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Trade balance and validity of the Marshall-Lerner condition: Evidence from Pakistan

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Abstract: In this study, the Marshall-Lerner condition (MLC) was used to examine the impact of depreciation on the balance of trade in Pakistan. MLC states that if the sum of the absolute values of demand elasticities of imports and exports is more significant than one, depreciation is theorized to improve the balance of trade of a country otherwise not. This study concludes that during 2001 to 2014 the sum of the absolute values of demand elasticities of imports and exports was more significant than one. During 2015 to 2020 the sum was less than one, implying that depreciation will not improve the balance of tradein Pakistan in the current situation. Our finding mirrors that of Bird (1983); devaluation fails to improve the present account component of the balance of payments. In the present scenario, there are no chances that the exchange rate management (devaluation) will improve the balance of trade, and depreciation alone does not guarantee improvement of the balance of payments of a country. In the same vein, the terms of trade deterioration also did not improve the balance of trade. Moreover, this study has also discussed the macroeconomic effects of a weaker currency. Finally, steps needed to be taken by the government have also been recommended to improve the balance of trade.

Keywords: Real exchange rate, J-curve, Terms of trade, Balance of trade, Pakistan

1. Introduction

During 2001 to 2020, Pakistan had seen continuous currency depreciation against the US dollar and deterioration in its balance of trade. There has always been a lack of consensus regarding the interrelationship between the exchange rate fluctuation and the balance of trade of a country. In literature,some studies showed a significant relationship between these two variables (for example, Sing (2002) and Onafowora (2003). On the contrary, Rose and Yellen(1989)and Rose (1990, 1991) reported no relationship between the exchange rate and the balance of trade.

The existing literature can be divided into two categories. First, those studies investigate whether there is any relationship between these two variables, both in the long-run and short-run. Some concluded that there exists a strong relationship between the exchange rate fluctuations and the balance

of trade. To quote some, Sing (2002),Musila and Newark(2003), and Vergil (2002), while investigations done by others such as Rose (1990, 1991), Wilson (2001),and Zhang(1999) are contrary to this.

Secondly, there are studies that probed into the matter to see whether the Marshall- Lerner condition and the J-curve hypothesis hold after currency depreciation. According to the Marshall-Lerner condition, depreciation improves the balance of trade if the sum of the absolute price elasticity of exports and price elasticity of imports exceeds unity, at the same time the J-curve depicts that after devaluation of a currency, the balance of trade initially deteriorates (as shown in figure 2) but improves ultimately, Hsing and Sergi (2010), Gomes and Paz (2005), Rose and Yellen (1989), Yusoff (2007), Rahman and Islam (2006). Such opposing and contradictory findings encouraged us to explore whether or not this relationship exists in Pakistan. Pakistan is having a managed floating exchange rate system currently.

The main objectives of Pakistan's macroeconomic policy are to enhance exports and reduce imports to bridge the gap between revenue from exports and expenditure on imports, which ultimately improve the current account balance and hence balance of payments. The chief objectives of State Bank are to achieve both the domestic and external targets. Main internal targets include: (i). Inflation and (ii). Employment level. External targets include: (i). Improvement of the current account, (ii). Increasing the foreign exchange reserve level, (iii). They maintain the exchange rate level within the desired level to increase international competitiveness. The key objectives of exchange rate policy are: (iv). Trade creation and trade diversion (geographically), (v). Discourage imports growth and encourage production of imports substitutes, (vi). Encourage foreign remittances inflow, (vii). Improve terms of trade, (viii). Keeping internal prices stable and (ix). Minimize fluctuation in economic growth. Hence, the effectiveness of exchange rate policy is of vital importance for a country. The current account depends the exchange rate, domestic and foreign income level (Y and Y^f) respectively, and ratio of domestic to foreign prices $\left(\frac{P}{eP^f}\right)$.

In this study, the Marshall-Lerner condition (MLC) was used to examine the impact of depreciation on the balance of trade of Pakistan. We conclude that depreciation did not improve the balance of trade and the Marshall-Lerner condition does not hold in the case of Pakistan, thus devaluation alone will not be successful in improving the balance of trade component of the balance of payments.

The rest of the paper is organized as follows. Section two presented the historical perspective of different exchange rates regimes in Pakistan. Section three presents the mathematical exposition of Marshall-Lerner condition (MLC) for Pakistan, respectively. Section four presents macroeconomic benefits of weaker currency. The last section concludes the paper.

1.2 Historical perspective of different exchange rates regimes in Pakistan

Pakistan rupee in 1955-56 was devalued by 30 percent which increased exports by 47 percent. The government then introduced the Export Bonus Scheme (EBS) in 1959 to enhance manufactured goods exports. The idea behind this was to compensate the overvalued exchange rate and increase exports. This led to increase in both textile and manufactured goods by 28 percent and 15 percent, respectively during 1958-59.

Pakistani currency was again devalued in 1972-73 by 55 percent which increased exports by 40 percent (in terms of US$) and 24 percent in 1973-74 which made balance of payments surplus of $153 million. After that, Pakistan maintained a fixed exchange rate against US$ till January 1982. To keep up with the appreciated dollar, the Pak rupee was revalued which led to overvaluation of the rupee at the 1973 rate. In 1982, the rupee was delinked from the US dollar and the managed floating exchange rate

policy was adopted from 1982 till 1999. In 1992 a unified floating exchange rate policy was introduced which boosted exports during 1999-2000.

In spite of devaluation of the currency by 12 percent in 1984-85, exports decreased by 8 percent during the first nine months of 1984-85. Once again, the rupee was devalued by 10 percent in 1993 and by 8 percent in 1996. These devaluations were not successful to increase exports; rather exports growth was negative in both 1993-94 and 1996-97. Therefore, devaluation has not always been successful in improving trade balance of the country.

