In Search of the S-curve: Is Currency Devaluation a Justifiable Economic Policy Tool to Improve Pakistan's Chronic Trade Imbalance?

By

Jawad Karim

Submitted to Central European University School of Public Policy

In partial fulfillment of the requirements for the degree of Master of Arts in Public Policy

Supervisor: Lajos Bokros

Budapest, Hungary

2019

Author's Declaration

I, the undersigned Jawad Karim hereby declare that I am the sole author of this thesis. To the best of my knowledge this thesis contains no material previously published by any other person except where due acknowledgement has been made. This thesis contains no material which has been accepted as part of the requirements of any other academic degree or non-degree program, in English or in any other language.

This is a true copy of the thesis, including final revisions.

Date: June 14, 2019

Name (printed letters): JAWAD KARIM



Abstract

In October 2018, the newly-elected government of Pakistan formally reached out to the International Monetary Fund for financial assistance to avoid the impending balance of payment crisis. As a precondition to receiving the 'bailout' package, the Fund has urged the country to switch to the free-float exchange rate regime and let the market forces of demand and supply determine the true value of the Pakistani rupee. Consequently, the State Bank of Pakistan (SBP) has withdrawn its support for the rupee and allowed to depreciate the country's currency in a bid to comply with the preconditions of the IMF and also to rein in the burgeoning trade account deficit that has been spiraling out of control. Although, theoretically speaking, depreciation or devaluation would lead to an improvement in the trade balance, the decision has received mixed responses. On the one hand, the decision has been hailed as it would contain the imbalance in the external account and put the country on a higher growth trajectory, on the other hand, the effectiveness of the devaluation has been questioned as it would have limited impact on correcting the country's trade imbalance while having negative repercussion on the country's economy. This thesis is an attempt to empirically evaluate the effects of the currency devaluation on the imports and exports of Pakistan. Analyzing the exchange rate movement between 2004 and 2017, this study investigates the existence of S-curve in Pakistan's trade relationship with its six major trading partners. Crosscorrelational method is employed to determine whether currency devaluation is a prudent monetary policy to improve the country's trade balance. Results demonstrate that the S-curve is evident in only half of the trade relationships of Pakistan mainly because of the country's import dependency on capital goods and raw materials for domestic manufacturing production, low export competitiveness, and slowdown in global economic growth. The study concludes the government

and the central bank of Pakistan should be careful employing foreign experience while designing domestic exchange rate policy as the country's economic dynamics are distinctive.

Acknowledgements

Foremost, I would like to thank my supervisor, Professor Lajos Bokros, for the passion, energy and dedication with which he mentored and guided me during my research. I am wholeheartedly grateful to him for his constructive feedback and in-depth knowledge that refined my research, for his profound lectures that instilled in me a love for macroeconomics and made me set about pursuing this research, and last but not the least for his soul-searching pieces of advice. "This is your once in a lifetime opportunity. Seize it. Don't be afraid to ask questions". Thank you, Professor, for all your wisdom. I truly believe that this research would not have been possible without your support.

I would like to thank my lion-hearted yet humble father for making me the person I am today. Thank you, Baba Jan, for always believing in me and for being a beacon of light guiding me through this life.

Lastly, I dedicate this thesis to my mother and my sisters, the apple of my eye and the light of my life. The three strong women I have ever come across in my life. They taught me how to be patient, kind-hearted and to be unlike those who have caused me injury. In them I see a hope for the Pukhtoon women who would one day find their voice and liberty in this oppressed society of ours.

THANK YOU!

Table of Contents

Abstract	i
Acknowledgements	iv
Introduction	1
Chapter 1: The History of Exchange Rate Regimes in Pakistan	6
1.1. Fixed-Exchange Rate System	6
1.2. Managed-Float Exchange Rate System	7
1.3. Dual Exchange Rate System	8
1.4. Market-based Exchange Rate System	8
Chapter 2: Theoretical Framework	13
2.1. Theoretical Background for the S-curve	13
2.2. Theoretical Framework of the S-curve	14
Chapter 3: Literature Review	18
3.1. Aggregated studies of the S-curve	18
3.2. Bilateral Studies of the S-curve	19
3.3. Industry-level Studies of the S-curve	20
3.4. Existing Studies of the S-curve for Pakistan	21
Chapter 4: Research Justification and Objectives	22
4.1. Research Justification	22
4.2. Research Objectives	22
Chapter 5: Data and Methodology	23
5.1. Methodology	23
5.2. Data	24
Chapter 6: Empirical Results	26
6.1. Bilateral Trade with the United States of America	27
6.2. Bilateral Trade with the United Kingdom	27
6.3. Bilateral Trade with the United Arab Emirates	

6.4. Bilateral Trade with Saudi Arabia
6.5. Bilateral Trade with China
6.6. Bilateral Trade with Germany
Chapter 7: Discussion
7.1. Supply-side Factors
7.1.1. Import Dependency
7.1.2. Low Export Competitiveness
7.2. Demand-side Factors
7.2.1. Global Economy Slowdown
Chapter 8: Recommendations
Research Limitations and Conclusion
Bibliography

Table of Tables and Figures

Figure 1: Current Account Balance and Average Monthly Nominal Exchange Rate, 2005 - 2019
Figure 2: Exchange Rate Movement between PKR and USD and PKR and GBP from 1957 to 1981 10
Figure 3: Pakistan's Terms of Trade During the Fixed Exchange Rate Regime, 1949 to 198110
Figure 4: Exchange Rate Movement between PKR and USD and PKR and GBP from 1982 to 199811
Figure 5: Pakistan's Terms of Trade During the Managed-Float Exchange Rate Regime. 1982-1998 11
Figure 6: Exchange Rate Movement between PKR and USD and PKR and GBP from 1999 to 2019 12
Figure 7: Terms of Trade During the Free-Float Exchange Rate Regime, 1999-2017
Figure 8: Sequence of Developments that Lead to the Formation of the S-curve
Figure 9: Diagrammatic Representation of the S-curve17
Figure 10: Correlation between Pakistan's real exchange rate and trade balance with the United States27
Figure 11: Correlation between Pakistan's real exchange rate and trade balance with the United Kingdom
Figure 12: Correlation between Pakistan's real exchange rate and trade balance with the United Arab
Emirates
Figure 13: Correlation between Pakistan's real exchange rate and trade balance with Saudi Arabia29
Figure 14: Correlation between Pakistan's real exchange rate and trade balance with China
Figure 15: Correlation between Pakistan's real exchange rate and trade balance with Germany
Figure 16: Nominal Exchange Rate and Imports and Exports of Pakistan in Current in US\$
Figure 17: Pakistan's and its Competitors Ranking in the Global Competitive Index, Ease of Doing
Business index, and Economic Freedom index. Higher Ranking Indicates Poor Performance

List of Abbreviations

- CPEC China Pakistan Economic Corridor
- GBP Great Britain Pound
- GDP Gross Domestic Product
- IMF International Monetary Fund
- ML Marshall Lerner Condition
- PKR Pakistani Rupee
- SBP State Bank of Pakistan
- UAE United Arab Emirates
- US United States
- USD United States Dollar

Introduction

Pakistan has once again found itself in the balance of payment crisis. Since 1982, the country has received 12 Structural Adjustment Packages, or in other words bailout packages, from the International Monetary Fund (IMF), while talks for the thirteenth are underway (Ahmad, 2018). Besides pushing the government for the privatization of state assets, liberalization of trade regime, eliminating subsidies, and overhauling tax policies, the IMF demands the government of Pakistan to devalue its currency (Mangi, 2019).

Pakistan's currency has generally been perceived as overvalued. The subsequent governments of Pakistan have resisted the demands of currency devaluation from the IMF as they considered an appreciated currency vital for the sound economy of the country. However, the critics point out to these misplaced economic policies of the government as one of the reasons for the country's dwindling foreign exchange reserves and falling export competitiveness (Cheema, 2019).

