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Impact of structural adjustment program on business cycles in Pakistan: a time series analysis

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ABSTRACT

Background: Understanding of business cycles is necessary for the policymakers because it has important bearings on the wellbeing of the society. In spite of vital importance of business cycles, previously no studies emphasis over measuring Structural Adjustment Program's (SAP) effect on statistical characteristics of business cycles i.e. persistence, co-movement and volatility for Pakistan.

Objectives: The primary objective of our study is to quantify the impact of SAP on business cycles for Pakistan economy by using time series data from 1974-2016.

Methods: The selected variables has been divided into three groups of variables specifically GDP's expenditure components, real variables, and nominal variables. In this study, whole time period is distributed in two sub periods i.e. 1974-1988 and 1989-2016. Hodrick and Prescott filter has been used for the extraction of cyclical component from the time series while for measuring the volatility, persistence and co-movements of the selected variables, standard deviation, correlation coefficient and first order correlation coefficient has been used respectively.

Results: Results of the study reveals that volatility of almost all the selected macroeconomic variables has increased after the implementation of SAP. Volatility of GDP, reference variable, has increased from 1.31 to 1.34. Similarly, terms of trade was found the most volatile series amongst all the variables during post-SAP period, with volatility of 4.25.

Conclusions: The findings suggest that SAP implemented during the period of 1988 adversely affected the economy and has not contributed in stabilizing and structuring the economy rather it exaggerated the volatility and economic fluctuations in Pakistan. Government of Pakistan and policymakers should continue to implement sound fiscal and monetary policies to reduce government budgetary deficit, as this decrease would release resources to develop physical as well as financial infrastructures to be capable to promote stability at macro level.

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1. INTRODUCTION

The nature of economic fluctuations in Pakistan has been continuously changing (Bengali et al., 2001). By the late 1970s and the turn of the 1980s, Asian countries and developing countries all over the world experienced substantial economic decline and hefty debt problem which were heightened by the worldwide economic contraction (Lago et al., 2004). Like many developing countries, Pakistan also confronted many economic problems including huge fiscal deficit, prompt monetary expansion, enhancing

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inflation, an unmaintainable current account deficit, worsening in the terms of trade, and handsome burden of external debt through 1970s and in the beginning of 80s.

Structural Adjustment Program (SAP) denotes certain policy measures that were needed to be implemented by the countries to be able to succeed in getting the loans from International Monetary Fund (IMF) (Jamal, 2003). Pakistan is amongst those countries that has approached IMF for the purpose of adjustment lending and packages for economic stabilization. First standby loan was advanced by IMF to Pakistan in 1958, however, the relationship between IMF and Pakistan strengthen in 1988 and Pakistan was advanced a loan, amounting to US$516 Million. This loan was provided to the countries including Pakistan with low interest rate but harsh conditions were attached to it (Nasir, 2012). The countries approached six or supplementary adjustment packages as 1980s including Pakistan. Authorities in Pakistan were forced by the worsened situations in 1988 to take loans from financial institutions to stabilize the economy. Acceptance of procedure for availing the packages recommended by IMF known as SAP in 1988 was a step towards attaining these aforementioned objectives. The objectives of acquiring the loans from IMF was an anticipation that this momentary IMF program would provide impetus to the economy of Pakistan, which was confronting macroeconomic imbalances. By adopting the SAP, it was aimed that it would accomplish a smooth adjustment irrespective of renovating to severe activities which might detriment long-term growth projections (Nasir, 2012).

In 1982, Pakistan received first Structural Adjustment Loan (SAL) (Iqbal & Bilquees, 1994). Under that loan, export development was targeted with the motive to extend the industrial export of the country. During the years 1985 and 1989, first and second energy loans were approved respectively. The basic motive behind providing such packages aimed at enhancing the strategies of the government regarding energy. The SAP was initiated by the IMF in 1986 and Pakistan got the major share in 1988. Strict conditionality were attached with loans advanced by IMF under SAP during 1988-1991 (duration of loans was initially three years), which were mandatory for authorities in Pakistan during the three fiscal years to follow. The key conditionality attached with such packages include the reduction of budgetary deficit to 5.5% in 1989-90 from 6.5% of GDP during the years of 1986-87, and more to be reduced to 4.8% till 1990-91, reducing inflation to 7% during 1989-90 from prevailing inflation of 10% during 1988-90 and gradual reduction to 7% during 1989-90 and to be reduced further to 6.5% during the years of 1990-91, decline in external current account deficit to 3.4%, 2.8% 2.6% of GDP during 1988-89, 1989-90 and 1990-91 respectively, reducing the ratio of civilian external debt service to less than 22% until 1990-91 as compare to prevailing 27-28 % during 1986-88, enhancing the reserves of gross official foreign exchange to almost seven weeks of imports until the year of 1990-91 from existing capacity of three weeks and to maintain harmony in the growth of money supply and domestic credit with that of growth of nominal GDP growth rate by maintaining the targeted level of inflation (Iqbal & Bilquees, 1994).