2. Mathematical Exposition

In order to judge the impact of depreciation and inflation on the balance of trade the following approach has been used. The symbols used in this paper are:

e = exchange rate of Pakistan rupee (domestic currency/ foreign currency US $). Depreciation of Pak rupee is shown by $e^{\uparrow}$, i.e. more rupees are exchanged for given US $.

x = quantity of exports of Pakistan termed as export function, $x = x((\frac{P}{e})^{-}, y^{f+}, P^{f+})$

m= quantity of imports of Pakistan termed as import function, $m = m((ep^{f})^{+}, y^{+}, P^{+}, e^{+})$

P = Price of Pakistan exports in domestic currency

P^{f} = Price of imports in foreign currency (US $)

$e = \frac{P}{P^{f}} \Rightarrow eP^{f} = P$, *the purchasing power parity, depreciation of the home country's currency (Pakistan rupee) is represented by rising value of e, more rupees for given* $.

$\varepsilon_{m} = \left(-\frac{ep^{f}}{m}\frac{\partial m}{\partial ep^{f}} \right)$ = The home import demand elasticity of foreign country's goods

$\varepsilon_{x} = \left(-\frac{\left(\frac{P}{e}\right)}{x}\frac{\partial x}{\partial\left(\frac{P}{e}\right)} \right)$ = The foreign demand elasticity for the home country's exports

Y = output of domestic (Pakistan) economy

Y^{f} = output of foreign (USA) economy

X = money value of exports of Pakistan, $= Price \times Quantity = P\,x((\frac{P}{e})^{-}, y^{f+}, P^{f+})$ (i)

M = money value of imports of Pakistan M= $eP^{f}\ m((ep^{f})^{+}, y^{+}, P^{+}, e^{+})$ (*ii*)

X-M= BOT= net exports= current account component of BOP in money terms

BOP = Current account + Capital account + Official financing + Balancing item

In order to see the impact of changes in P on X, we differentiae (i) X= P $x(P^{-}, e^{-})$ with respect to P, which yields:

$$\frac{\partial X}{\partial P}=P\frac{\partial x}{\partial\left(\frac{P}{e}\right)}\frac{\partial\left(\frac{P}{e}\right)}{\partial P}+x=\ P\frac{\partial x}{\partial\left(\frac{P}{e}\right)}\frac{1}{e}+x\ \ \Rightarrow\frac{\partial X}{\partial P}=x\left(\frac{\left(\frac{P}{e}\right)}{x}\frac{\partial x}{\partial\left(\frac{P}{e}\right)}+1\right)=\ x\left(1-|\varepsilon_{\mathrm{x}}|\right)$$

$$\Rightarrow\ \frac{\partial X}{\partial P}=x\left(1-|\varepsilon_{\mathrm{x}}|\right)<0\ \textit{if}\ \ |\varepsilon_{\mathrm{x}}|>1\ \textit{where}\ \ \varepsilon_x=\left(-\frac{\left(\frac{P}{e}\right)}{x}\frac{\partial x}{\partial\left(\frac{P}{e}\right)}\right),\ \textit{in case of pakistan}\ |\varepsilon_{\mathrm{x}}|=1.32,$$

$$\text{thus,}\ \frac{\partial X}{\partial P}=x\left(1-1.32\right)=-0.32x\ \textit{which is negative, thus exports decreased owing to inflation.}$$

Where ε_x stands for the price elasticity of demand for exports. An increase in P reduces exports x, the money value of exports (X) increases or decreases depending upon the absolute value of $|\varepsilon_{\mathrm{x}}|$ < 1 or $|\varepsilon_{\mathrm{x}}|$ >1. The export and import elasticities are adopted from Afzal (2001; 2001).

The impact of changes in ep^f on M can be observed by differentiating (ii) with respect to ep^f yields :

M= $eP^f\ m((ep^f)^+,y^+,P^+,e^+)$

$$\frac{\partial M}{\partial ep^f}=m+ep^f\frac{\partial m}{\partial ep^f}\Rightarrow m\left(1+\frac{ep^f}{m}\frac{\partial m}{\partial ep^f}\right)\quad \textit{where}\ \varepsilon_m=-\frac{ep^f}{m}\frac{\partial m}{\partial ep^f},\ \textit{hence}$$

$$\frac{\partial M}{\partial ep^f}=m\left(1-|\varepsilon_{\mathrm{m}}|\right)>0\ \textit{if}\quad |\varepsilon_{\mathrm{m}}|<1\ \text{otherwise}\ \frac{\partial M}{\partial ep^f}<0\ \textit{if}\quad |\varepsilon_{\mathrm{m}}|>1.$$

$$\text{In case of Pakistan}\ |\varepsilon_{\mathrm{m}}|=0.33,\ \text{thus}\ \frac{\partial M}{\partial ep^f}=m\left(1-0.33\right)=0.77m,\ \textit{which is positive.}$$

$$\textit{Thus}\ \ \frac{\partial M}{\partial ep^f}>0.\ \textit{Which is in accordance with our perception.}$$

Table 1: Export and Import Demand Elasticities for Pakistan

Authors	Export elasticity (ε_x)	Import elasticity (ε_m)
Afzal (2001; 2001)	1.32	-0.33
Hasan, M.A. & Ashfaque	0.617primary goods	-1.34industrial raw material
H.Khan (1994)	1.278manufactured goods	-0.383 industrial manufactured goods

Based on 2020, ratio of total exports (30 b) to imports (62 b) was 30/62= 0.483. Using expression (*iii*), sum of the elasticities = $\left(0.483|\varepsilon_{\mathrm{x}}|+|\varepsilon_{\mathrm{m}}|\right)$= $\left(0.483\times1.32+0.33\right)$= 0.96, The Marshall-Lerner condition is = [$\left(0.483|\varepsilon_{\mathrm{x}}|+|\varepsilon_{\mathrm{m}}|\right)$-1] = [0.96-1] = -0.04, since sum of the elasticities is less than 1, thus, MLC did not hold in 2020.

The demand elasticities of imports and exports are adopted from Afzal (2001; 2001) in Table 1. It is evident from Table 2 that MLC was holding from 2001 through 2014, but was not holding from 2015

through 2020, showing that the ratio between revenue from exports and expenditure on imports (θ) plays an important role to make MLC greater or less than 1.

