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Producer and Consumer Subsidy Equivalents of Rice Crop in Pakistan

Saima Ayaz, Zakir Hussain, Sofia Anwar and Naila Irum*

Abstract: In order to examine the outcomes of government interference in basmati rice crop, the techniques of producer and consumer subsidy equivalents (PSE and CSE) were used for the period of 1987 to 2007 for Pakistan. The producers of basmati rice were facing implicit taxation throughout the analysis except from 1990 to 1997. Price support and state trading, followed by macroeconomic policies, were the main factors causing negative transfers to the producers. Positive support through assistance on input and investment on infrastructure was not able to mitigate the negative effects of the above mentioned policies by a significant amount. The consumers of basmati rice were the consistent beneficiaries of government intervention (from 1987 to 2006). This analysis depicts Pakistan's strong trend towards WTO-led trade liberalization, as it was not providing protection to the farming sector.

Keywords: PSE, WTO
JEL Classification: Q1, F1

1. Introduction

Agriculture is the dominant sector in Pakistan, so sustained growth of this sector has historically remained a priority for Pakistan's economy (Chaudhary and Sahibzada, 1995). Studies show that consistent agricultural growth is essential for employing a growing labor force and improving the welfare of the masses (Mellor, 1988); obtaining food self-sufficiency (Chaudhary and Chaudhary, 1994); attaining industrial development (World Bank, 1982); and altering economic growth. Without an appropriate pricing policy for inputs as well as outputs, growth of the agriculture sector is out of question. Price is the key factor guiding growers in production decisions, efficient resource allocation, and market

* The authors are, respectively, graduate student, Professor and Chairman, and graduate students, at the Department of Economics, University of Sargodha.

efficiency (Saeed, 2007). Price policy is the main instrument through which a government intervenes in the agriculture sector.

Since its birth, Pakistan has constantly followed an interventionist pricing policy (Chaudhary, 1995). In the 1950s, a compulsory procurement policy was practiced with a lower output price as compared to the world price and an overvaluation of rupee to facilitate the consumers. In the next decade, during Green Revolution, a liberalized policy for modern inputs was adopted that was missed in the previous period. In the 1970s, due to further devaluation of currency, market prices of agricultural output fell short of world prices. The production and distribution of all major inputs was put under government control through Nationalization Programme. Fertilizer prices were raised to curtail the budgetary expenditure which occurred due to subsidy (Chaudhary, 1995).

Developing nations carried out significant policy reforms from the mid-1980s. In addition, in the developing countries, several restraints on agricultural trade policies were imposed through the Uruguay Round Agreement on Agriculture (URAOA). The awareness of structure of farm support or taxation in developing world is becoming more important with rising membership of these countries in the WTO (Mullen *et al.,* 2005).

The 1980s was a decade of agriculture sector liberalization and reforms. In compliance with the Structural Adjustment Programme (SAP), state intervention in agriculture sector was reduced and the private sector's role was increased. Prices of both inputs and outputs approached the international market prices (World Bank, 1982). Most subsidies (on pesticides, seeds and machinery) were immediately withdrawn, while a program for segmented removal of fertilizer subsidies was set up (Ali, 1992; Chaudhary and Sahibzada, 1995).

The purpose of SAP was to create a distortion-free agriculture sector, obtain enhanced global production of food items, and improve market access to foster trade and economic growth. Various studies show that this objective was not accomplished as agricultural commodities were mostly under-priced and inputs showed higher prices than the world prices (Chaudhary, 1995; Khan, 2002; Anwar *et al.*, 2005; Hussain *et al.,* 2006).

In both the developed and the developing nations, the World Trade Organization's (WTO) Agreement on Agriculture (AOA) during the Uruguay Round (1986-94) required a reduction in the support for and protection of the agriculture sector over an agreed period of time. It also asked for major reductions in tariffs on agriculture, domestic support and export subsidies. Pakistan's terms of trade have been seriously affected by trade liberalization and this is becoming a major determinant of agricultural production pattern and trade. Being a WTO member, the Government of Pakistan has to report its reduction of agricultural protection and support and must be ready to compete in the changing scenario of world trade (Khan, 2002).