In December 2017, the State Bank of Pakistan (SBP) allowed to depreciate the country's currency in a bid to rein in the current account deficit that has been spiraling out of control. A similar attempt was made by the SBP in June 2015; however, it was received with a huge backlash from all segments of the society, including the ruling political party and thus, the decision was reversed by the then government of Pakistan (Jorgic & Sayeed, 2017). Consequently, between December 2017 and March 2019 the Pakistani rupee witnessed an unprecedented drop in its value in such a short period of time. A 35% decline was observed in the value of the rupee during this period.

Figure 1 presents the current account position of Pakistan between 2005 and 2019. The country's current account balance has remained mostly in the negative and the deficit in the trade balance is accountable for it in entirety. Pakistan saw its largest current account deficit in the fiscal year 2007-

08 when the deficit stood at more than \$13.8 (SBP, 2009). It started to improve afterwards and in the subsequent years the country even experienced current account surplus, a rarity for this South Asian country. However, the deficit started ballooning again in 2016, partly due to the increased imports from China for the "China-Pakistan Economic Corridor", a joint economic venture between the two countries.

Thus, understanding the relationship between exchange rate and trade balance is of the utmost importance for the policy makers due to the crucial role that it plays in a country's economy. Keeping the exchange rate stable is vital to the macroeconomic stability of a country. It is a potent monetary tool in aligning a country's trade balance and thus, improving the current account position. An economy may seek to devalue or depreciate its currency under a fixed exchange rate or floating/managed exchange rate regime respectively with the aim of increasing exports through improving competitiveness and discouraging imports via making them expensive for the domestic consumers.

The phenomenon rests on the theory put forward by Alfred Marshall and Abba Lerner, known as Marshall-Lerner (ML) condition (Bahmani-Oskoee & Ratha, 2007). The theory postulates that if a country's price elasticity of demand for exports and imports is greater than one, currency depreciation or devaluation may result in improved trade balance in the long run. Early studies employed the ML condition to determine the export and import price elasticities in a bid to seek out a relationship between the exchange rate and trade balance of a country. However, the studies showed mixed results for different countries (Shahbaz, Jalil, & Islam, 2012). Moreover, even in the cases where a country went through major devaluation or depreciation, a slow response in the trade balance was reported. For example, during the first oil crisis of the early 1970s, the United

States trade balance worsened despite the depreciation of the US dollar by 15% (Bahmani-Oskooee & Wang, 2008).

The flaws in the Marshall-Lerner condition led to the development of the J-curve. Stephen Magee (1973) introduced the concept of J-curve. According to Magee, a depreciation or devaluation of a currency may deteriorate the trade balance in the short run before improving in the long run (Bahmani-Oskooee & Bolhasani, 2008). The price/value effect is at play in the short run while the volume effect dominates in the long run. For instance, due to the sticky prices and contractual obligations, depreciation or devaluation leaves the exports undisturbed in the short run while increasing the unit value of imports. On the other hand, in the long run when the contracts expire and the prices adjust, the exports become cheaper and imports expensive, leading to a country exporting more and importing less. The combined outcome of the price and volume effect on trade balance results in the delayed effect of the exchange rate depreciation or devaluation. Thus, if plotted against the time trade balance would produce a J-curve on a graph.

Although the J-curve concept has enabled the researchers to determine the possible short run as well the long run effects of currency depreciation or devaluation on trade balance, the results have not been consistent across the studies on different economies (Bahmani-Oskooee & Ratha, 2004). Thus, Backus et al. (1994) introduced an alternative approach to calculate the short-run effects of fluctuation in exchange rate on trade balance. Their finding suggests that there exists a positive correlation between the current exchange rate and future trade balance while the correlation between the current exchange rate and previous trade balance is negative. The phenomenon is called 'S-curve' because, like the J-curve, if plotted against the time, trade balance represents the letter **S** on the graph. S-curve employs cross-correlation to analyze the impact of currency

depreciation on trade balance unlike the J-curve which relies on the regression methods (Bahmani-Oskoee and Hosny, 2012).

This thesis will evaluate the recently taken decision by the State Bank of Pakistan, and by extension the Government of Pakistan, to devaluate the currency and let the market forces determine the equilibrium exchange rate. Analyzing the period between 2004 and 2017, this research will make use of the cross-correlational method proposed by Backus *et al.* (1994) to investigate the relationship between exchange rate and trade balance of Pakistan at the bilateral-level. In light of the findings, the thesis will determine whether currency devaluation is a prudent monetary policy to improve the country's trade balance. Although scores of studies have examined the relationship between the exchange rate and trade balance in Pakistan using the concept of J-curve, only a single study has been produced to investigate the relationship using S-curve. Thus, this study will contribute towards assisting the policy makers in anticipating the changes in trade balance at bilateral level upon the currency devaluation.

The thesis is divided into eight chapters and organized as follows: Chapter 1 provides an overview of the different exchange rate regimes adopted by Pakistan throughout its history and their effects on the trade balance of the country; Chapter 2 and Chapter 3 presents the theoretical framework and literature review of the S-curve, respectively, which is followed by Chapter 4: Research Justification and Objectives; Chapter 5 describes the methodology adopted in this research and the data sources; Chapter 6 presents the findings of the study; Chapter 7 analyzes, interprets and discusses the results of the research; and Chapter 8 provides recommendations in light of the findings and analysis. The thesis is concluded by listing the research limitations.



Figure 1: Current Account Balance and Average Monthly Nominal Exchange Rate, 2005 - 2019

Source: State Bank of Pakistan

Chapter 1: The History of Exchange Rate Regimes in Pakistan

This section will provide a brief overview of the different exchange rate regimes adopted by Pakistan throughout its history and their effects on the trade balance of the country. The objective is to see whether currency devaluations had the desired effect of increasing the country's exports and decreasing imports. The terms of trade statistics is analyzed, which is the ratio of export revenue to import revenue in percentage terms. As trade revenue also depends on the fluctuation in the exchange rate, the indicator is useful to understand whether the devaluation of the Pakistani currency had the desired effect on trade. The higher the ratio, the better trade performance of the country is.

Developments pertaining to global financial order and domestic economic and political realities, Pakistan maintained four different exchange rate policies at different times since its independence in 1947.

1.1. Fixed-Exchange Rate System

Pakistan had a fixed exchange rate regime from August 1947 until December 1981 (Hussain, 2006). At the beginning, the Pakistani rupee was pegged to the Pound Sterling till 1971 when the government delinked the currency from the UK Pound and pegged it to the United States (US) dollar. The PKR's value vis-a-viz GBP was fixed at 13.35 (see Figure 2) (State Bank of Pakistan (SBP) Economic Data). However, when the United Kingdom devalued the Pound by more than 30% in 1949 and the Pakistani government decided to keep the value of the rupee unchanged, the GBP/PKR parity fell to 9.26 (Riazuddin, 2018). Similarly, in 1967, the British government again devalued its currency. Yet Pakistan held the PKR/GBP parity constant which appreciated the Pakistani rupee (ibid). Thus, a long history of keeping the Pakistani currency overvalued against major international currencies began that remains unchanged to this day.

The two nominal exchange rate appreciations were clearly against the rational economic sense and had negative repercussions for the country's trade balance. Except the periods between 1949-1955, when the country's exports grew exponentially due to the increased international demand during and in the aftermath of the Korean War (Riazuddin, 2018), and 1971-72, Pakistan's export-import ratio or terms of trade gradually declined during the fixed exchange rate regime (see Figure 3).