When θ assumes the value of 0.50 or less, value of the MLC becomes negative. Put it differently, devaluation or depreciation will not improve trade balance of a country if θ is 0.50 or less, *ceteris paribus*.

Table 2: Trade data of Pakistan for the period 2001-2020

Years	Exports (X) ($ billions)	Imports (M) ($ billions)	X/M = θ	$\theta \lvert\varepsilon_x\rvert$ ε_x = 1.32	$\theta \lvert\varepsilon_x\rvert + \lvert\varepsilon_m\rvert$, $\lvert\varepsilon_m\rvert$ = 0.33	MLC = $\theta \lvert\varepsilon_x\rvert + \lvert\varepsilon_m\rvert$-1
2001	10.6	11.4	0.92	1.21	1.54	0.54, > 0
2002	11.0	11.1	0.99	1.30	1.63	0.63, > 0
2003	11.9	13	0.91	0.87	1.20	0.20, > 0
2004	13.4	17.9	0.75	1.20	1.32	0.32, > 0
2005	16.1	25.1	0.64	0.84	1.17	0.17, > 0
2006	16.9	28.9	0.58	0.76	1.09	0.09, > 0
2007	17.8	32.6	0.54	0.71	1.04	0.04, > 0
2008	20.3	42.3	0.47	0.62	0.95	-0.05, < 0
2009	17.6	31.6	0.55	0.72	1.05	-0.05, > 0
2010	24.4	37.5	0.65	0.85	1.18	0.18, > 0
2011	25.3	43.6	0.58	0.76	1.09	0.09, > 0
2012	24.6	43.8	0.56	0.73	1.06	0.06, > 0
2013	25.1	43.8	0.57	0.75	1.08	0.08, > 0
2014	24.7	47.5	0.52	0.68	1.01	0.01, > 0
2015	22.1	44	0.50	0.66	0.99	-0.01, < 0
2016	20.5	47	0.43	0.56	0.89	-0.11, < 0
2017	25.1	53.6	0.43	0.56	0.89	-0.11,< 0
2018	28.2	63.1	0.44	0.58	0.91	-0.09, < 0
2019	28.2	56.5	0.49	0.64	0.97	-0.03, < 0
2020	30.0	62	0.48	0.63	0.96	-0.04, < 0
Growth Rate	3.16%	9.31%				$MLC_{2001-2014} > 0$ $MLC_{2015-2020} < 0$

Source: Author's own calculations

It is evident from Table 2 that depreciation during 2015-2020 could not improve the balance of trade of Pakistan because MLC did not hold.

3.2 Derivation of the Marshall-Lerner condition

The current account component in the balance of payments of a country could be written as:
BOT =Net exports= money value of exports – money value of imports

$$X - M = P\,x((\frac{P}{e})^{-}, y^{f+}, P^{f+}) - eP^{f}\; m((ep^{f})^{+}, y^{+}, P^{+}, e^{+})$$

differentiating it with respect to P gives us

$$\frac{\partial(X-M)}{\partial P} = \frac{\partial\left[P\,x((\frac{P}{e})^{-}, y^{f+}, P^{f+})\right]}{\partial P} - \frac{\partial\left(eP^{f} m((ep^{f})^{+}, y^{+}, P^{+}, e^{+})\right)}{\partial P}$$

$$\frac{\partial(X-M)}{\partial P} = \left[P\frac{\partial x}{\partial\left(\frac{P}{e}\right)}\frac{\partial\left(\frac{P}{e}\right)}{\partial P} + x\right] - \left[eP^{f}\frac{\partial m}{\partial eP^{f}}\frac{\partial eP^{f}}{\partial P} + m\frac{\partial eP^{f}}{\partial P}\right]$$

According to the Purchasing Power Parity, $eP^{f} = P$*, so replacing* eP^{f} *by P.*

$$\frac{\partial(X-M)}{\partial P} = \left[P\frac{\partial x}{\partial\left(\frac{P}{e}\right)}\frac{1}{e} + x\right] - \left[m\frac{P}{m}\frac{\partial m}{\partial P} + m\right] \Rightarrow \frac{\partial(X-M)}{\partial P} = x\left[1+e_{x}\right] - m\left[1+e_{m}\right]$$

$$\frac{\partial(X-M)}{\partial P} = x\left[1-|\varepsilon_{x}|\right] - m\left[1-|\varepsilon_{m}|\right] \Rightarrow \frac{\partial(X-M)}{\partial P} = \frac{\partial X}{\partial P} - \frac{\partial M}{\partial P}$$

Theoretically speaking, a rise in P decreases exports of the home country; becaue exports become less competitive in international markets. Since $|\varepsilon_{x}| > 1$ and $|\varepsilon_{m}| < 1$*, therefore,*

$\left(\frac{\partial X^{-}}{\partial P} - \frac{\partial M^{+}}{\partial P}\right) < 0$*, in case of pakistan* $\left(|\varepsilon_{x}| + |\varepsilon_{m}|\right) = (1.32 + 0.33) = 1.65$*, that is* $\left(|\varepsilon_{x}| + |\varepsilon_{m}|\right) > 1$*,*

thus $\frac{\partial(X-M)}{\partial P} < 0$*. This implies that a rise in prices in the home country worsens the current account balance (net exports) which in turn has unfavourable impact on the balance of payments.*

Similarly, the impact of depreciation of Pak rupee ($e^{\uparrow}$) on current account could be judged as follows.
BOT = Current account = money value of exports – money value of imports

$$\text{BOT} = P\,x((\frac{P}{e})^{-}, y^{f+}, P^{f+}) - eP^{f}\; m((ep^{f})^{+}, y^{+}, P^{+}, e^{+})$$

In order to see the impact of depreciation of the currency ($e^{\uparrow}$) on the BOT, we differentiate it with respect to 'e'.