In order to measure government intervention in agriculture and to monitor its reduction under liberalization, several aggregate measures are adopted. The Producer Subsidy Equivalent (PSE) was one such aggregate measure, developed by the Organization for Economic Cooperation and Development (OECD). It measures the overall monetary value of a set of policy interventions by a government to the producers and consumers. However, because of the risk of inaccurate measures by the PSE, due to quality differences and high transaction costs, less research work exists in developing economies (Nguyen and Grote, 2004). Still Producer Subsidy Equivalents (PSEs) and Consumer Subsidy Equivalents (CSEs) have significantly showed the effects of various policies practiced in important agricultural producing and exporting nations like Pakistan.

Ender (1991) estimated PSEs and CSEs in Pakistan by using data from 1981-82 to 1986-87. The conclusion of the study was at best tentative due to data limitations, such as pricing of irrigation water credit etc. Since the WTO regime became operational in January 1995, it seems imperative to revisit the PSEs/CSEs to evaluate the protection to agriculture and its implication for the development of the agriculture sector.

In this study, PSEs and CSEs methodology was applied to basmati rice covering the time period from 1987 to 2007. In the context of Pakistan, as rice is the major exportable commodity, the issue raised was of whether the producers and consumers of basmati rice were taxed or subsidized. Thus, it was useful to provide the quantitative measure of agricultural protection through PSEs to evaluate the current level of protection (or lack

of it) that exists for rice. Such measures, subject to limitations, provide parameters of how to continue with agricultural reforms from the perspective of domestic policymaking. The objective of this paper is to measure the degree of subsidization and to evaluate the past and current levels of protection for this highly-valued cash crop.

2. Methodology and Data

This study describes the Producer Subsidy Equivalents (PSEs) and Consumer Subsidy Equivalents (CSEs) measurement issues and their implications in policy analysis. The (PSEs and CSEs) analysis was used to evaluate government intervention for Pakistan's rice crop over the period 1987-88 to 2006-07. The time series data on production and consumption were taken from various publications of the Agricultural Prices Commission of Pakistan. The other secondary data on exchange rate, prices, expenditure on irrigation etc. were obtained from various issues of the Pakistan Economic Survey, Agricultural Statistics of Pakistan and other government publications.

2.1 Producer Subsidy Equivalents

It is the monetary value of gross transfers from consumers and taxpayers to agricultural producers that result from the government's domestic and trade policies. It measures nominal assistance and does not take into account the protection of tradable inputs (OECD, 2002). PSEs not only show the rate of assistance, but also the quantity of agriculture production. Producer Subsidy Equivalents (PSEs) are interpreted in three different ways:

2.1.1 Total PSE (TPSE)

It is useful in quantifying the policy effects of a particular scale of activity.

$$TPSE = MPS + BP \qquad (1)$$

Where MPS = market price support, BP = budgetary payments to producers of the commodity. And

$$MPS = (P_d - P_w) + Q_p \quad (2)$$

where Q_p = the level of production, P_d= domestic price and, P_w = the world price.

2.1.2 Unit PSE (UPSE)

These are the transfers per unit of commodity produced (Ali, 1992).

$$UPSE = TPSE / Q_p \quad (3)$$

2.1.3 Percentage PSE (PPSE)

It is an estimate of producer subsidies as a percentage of the total value of production at domestic prices (Ali, 1992).

$$\text{Percentage PSE} = 100(TPSE) / [Q_p * (P_d) + BP] \quad (4)$$

2.2 Consumer Subsidy Equivalents

These are the indicators that estimate the value of transfers from government policies to consumers of a given commodity (Ali, 1992) and are expressed in three ways as given below:

2.2.1 Total CSE (TCSE)

$$TCSE = Q_c (P_d - P_w) + G \quad (5)$$

where Q_c = Level of Consumption and G = Subsidies to Consumers.