The International Monetary Fund (IMF) and World Bank (WB) proposed that in order to get rid the developing countries out of the problems and to put them on the path of economic growth, SAPs were badly needed. They contended that as a result of implementing SAP by the developing countries, their national wealth will ultimately spur and will spread all over the economy and finally to the poor. The effect of structural adjustment program over three variables which include income distribution, poverty and employment in bringing the stability in economy is negligible (Kemal, 1994). The structural reforms associated to SAP over industrialization in Pakistan sharply increased production cost as an outcome of stabilizing the currency which resulted in less exports (Khan et al., 2011). All joint policies associated with SAP that aims to equalize income distribution in Pakistan bears substantial adverse effect over the incomes of the household of the entire groups in both urban and rural (Iqbal & Siddiqui, 1998). The stabilization of fiscal and monetary policy for Pakistan via means of SAP should have been aimed at reducing the budget deficit by means of either intensification in revenue or reducing current expenditures, and not via reducing developmental outlays (Bengali et al., 2001). As a result of employing SAP to reduce poverty, both growth rates and investment declines, while poverty and unemployment augments in Pakistan. Kemal (2001)

inspects the vigorous features of inequality and poverty during the years of 1988-99 as an outcome of SAL program from World Bank and IMF reveals that after implementing SAP, Pakistan's performance has come down and entirely the stabilization signs excluding minor decline in the budget deficit while a minor rise in share of exports in GDP and total revenues (Jamal, 2003). The conditionality attached to the SAP in women's exploitation in Pakistan including trade liberalization, removal of subsidies and devaluation boosts the moral of manufacturers to raise the potential assets to tradable items instead of non-tradable and the policies like alleviating poverty, facilitating growth and structural adjustment facilities should not be gender insensitive (Ali & Mujahid-Mukhtar, 2003). The initiated programs by International Monetary Fund (IMF) resulted in reasonably slight effects over social expenditures and lasted for short period of time, favored those nations which were ongoing patrons of the International Monetary Fund (IMF) (Lago et al., 2004). All the policy instruments of Structural Adjustment Program (SAP), i.e. decrease in budget deficit, imposition of indirect tax, adjustment of exchange rate and shrink in subsidies has adverse effects on the employment, income distribution, per capita income and inflation except imposition of indirect tax which positively affected the inflation (Khan et al., 2011). Various articles published after 2000 in various electronic databases declares that comprehensive impact of SAP in developing countries on health determinants is inverse (Thomson et al., 2017). Components of SAP and a conceptual framework for health system that intends to improve it are controversial (Kentikelenis, 2017). The impact of IMF lending programs on health equity in developing countries has reduced access to health and lead to rise in neonatal mortality (Forster et al., 2019).

The above discussion makes it clear that literature provides inconclusive results regarding the effectiveness of SAP on various macroeconomic variables because the results obtained from the studies is mixed. Unfortunately, even with the recent flow in the literature on business cycles in developing economies, to the best of author's knowledge, there is no study available in the literature in context of Pakistan which investigated the impact of SAP on business cycle characteristics. This paper contributes to the literature to fill in the gap in the existing knowledge on the issue in several aspects. First, to the best of author's knowledge, for the first time, this study documented the statistical properties of how business cycles characteristics for the economy of Pakistan are affected by SAP of 1988. Second, a large and up-to-date interval of data ranging from 1974-2016 is employed for analysis. Third, to best of our knowledge, no other study has used such a large set of variables and sectoral distribution of variables for studying the impact of SAP of 1988 on business cycles characteristics and fluctuations in Pakistan. Fourth, the study in hands is the first attempt to thoroughly report the comprehensive stylized facts for Pakistan's economy during Pre and Post SAP commenced by International Monetary Fund (IMF) for developing countries with the aim of stabilizing the economy. It is expected that the results of this study can be a significant contribution to the recent literature and particularly for policymakers in using monetary and fiscal policy more effectively in the future.

The remaining paper is planned as follows: Section 2 is about methods employed, results are given in section 3. Whereas, in section 4, discussion of the study has been given. The study is concluded under section 5.

