

Bilateral J-Curves Between Pakistan and her Trading Partners

by

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The J-Curve Phenomenon

Currency devaluation, due to its lag structure, is said to *worsen* the trade balance first, and then *improve* it later resulting in a pattern resembling the letter J, hence the J-Curve nomenclature

The Standard Theoretical Explanation

- A change in the exchange rate has two effects on trade flows:
 - ▶ price effect
 - ▶ volume effect
- Price effect implies that currency depreciation will cause imports to be more expensive and domestic exports to be cheaper for foreign buyers at least in the short run. Since the volume of goods imported and exported goods might not change drastically in the short run, the trade balance may initially deteriorate.
- The price effect is believed to dominate in the short run.
- Volume of trade changes eventually in response to the depreciation.
- In the long run, if the Marshall-Lerner condition holds, the volume effect dominates and the trade balance improves.
- The total effect when plotted over time with trade balance on the y-axis will yield the J-curve.

Empirical Evidence

- The empirical evidence for the existence of the j-curve can at best be described as mixed
- Earlier studies like Krugman and Baldwin (1987) find evidence of a J-curve in the US data.
- However, Rose and Yellen (1989), Rose (1990) and (1991) reject the J-curve hypothesis, but also argue that there is no significant effect of the real exchange rate on the trade balance for both the developing and the developed countries, including the US.
- In a more recent study, Bahmani-Oskoee and Brooks (1999) used the ARDL approach to analyze the US data and found that short-run results support the Rose and Yellen findings that there is no effect of real exchange rate on the trade balance in the short run, but in the long-run the real depreciation of the US Dollar found to have a favorable effect on the trade balance.

The J-curve Phenomenon for Pakistan

Only two studies have tested the J-curve phenomenon for Pakistan

- Aftab and Aurangzeb (2002)
- Bahmani-Oskooee (1985)

These studies employed aggregate trade data, and suffer from 'aggregation bias'.

Disaggregated Analysis

This paper uses disaggregated country-wise trade data for Pakistan in order to avoid “aggregation bias”.

To the best of our knowledge this paper is the first attempt to apply such an approach to the case of Pakistan.

We investigate the short-run and the long-run effects of real depreciation of the Pakistani Rupee on the bilateral trade balance between Pakistan and each of her 12 trading partners

We use quarterly data over the time period 1980-2005.

Pakistan's Trade Share with its Major Trading Partners

TRADE SHARES	Share
United States	14.4%
Canada	1.3%
Japan	4.4%
France	2.5%
Germany	4.9%
Italy	2.6%
Netherlands	1.8%
Spain	1.3%
United kingdom	5.2%
Hong Kong	3.1%
Korea	2.5%
Singapore	3.6%
<i>Total</i>	<i>47.6%</i>

Methodology

Following Bahmani-Oskooee and Brooks (1999) our model expresses the trade balance as a function of domestic income, foreign income and the real exchange rate.

$$\ln\left(\frac{x_{it}}{m_{it}}\right) = \beta_0 + \beta_1 \ln r_{ti} + \beta_2 \ln y_{pt} + \beta_3 \ln y_{it} + \varepsilon_{it} \dots\dots\dots(1)$$

Long Run Analysis (Co-integration)

Autoregressive Distributed Lag (ARDL)

$$\begin{aligned}\Delta \ln\left(\frac{x_{it}}{m_{it}}\right) &= \beta_0 + \sum \beta_{1j} \Delta \ln r_{t-j} + \sum \beta_{2j} \Delta \ln y_{pt-j} + \sum \beta_{3j} \Delta \ln y_{it-j} \\ &+ \sum \beta_{4j} \Delta \ln\left(\frac{x_{it-j}}{m_{it-j}}\right) + \gamma_1 \ln(x_{it-1} / m_{it-1}) + \gamma_2 \ln r_{it-1} \\ &+ \gamma_3 \ln y_{pt-1} + \gamma_4 \ln y_{it-1} + \varepsilon_{it} \dots \dots \dots (2)\end{aligned}$$

Short run Dynamics

Error-Correction Model

$$\begin{aligned} \Delta \ln \left(\frac{x_{it}}{m_{it}} \right) = & \beta_0 + \sum \beta_{1i} \Delta \ln r_{it-j} + \sum \beta_{2i} \Delta \ln y_{pt-j} + \sum \beta_{3i} \Delta \ln y_{it-j} \\ & + \sum \beta_{4i} \Delta \ln \left(\frac{x_{it-j}}{m_{it-j}} \right) + \lambda EC_{it-1} + u_t \dots \dots \dots \textcircled{B} \end{aligned}$$