$$\frac{\partial(BOT)}{\partial e} = P\frac{\partial x}{\partial(\frac{P}{e})}\frac{\partial(\frac{P}{e})}{\partial e} - \frac{\partial e}{\partial e}p^f m - ep^f \frac{\partial m}{\partial(ep^f)}\frac{\partial(ep^f)}{\partial e} \Rightarrow$$

$$\frac{\partial(BOT)}{\partial e} = P\frac{\partial x}{\partial(\frac{P}{e})}\frac{(-P)}{e^2} - p^f m - ep^f \frac{\partial m}{\partial(ep^f)}p^f, \text{ setting } \frac{\partial(BOT)}{\partial e} = 0 \text{ and dividing by } p^f m$$

$$\frac{P}{p^f m}\frac{\partial x}{\partial(\frac{P}{e})}\frac{(-P)}{e^2} - 1 - \frac{ep^f}{m}\frac{\partial m}{\partial(ep^f)} = 0 \Rightarrow \text{rearranging gives us } \frac{P}{p^f m}\frac{\partial x}{\partial(\frac{P}{e})}\frac{(-P)}{e^2} - \frac{ep^f}{m}\frac{\partial m}{\partial(ep^f)} - 1$$

In order to elasticize this expression we multiply by $\frac{x}{x} = 1$ *which yields*

$$\frac{Px}{ep^f m}\left(-\frac{\partial x}{\partial(\frac{P}{e})}\frac{(\frac{P}{e})}{x}\right) + \left(-\frac{ep^f}{m}\frac{\partial m}{\partial(ep^f)}\right) - 1 \text{ where price elasticity of export } \varepsilon_x = \left(-\frac{\partial x}{\partial(\frac{P}{e})}\frac{(\frac{P}{e})}{x}\right)$$

and price elasticity of import $\varepsilon_m = \left(-\frac{ep^f}{m}\frac{\partial m}{\partial(ep^f)}\right)$, *hence*

$$\frac{\partial(BOT)}{\partial e} = \frac{Px}{ep^f m}|\varepsilon_x| + |\varepsilon_m| - 1 \quad \text{where } \frac{Px}{ep^f m} = \frac{\text{revenue from exports}}{\text{expenditure on imports}} = \theta, \qquad (iii)$$

if the balance of trade is balanced, then $\theta = 1$, *which gives us* $\frac{\partial(BOT)}{\partial e} = (|\varepsilon_x| + |\varepsilon_m|) - 1$

Depreciation of the currency will improve BOT if $\frac{\partial(BOT)}{\partial e} > 0$, *for that* $(|\varepsilon_x| + |\varepsilon_m| > 1)$

This $(|\varepsilon_x| + |\varepsilon_m| > 1)$ *is called the Marshall – Lerner condition.*

In case of Pakistan the term θ *during* $2015-2020$ (*Table* 2) *was less than* 1, *while during* $2001-2014$, $\theta > 1$. *It reflects that as imports increase more than exports, this ratio decreases which changes elastic exports elasticity of demand to inelastic, which makes MLC invalid. For example, in the year* 2020, θ *was* $\frac{30}{62} = 0.483 < 1$ *implying*

$$\frac{\partial(BOT)}{\partial e} = (0.483|\varepsilon_x| + |\varepsilon_m|) - 1, \quad \frac{\partial(BOT)}{\partial e} = \left[(0.483 \times 1.32 + 0.33) - 1\right]$$

$$\Rightarrow \frac{\partial(BOT)}{\partial e} = \left[(0.6375 + 0.33) - 1\right] \Rightarrow \frac{\partial(BOT)}{\partial e} = -0.032 < 1. \text{ Thus, the Marshhall – Lerner condition did not hold. Hence depreciation of Pakistan currency did not improve the BOT.}$$

Table 3: Trade, Exchange Rate, CPI, TOT, Nominal Gross Domestic Product of Pakistan and USAdata for the period 2001-2020

Years	Exports X ($ billions)	Imports M ($ billions)	Current accounts (X-M) ($ billions)	Exchange rate (e) Rs./$	Consumer Price Index (P)	Terms of Trade (2000=100)	Nominal GDP of Pakistan Billion US $.	Nominal GDP of USA Billion US $.
2001	10.6	11.4	-0.8	61.92	3.14	99.85	79.70	10621.9
2002	11.0	11.1	-0.1	59.72	3.29	94.81	77.93	10977.5
2003	11.9	13	-1.1	57.75	2.91	88.68	89.72	11510.7
2004	13.4	17.9	-4.5	58.25	7.444	84.56	106.64	12274.9
2005	16.1	25.1	9.0	59.51	9.06	75.9	119.38	13093.7
2006	16.9	28.9	-12	60.27	7.92	70.1	136.45	13855.9
2007	17.8	32.6	-14.8	60.73	7.59	65.54	152.96	14473.6
2008	20.3	42.3	-22	70.40	20.28	57.63	155.79	14718.6
2009	17.6	31.6	-14	81.71	13.64	64.83	162.17	14418.7
2010	24.4	37.5	-13.1	85.19	12.93	64.69	173.95	14964.4
2011	25.3	43.6	-18.3	86.34	11.91	61.79	212.54	15517.0
2012	24.6	43.8	-19.2	93.39	9.68	59.34	211.84	16155.3
2013	25.1	43.8	-18.7	101.62	7.69	56.67	225.85	16784.9
2014	24.7	47.5	-22.8	101.10	7.18	58.8	254.72	17521.3
2015	22.1	44	-21.9	102.76	2.52	60.24	259.60	18224.8
2016	20.5	47	-26.9	104.76	3.76	62.83	277.54	18715.0
2017	25.1	53.6	-28.5	105.45	4.08	58.19	304.35	19519.4
2018	28.2	63.1	-34.9	121.82	5.07	54.92	284.81	20580.2
2019	28.2	56.5	-28.3	150.03	10.57	59.7	232.88	21439.0
2020	30.0	62	-32.0	165	12.03	61.4	248.12	20234.0
Growth Rate	3.16%	9.31%	-21.41%	-5.29 %	7.54%	-2.53%	6.15%	3.45%

Source: World development indicators. Note: Growth rates are calculated by using the formula: GR= $[(\frac{V_n}{V_0})^{\frac{1}{n}}-1]100$. Where V0 = initial value, Vn = last value, n= number of years