2. METHODS

2.1 Study design

The analysis of the study was based on time-series data and the data was collected from secondary sources.

2.2 Setting

Being a developing economy, the economy of Pakistan, with more than 220 million population, is the 23rd largest economy in terms of purchasing power parity and 43rd largest in terms of nominal gross domestic product (Pakistan Bureau of Statistics, 2017). The economy of Pakistan, being a labor abundant economy,

a hefty share of its population is comprised of working age population, has the potential to become one of the largest economies in the world in 21st century (Grant, 2011).

2.3 Variables

2.3.1 Reference variable

Gross domestic product (GDP) has been used as a reference variable in the study and the characteristics of the rest of variables are compared to GDP.

2.3.2 Other study variables

For measuring the business cycles characteristics, in order to put some structure on our analysis, we opted the approach adopted in some previous studies e.g. (Blackburn & Ravn, 1992; POVOLEDO, 2004; Schlitzer, 1996), and classified the variables into three groups. First group of the variables is regarded as GDP's expenditure components and includes variables: government consumption, gross total investment, gross total consumption, fixed investment, private consumption, government investment, private investment. Second group of variables is named as real variables and includes variables: employment in agriculture sector, employment in services sector, employment in industrial sector, Share of industrial sector as percentage of GDP, services as percentage of GDP, total employment and agriculture as percentage of GDP. Third group of variables is nominal variables and includes variables: nominal interest rate, velocity of money (V1), money supply (M1), terms of trade, velocity of money (V2), money supply (M2), and consumer price index.

2.4 Data sources

The data for the study ranges from 1974 to 2016 and has been collected from the Economic Surveys of Pakistan, State Bank of Pakistan annual reports and World Development Indicators (WDI) of World Bank. The reason for selecting 1974 as the base year is that, in 1973, Pakistan entered into a new era of exchange rate regime i.e. floating exchange rate system, which changed the structure of the economy. To capture the effects of this structural change, 1974 was selected as base year.

2.5 Data analysis methods

This study has adopted the atheoretical methodology, therefore, no theoretical model has been employed. The empirical estimation of the study is carried out in two parts. First part deals with documenting the business cycle characteristics i.e. volatility, co-movement and persistence during the period of 1974-1988[1], named as pre-SAP period. While in second part, known as period of post-SAP, ranges from 1989-2016, aforementioned characteristics of business have been reported. For the computation of results, first, Hodrick and Prescott (1997) filter has been used for the extraction of cyclical component from the time series.

2.5.1 Definition of terms and statistical/regression models used

This section has elaborated the terms and statistical methods that are used for the analysis.

(1) Volatility

Generally it measures the extent to which a series deviates from its average value. The high value of standard deviation of a series is, the more volatile is that series and vice versa. For measuring the volatility of selected macroeconomic variables, standard deviation has been employed. The formula used for calculation of standard deviation is given as under:

[1]Financial year 1988 has been selected as a structural break period. Because during this period this was the year in which economy was facing huge budget deficit and many other problems. As a result authorities in Pakistan during those years accepted the recommended packages of IMF, regarded as Structural Adjustment Program (SAP).

$$\sigma = \sqrt{\frac{\sum(X - \bar{X})2}{n}}$$

where, σ = standard deviation

$\sum$= sum of

X= each value in the data set

$\bar{X}$= mean of all values in the data set

n = number of value in the data set

(2) Co-movement

Co-movement with contemporaneous output series reflect the cyclicality of important macroeconomic variables. Co-movement indicates the directions of the two variables in which they tends to move as a result of policy change i.e. shock. For measuring the co-movement, correlation coefficient has been used. The technique/formula used for measuring correlation coefficient is as under:

$$r = \frac{n\Sigma xy - (\Sigma x)(\Sigma y)}{\sqrt{n(\sum x^2) - (\sum x)^2}\sqrt{n(\sum y^2) - (\sum y)^2}}$$

Where r denotes correlation coefficient and its value ranges between -1 and +1.

(3) Persistence

Persistence shows the inertia in business cycles, specifically in the cyclical components and document the length of observed fluctuations. For measuring persistence, first order autocorrelation coefficient has been employed. The formula for measuring first order autocorrelation is as under:

$$u_{t=} \rho u_{t-1+} \varepsilon_t$$

where, rho (ρ) is known as first order autocorrelation coefficient and its value lies between -1 and +1.

