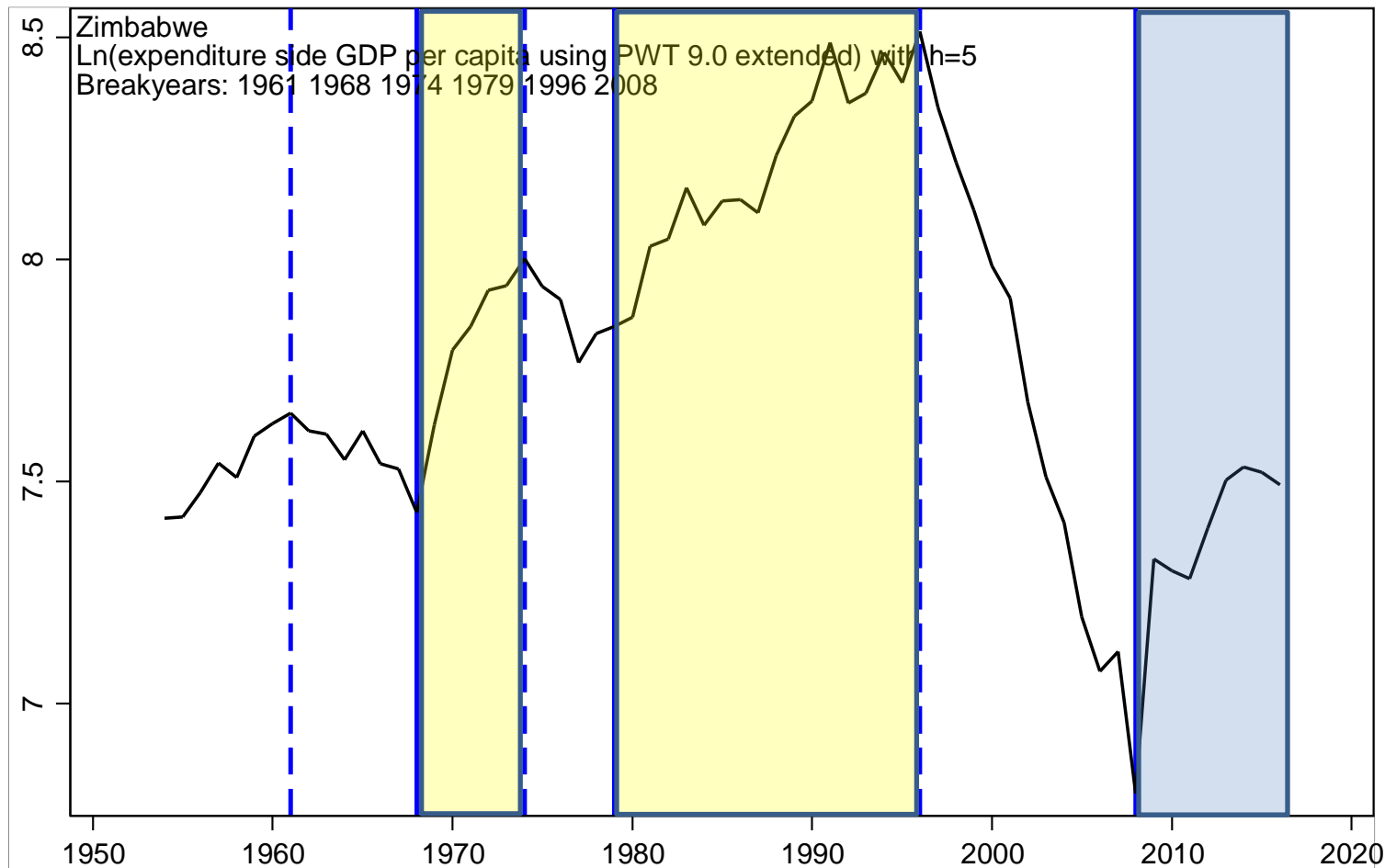


■ Up breaks   
 ■ Down breaks   
 ■ Completed Spells   
 ■ Incompleted Spells

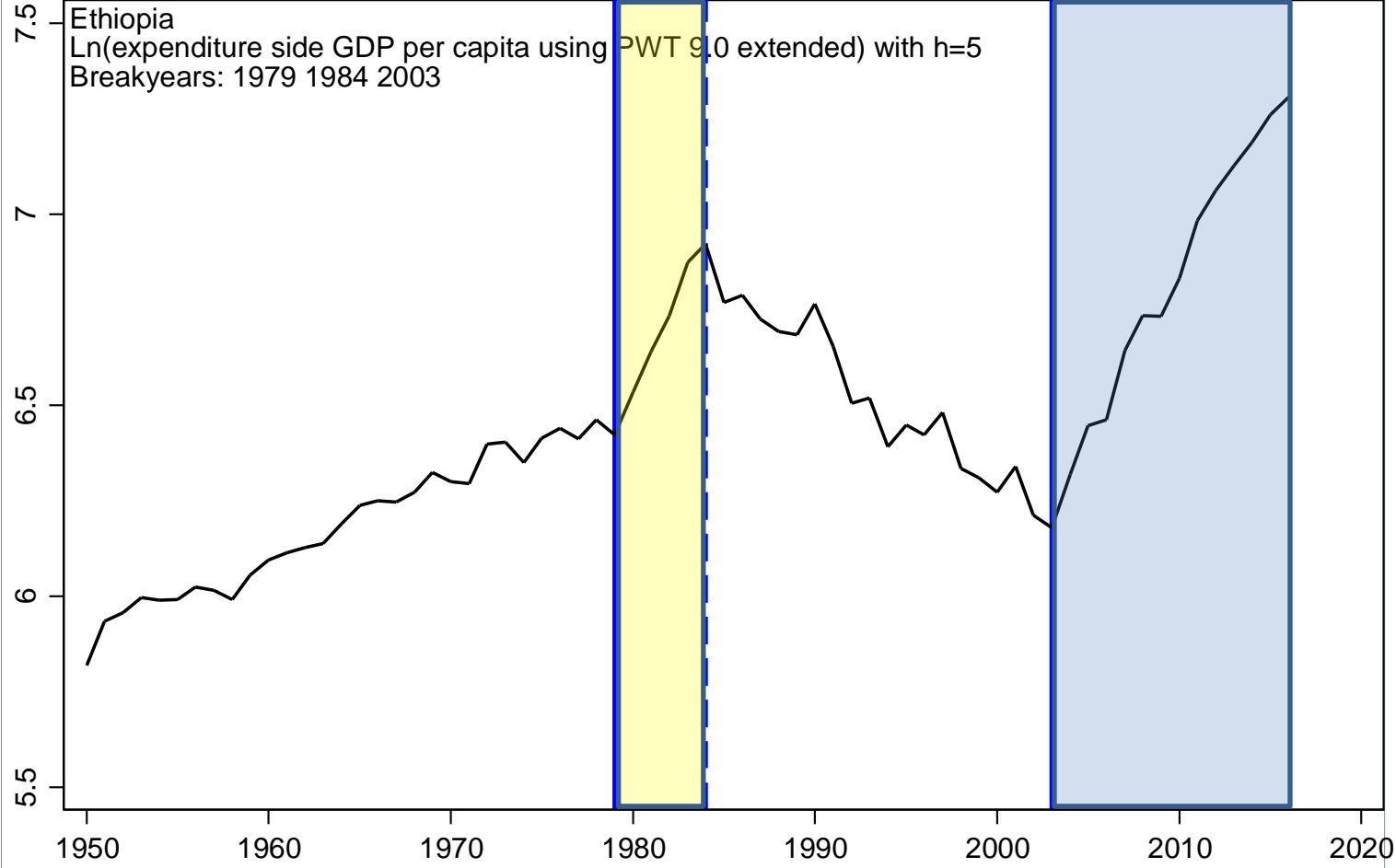
# Nigeria



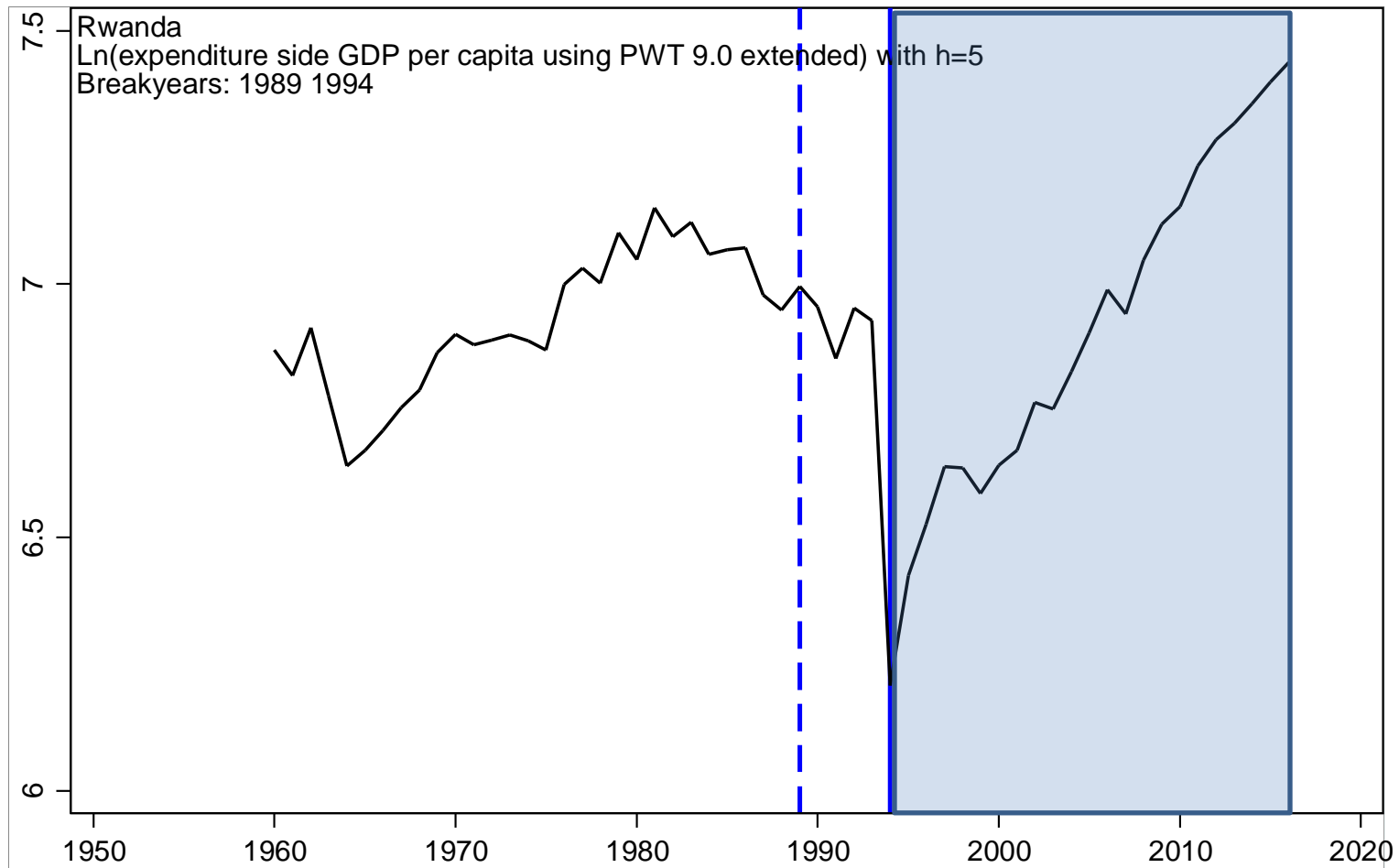
# Zimbabwe



# Ethiopia

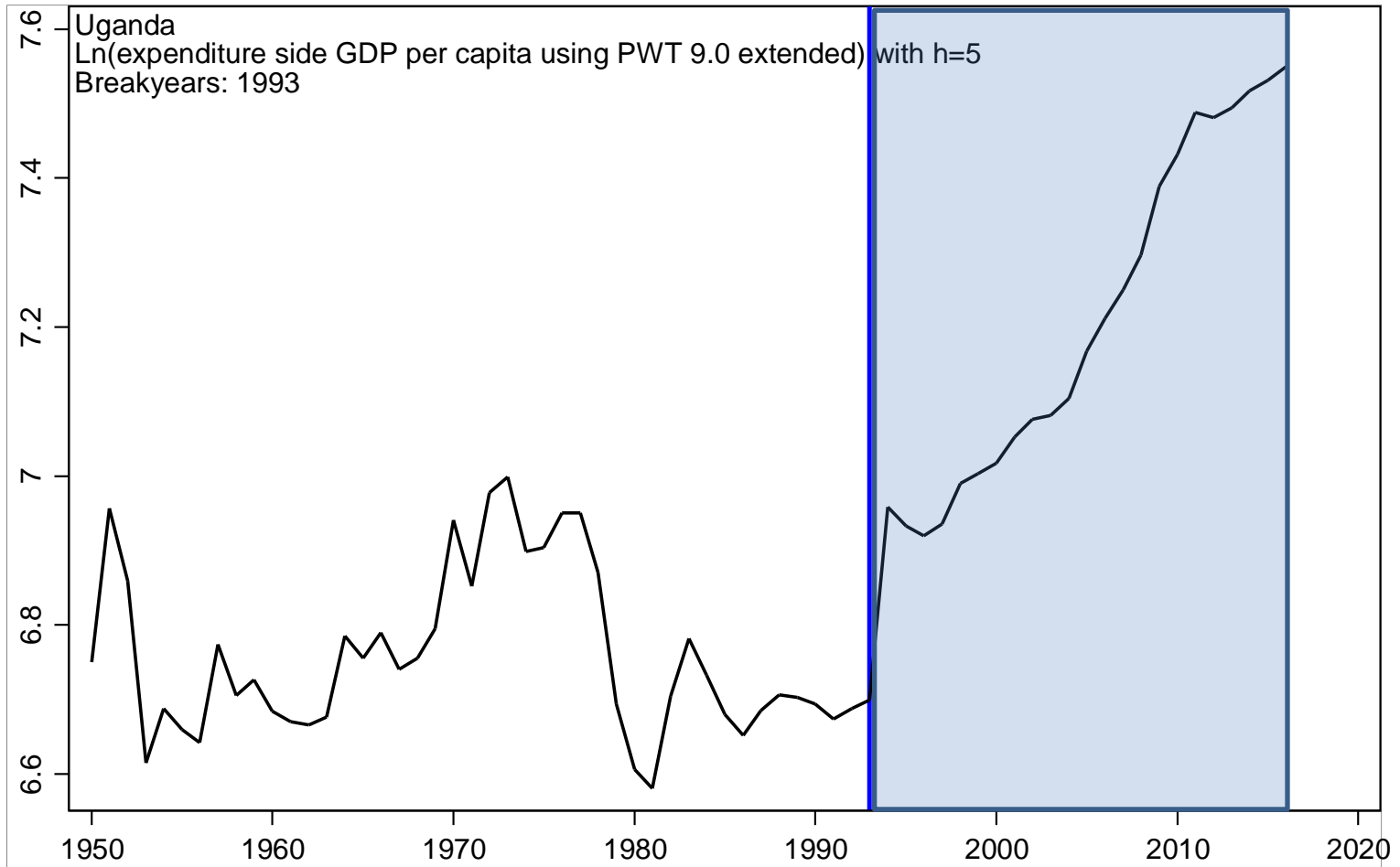


# Rwanda





# Uganda



# Changes during growth turning points



Variables	World			Emerging and Developing				Emerging and Developing no SSA				Sub-Saharan Africa			
	Up breaks	Down breaks	Sym	Up breaks	Obs	Down breaks	Sym	Up breaks	Obs	Down breaks	Sym	Up breaks	Obs	Down breaks	Sym