2.2.2 Unit CSE (UCSE)

$$UCSE = TCSE / Q_c \quad (6)$$

Per unit CSEs illustrate the relative intervention for a given commodity, but cannot be used to evaluate across commodities (Ender, 1991).

2.2.3 Percentage CSE (PCSE)

$$PCSE = 100(TCSE) / [Q_c (P_d)] \quad (7)$$

(At domestic prices)

Percentage PSEs and CSEs could be used to compare:

1) Countries with different-sized agricultural sectors and budgets.
2) Comparative taxation or subsidy to different commodities.
3) The relative effect of different policies (Ender, 1991).

The PSE/CSE concept offers a rational framework to examine in a planned and regular way all of the policies affecting agricultural production, consumption and trade. Calculating the monetary transfers resulting from agricultural policies has enabled a more accurate and controlled assessment of such policies. This is an edge over entirely qualitative measurement (Cahill and Legg, 1990).

2.3 Description of variables

The estimated variables were Support Price and State Trading, Input Subsidies, General Taxes, Import Duties, Investment in Infrastructure and Overvaluation of Exchange Rate. Infrastructure covered Expenditure on Extension and Investment in Irrigation and Inputs included fertilizer, credit, irrigation (O&M) and electricity.

2.3.1 Fertilizer subsidy

Fertilizer subsidies that were given to assist growers to achieve food self-sufficiency were withdrawn gradually – nitrogenous fertilizers in 1984-85; phosphate and potash fertilizers in 1989-90. Government is providing an indirect subsidy on gas to the fertilizer producers at around $ 0.2 billion annually. The underlying argument was that subsidy was not actually being passed on to the farmers, whereas industry was of the view that in comparison with international prices, subsidy was being received by the farmers (Hanif, 2004).

In this study, the data on fertilizer subsidy on crop was taken from Public Sector Development Programmes (PSDP), Planning and Development Division. The subsidy granted on local production could be estimated through price wedge, but due to non-availability of import prices on all locally produced fertilizers, budgetary subsidy was considered as the best alternative.

2.3.2 Subsidy on Irrigation Water

Irrigation water witnessed almost complete implicit subsidies by the government and shared about 60 percent of the total implicit subsidy in various years (Hanif, 2004). In order to estimate the subsidy on irrigation water, the approach followed by the National Commission on Agriculture (NCA) was used (Ali, 1992), where operational and maintenance cost was apportioned to various crops by their weighted crop-area share in the total crop acreage for the respective years.

2.3.3 Electricity Subsidy

In the past, electricity subsidy occupied an important place in implicit subsidies and ranked third in the total subsidy volume under the category (Ender, 1991). For calculating this subsidy, the rate differential to agriculture and the weighted crop share on national basis were multiplied to get the subsidy share for rice crop. The crop share was estimated by the use of irrigation water since pumps are of primary use for agricultural electricity.

2.3.4 Credit subsidy

Institutional credit is mainly disbursed by the Zarai Taraqiati Bank Limited (ZTBL) and is considered second by its volume in the total amount of implicit subsidies extended by the government over time. The mark-up rate for Commodity Operation Financing (COF) was 11 percent per annum (Hanif *et al.,* 2004).The subsidy on production loans was estimated by multiplying the loan volume with the differential of marketed interest rate and agricultural interest rate.

2.3.5 Commodity Price Policies

In order to estimate the policies that directly affected market prices, the wedge between domestic prices and import parity prices has been taken. As the import parity prices were higher than the domestic prices, PSEs were found to be negative and the CSEs showed a positive trend.

2.3.6 Overvaluation of Exchange Rate

In developing countries like Pakistan, exchange rate distortions affect mostly the agricultural producers and consumers because more than half of the total exports are agriculture-based. Different approaches were adopted in various studies for such measurement. In the present analysis, the following formula was used for measuring overvaluation of local currency:

$$\text{Extent of Valuation} = 100\left\{\frac{(M + Tm) + (X - Tx)}{M + X} - 1\right\}$$

where M = Value of Imports, T_m = Import Duties and Custom Minus Import Rebates, X = Value of Exports, and T_x = Export Subsidies Minus Export Duties.