3. RESULTS

This section documents the characteristics of business cycle of Pakistan during pre-SAP period of 1974-1988 and post-SAP period of 1989-2016 respectively. We first document the business cycle characteristics of Pakistan for the pre-SAP period of 1974-1988.

3.1.1 Characteristics of Pakistan's business cycles for the Pre-SAP period of 1974-1988

In this section, we documented the business cycle characteristics of Pakistan during 1974-1988. For doing so, we taken the year of 1988 as the year of structural break. The only notion behind taking the year of 1988 as the year of structural break is to review the importance of different policy reforms/ structural changes that took place since the inception of Pakistan and their effects on business cycle characteristics. Among those policy reforms, one is the implementation of SAP initiated by IMF for developing countries in 1986 and Pakistan accepted the policy reforms associated with the said program in 1988. We named the characteristics of business cycle fluctuations in this section as pre-SAP period. We study the fluctuations experienced by economy of Pakistan and their nature in terms of the characteristics of business cycle fluctuations during pre-SAP period of 1974-1988.

During pre-SAP period of 1974-1988 analyzed, the volatility of gross domestic product (GDP), being reference cycle is calculated as 1.31. Whereas the volatility of total investment (gross) in the group of GDP's expenditures components is highest, calculated as 1.41, with more volatility as compare to GDP. Whereas the lowest volatility of any variable in the group is that of private investment, recorded as 0.73. Consumption components are least volatile than GDP in accordance with the characteristics of business

cycle reported for developed countries. Among the second group of variables, regarded as real variables, the variable found with highest volatility among this group is employment in services sector i.e. 2.39 while the variable with minimum volatility in the group is agriculture share expressed in percentage of GDP, 1.07. Except agriculture employment, total employment and services employment, rest of the variables included in this group shows less volatility as compare to GDP. Examining the volatility of variables included in the third group i.e. nominal variables, the variable reported in the group with highest volatility is money supply (narrow) M1, which is 1.53. Among the entire variables included in the third group

Table 1 Business Cycles features (Characteristics) of Pakistan for the period of pre-SAP i.e. 1974-1988

Variables	Characteristics of Business cycles		
	Volatility	Co-movement	Persistence
Reference Cycle			
GDP	1.31	1	0.62
GDP's Expenditure Components			
Private investment	0.73	0.95	-0.49
Public investment	1.13	0.98	0.92
Fixed investment (Gross)	0.81	0.93	-0.66
Total investment (Gross)	1.41	0.97	0.60
Government consumption	0.80	0.95	0.99
Private consumption	0.83	0.94	0.98
Total consumption (Gross)	0.75	0.97	-036
Real Variables			
Share of agriculture as percentage of GDP	1.07	0.99	0.74
Share of services as percentage of GDP	1.07	-0.99	-0.05
Share of industry as percentage of GDP	1.02	0.76	0.72
Real interest	1.25	0.73	0.76
Employment in services sector	2.39	0.96	-0.07
Total employment	1.94	-0.72	0.83
Employment in agriculture sector	1.90	-0.94	-0.57
Nominal Variables			
Nominal interest	0.45	0.69	0.88
Consumer price index	1.29	-0.78	0.72
Terms of trade	0.60	-0.06	0.75
Velocity of broad money supply V2	0.89	0.92	0.95
Velocity of narrow money supply V1	0.75	0.99	-0.07
Broad money supply M2	1.14	0.98	-0.60
Narrow money supply M1	1.53	0.98	0.69

Source: Author's Calculation from the data 2017

Table 1 reports the business cycle characteristics during pre-SAP period of 1974-1988. We consider GDP as the reference cycle and all the variables included will be compared to GDP in terms of each characteristic reported.

of variables, nominal variables, apart from money supply (narrow) M1, rest of the variables represent low volatility as compare to GDP. The variable in this group with lowest volatility is nominal interest. In the three groups of variables discussed above being analyzed for volatility, the group known as nominal variables expressed less volatility as compare to rest of the groups of variables.

Examining the second characteristic of business cycle variables, regarded as Co-movement, the co-movement of reference cycle, GDP with itself is 1.00 as it is taken as reference cycle. All the variables incorporated in the group of GDP's expenditures components depicts high Pro-cyclicality, as found in developing countries. Specifically, the components attached to investment go side by side i.e. co-move with GDP, with values of co-movement for entire investment's components more than 0.90. Among the second group of variables, regarded as real variables, the variables found with utmost negative co-movement among this group are those of employment in agriculture sector, share of services expressed in percentage of GDP and total employment with values of -0.94, -0.99 -0.72 correspondingly. Whereas all the remaining variables in the group depicts strong positive co-movement with GDP, employment in services sector being the strongest co-mover with GDP with a co-movement value of 0.96 while industry's share expressed in percentage of GDP is found the weakest co-mover with GDP i.e. 0.76. Examining the co-movement of variables included in the third group i.e. nominal variables, both variables, terms of trade and consumer price index are documented with negative co-movement with GDP i.e. -0.06 and -0.78 respectively. Whereas remaining variables in the group depicts strong co-movement with monetary aggregates, whereas depicting positive co-movement of 0.69, nominal interest is the weakest co-mover with GDP.