<b>External Shocks</b>															
Fed Funds (Krippner)	-2.4 ***	-0.9 ***	***	-2.4 ***	145	-0.8 ***	***	-2.2 ***	98	-0.9 **	**	-2.9 ***	47	-0.8	***
Trading partners growth	0.4 ***	-0.3 *		0.4 **	90	-0.2		0.5 ***	63	-0.4 *		0.0	27	0.3	
CTOT, change	0.5 ***	-0.3 ***		0.5 ***	142	-0.4 ***		0.6 ***	97	-0.3 **		0.5 **	45	-0.6 *	
<b>Institutions</b>															
Political risk	6.1 ***	1.3 *	***	6.5 ***	57	1.1	***	7.6 ***	39	0.7	***	4.1 **	18	2.1	
Internal conflict	1.3 ***	0.0	***	1.4 ***	58	0.1	***	1.3 ***	40	0.0	***	1.5 ***	18	0.3	**
Law order	0.4 ***	0.0	***	0.4 ***	58	0.0	**	0.4 ***	40	0.0	**	0.4 **	18	-0.1	
<b>Social and Human Development</b>															
Infant mortality rate	-23.2 ***	-18.3 ***	**	-24.8 ***	137	-20.4 ***	**	-23.7 ***	95	-18.9 ***	*	-27.3 ***	42	-23.6 ***	
Gini coefficient	-1.5 ***	0.4		-1.5 ***	29	0.3		-1.1 *	22	0.2		-2.5 **	7		
<b>Macro Economic Indicators</b>															
Log (1+inflation)	-0.3 ***	0.0	**	-0.3 ***	133	0.1		-0.2 **	94	0.1		-0.4 ***	39	0.1	
Total inv. to GDP	3.4 ***	-0.5	***	3.6 ***	151	0.1	***	3.2 ***	104	0.2	***	4.4 ***	47	-0.2	*