1.2. Managed-Float Exchange Rate System

In 1982, Pakistan unpegged the Pakistani rupee from the US dollar and switched to a managedfloat exchange rate policy. The decision was part of a growing worldwide trend to do away with the fixed exchange rates due to the collapse of the Bretton Woods system (IMF website). Like the other developing countries, Pakistan adopted the regime to create room for the State Bank of Pakistan to make timely adjustments and avoid the vulnerabilities associated with the inflow and outflow of foreign exchange in the country. Consequently, the Pakistani exchange rate gradually started to move upward against other currencies and between 1982 and 1998, the currency had lost more than 300% of its value (see Figure 4) (SBP Economic Data). Moreover, the trend reveals that PKR was devalued 0.75% on average a month; however, the median was only 0.32% (Riazuddin, 2018). The huge difference in these two figures point toward the untimely adjustment in the exchange rate and brings to the fore a peculiar characteristic of the Pakistani political and economic elite i.e. the reluctance to adjust the exchange rate until the country's macroeconomic situation is in distress.

The constant depreciation of the Pakistani currency during this period had a positive impact on the trade balance of the country. Figure 5 shows that the terms of trade doubled between 1982 and 1998. However, despite the improvement in the export-import ratio, the country faced a number

of balance of payment crises during this period that indicates that managed-float exchange rate regime was unable to counter the external sector vulnerabilities.

1.3. Dual Exchange Rate System

Pakistan faced unprecedented economic sanctions after the country test-fired its nuclear missiles in April 1998 ("Pakistan takes a beating", 1998). The falling foreign exchange reserves, weakening currency and looming balance of payment crisis that followed forced the government to adopt, albeit temporarily, the dual exchange rate system in the country. The system consisted of two exchange rates in the country: an official fixed exchange rate at PKR 46/USD and an unofficial floating exchange rate the parity of which was determined by the market forces in the interbank market (SBP Economic Data). Upon the recovery of the economy, the dual exchange rate system was abolished.

1.4. Market-based Exchange Rate System

Although the State Bank of Pakistan asserts that the country has been following a market-based exchange rate system since 1999 after the abolishment of the dual exchange rate system (SBP website), it continues to play a dominant role in the determination of the exchange rate as it fixes daily buying and selling exchange rates in transaction with commercial banks ("The IMF", 2019). The SBP has been manipulating the exchange rate by flooding the economy with the US dollars whenever the demand for the foreign currency increases in the domestic market. For instance, the previous ruling government injected billions of dollars into the economy to keep the Pakistani currency artificially elevated against the US dollar, depleting the already-stretched foreign exchange reserves in the process (Alam, 2019). The International Monetary Fund (IMF) has warned on many different occasions that the Pakistani rupee is highly overvalued which has

economic repercussions for the country and therefore it needs to be adjusted according to the market forces of demand and supply (Mangi, 2018).

However, quite recently, in the face of defaulting on its external debt and to meet one of the preconditions for receiving a bailout package from the IMF, the SBP has withdrawn its support for the rupee. Therefore, since December 2017, the Pakistani currency has lost 34% of its value (see Figure 6). In a statement issued after the currency depreciation, the SBP said,

"This market-driven adjustment in the exchange rate will contain the imbalance in the external account and sustain higher growth trajectory. The exchange will continue to reflect the demand and supply conditions; and SBP stands ready to intervene, in case speculative and/or monetary pressures emerge, for the smooth functioning of the foreign exchange markets" (Iqbal, 2017). Thus, it suggests that the Pakistan's exchange rate system is finally moving towards market-based. The interventions by the State Bank of Pakistan to keep the Pakistani rupee overvalued has taken

a toll on the growth of country's exports while also encouraging the imports. Figure 7 shows that since 2002, the terms of trade have constantly been on the decline. From the peak of 96% in 2002, it fell to 45% in 2017.



Figure 2: Exchange Rate Movement between PKR and USD and PKR and GBP from 1957 to 1981







Source: Author's calculation based on data from the Economic database of the State Bank of Pakistan



Figure 4: Exchange Rate Movement between PKR and USD and PKR and GBP from 1982 to 1998

Source: State Bank of Pakistan



Figure 5: Pakistan's Terms of Trade During the Managed-Float Exchange Rate Regime. 1982-1998

Source: Author's calculation based on data from the Economic database of the State Bank of Pakistan



Figure 6: Exchange Rate Movement between PKR and USD and PKR and GBP from 1999 to 2019





Figure 7: Terms of Trade During the Free-Float Exchange Rate Regime, 1999-2017

Source: Author's calculation based on data from the Economic database of the State Bank of Pakistan

Chapter 2: Theoretical Framework

2.1. Theoretical Background for the S-curve

There has been a growing literature on the economic implications of currency devaluation on the country, especially its positive effects on correcting the trade imbalances (see for example, Harberger, 1950; Meade, 1951; Alexander, 1952; Mundell, 1968; Bahmani-Oskooee, 1985; and Himarios 1989). Recent studies presenting positive relationship between currency devaluation or depreciation on trade balance include Upadhyaya and Dhakal (1997), Kale (2001) and Bahmani-Oskooee *et al.*, (2005).

In economics, three approaches provide a foundational basis for the positive effect of the domestic currency devaluation on a country's trade balance: the elasticity approach, the absorption approach and the monetary approach. The elasticity approach has been derived from the Marshall-Lerner condition. It says that in case of the currency devaluation or depreciation, a country's trade balance will improve only if the sum elasticity of the import and export demand exceeds one (Bahmani-Oskooee & Ratha, 2014). Thus, the greater the elasticity of the import and export demand, the bigger the impact of the currency devaluation would be. Second, the absorption approach postulates that devaluation makes the imported goods expensive vis-a-viz domestic goods which tilts the domestic consumers preference towards the locally-produced goods and thus, it betters the trade balance of a country. The monetary approach asserts that currency devaluation decreases the real value of the country's money base and hence, the trade balance improves (Shieh, 1981).

However, even when the necessary Marshall-Lerner or elasticity condition was met, the currency devaluation produced inconsistent effects on a country's trade balance. This gave way for the economists to explore the short-run effects of the currency devaluation on trade balance. Magee (1973) put forward a theory that suggests that in the short run when the prices are sticky and

contractual obligations have to be met, devaluation worsens a country's trade balance. However, after a lapse of certain time period, both global and domestic consumers adjust to the relative prices; thus, improving the trade balance in the long run.

2.2. Theoretical Framework of the S-curve

While the J-curve shows the probable time path of a country's trade balance after the devaluation or depreciation of its currency, an alternative approach investigates how trade balance is affected by the past as well as the future movements in the exchange rate. The concept was first discussed in a paper by Backus, Kehoe and Kydland (1994) who introduced the approach in response to the prevalent method of quantifying the short and long-run relationship between the exchange rate and trade balance of a country.

Using exchange rate as a proxy for the terms of trade, the authors show that "[there] is the tendency for the trade balance to be negatively correlated with current and future movements in the terms of trade, but positively correlated with past movements" (Backus *et al.*, 1994). In other words, trade deficit would trigger a depreciation or devaluation, (that is, negative correlation between current exchange rate and past trade balance) which in turn would lead to the improvement in the trade balance in the future after a certain period of time (that is, positive correlation between current exchange rate and future trade balance).

Let's consider an open economy that engages in trade with the rest of the world. Suppose the Marshall-Lerner condition is satisfied, and the elasticity of the country's imports and exports are greater than one. If the country decides to devalue its currency, two rounds of effects take place. In the first round, as mentioned above, the trade balance would deteriorate in the short-run and then would start improving as the volume of exports increase and that of imports decrease. However, the literature suggests that the increased net exports (the difference between exports and

imports) would expand the domestic income which in turn would increase the imports (Prakash & Maiti, 2016). This is called the trade-induced income effect. Thus, in the second round the effects of the initial currency devaluation is curtailed after a certain time period.