Examining the third characteristic of business cycle variables, regarded as Persistence, Gross Domestic Product (GDP), the reference cycle, depicts strong persistence of 0.62. Amongst the variables incorporated in the group of GDP's expenditures components, the variables that depict negative persistence of -0.36, -0.49 -0.66 are total consumption and investment components i.e. fixed and private investment. Whereas remaining variables incorporated in the group depicts high positive persistence. With a value of persistence of 0.98, variable private consumption is the strongest persistent in the group. Amongst the variables of the second group, known as real variables, employment in services sector, share of services expressed as percentage of GDP, and employment in services sector variables depicts negative weak persistence of -0.07, -0.05 and -0.57 respectively. Whereas remaining variables the group depicts strong and positive persistence with total employment showing high persistent with persistence 0.83. Examining the co-movement of variables included in the third group i.e. nominal variables, both variables, V1 velocity of narrow money and M2 supply of money (broad) depicts weak negative persistence in comparison with other variables in the group i.e. –0.07 and -0.60 respectively. Whereas remaining variables incorporated in the group depicts high positive persistence, variable V2 money supply (broad) illustrates strong and positive persistence of 0.95 which is in accordance of developed countries business cycle.

3.1.2 Characteristics of Pakistan's business cycles for the Post-SAP period of 1989-2016

In this section, we documented the business cycle characteristics of Pakistan during post-reforms period of 1988, as authorities in Pakistan adopted the policy proposals of IMF which changed the structure of Pakistan economy. Therefore, analyzing the effects of these policy reforms on business cycle characteristics is the motive behind studying the post-SAP period of 1989-2016.

Table 2 reports Pakistan's business cycle characteristics during Post-SAP period of 1989-2016. Through this period, GDP volatility, being a reference cycle in the study, is 1.33. Examining the volatility of variables incorporated in the group of GDP's expenditures components depicts low volatility comparing to GDP. Among the variables of the aforementioned group, the variable with strong volatility is that of public investment which is 1.25 whereas the variable with lowest volatility in the group is private consumption i.e. 0.95. Amongst the variables of the second group, known as real variables, the variable found to be utmost volatile is employment in the agriculture sector which is calculated as 2.45. Whereas the variable in the

group that depicts low volatility is employment in the services sector, reported as 0.84. Another variable in the group, possesses volatility more than GDP, which is 1.50. Examining the volatility of variables included in the third group i.e. nominal variables, the variable in the group with highest volatility was found to be terms of trade, with value of volatility 4.25. With such high volatility, terms of trade is nearly three times more volatile as compare to GDP. Whereas the variable depicting low volatility in the group is V1 velocity of money supply (narrow) which is calculated as 0.95. Two more variables in the group also depicts more volatility than GDP which are M2 money supply (broad) and nominal interest with values of 1.88 and 2.15 respectively.

Table 2 Business cycles features (characteristics) of Pakistan for the period of Post-SAP period (1989-2016)

Variables	Characteristics of Business cycles		
	Volatility	Co-movement	Persistence
Reference Cycle			
GDP	1.33	1	0.64
GDP's Expenditure Components			
Private investment	1.15	0.99	0.80
Public investment	1.25	0.98	0.86
Fixed investment (Gross)	1.11	0.98	0.83
Total investment (Gross)	1.12	0.98	0.85
Government consumption	1.10	0.95	0.70
Private consumption	0.95	0.94	0.72
Total consumption (Gross)	0.96	0.94	0.72
Real Variables			
Share of agriculture as percentage of GDP	1.15	0.80	0.44
Share of services as percentage of GDP	0.97	-0.26	0.85
Share of industry as percentage of GDP	1.12	-0.97	-0.03
Real interest	1.50	0.03	0.83
Employment in services sector	0.84	0.13	0.72
Total employment	1.02	0.89	0.75
Employment in agriculture sector	2.45	-0.66	0.71
Nominal Variables			
Nominal interest	2.15	0.10	0.87
Consumer price index	1.30	-0.06	0.96
Terms of trade	4.25	-0.81	0.95
Velocity of broad money supply V2	1.22	0.97	0.82
Velocity of narrow money supply V1	0.95	0.56	0.83
Broad money supply M2	1.88	0.06	0.78
Narrow money supply M1	1.11	0.87	0.77