2.2 Graphical Elucidation

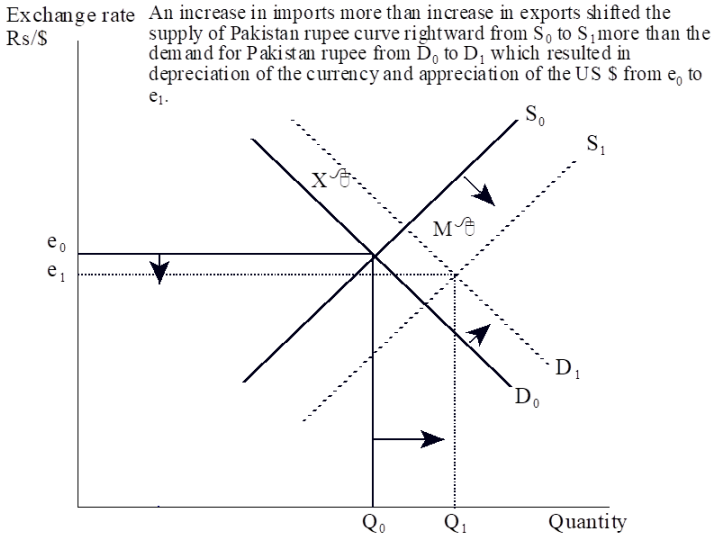

Figure 1: Exchange rate of Pakistan rupee in term of US$

Figure 1 shows the impact of increase in exports and imports during 2001-2020. This figure shows the composite effect of increase in exports and imports on the exchange rate of Pakistan rupee against the US$, during 2001 and 2020. The rupee depreciated by 166%. Since growth of imports (9.31%) were more than growth of exports (3.16%), it exerted a downward pressure on the exchange rate from e_0 to e_1. Rise in exports increased the demand for Pakistan rupee by its trading partners which is reflected through shifting of the demand curve from D_0 to D_1, while increase in its imports shifted the supply curve of Pakistan rupee from S_0 to S_1. Since growth in imports were almost 3 times more than growth in exports, consequently the supply curve shifted more than the demand curve which resulted into depreciation of the currency. It was perceived by the donor agencies such as IMF and World bank that Pak rupee is overvalued and need exists to introduce floating exchange rate system (*de jure*). This led to depreciation of the currency against US$.

A depreciation of the currency means the currency buys less foreign currency, and therefore, imports in the home country become more expensive and exports become cheaper for foreigners.

Since depreciation makes imports expensive in the depreciating country, this causes imported inflation in the country.

Reasons behind low exports of Pakistan could be attributed to many factors, such as poor governance, low productivity, lack of capacity to enhance production to meet higher demand of trading partners, high cost of production, obsolete technology, expansionary monetary policy (printing of money and excessive borrowing by the government from the state bank) which in turn made our exports expensive for foreigners, shortage of electricity and gas to run factories, non-congenial government export policies and lack of vision for long-term export promotion.

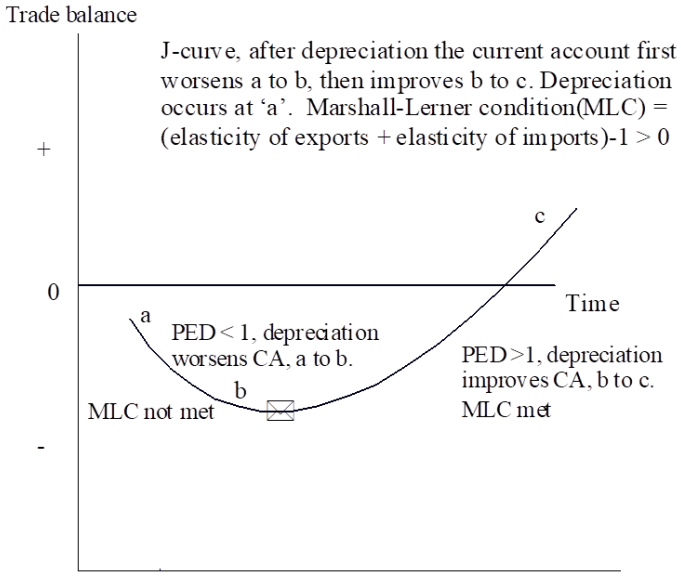

Figure 2: The J-curve effect after depreciation

The J-curve behaviour for Pakistan balance of trade could be explained in the following way. Pakistan being a relatively small country economically, its production capacity determines its export supply. Thus, when exports demand increases due to depreciation of its currency, the demand for intermediate inputs which are used in exporting industries increases radically. Because of many constraints, the production can't be increased immediately. Put it differently, the price elasticity of exports and imports are inelastic in the short run, thus Marshall-Lerner condition does not hold in the short run, even after depreciation the trade balance keeps on going downward from a to b as shown in Figure 2.

The J-curve effect shows that a depreciation of a currency can worsen the current account in the short-term because demand is inelastic (a to b), i.e. Marshall-Lerner condition does not hold, but over time, demand of both exports and imports become more elastic and therefore, the current account improves (b to c) following a depreciation. In the case of Pakistan, depreciation could not improve the current account because exports could not be increased to bridge up the gap between exports and imports. Figure 3 depicts an increasing gap between injections and withdrawals during the period under consideration. Exports could not be increased due to the reasons mentioned above. Need exists to close the gap between 'd' and 'c' in this figure by using appropriate policies. Regarding Pakistan the gap between revenue from exports and expenditure on imports is closing rapidly. Pakistan's trade deficit shrank 22.6 percentage ($1587 million) in October 2020, showing an improvement of $463 million over the same month of last year. Exports of Pakistan in December 2020 were recorded to be US $ 2.3 billion which are higher by almost 20% than last year's December exports of US $ 1.99 billion. This trend reflects a reduction in trade balance deficit. Figure 4 indicates the growth rates of exports, imports and the worsening of the current account of Pakistan.