Empirical results

Trade partner	Lags selected	F-statistics
Canada	2	2.4
France	8	8.4
Germany	2	12.6
Hong Kong	6	20.5
Italy	2	5.5
Japan	2	1.2
Korea	6	2.4
Netherlands	8	8.9
Singapore	2	2.5
Spain	2	9.5
UK	2	8.0
USA	6	4.7

Long Run Estimated Equations for the Trade Balance

Country	Exchange Rate	Income (Pak)	Income (trade partner)
France	-0.2(-1.3)	0.9(2.9)	-0.5(-2.8)
Germany	0.9(5.8)	-0.7(-2.6)	-0.06(-0.4)
Hong Kong	0.5(2.2)	-0.07(-0.2)	2.9(6.4)
Italy	0.6(1.9)	-0.7(-1.3)	1.1(1.5)
Netherlands	1.6(4.1)	-0.4(-1.0)	5.7(2.2)
Spain	1.1(4.1)	0.2(0.6)	0.3(0.7)
UK	0.3(1.3)	-0.3(-1.6)	3.8(3.0)
USA	-0.4(-0.9)	3.8(3.7)	-3.8(-3.7)

Coefficient Estimates of the Exchange Rate and the Error Correction term

Trading Partners								
	France	Germany	Hong Kong	Italy	Nether land	Spain	UK	USA
$\Delta \ln r$	-0.1(-06)	0.5(1.5)	1.8(0.9)	0.8(0.2)	0.4(0.5)	0.5(0.6)	0.5(0.9)	-0.3(-1.6)
$\Delta \ln r_{t-1}$	0.1(0.3)	0.02(0.1)	1.2(0.6)	0.3(0.5)	0.4(0.5)	0.6(0.8)	0.2(0.4)	-0.2(-1.4)
$\Delta \ln r_{t-2}$	-0.4(-0.2)	0.2(0.4)	-0.7(-0.3)	-0.5(-0.3)	-0.9(-1.2)	0.4(0.6)	0.5(0.7)	-0.3(-1.7)
$\Delta \ln r_{t-3}$	-0.3(-1.2)		4.4(2.4)		-1.0(-1.2)	0.6(0.8)	-0.4(-0.6)	-0.1(-0.9)
$\Delta \ln r_{t-4}$	0.2(0.8)		3.1(1.7)		-1.1(-1.3)	0.7(0.9)	0.3(0.5)	-0.1(-3.2)
$\Delta \ln r_{t-5}$	-0.1(-0.3)		1.4(0.7)		0.5(0.7)			
$\Delta \ln r_{t-6}$	-0.4(-1.9)		-0.2(-0.1)		0.02(0.3)			
$\Delta \ln r_{t-7}$	-0.1(-0.7)				-0.03(-0.1)			
$\Delta \ln r_{t-8}$	0.3(1.4)				0.4(0.5)			
EC_{t-1}	-0.6(-2.8)	0.6(-4.5)	-0.9(-5.0)	-0.3(-3.3)	-0.4(-2.5)	-0.4(-2.7)	-0.2(-2.3)	-0.1(-3.2)

Findings of previous studies

	Marshall-Lerner Condition	Methodology	Estimation Period	Data Frequency
Aftab and Aurangzeb (2002)	Satisfied	Co-integration	1980–2000	Quarterly
Akhtar and Malik (2000)	Not satisfied for US and Germany but satisfied for UK and Japan	3SLS	1982-96	Quarterly
Bahmani-Oskooee (1998)	Strongly satisfied (3.11)	Co integration	1973-90	Quarterly
Khan and Aftab (1995)	“Barely satisfied”	IV	1983-931	Quarterly
Hasan and Khan (1994)	Strongly satisfied (1.64)	3SLS	1972-91	Annual

Conclusion

- Exchange rate depreciation *does not* have a significant impact on the trade balance in *three* of the *eight* countries considered.
- These three countries are USA, UK, and France.
- Together they account for a little more than 22% of Pakistan's total trade share; in fact, USA and UK are among Pakistan's largest trading partners.
- While, for five of the eight countries (Germany, Hong Kong, Italy, Netherlands, and Spain) a real devaluation of the Pakistani Rupee improves the Pakistani trade balance with each country.

Conclusion contd.

- The present concentration of trade with countries where real devaluation does not have a significant effect on the respective trade balance, suggests a need for Pakistan to diversify its export destinations and look for new markets.
- Moreover, we need to view a devaluation policy with caution!
- Further research, closely analyzing the commodities traded with each bilateral trade partner, is suggested before making clear policy recommendations *vis a vis* the viability of a real exchange devaluation.

Thank you !