Source: Author's Calculation from the data 2017

Examining the second characteristic of business cycle variables, regarded as Co-movement, the co-movement of reference cycle, GDP with itself is 1.00 as it is taken as reference cycle. Examining the co-

movement of variables incorporated in the group of GDP's expenditure components, components of investment i.e. public, gross total and gross fixed are the variables of the group that strongly and positively co-move with GDP with value of 0.98 each. In comparison with other variables in the group, consumption components variables, private consumption and total consumption (gross) each show weak co-movement of 0.94. Amongst the variables of the second group, known as real variables, three variables, share of services expressed as percentage of GDP, share of industry as percentage of GDP and employment in agriculture sector depict negative co-movement of -0.26, -0.97 and -0.66 correspondingly. Whereas rest of the variables incorporated in the group depict positive co-movement. Another variable, total employment shows positive co-movement of 0.89 in the group. Pro-cyclicality of a variable shows that both GDP and the variable considered goes in the same direction while counter cyclicality shows that both variables move in the opposite direction. Examining the co-movement of variables included in the third group i.e. nominal variables, both variables, terms of trade and consumer price index are documented with negative co-movement with GDP i.e. -0.81 and -0.06 correspondingly. Whereas entire variables in the group depict positive co-movement with variable M1 money supply (narrow) with strong positive co-movement of 0.87.

Persistence characteristic of variables, which measures the inertia in business cycle reveals that persistence of reference cycle GDP, is 0.64 which is high persistent. Examining the co-movement of variables incorporated in the group of GDP's expenditure components, public investment show high persistent with persistence value of 0.86. On average, all the components of GDP show high persistence with smallest value of persistence 0.70. Amongst the group of real variables, all the variables incorporated in the group depict strong persistence excluding one variable, share of industry as percentage of GDP shows negative and weak persistence of -0.03. While examining the co-movement of variables included in the third group i.e. nominal variables, consumer price index (CPI) display strongest persistence of 0.96 while M1 money supply (narrow) represents the lowest persistence of 0.77 in relation to other variables of the group. On average, all nominal variables show high persistence which reveals that in terms of nominal variables economy of Pakistan resembles like developed countries.

4. DISCUSSION

This During pre-SAP period of 1974-1988, variables incorporated in the group of GDP's expenditure components, public investment and total investment (gross) variables in the group has expressed volatility exceeding unity i.e. 1 which is 1.13 and 1.41 correspondingly while remaining variables in the set shows volatility less than 1. After implementing SAP of 1988, we found that amongst variables incorporated in the group of GDP's expenditure components, entire variables volatility has gone up except that of gross total investment which declined from 1.43 to 1.12, illustrating negative impact of SAP on business cycles in Pakistan. The findings of our study are consistent with Iqbal and Siddiqui (1998), Khan et al. (2011), Jamal (2003), and Kemal (1994). They found that the impact of SAP on different variables quantified in their studies is significantly unfavorable. Among real variables, volatility of employment in agriculture sector and real interest, industry, and share of agriculture expressed in percentage of GDP has gone up from 1.91, 1.25, 1.10, and 1.07 respectively to 2.45, 1.50, 1.12 and 1.15 respectively. While amongst the nominal variables, volatility of all the variables has gone up except M_1 whose volatility has declined from 1.53 to 1.11. While terms of trade is the most volatile series amongst the variables incorporated. This behavior of terms of trade is consistent with the findings of Blackburn and Ravn (1992). They revealed that terms of trade is a highly volatile series.

During pre-SAP period of 1974-1988, examining the co-movement characteristics of variables incorporated in the group of GDP's expenditure components strongly co-move with GDP i.e. in the same direction show strong pro-cyclicality with GDP suggesting that GDP and rest of the variables in the set go side by side. Pro-cyclicality of all variables in this set greater than 0.97 during pre-SAP period of 1974-1988 While during post-SAP period of 1989-2016, the co-movement of variables has declined for half of the

variables in the set with decline in pro-cyclicality from the lowest value of 0.97 before 1988 to 0.93 during post-SAP period of 1989-2016. Amongst the real variables, co-movement of almost all the variables has decreased after the 1988 SAP. While amongst the nominal variables, the co-movement of the majority of variables has dropped during post-SAP period of 1989-2016 as compare to pre-SAP period of 1974-1988 while both M1 and M2 are found to be pro-cyclical. This behavior of monetary aggregates is in accordance with the findings of Ghate et al. (2013). They revealed that the monetary aggregates are pro-cyclical with GDP after post reforms period.