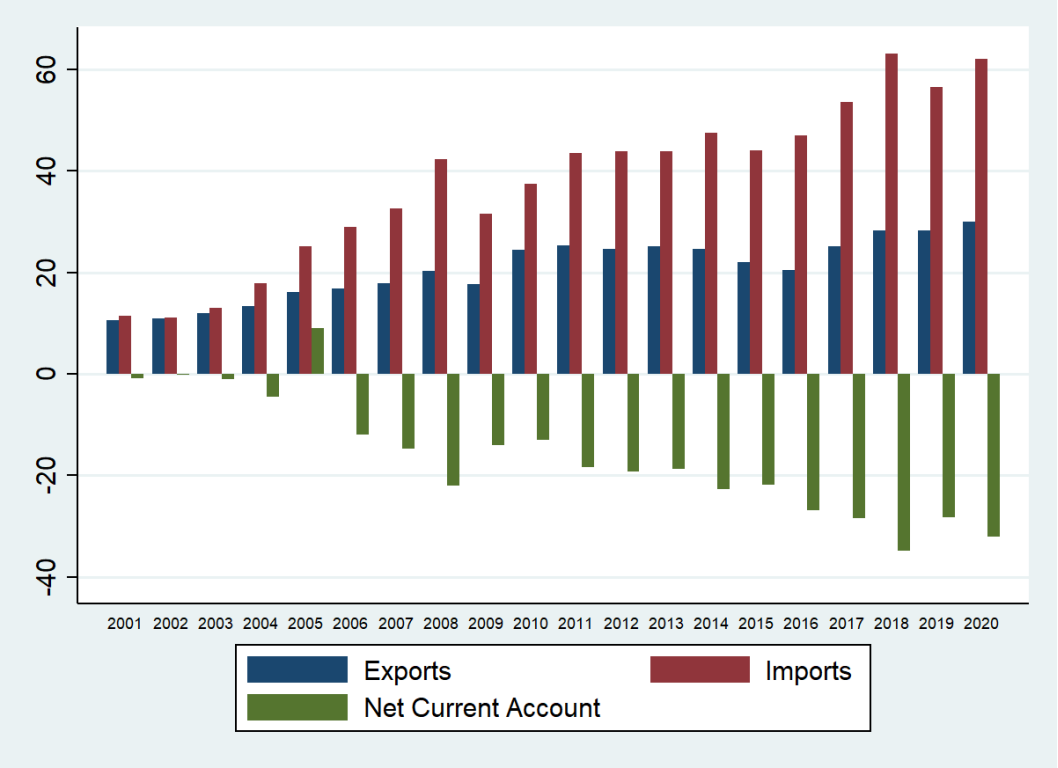

Figure 3: Pakistan's exports, imports and net current account (US $billions) 2001-2020
Source: World development indicators.

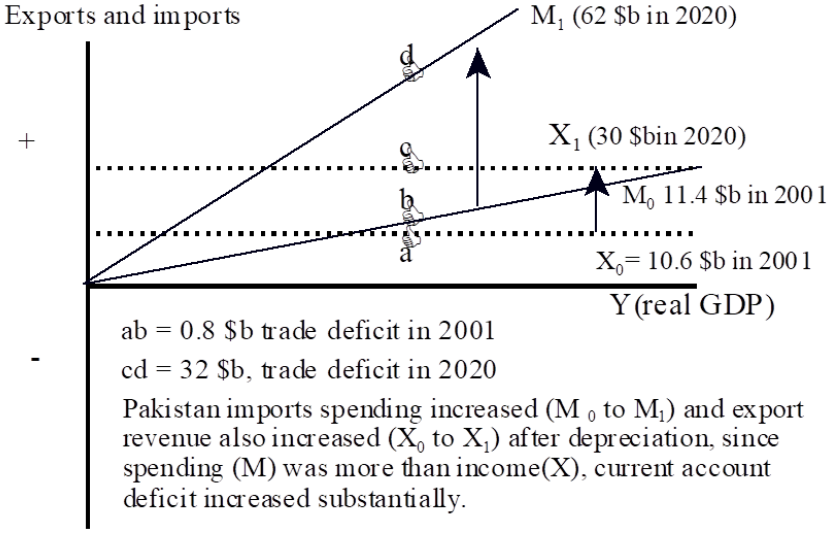

Figure 4: Impact of depreciation on current account of Pakistan (2001-2020)

There is a direct correlation between inflation and interest rates which in turn influences exchange rate. Higher interest rates tend to attract foreign investment which has favourable
effect on the capital account (inflow of capital – outflow of capital) component of the balance of payments. This is due to the rise in interest rates which is likely to increase the demand for a country's currency by foreigners, implying a rise in inflow of capital, *ceteris paribus*, which leads to an appreciation of the currency. The converse (outflow of capital) holds if interest rate decreases. A fall in exchange rate by 1 percent requires a cut in interest rate by 0.2 percent.

According to the Fisher equation, higher inflation rates negatively affect the value of currency. The currency becomes weaker compared to other currencies, meaning it buys less of other currencies. Every investor dealing with international goods and services is affected by Forex rates. When a currency depreciates foreign investor's profit decreases.

In Pakistan, we have price inflation, cost-push inflation, imported inflation and monetary inflation. Monetary inflation takes place due to government borrowing of money. Printing more money increases money supply (M) which increases inflation (P) (MV= PT). In the case of Pakistan; depreciation of the rupee could not cause reduction in imports because the import elasticity of demand is inelastic.