In other words, the first round which resembles the J-curve shows that after the decrease in nominal currency depreciation or devaluation, there is an initial deterioration in trade balance which eventually improves after a certain time lapse. In the second round, the relationship between the two variables reverse as the improvement in the trade balance gives way to the trade-induced income effect and the effect of the devaluation subsides. Therefore, gradual and continuous devaluation of the currency is justified as a necessary monetary policy (Prakash & Maiti, 2016). The relationship between the exchange rate and trade balance, which resembles the letter 'S', is depicted in Figure 8.

Backus *et al.* (1994) put forward a mechanism that generates the S-curve. According to them, in a two-country general equilibrium model which produced imperfectly substituted goods using capital and labor, a persistent positive shock to the domestic productivity would lead to the following sequence of developments, thus giving rise to the S-curve (also see Figure 9):

1. Positive shock to domestic productivity increases the output, consumption and investment in the country;

2. The increase in domestic output worsens the country's terms of trade;

3. As the positive shock remains persistent, the increase in the output would be outstripped by the increase in the consumption and investment;

4. It would result in the country's trade deficit;

5. As time passes, the country's consumption and investment subside and the trade deficit either decreases or turns into surplus.

6. The improvement in the trade balance would influence the domestic income and thereby imports; resulting in the deterioration of trade balance



Figure 8: Sequence of Developments that Lead to the Formation of the S-curve

Figure 9: Diagrammatic Representation of the S-curve



Chapter 3: Literature Review

With the introduction of the S-curve in 1994, a considerable number of scholars have tried to investigate the cross-correlational relationship between the exchange rate and trade balance. The studies can be classified into three different categories based on the trade data that they employ in their research, namely, aggregated data, bilateral data and industry-level data. This section will review the studies produced in each category:

3.1. Aggregated studies of the S-curve

The aggregated approach uses trade balance of a country with respect to the rest of the world (Bahamani-Oskooee & Ratha, 2004). Backus *et al.* (1994) were the first who introduced and documented the effect of devaluation or depreciation on trade balance using S-curve. Using the aggregated data to examine 11 Organization of Economic Development (OECD) countries, they validated the S-curve theory and found the existence of asymmetric cross-correlation relationship between the terms of trade or exchange rate and trade balance. Moreover, as mentioned in the previous section, the authors showed that the S-curve pattern relies considerably on the persistent positive external shock to domestic productivity. The economic shock would initially deteriorate the trade balance but eventually improve in the long-run.

In order to see whether the S-curve phenomenon also stands true for the developing countries, Senhadji (1998) extended the S-curve analysis to the Least Developed Countries (LDCs). Analyzing the aggregate trade data from thirty LDCs, the author reached the same conclusion as that of Backus *et al.* in his research, that is, the study provided evidence in support of the S-curve. Moreover, comparing LDCs with small-open economies, he asserted that both have scarce foreign exchange reserves and also have limited access to international financial markets. Thus, in the event of a persistent positive exogenous shock, both the LDCs and the small-open economies would have limited capacity to absorb its effects. Thus, small-open economies, the author concluded, share important macroeconomic features with the Least Developed Countries and would show similar relationship between the terms of trade and trade balance; thus, producing the S-curve.

Other studies have also employed aggregate data to test the concept of the S-curve. Parikh and Shibata (2004) uses trade data from 59 developing countries and obtains overwhelming evidence in support of the S-curve and thus, further strengthening the cross-correlational relationship between exchange rate and trade balance. Bahmani-Oskooee and Kutan (2009) investigates the S-curve pattern among the ten post-socialist Central and Eastern European countries and finds strong evidence in four cases, weak evidence in three cases, and no evidence in the rest of the cases. Lastly, shifting their focus away from the European or North American countries, Bahmani-Oskoee *et al.* (2008b) study 20 African countries to analyze the relationship between currency devaluation or depreciation and trade balance. The authors uncover the existence of the S-curve pattern in 8 out of 20 countries.

3.2. Bilateral Studies of the S-curve

Rose and Yellen (1989) point out that the aggregated data might suffer from the aggregation bias and thus its validity could be compromised. Moreover, advocating the use of disaggregated data in studying the effects of currency depreciation or devaluation on trade balance, Bahmani-Oskooee and Brooks (1999) show that a country experiences uneven trade relationship with its trading partners. In other words, a country's trade balance could be improved with one trading partner while worsen with another. Thus, employing aggregate data would reveal a distorted relationship between exchange rate movement and trade balance. Thus, bilateral level disaggregated trade data approach was introduced. Bilateral approach incorporates trade balance of a country with its trading partners to examine the effect of exchange rate on trade balance (Bahmani-Oskooee & Ratha, 2004).

Bahamani-Oskooee and Ratha (2007b) use the bilateral trade data of the United States with its 24 trading partners and found out that disaggregated data provided much better evidence in support of the S-curve. Similarly, Bahmani-Oskooee and Ratha (2007a) repeated the same experiment for Japan and its trading partners and landed the same conclusion.

3.3. Industry-level Studies of the S-curve

The level of analysis was further narrowed down to the industry-level due to the apprehension about the bilateral trade data that it might still be suffering from the aggregation bias (Bahmani-Oskooee & Ratha, 2004). This category includes studies which have employed bilateral trade data between two countries but disaggregated by commodity (ibid). Bahmani-Oskooee and Ratha (2008) took on a challenge to disaggregate data at the bilateral and industry-level between two of the world's largest trading partners, the United States and the United Kingdom. They did not find any support for S-curve at the bilateral level. Nevertheless, they examined the trade pattern of 88 major industries that traded between the two countries and extracted overwhelming evidence in support of the S-curve for most of the industries. A similar research was undertaken by Bahmani-Oskooee and Ratha (2009) for the two North American countries, the United States and Canada. Using disaggregated data at the bilateral and industry-level, the authors provided evidence of the existence of S-curve at the bilateral level as well as the industry-level. Investigating 60 industries that traded merchandise goods between the two countries over the period of 1964 to 2004, around 70% or 41 industries backed up the evidence in support of S-curve.

3.4. Existing Studies of the S-curve for Pakistan

To the best of the author's knowledge, so far only single study has been conducted to investigate the existence of the S-curve in the context of Pakistan. Covering the period between 1983 and 2014, Kausar et al. (2017) evaluated the impact of the successive Pakistani rupee devaluation on the country's trade balance. The researchers used industry-level data to analyze 16 industries that produce export goods. The study found evidence in support of the S-curve in only 6 industries. The authors concluded that currency devaluation is not a viable policy option for the country since majority of the industries investigated in the study did not see any boost in their output as a result of the currency devaluation.

Literature review revealed no studies investigating the S-curve phenomenon at bilateral level for Pakistan. Thus, this thesis would be a first of its kind to study the effects of the currency devaluation on Pakistan's trade balance using bilateral-level data. Moreover, as mentioned above, one of the necessary conditions for the currency devaluation to work is that the sum of price elasticity of exports and imports must be greater than one. Multiple studies have tested the Marshall-Lerner condition for Pakistan and found that the sum of exports-imports elasticities exceeds unity (for example, Hasan & Khan, 1994 and Akhtar & Malik (2000). Thus, this thesis does not need to test the imports and exports of Pakistan for their elasticities.

Chapter 4: Research Justification and Objectives

4.1. Research Justification

It is important to analyze the effect of currency depreciation on trade balance for a country like Pakistan where policy makers have historically used exchange rate as a monetary tool to adjust the country's balance of payment. As mentioned in the previous section, thus far only one study has been carried out in the context of Pakistan to examine the existence of the S-curve in the relationship between the real exchange rate and trade balance. The study employed industry-level data to analyze relationship between these two variables; therefore, it is imperative to use different data to see whether the results remain the same or differ from the study. Thus, this thesis is an attempt to contribute to the public policy literature by studying the effects of the currency devaluation on Pakistan's trade balance using bilateral-level data.