During pre-SAP period of 1974-1988, amongst the expenditure components of GDP, in terms of persistence, persistence of majority of is high. Amongst the real variables, the persistence of majority of variables has gone up during post-SAP period of 1989-2016. While the persistence of all nominal variables has gone up considerably after the Structure Reforms of 1988. Our findings are consistent with Ghate et al. (2013). They discovered that the persistence of macroeconomic variables has gone up after the post reforms period in India.

Study limitations and future research

For the first time in Pakistan, present study quantified the effects of SAP on business cycles and has shown that SAP has increased the volatility of the incorporated macroeconomic variables. However, present study has utilized annual data for conducting the analysis, conversely, it would be interesting to utilize quarterly data for the analysis in order to authenticate the findings of the study. Furthermore, the focus of the present study was to document characteristics of Pakistan's business cycles before and after the implementation of SAP, however, present study can also be extended in future for cross country comparison with that of other developing countries like South Asian Association for Regional Cooperation (SAARC) etc.

5. CONCLUSION

The objective of the present study is to investigate the impact of SAP on business cycles in Pakistan using time series analysis. In spite of vital importance of business cycles, previously no studies focus on measuring the impact of SAP on business cycles in Pakistan. For the first, time this study quantified the impact of SAP on these characteristics for Pakistan economy by using time series data from 1974-2016 and reveals that during both periods i.e. pre and post-SAP, during Pre-SAP period, the volatility of two groups of variables; nominal variables and real variables were witnessed to be high than GDP. Likewise, both volatility and persistence of all the three groups of variables were witnessed relatively high through post-SAP period than pre-SAP period. This increase in volatility of variables during post-SAP period suggest that SAP implemented during the period of 1988 adversely affected the economy and has not contributed in stabilizing, and structuring the economy rather it exaggerated the volatility and economic fluctuations in Pakistan. Government of Pakistan and policymakers should continue to implement sound fiscal and monetary policies to reduce government budgetary deficit, as this decrease would release resources to develop physical as well as financial infrastructures to be capable to promote stability at macro level.

DECLARATIONS

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Ali, N., Tariq, M., & Kousar, S. (2020). Impact of structural adjustment program on business cycles in Pakistan: a time series. *Journal of Geography and Social Sciences*, 2(1): 51-62.

REFERENCES

Ali, K., & Mujahid-Mukhtar, E. (2003). Gender Exploitation: from Structural Adjustment Policies to Poverty Reduction Strategies [with Comments]. *The Pakistan Development Review*, 669-694.

Bengali, K., Ahmed, Q. M., & Hijazi, S. T. (2001). Stabilisation policy vs. growth-oriented policy: Implication for the Pakistan economy [with comments]. *The Pakistan Development Review*, 453-466.

Blackburn, K., & Ravn, M. O. (1992). Business cycles in the United Kingdom: facts and fictions. *Economica, 59*(236), 383-401.

Forster, T., Kentikelenis, A. E., Stubbs, T. H., & King, L. P. (2019). Globalization and health equity: The impact of structural adjustment programs on developing countries. *Social Science & Medicine*, 112496.

Ghate, C., Pandey, R., & Patnaik, I. (2013). Has India emerged? Business cycle stylized facts from a transitioning economy. *Structural Change and Economic Dynamics, 24*, 157-172.

Grant, T. (Producer). (2011). On 10th birthday, BRICs poised for more growth. *Toronto: The Globe and Mail*. Retrieved from https://www.theglobeandmail.com/report-on-business/economy/economy-lab/on-10th-birthday-brics-poised-for-more-growth/article536100/

Hodrick, R. J., & Prescott, E. C. (1997). Postwar US business cycles: an empirical investigation. *Journal of Money, credit, and Banking, 29*(1), 1-16.

Iqbal, Z., & Bilquees, F. (1994). Macroeconomic Effects of Adjustment Lending in Pakistan [with Comments]. *The Pakistan Development Review, 33*(4), 1011-1031.