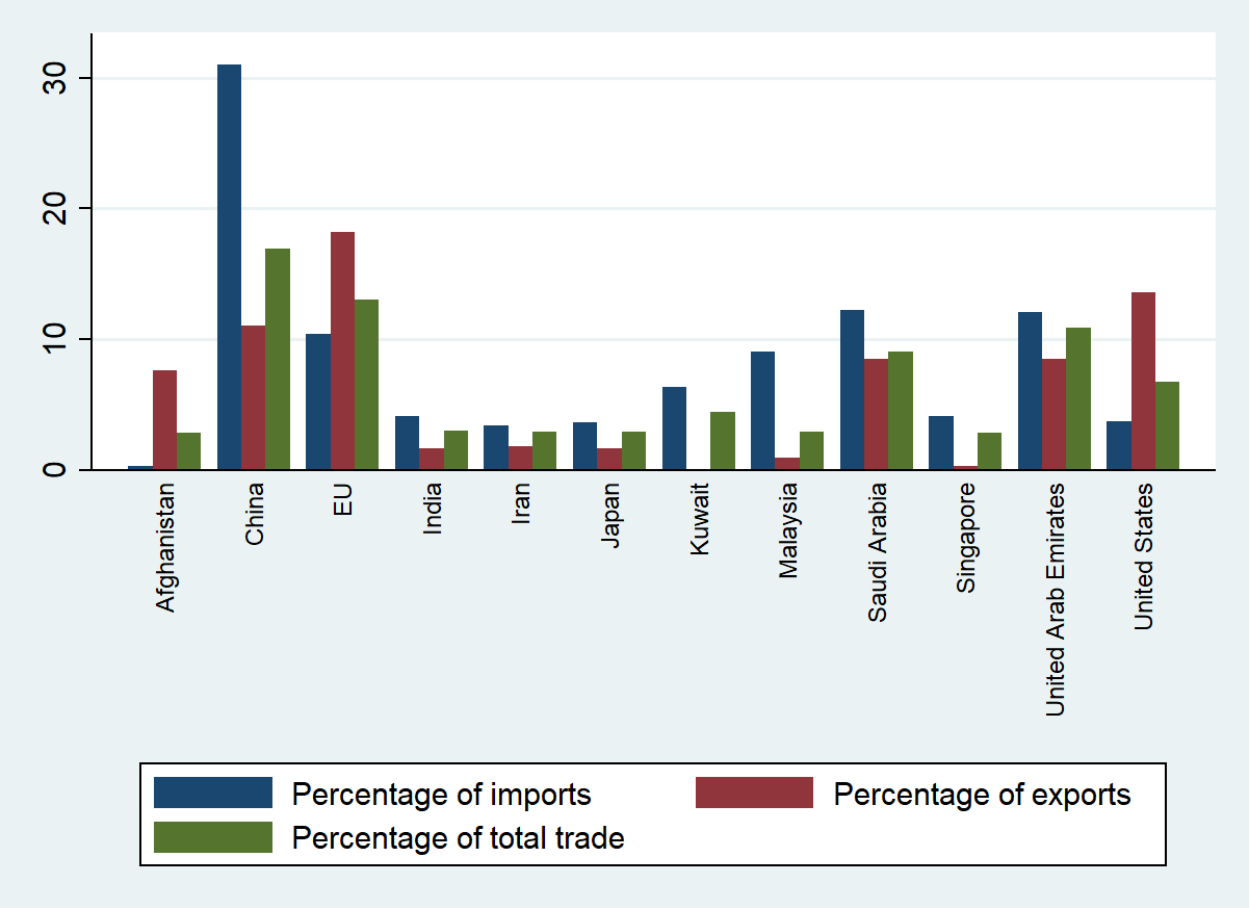

Figure 5: Pakistan's main trading partners as of July 2017

Source: World Development Indicators.

The currency exchange rate has an indirect impact on unemployment level because it affects the competitiveness of local firms and the cost of imported goods and raw materials. Thus, depreciation might cause job losses (unemployment) or grow the demand for employees (decrease unemployment) owing to expensive inputs to import from abroad. The depreciating county might start producing import substitutes to minimize imports and increase employment level in the country.

3. Macroeconomic benefits of a weaker currency

A cheaper currency provides a competitive boost to an economy and can lead to positive multiplier and accelerator effect within the circular flow of income and spending. Depreciation of currency has the effect of increasing the value of profits and income for a country's businesses with investments overseas.

It gives a boost to tourists and farming industries. Unfortunately, tourism in Pakistan did not increase due to security reasons and terrorist attacks. Not all the effects of a cheaper currency are positive in the country due to the following reasons. Firstly, Pakistan rupee being a weak currency caused capital-flight. Secondly, a weak currency makes it harder to pay for a trade deficit that is owed to overseas creditors. Thirdly, a depreciated currency increases the cost of inputs which in the long run adversely affect the productive potential of the country. Fourthly, weak global demand due to international recession can reduce the beneficial effects of a lower currency. It becomes harder to export when key markets are in recession and overseas sales are falling. Fifthly, if the price elasticity of demand for export and import are low (inelastic), that is the Marshall-Lerner condition does not hold, a depreciation of the exchange rate may initially cause a worsening of the balance of trade in goods and services as shown in the downward sloping portion of the J-curve in Figure 2. Sixthly, if the sum of the price elasticity of demand for exports and imports is greater than one, then the trade balance will improve over time, otherwise not. This is termed the Marshall-Lerner condition effect. Seventhly, lack of capacity to increase production to meet increased demand by trading partners resulted into insufficientrevenue from exports to compensate for higher spending on imports.

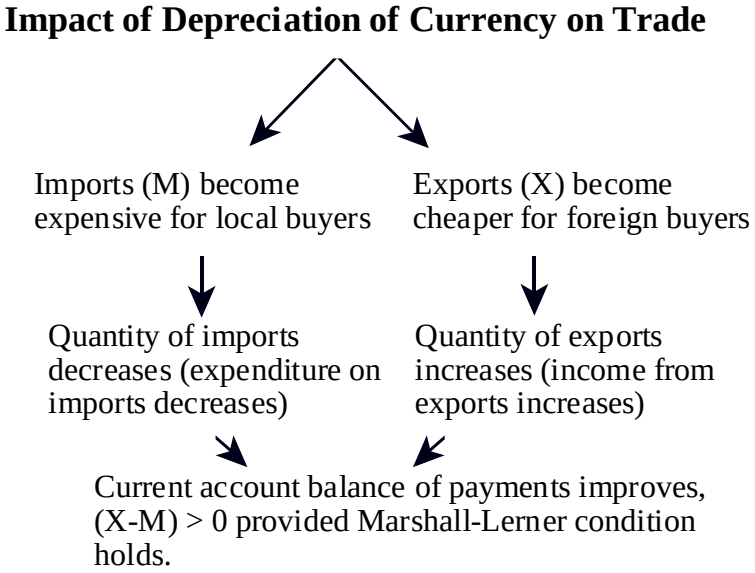

Figure 6: Impact of depreciation of currency on trade

When a country's currency depreciates goods produced in the home country become cheaper for foreigners. If foreign demand is inelastic exports remain the same but value of exports decreases, but if the foreign demand is elastic volume of exports increases while value of exports decreases.