4.2. Research Objectives

The objective of this research is to test whether there exists a positive correlation between the current exchange rate and future trade balance and negative correlation between current exchange rate and past trade balance for Pakistan. If this hypothesis holds true, it would lead us to conclude that currency devaluation results in correcting Pakistan's trade imbalance with its major trading partners.

Chapter 5: Data and Methodology

5.1. Methodology

As mentioned above, the S-curve is a cross-correlational function between the real exchange rate and the past, current and future values of the trade balance. Thus, this study defines the trade balance, real exchange rate and cross-correlation coefficient (COR) between the real exchange rate and trade balance as defined by Bahmani-Oskooee and Ratha (2007b):

$$COR = \sum (RE_t - RE') (TB_{t+k} - TB')$$

$$\boxed{\sum (RE_t - RE')^2 (TB_{t+k} - TB')^2}$$

Where k denotes a single unit of time period (in this case a month), RE and TB are the two timeseries variables, Real Exchange Rate and Trade Balance, respectively, and RE' and TB' are the mean values of the observations over the study period. In this study the total number of observations are 14, that is it covers the period between 2004 and 2017. The k in the equation can take both negative and positive values which allows the cross-correlation coefficient to be calculated between current exchange rate and past values of the trade balance and current exchange rate and future values of the trade balance, respectively.

For example, when k = 0 in the equation, I calculate the correlation coefficient (COR₀) between the current real exchange rate (RE_t) and current trade balance value (TB_t). When k = 1, COR₁ is calculated between the real exchange rate (RE_t) and the one-period lead or future trade balance value (TB_{t+1}). When k = 2, COR₂ is calculated between the real exchanger rate (RE_t) and the twoperiod lead or future trade balance value (TB_{t+2}) and so on. Similarly, when k = -1, correlation coefficient (COR-1) is calculated between the real exchange rate (RE_t) and one-period lagged or past trade balance value (TB_{t-1}). Thus, correlation coefficient is calculated until k = 14 or k = -14. The S-curve is then obtained by plotting the coefficient correlation (COR) on the y-axis of a graph and k or the time period on the x-axis.

Moreover, the trade balance and real exchange rate are defined as:

Trade Balance (TB) =
$$(X - M)/GDP$$

Where X is Pakistan's exports to the trading partner, M is Pakistan's imports from the same trading partner and GDP is the nominal gross domestic product of Pakistan.

Real Exchange Rate (RE) = (CPI_f / CPI_d) . E

Where CPI_f is the consumer price index of the Pakistan's trading partner, CPI_d is the domestic consumer price index, and E is the nominal exchange rate between Pakistan and its trading partner. Moreover, a time-series data has to be tested for the presence or absence of unit root in data, that is, whether the data is stationary or non-stationary. If the data has no unit roots, it "fluctuates around a constant long run means [which] implies that the series has a finite variance which does not depend on time which is crucial for economic forecasting" (Libanio, 2005). Therefore, unit root testing was carried out for all the variables in the data before analyzing the data.

5.2. Data

Annual bilateral time series data was collected from 2004 to 2017 for Pakistan vis-à-vis its trading partners. The author originally planned to analyze the monthly time period data starting from 1999 as this was the year when Pakistan shifted towards free-float exchange rate regime. However, due to the lack of the data, 2004 – 2017 was chosen as the period of analysis. The annual data on Pakistan's export and import and the nominal exchange rate with its trading partners over the 2004 - 2017 period is taken from the statistical record of the State Bank of Pakistan. The data on

consumer price index is taken from the International Financial Statistics (IFS) of the International Monetary Fund. For uniformity, all the variables were measured in US dollars.

The trading partners of Pakistan are selected based on the share of the partners' total trade with Pakistan. In total, six trading partners, namely the United States of America, the United Kingdom, the United Arab Emirates, Saudi Arabia, China and Germany, were chosen whose cumulative percentage of imports to and exports from Pakistan in the year 2017 were about 52% and 43%, respectively (also see Appendix 1) (United Nations COMTRADE database).

Chapter 6: Empirical Results

In this section, I will present the results that have been derived from the cross-correlation between the exchange rate and trade balance to see if the evidence provides support for the existence of Scurve at the bilateral level. It should be noted here that the positive correlation means that the currency devaluation leads to the improvement in the trade balance while the negative correlation means that it worsens the trade balance.

I will first present a summary of the findings which is then followed by the detailed provision of the results.

Table 1: Trading Partners of Pakistan and Their Percentage of Imports to Exports from Pakistan

Country Name	Support
United States	Yes
United Kingdom	No
China	No
Saudi Arabia	Yes
United Arab Emirates	Yes
Germany	No

The above table shows that the S-curve is observed in only half of the bilateral trade of Pakistan with its major trading partners. However, the United States, the largest destination for the Pakistani exports, is also among the countries with whom there is a tendency that Pakistan increases its trade balance after the devaluation of the Pakistani rupee.

6.1. Bilateral Trade with the United States of America

The cross-correlation values between Pakistan's exchange rate and trade balance with the United States are positive at lead times and negative at lags; thus, indicating that the S-curve exists (See Figure 10). Although the S-curve may not be detected visually in the graph; nevertheless, the core principle of the phenomenon is satisfied, that is, the current exchange rate is negatively correlated with the past values of the trade balance while positively correlated with the future values of the trade balance. Moreover, the highest positive correlation value (0.2471) occurs at lag 2 which means that it takes approximately two years for the effect from the currency devaluation to propagate to the trade balance between the two countries.





6.2. Bilateral Trade with the United Kingdom

The graph of the United Kingdom shows that the S-curve does not exist in the bilateral trade with Pakistan as all the lag coefficients are positive (see Figure 11). Thus, the currency devaluation of the Pakistani rupee does not have any link between the trade relationship of Pakistan and the United Kingdom.



Figure 11: Correlation between Pakistan's real exchange rate and trade balance with the United Kingdom

6.3. Bilateral Trade with the United Arab Emirates

The S-curve exists in the bilateral trade pattern between the UAE and Pakistan. Pakistan's trade balance improves with increase in the exchange rate as shown in Figure 12. It shows that the highest correlation value (0.4433) occurs at lag 3 suggesting that the devaluation bears maximum fruit after three years.



Figure 12: Correlation between Pakistan's real exchange rate and trade balance with the United Arab Emirates

6.4. Bilateral Trade with Saudi Arabia

Similarly, Figure 13 shows that the S-curve exists in the bilateral trade between Pakistan and Saudi Arabia. Devaluation of the Pakistani currency, the trade balance between the two countries moves towards improvement.





6.5. Bilateral Trade with China

Figure 14 shows that all the lead values are in negative; hence, the S-curve does not exist in the trade pattern of Pakistan and China.



Figure 14: Correlation between Pakistan's real exchange rate and trade balance with China

6.6. Bilateral Trade with Germany

Similarly, the S-curve is absent from the trade relationship between Germany and Pakistan as depicted in Figure 15.

Figure 15: Correlation between Pakistan's real exchange rate and trade balance with Germany



Chapter 7: Discussion

The cross-correlational analysis of Pakistan's bilateral trade with six of its major trading partners reveals that the devaluation of the PKR did not boost exports and curb imports across the board. While the exchange rate appreciation improved the country's trade balance with the UAE, Saudi Arabia and the United States, it deteriorated in the case of China and Germany while having no significant impact on the bilateral trade with the United Kingdom. It is contrary to what the theories in the international trade suggest: when exports-imports are price elastic, currency devaluation worsens the trade balance in the short-run but improves in the long-run. This is even evident in the aggregate trade data of Pakistan; despite 140% drop in the nominal value of the Pakistani currency between 2004 and 2017, Pakistan's exports have shown a meagre increase of 77% while the imports have ballooned by more than 320% (Figure 16).