Iqbal, Z., & Siddiqui, R. (1998). The Impact of Structural Adjustment on Income Distribution in Pakistan A SAM-based Analysis. *The Pakistan Development Review, 37*(4 Part II), 377-397. doi: 10.30541/v37i4IIpp.377-397

Jamal, H. (2003). Poverty and inequality during the adjustment decade: Empirical findings from household surveys. *The Pakistan Development Review, 42*(2), 125-135.

Kemal, A. R. (1994). Structural Adjustment, Employment, Income Distribution and Poverty. *The Pakistan Development Review, 33*(4), 901-914. doi: 10.30541/v33i4IIpp.901-914

Kemal, A. R. (2001). *Structural Adjustment, Macroeconomic Policies, and Poverty Trends in Pakistan*. Paper presented at the Asia and Pacific Forum on Poverty: Reforming Policies and Institutions for Poverty Reduction, to be held at the Asian Development Bank, Manila, 5-9 February 2001.

Kentikelenis, A. E. (2017). Structural adjustment and health: a conceptual framework and evidence on pathways. *Social Science & Medicine, 187*(8), 296-305. doi: https://doi.org/10.1016/j.socscimed.2017.02.021

Khan, R. E. A., Nawaz, M. A., & Hussain, A. (2011). Impact evaluation of structural adjustment program: a case of Pakistan. *European Journal of Economics, Finance and Administrative Sciences, 29*, 51-62.

Lago, I. M. Y., Goldsbrough, D. J., Chelsky, J. A., Segura-Ubiergo, A., Kaufman, M. D., Kayizzi-Mugerwa, S., . . . Sembene, D. (2004). *Evaluation of the IMF's role in poverty reduction strategy papers and the poverty reduction and growth facility*: International Monetary Fund.

Nasir, J. (2012). IMF Programs in Pakistan (1988-2008)–An Analysis. *Criterion Quarterly, 6*(4), 1-20.

Pakistan Bureau of Statistics. (2017). *Population & Housing Census 2017*.

POVOLEDO, L. (2004). *Business Cycles in Italy: The Facts and Some Models.* Paper presented at the Royal Economic Society Annual Conference.

Schlitzer, G. (1996). Business cycles in Italy: A statistical investigation. *European Journal of Political Economy, 11*(4), 683-698.

Thomson, M., Kentikelenis, A., & Stubbs, T. (2017). Structural adjustment programmes adversely affect vulnerable populations: a systematic-narrative review of their effect on child and maternal health. *Public health reviews, 38*(13), 1-18. doi: 10.1186/s40985-017-0059-2

Appendix 1 Data sources and definition of variables.

Series	Definition	Sources
GDP	Gross Domestic Product at current prices / GDP implicit price deflator in PKR	ESP
Government consumption	Government Final Consumption Expenditure at current prices / Government Final Cons. implicit price deflator in PKR	-do-
Private consumption	Private Final Consumption Expenditure at current prices / Private Final Consumption implicit price deflator in PKR	-do-
Total consumption	Private cons. + Government cons in PKR	-do-
Total investment	Gross Fixed Capital Formation + Increase in Stocks) / GFCF implicit price deflator in PKR	-do-
Fixed investment	Gross Fixed Capital Formation / GFCF implicit price deflator in PKR	-do-
Private investment	Private fixed capital formation/ GFCF implicit price deflator in PKR	-do-
Public investment	Public fixed capital formation/ GFCF implicit price deflator in PKR	-do-
Share of agriculture as percentage of GDP	Contribution of agriculture sector to GDP in %	-do-
Share of services as percentage of GDP	Contribution of services sector to GDP in %	-do-
Share of industry as percentage of GDP	Contribution of industrial sector to GDP in %	-do-
Real interest rate	Interest rate adjusted for inflation %	-do-
Employment in services sector	People engaged in services sector as % of total employment	-do-
Total employment	Total working age population in %	WDI
Employment in agriculture sector	People engaged in agriculture sector as % of total employment	ESP
Nominal interest rate	Interest rate without considering inflation in %	SBP
Consumer price index	The average change in prices over time in %	-do-
Terms of trade	The ratio between the index of exports and the index of import prices in %	-do-
Velocity of broad money	GDP divided by money supply (M2) in PKR	-do-
Velocity of narrow money	GDP divided by money supply (M1) in PKR	-do-
Broad money supply M2	Currency in circulation + other deposits with SBP + total deposits with commercial banks in	-do-
Narrow money supply M1	Currency in circulation + demand deposits	-do-

Abbreviations: ESP=Economic Survey of Pakistan; WDI= World Development Indicators; SBP= State Bank of Pakistan; PKR= Pakistani Rupee (The national currency of Pakistan)