Infact there are two opposing forces which act upon the trade balance. One is called the value effect and the other is termed price effect. If due to depreciation the demand for home country's exports increases the trade balance will improve. Owing to depreciation domestic currency prices of imported goods will rise resulting into drop in demand volume for imports, thus trade balance will improve. If the home country is to pay more for any remaining imports, the trade balance will deteriorate. Thus, depreciation of a currency does not improve trade balance unconditionally. Put it differently, depreciation of currency for improvement of trade balance is a necessary condition but not a sufficient condition.

4.1 Terms of Trade and Balance of Trade

An increase in the terms of trade (TOT= [Index of export prices/index of import prices] 100) means that the value of exports is increasing relative to the value of imports. The country can afford to buy more imports with the revenue from its exports. A decrease in the commodity terms of trade means that the value of exports is decreasing relative to the value of imports. The exchange rate and terms of trade are two variables that are often used as a proxy for one another. They move in tandem if ratio of the CPIs of the two trading partners in local currencies remains unchanged.

The declining trend of TOT of Pakistan throughout the period (2001-2020) under consideration is evident from Table 3 (column 7). It means that the value of exports was decreasing relative to the value of imports. There is an inverse relationship between the TOT and BOT, in case of Pakistan despite deteriorating TOT the BOT did not improve. Deteriorating TOT means a decrease in real income of the country. A lesser income implies less consumption and a decrease in the standard of living.

It also means a decrease in domestic purchasing power. A trade deficit means that exports are insufficient to pay for imports.As mentioned above, depreciation of a currency will improve the balance of trade if the MLC holds. Another reason for depreciation failure to improve the BOT is vividly explained by Williamson (2004). It was stated that if a country finances its current account deficit by foreign loan, both the principle and interest would increase in home currency term with the undervaluation of currency and therefore the advantage of depreciation would be eaten up by the repayments of its previous commitments.

4. Conclusion

The main objective of this paper was to examine the validity of the argument that depreciation improves the balance of trade of Pakistan. The conclusion is that depreciation did not improve the balance of trade. The Marshall-Lerner condition does not hold in the case of Pakistan, thus devaluation alone will not be successful in improving the balance of trade component of the balance of payments. The sustained deficit over an extended period could be reduced or eliminated by consuming less and producing more. Citizens of Pakistan spend more than they earn and finance the difference with foreign credit. The government of Pakistan is encouraging FDI. An inflow of FDI can lead to higher imports of production inputs for new foreign owned plants which may lead to imported inflation. To tackle this, this short-run effect may be balanced by more exports in the future.

Balance of trade is a component of GDP of a country: *ceteris paribus*, a deficit BOT decreases GDP. If the impact is strong enough, it gives rise to the traditional Keynesian reverse multiplier effect with consumption moving in the same direction, If MPC = 0.8, the multiplier K= 1/1-MPC= 5, there will be potential five timed downward multiplier effect on the rest of the economy. In financial terms, trade balance influences the total size and composition of the current account balance and, more broadly, it influences the BOP which comprehends not only the BOT but also income payments, loans and aid from abroad, while a long-lasting trade deficit will lead to foreign debt, on which the country has to pay high interest.

An overvaluation of Pak rupee in the past – owing to false fixed exchange rate policy till January 1982- caused deep trade deficit on most products and with most countries. Figure 5 depicts that Pakistan has had trade deficit with 9 out of 12 countries. It is recommended that a sharp depreciation of the currency can considerably improve this undesirable situation provided MLC holds. Since imports are elastic to GDP, i.e., imports rise more than proportionally, figure 5, shows that Pakistan's GDP growth rate was noted to be 6.15% while imports grew by 9.31%. Trade balance should be decomposed by **product** and by **country** (bilateral trade balance). The authorities concerned should look into the degree of concentration of the imbalance in trade caused by one or few commodities. If concentration is high, a targeted industrial policy could reduce the imbalance.

On the other hand, if a deficit is due only to few partners, proactive and consensus-based trade negotiations with them quickly remove the imbalance. In case of Pakistan, it is mainly the "merchandise balance" which includes only goods not services.

Since the price elasticities of exports and imports are sufficiently low, the balance of trade expressed in domestic currency worsened. Grubel (1976) rightly argued that a country's persistent deficit balance of trade could be attributed to faulty monetary policies and cannot be improved by either devaluation or fiscal policy. Policies should also be formulated and implemented to increase the inflow of capital and decrease the outflow of capital which will improve the capital account component of the balance of payments. In a relatively small and developing country like Pakistan, restriction on imports and import quota should be imposed depending upon the country's foreign exchange reserves.

The authorities concerned must adopt policies specifically designed to attract foreign investment which will increase employment level and to keep its currency's exchange rate to stimulate exports and reduce imports and build up its currency reserves.

A number of political factors and changes in regimes could be held responsible for faulty monetary policies (expansionary) which in turn affected the interest rates and the exchange rates which in turn adversely affected the balance of trade and hence balance of payments of Pakistan. Expansionary monetary policy causes inflation which makes our exports less competitive in foreign markets and thus exerts downward pressure on exports, less exports means less demand for Pak rupee which causes depreciation of the currency. Besides, less exports leads to unfavourable trade balance. Various regimes prior to 1918 in the country borrowed in billions from IMF and World Bank which is being repaid - principle and high interest - now, this is eating up the country's foreign exchange reserves.

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