Private inv. to GDP	3.5 ***	-1.3		3.6 ***	47	-0.8		3.8 ***	26	0.4		3.4	21	-2.4	
Gov. revenue to GDP	2.2 ***	0.8		2.2 ***	60	0.5	*	1.4 *	47	0.4		3.7 **	13		
Gov. exp. to GDP	-2.8	2.6 ***		-3.1	58	2.4 ***		-2.2	44	2.5 ***		-4.7	14		
Fiscal balance to GDP	5.1 *	-1.7 ***		5.3 *	57	-1.8 **		3.7	44	-2.1 ***		8.4	13		
Trade to GDP	9.5 ***	6.5 ***		9.3 ***	151	3.2 **	***	9.5 ***	104	2.9 *	***	9.0 **	47	3.9	
FDI to GDP	-1.5 ***	-0.5 *	**	-1.6 ***	119	-0.6 **	**	-1.4 ***	86	-0.8 **		-2.2 ***	33	-0.2	**
Aid to GDP	-0.6	0.8		-0.6	125	0.9		-0.8	87	-0.9 **		-0.1	38	5.0 ***	**
<b>Exchange Rate Misalignments and Regimes</b>															
RER overvaluation	-1.9	5.0 ***		-4.0 *	141	4.1 *		-3.8	94	4.0		-4.2	47	4.4	
Large overvaluation	-0.1 ***	0.0	**	-0.1 ***	151	0.0	***	-0.1 ***	104	0.0	*	-0.1	47	-0.1 *	
<b>Structural Transformation and Technology Adoption</b>															
TFP, growth	3.1 ***	-3.5 ***		3.6 ***	88	-3.9 ***		3.3 ***	69	-4.0 ***		4.8 ***	19	-3.4 ***	
Diversification index	0.044 ***	-0.027 **		0.046 ***	118	-0.036 **		0.055 ***	80	-0.042 **		0.025	38	0.0	
Mobile lines per 100 people	1.6 ***	-1.6 ***		1.8 ***	116	-1.6 ***		2.4 ***	79	-2.1 ***		0.4	37	-0.9 **	