Figure 16: Nominal Exchange Rate and Imports and Exports of Pakistan in Current in US\$

Source: State Bank of Pakistan

However, macroeconomics is a complex realm and economic theories may not always stand accurate as myriad of national and international political, social and economic factors are into play. I will discuss why the currency devaluation did not produce effective results in some cases of Pakistan's bilateral trade while worked in others. Moreover, I will argue that currency devaluation is not a panacea for fixing Pakistan's chronic trade imbalance, rather it must be supported by other economic policies as well.

7.1. Supply-side Factors

7.1.1. Import Dependency

A country's increased economic activity leads to a boost in the domestic production which results in the increase in demand for capital goods and raw material. During the last two decades, Pakistan experienced two phases of economic leaps. The first was between 2003 to 2007 when the then government's liberalization policies coupled with the inflow of billions of dollars in the form of aid to Pakistan in return for the country's unconditional support in the global war on terror allowed the country to maintain an average GDP growth of more than 6 percent (SBP Economic Data). The second phase was between 2014 to 2017 when China and Pakistan entered into an agreement to build a network of roads, railways and other infrastructure to provide access to the Chinese goods to the Arabian Sea through Pakistan. The agreement, which is termed as the China-Pakistan Economic Corridor (CPEC) and worth \$54 billion, is the single biggest economic agreement in the history of Pakistan.

However, Pakistan is an import dependent economy. Its imports are highly concentrated in a few items, including machinery, petroleum and petroleum products, chemicals, transport equipments, and iron and steel, which make up about 65% of the country's total imports (Nakhoda, 2016). As these items are crucial for the domestic production of goods, especially during the times of high

domestic production, they could hardly be discouraged due to the lack of domestic substitution. Thus, devaluation of the Pakistani rupee puts immense pressure on the country's import bills.

This argument is supported by Bahmani-Oskooee and Kutan (2008), Narayan and Narayan (2004a) and Singh (2006). According to them, countries which rely heavily on imported capital goods and raw materials to produce domestic manufacturing goods are more likely to see the deteriorating effects of the currency devaluation on trade balance. Dr. Ishart Hussain, the former Governor of the State Bank of Pakistan, presented the same line of argument. He argued that as Pakistan is an import-dependent country, currency devaluation leads to inflation in the country which in turn raises the cost of export producing industries; thus, offsetting any gains that may be accrued from the devaluation (Alam, 2019).

7.1.2. Low Export Competitiveness

In today's increasingly globalized and interconnected world with highly dynamic global markets, suppliers are competing against one another for a share of the global market. The role of export competitiveness is of utmost importance here. Improving export competitiveness is extremely crucial for boosting exports of a country which in turn is dependent on multiple domestic factors. A conducive entrepreneurial and business environment is necessary for increasing the productivity of local firms and industries (and hence export competitiveness of the country). Efficient and well-connected infrastructure network, enabling bureaucratic and legal framework, well-functioning labor and capital market, low cost of factor production, and flexible regulations for market entry/exit among others are some of the determinants that would push the domestic firms and industries to become more competitive and productive. Thus, having efficient and competitive firms allow a country to increase its export competitiveness in the global market.

Exports play a critical role in Pakistan's economy. Firstly, it is an important source of receiving the foreign exchange reserves and secondly, Pakistan has a relatively small domestic consumption market which is not sufficient for sustaining the economic growth of the country. However, Pakistan fares poorly compared to its global competitors in every indicator that measures business environment of a country. For example, in 2018, the country ranked 147th, 131th, and 115th in the ease of doing business index, economic freedom index, and global competitiveness index (GCI), respectively (From the website of The World Bank Group; Heritage Foundation; and World Economic Forum) (see Figure 17). GCI defines competitiveness as "the set of institutions, policies and factors that determine the level of productivity of a country", the Doing Business index focuses on "the quality of laws on regulations affecting local business", while EFI measures the "degree individuals are free to work, produce, consume and invest in any way they please" (CESifo DICE Report, 2012).

Thus, in the dilapidated business environment like Pakistan's, it is no wonder that the domestic firms and industries suffer from the lack of efficiency and productivity which ultimately hurts the country's export competitiveness. Therefore, though devaluation would provide cost-competitive advantage to the Pakistani exports, the fundamental economic structure necessary to boost exports are missing in the context of Pakistan.

Figure 17: Pakistan's and its Competitors Ranking in the Global Competitive Index, Ease of Doing Business index, and Economic Freedom index. Higher Ranking Indicates Poor Performance



Source: The World Bank Group, World Economic Forum, and the Heritage Foundation

7.2. Demand-side Factors

7.2.1. Global Economy Slowdown

Global demand is another factor that determines the export growth of a country, or more specifically of a product. The slowdown in the global economy in the aftermath of the 2009 financial crisis had an impact on the export growth of the developing countries. Moreover, those products that had a higher income elasticity of demand were affected more so than other products.

Appendix 2 and Appendix 3 present the economic growth of Pakistan's top five export destination countries and the income elasticity of demand of the top exporting products of Pakistan, respectively. They show that almost all the export destination countries went through economic slowdown, except China. Moreover, the income elasticity of demand of the Pakistani exports are either higher or close to unity except the low value-added products, suggesting that global income

plays a role in the export quantity of these products. For example, a 1 percent decline in the global income growth will lead to a 1.6 percent drop in the growth of Pakistan's made-up export products (Hussain, 2010). Thus, the demand side factors might offset the benefits that could be gained from the devaluation of the currency.

The non-occurrence of the S-curve in half of the bilateral trade relationship between Pakistan and its trading partners despite the devaluation of the Pakistani rupee could be attributed to both the supply-side and demand-side factors discussed above. Thus, the author of this study argues that the inability or incapacity of the policy of exchange rate management, that is determining the true value of currency through the market forces of supply and demand, which is one of the core principles of liberal economics, should be considered in a wider context of a country's economic and political environment.

Chapter 8: Recommendations

The thesis has not found any significant relationship between the currency devaluation and trade balance of Pakistan. This implies that the government of Pakistan and the State Bank of Pakistan cannot influence the country's trade balance using exchange rate policy unless they adjust other macro and microeconomic fundamentals. The following recommendations are suggested to improve Pakistan's trade balance.

1. Pakistan exports mostly low or primary value-added products which earn low export revenue. This fact is also evident in the country's ever deteriorating terms of trade (see Figure 7). Pakistan should transition from exporting commodity-based products to high-value added products. The government of Pakistan should introduce schemes and provide incentives for the domestic manufacturers to specialize in producing finished exportable products in order to earn high foreign exchange and improve the trade balance. In the current scenario the currency devaluation would only increase the quantity of primary products which is insufficient for correcting the country's trade imbalance.

2. In order to better absorb the global financial shocks and mitigate the effects of commodity price fluctuations, Pakistan should diversify its exports to new geographical destinations and expand its export basket. As Pakistan exports 40% of its products to just six countries (see Appendix 1) and more than 60% of the exports are confined to just nine products (see Appendix 3), there is a need for access to new markets with increased export products.

3. The results obtained in this study do not correspond with the general international trade theory, that is the currency devaluation do not significantly improve trade balance in the context of Pakistan. That's not to say that the theory is itself incorrect but that the Pakistani economy is

different in this sense from most countries. Thus, the government and the central bank of Pakistan should be careful employing foreign experience while designing economic policies for the country.

4. While the share of the service sector in Pakistan's economy is more than 50% (SBP Economic Data), it has remained obscured in the exports of the country. The country has a huge potential in producing information technology (IT) related services as well as tapping the tourism sector. The government of Pakistan should promote the service sector to correct the country trade imbalance.

