

Measuring sensitivity of exports to Global Value Chains and to exchange rate in emerging and developing economies

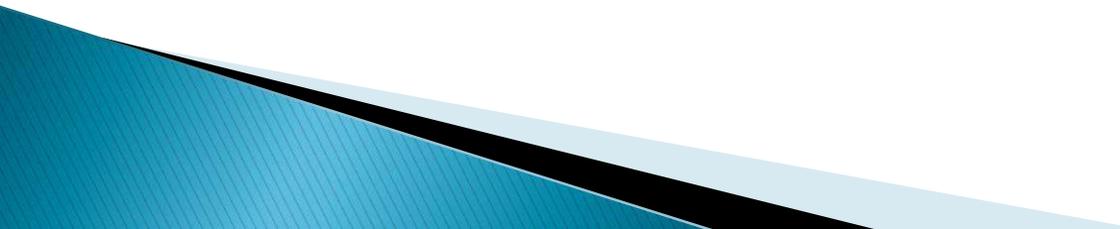
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Introduction

- ▶ We examine the sensitivity of exports to the exchange rate volatility over time and across countries.
- ▶ We analyze how the formation of GVCs has impacted this relation and if there is a threshold effect of GVCs when measuring the impact of the exchange rate on exports.

(Mattoo et al., 2012, Eichengreen and Gupta, 2013, Auboin and Ruta, 2013, Eichengreen and Tong, 2015, Ahmed et al., 2015, Cheng et al., 2016)

Variables and Data

- ▶ This analysis focuses on a panel of 27 emerging and developing countries covering the period 2000-2014.
 - ▶ Endogenous variable: Exports
 - ▶ Control Variable: The GDP growth
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Variables and Data

► Explicative variables:

Exchange Rate

The real effective exchange rate (REER)

Global Value Chains (method developed by Koopan et al(2010))

$$\begin{aligned} GVCparticipation_{ijt} &= FL + BL \\ &= \frac{IV_{ijt}}{EXP_{ijt}} + \frac{FV_{ijt}}{EXP_{ijt}} \end{aligned}$$

Forward Linkages (FL) is the value of inputs produced domestically in country *i* embodied in sector *j* that are used in other countries' exports

Backward Linkages (BL) is the foreign value added content of imports in gross exports.

$$GVCposition_{ijt} = \ln\left(1 + \frac{IV_{ijt}}{EXP_{ijt}}\right) - \ln\left(1 + \frac{FV_{ijt}}{EXP_{ijt}}\right)$$

This indicator measures the relative position of sector *j* in country *i* at *t* time within the GVCs.

Empirical model

- We test at first the direct effect of Global Value Chains and exchange rate volatility on exports using a dynamic panel model:

$$y_{ijt} = \alpha + \beta_1 y_{ijt-1} + \beta_2 REER_{ijt} + \beta_3 GVC_{ijt} + \beta_5 X_{ijt} + \varepsilon_{ijt} \quad (1)$$

- We refine the analysis by introducing the key interaction term between GVCs and REER indicator to detect, possibly, the presence of a threshold effect of GVCs:

$$y_{ijt} = \alpha + \beta_1 y_{ijt-1} + \beta_2 REER_{ijt} + \beta_3 GVC_{ijt} + \beta_4 GVC_{ijt} REER_{ijt} + \beta_5 X_{ijt} + \varepsilon_{ijt} \quad (2)$$

Empirical model

- ▶ The marginal impact of REER on exports is expressed as follows:

$$\frac{\partial y_{ijt}}{\partial REER_{ijt}} = \beta_2 + \beta_4 GVC_{ijt} \quad (3)$$

- ▶ When β_4 is negative, the marginal impact of the exchange rate on exports is more negative at a greater level of GVCs.

When β_4 is positive, the greater level of GVCs will reduce the negative impact of exchange rate on exports.

- ▶ The threshold value of GVC is expressed as follows:

$$\frac{\partial y_{ijt}}{\partial REER_{ijt}} = 0 \Leftrightarrow \beta_2 + \beta_4 GVC_{ijt} = 0 \Leftrightarrow \textit{Threshold GVC} = \frac{-\beta_2}{\beta_4} \quad (4)$$

Results

The three first columns are the estimation for the equation (3) and the two last columns are for equation (4).

Table: Real exchange rate, global value chain and export

Variables	(1)	(2)	(3)	(4)	(5)
REER	-0.0082*	-0.0093**	-0.015*	-0.019*	-0.032**
	(0.078)	(0.011)	(0.078)	(0.064)	(0.049)
GVCparticipatio		0.0011***		0.0017*	
		(0.000)		(0.069)	
GVCposition			0.013*		0.084*
			(0.086)		(0.076)
REER×GVCparticipation				0.018*	
				(0.058)	
REER×GVCposition					0.043*
					(0.077)
y_{ijt-1}	0.865***	0.733***	0.0013	0.0044**	0.0014*
	(0.000)	(0.000)	(0.626)	(0.016)	(0.052)
Test of Sragan (p-value) ¹	0.198	0.661	0.584	0.660	0.795
Test of second order correlation (p-value) ²	0.321	0.744	0.542	0.964	0.827
Threshold Value of GVCs $(-\beta_2/\beta_4)$				0.1056	0.0932

Results

- ▶ The estimation results with the System GMM method of the two specifications of equation (1) and equation (2) to test the interaction between the exchange rate and global value chains validate the presence of the threshold effect.
- ▶ Without GVC participation, the REER impact on export is (-0.019), therefore on average the GVC participation reduces this negative impact by approximately 16 percent. ($0,16=0,018*0,1721/0,019$ (an average of GVC participation is 0.1721)).

 The GVCs can reduce the negative impact of exchange rate on exports.

References

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