Research Limitations and Conclusion

The purpose of this thesis was to examine the impact of currency devaluation on the bilateral trade balance of Pakistan with its major trading partners. As the country has found itself again in the balance of payment crisis, the State Bank of Pakistan decided to devalue the PKR in order to rein in the growing current account deficit. The study has found that devaluation does not have significant impact on increasing the country's exports and reducing imports, and therefore, exchange rate policy must be accompanied by other macroeconomic adjustments.

This study has a few shortcomings. First, the unavailability of the data limited the analysis of Pakistan's bilateral trade relationship to just six trade partners. Although they account for about half of the country's total trade share, the research could have been comprehensive had the data for Pakistan's other trade partners was available. Second, the methodology applied in the research to establish a relationship between exchange rate and trade balance may have limitations. The model used in this study which is adopted from the paper published by Backus *et al.* (1994) assumes that trade balance is determined only through the fluctuation in the exchange rate. However, there are certainly other variables that influence trade balance as well. Taking into account these variables would help further refine the results. Moreover, the S-curve can only show the movement of the trade balance before and after the currency devaluation. Thus, the policy makers should tread carefully with the results and analysis of this study as correlation does not imply causation.

Bibliography

Akhtar, S., & Malik, F. (2000). Pakistan Performance vis a vis Its Major Trading Partners. *The Pakistan Development Review*, 39(1), 37-50. Retrieved from https://www.jstor.org/stable/41260238

Alam, K. (2019, march 26). The Aftershocks of a Fallen Rupee. *Dawn*. Retrieved from <u>https://herald.dawn.com/news/1398843</u>

Alexander, S. S. (1952). Effects of Devaluation on a Trade Balance. International Monetary FundStaffPapers,2(2),263-278.Retrievedfromhttps://www.jstor.org/stable/3866218?origin=pubexport&seq=1#metadata_info_tab_contents

Ahmad, A. (2018, August 6). Pakistan will be Going to the IMF for the 13th Time. Will PTI's Asad Umar Fare Better than Past Ministers? *Dawn*. Retrieved from <u>https://www.dawn.com/news/1425319</u>

Backus, D. K., Kehoe, P. J., & Kydland, F.E. (1994). Dynamics of the Trade Balance and the Terms of Trade: The J-curve? *American Economic Association*, 84(1), 84-103. Retrieved from https://www.jstor.org/stable/2117972?seq=1#metadata_info_tab_contents

Bahmani-Oskooee, M. (1985) Devaluation and the J-curve: Some Evidence from LDCs. *The Review of Economics and Statistics*, 67(3), 500-504. Retrieved from https://www.jstor.org/stable/1925980?seq=1#metadata_info_tab_contents

Bahmani-Oskooee, M., & Brooks, T. J. (1999). Bilateral J-curve Between US and Her Trading Partners. *Weltwirtschaftliches Archiv*, 135(1), 156-165. Retrieved from https://www.jstor.org/stable/40440680

Bahmani-Oskooee, M & Ratha, A. (2004). The J-curve: A Literature Review. *Applied Economics*, 36(13), 1377 – 1398. DOI: <u>10.1080/0003684042000201794</u>

Bahmani-Oskooee, M., Goswami, G. G., and Talukdar, B. K. (2005). The Bilateral J-curve: Australia versus Her 23 Trading Partners. *Australian Economic Papers*, 44(2), 110-120. DOI: 10.1111/j.1467-8454.2005.00252.x

Bahmani-Oskooee, M., & Ratha, A. (2007a). Bilateral S-curve Between Japan and Her Trading Partners. *Japan and the World Economy*, 19(4), 483-489. https://doi.org/10.1016/j.japwor.2006.09.005

Bahmani-Oskooee, M., & Ratha, A. (2007b). The S-curve Dynamics of US Bilateral Trade. *Review of International Economics*, 15(2), 430-439. Retrieved from https://doi.org/10.1111/j.1467-9396.2007.00640.x

Bahmani-Oskooee, M., & Ratha, A. (2008). S-curve at the Industry-level: Evidence from US-UK Commodity Trade. *Empirical Economics*, 35(1), 141-152. DOI: 10.1007/s00181-007-0147-0

Bahmani-Oskooee, M & Wang, Y. (2008). The J-curve: Evidence from Commodity Trade Between US and China. *Applied Economics*, 40(21), 2735-2747. DOI: 10.1080/00036840600970328

Bahmani-Oskooee, M & Bolhasani, M. (2008). The J-curve: Evidence from Commodity Trade Between Canada and the U.S. *Journal of Economics and Research*, 32(3), 207-225. Retrieved from https://link.springer.com/article/10.1007%2Fs12197-007-9024-0

Bahmani-Oskooee, M, Kutan, A, & Ratha, A. (2008b). The S-curve in Emerging Markets. *Comparative Economics Studies*, 50(2), 341-251. DOI: 10.1057/palgrave.ces.8100236

Bahmani-Oskooee, M., & Ratha, A. (2009). S-curve Dynamics of Trade: Evidence from US-Canada Commodity Trade. *Economics Issues*, 14(1), 1-16. Retrieved from http://www.economicissues.org.uk/Files/109Bahmani-Oskooee.pdf

Bahmani-Oskooee, M & Kutan, A. (2009). The J-curve in the Emerging Economies of Eastern Europe. *Applied Economics*, 41(20), 2523-2532. DOI: <u>10.1080/00036840701235696</u>

Bahmani-Oskooee, M, & Hosny, A.S. (2012). S-curve Dynamics of Trade Between Egypt and Her Two Largest Partners. *International Journal of Trade and Global Markets*, 5(2), 142-152. Retrieved from http://www.inderscience.com/offer.php?id=48530

Cheema, N. (2019, January 14). Currency Management. *Dawn*. Retrieved from <u>https://www.dawn.com/news/1457427</u>

CESifo DICE Report. (2012). *Journal for Institutional Comparisons*. Retrieved from https://www.ifo.de/DocDL/dicereport112-db5.pdf

Harberger, A.C. (1950). Currency Depreciation, Income, and the Balance of Trade. The JournalofPoliticalEconomy,58(1),47-60.Retrievedfromhttps://www.jstor.org/stable/1826198?seq=1#metadata_info_tab_contents

Hasan, M. A., & Khan, A. H. (1994). Impact of Devaluation on Pakistan's External Trade Balance: An Econometric Approach. *The Pakistan Development Review*, 33(4), 1205-1215. Retrieved from <u>https://www.jstor.org/stable/41259822</u>

Heritage Foundation (HF), Index of Economic Freedom. Retrieved from <u>https://www.heritage.org/index/explore</u>. Accessed 7 June, 2019.

Himarios, D. (1989). Devaluations Improve the Trade Balance? The Evidence Revisited.*Economic*Inquiry.27(1),143-168.Retrievedfromhttps://onlinelibrary.wiley.com/doi/abs/10.1111/j.1465-7295.1989.tb01169.x

Hussain, A.M. (2006). Choosing the Right Exchange Rate Regime for Pakistan. State Bank ofPakistan–ResearchBulletin,2(1).Retrievedfromhttps://www.sbp.org.pk/research/bulletin/2006/Choosing_Right_Exchange_Rate_Regime.pdf

Hussain, F. (2010). Pakistan's Export Demand: A Disaggregated Analysis. SBP Research Bulletin.
6(2). Retrieved from https://www.sbp.org.pk/research/bulletin/2010/Vol6No.2/Fayyaz.pdf

Iqbal, S. (2017, December 9). Dollar Rises to Rs107 in 'Market-driven Adjustment'". *Dawn*. Retrieved from <u>https://www.dawn.com/news/1375392</u>

Jorgic, D & Sayeed, S. (2017, July 6). Pakistani Finance Minister Criticizes Central Bank Over Rupee Plunge. *Reuters*. Retrieved from <u>https://www.reuters.com/article/us-pakistan-</u> <u>currency/pakistani-finance-minister-criticizes-central-bank-over-rupee-plunge-</u> idUSKBN19R0X8

Kale, P. (2001). Turkey's Trade Balance in the Short and the Long Run: Error Correction Modeling and Cointegration. *The International Trade Journal*, 15(1), 33-56. doi.org/10.1080/088539001300005440

Kousar, N., Yaseen, M. R., & Qaiser, I. (2017). The S-curve Dynamics of Trade: The Case Study of Pakistan. *Pakistan Journal of Applied Economics*, 27(1), 121-138. Retrieved from https://www.researchgate.net/publication/317587833_THE_S- CURVES DYNAMICS OF TRADE The Case Study of Pakistan Libanio, G. A. (2015). Unit Roots in Macroeconomics Time-Series: Theory, Implications, and Evidence, *Nova Economia*, 15(3). http://dx.doi.org/10.1590/S0103-63512005000300006

Magee, S. (1973). Currency Contracts, Pass-through, and Devaluation. Brookings Papers onEconomicActivity,4(1),303-325.Retrievedfromhttps://EconPapers.repec.org/RePEc:bin:bpeajo:v:4:y:1973:i:1973-1:p:303-325

Mangi, F. (2018, October 9). Rupee Said to be Devalued as Pakistan Turns to IMF for Bailout. *Bloomberg*. Retrieved from <u>https://www.bloomberg.com/news/articles/2018-10-09/rupee-said-to-be-devalued-as-pakistan-turns-to-imf-for-bailout</u>

Mangi, F. (2019, May 30). Pakistan's Rupee is Close to Becoming the Month's Top Loser. *Bloomberg.* Retrieved from <u>https://www.bloomberg.com/news/articles/2019-05-29/pakistan-s-</u> <u>rupee-is-close-to-becoming-the-month-s-biggest-loser</u>

Meade, J. E. (1951). The Balance of Payments. *Oxford University Press*. Retrieved from <u>https://books.google.hu/books/about/The_balance_of_payments.html?id=ekMrAAAAMAAJ&re</u> <u>dir_esc=y</u>

Mundell, R. A. (1968). International Economics. New York: Macmillan. Retrieved from http://www.columbia.edu/~ram15/ie/ietoc.html

Nakhoda, A. (2016, November 28). Understanding Pakistan's Import Composition. *Express Tribune*. Retrieved from <u>https://tribune.com.pk/story/1246172/trade-structure-understanding-pakistans-import-composition/</u>

Narayan, P., & Narayan, S. (2004a). The J-curve: Evidence from Fiji. International Review ofAppliedEconomics,18(3),369-380.Retrievedfromhttps://www.tandfonline.com/doi/full/10.1080/0269217042000227088

"Pakistan Takes a Beating". (1998, August 20). *The Economist*. Retrieved from https://www.economist.com/asia/1998/08/20/pakistan-takes-a-beating

Parikha, A, & Shibata, M. (2004). Dynamics of the Relationship between the Terms of Trade and the Trade Balance in Developing Countries of Asia, Africa, and Latin America. *Journal of Quantitative Economics*, 2(2), 104-121. DOI: <u>10.1007/BF03404611</u>

Prakash, K., and Maiti, D. (2016). Does Devaluation Improve Trade Balance in Small Island Economies. *Economic Modeling*. DOI: 10.1016/j.ec onmod.2016.02.023

Riazuddin, R. (2018). Reforming Exchange Rate Management in Pakistan. *Paper of presentation in 34th annual conference of PSDE*. Retrieved from <u>https://www.researchgate.net/publication/329809121_Reforming_Exchange_Rate_Management</u> _in_Pakistan

Rose, A. K., & Yellen, J. L. (1989). Is There a J-curve? *Journal of Monetary Economics*, 29(1), 2453-2468. <u>https://doi.org/10.1016/0304-3932(89)90016-0</u>

Senhadji, A. (1998). Dynamics of the Trade Balance and the Terms of Trade in LDCs: The Scurve. *Journal of International Economics*, 46(1), 105-131. DOI: <u>10.1016/S0022-1996(97)00043-</u> <u>3</u>

Shieh, Y. (1981). Monetary Approaches to Devaluation. *Southern Economic Journal*, 47(4), 1143-1146. DOI: 10.2307/1058175

Singh, R. (2006). Conintegration Tests on Trade Equation: Is Devaluation an Option of Fiji. *School of Economics Working Paper Series, The University of South Pacific*. Retrieved from https://books.google.hu/books/about/Cointegration_Tests_on_Trade_Equations.html?id=UCcEk AEACAAJ&redir_esc=y

State Bank of Pakistan (SBP). Review of Pakistan's Balance of Payments: July 2008 – June 2009.AccessedMay28,2019.Retrievedfromhttp://www.sbp.org.pk/publications/bop/BOPY09/AnnualBookletReview-2008-09.pdf

State Bank of Pakistan (SBP). *Economic Data*. <u>http://www.sbp.org.pk/ecodata/index2.asp</u>

State Bank of Pakistan (SBP) website. <u>https://www.sbp.org.pk/DFMD/FS-Exg.asp</u>

International Monetary Fund (IMF). The End of the Bretton Woods System (1972 – 81). Retrieved from https://www.imf.org/external/about/histend.htm

The IMF Has Agreed to Break Pakistan's Fall. Again. (2019, May 16). *The Economist*. Retrieved from https://www.economist.com/finance-and-economics/2019/05/16/the-imf-has-agreed-to-break-pakistans-fall-again

TheWorldBankGroup,DoingBusiness.Retrievedfromhttp://www.doingbusiness.org/en/custom-query. Accessed 7 June, 2019.

United Nations COMTRADE Database. <u>https://comtrade.un.org/labs/dit-trade-</u> vis/?reporter=586&type=C&year=2017&flow=2

Upadhyaya, K. P, and Dhakal, D. (1997). Devaluation and the Trade Balance: Estimating the Long Run Effect. *Applied Economics Letters*, 4(6), 343-345. DOI: <u>10.1080/135048597355276</u>

World Economic Freedom, Global Competitiveness Report 2018. Retrieved from https://www.weforum.org/reports/the-global-competitveness-report-2018. Accessed 7 June 2019.

Appendix 1

Country	Percentage of Imports	Percentage of Exports
United States	4.9	16.3
United Kingdom	1.3	7.5
China	26.8	6.9
Saudi Arabia	4.75	1.53
United Arab Emirates	13.10	3.97
Germany	1.9	5.9
Total	57.97	42.1

Source: United Nations COMTRADE database https://comtrade.un.org/labs/dit-trade-

vis/?reporter=586&type=C&year=2017&flow=2

Appendix 2

	Global GD	P US GD	P UK GDP	Germany GDP
	growth (%)	Growth (%)	growth (%)	growth (%)
2008	1.8	-0.2	-0.5	1.08
2009	-1.7	-2.8	-4.2	-5.6
2010	4.3	2.7	2.2	4.08
2011	3.1	1.5	1.6	3.6
2012	2.5	2.2	1.4	0.5

Source: World Bank database

Appendix 3

Products	Share	Income Elasticity of Demand		
Low Value-Added Products				
Rice	8.4	-0.5		
Leather	1.9	-0.9		
Textile Yarn	7.7	-0.2		
Medium Value-Added Products				
Cotton Fabrics	11.3	-1.0		
Made-up Articles	17.6	-1.6		
High Value-Added Products				
Men and Boys' Garments, not knitted	4.7	-0.5		
Men and Boys Garments, knitted	4.7	-0.4		
Clothing Accessories	2.0	-0.6		
Apparel and Accessories other than textile fabrics	3.4	-1.3		
Source: Hussain, 2010	1	1		