3. Results and Discussion

Rice is the second most important cash and food crop grown in the Kharif season. The crop covers 10 percent of the cropped area. The varieties are both coarse (IRRI) and fine (Basmati). Basmati rice is famous for its aromatic flavor and long grain. The rice production increased by 65 percent during 1961-70 compared to the previous decade and increased further by 83 percent due to the introduction of Green Revolution technologies during the period 1971-1980. Over the next two decades, production started decelerating. The compound growth rate over these decades was 2.45 percent (Table 1). In 1992-93, the production of rice declined; the drastic decline was experienced in 1994-95 due to heavy attack of stem borer. Rice is grown mainly in the Punjab (fine variety) and Sindh (coarse varieties) provinces, while production in other two provinces is nominal. Pakistan is a net exporter of rice, which is also the second largest foreign exchange earning crop and annually earns Rs 20-25 billion through export.

The rice production target of 5 million tons was achieved in the year 1999-2000. This generated a surplus of about 2-2.5 million tons for export. In the current year, the total production was over 6 million tons.

The constraining factors to rice productivity are: exploitation of genetic potential and evolution of hybrid varieties; replacement of IRRI-6 with improved rice; low level of plant population, attack of pests especially rice stem borer; leadership in rice program; and fair returns to growers.

Table 1: Rice Production (1951-07)

Year	Average Production (Mil. Tons)	Percent Increase
1951-60	0.873	---
1961-70	1.441	64.96
1971-80	2.635	82.91
1981-90	3.272	24.16
1991-99	3.816	16.61
2000-07	5.02	31.55

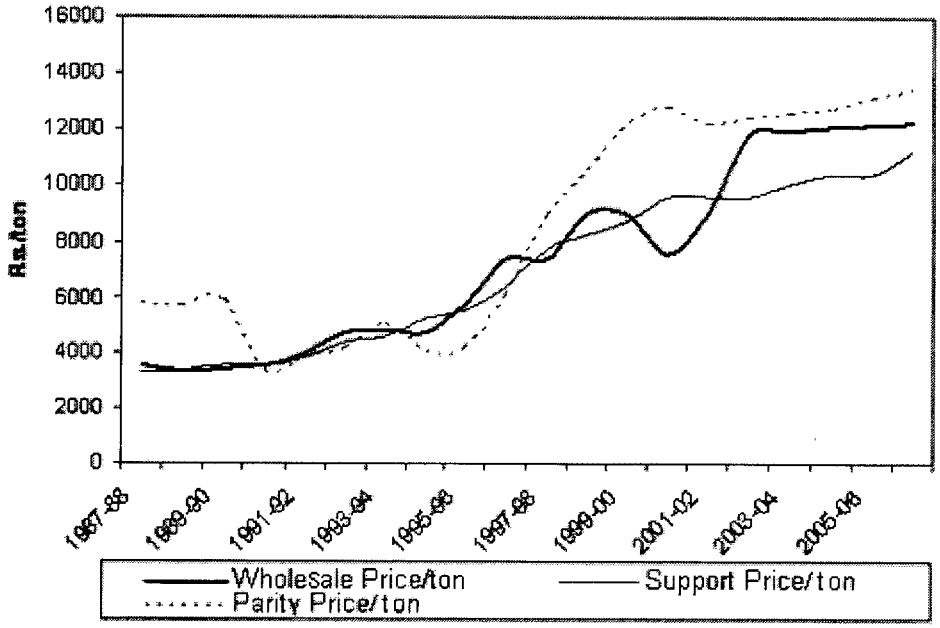
Compound growth rate (1980-1999) is 2.45 percent

3.1 Producer Subsidy Equivalent of Basmati Rice

The results for the estimation of Producer Subsidy Equivalents for basmati rice are shown in Annex 1. It was revealed that the overall effect of various estimated policies were negative during most of the period under analysis. The extent of implicit burden resulting from price support and state trading was as high as 72 percent in the year 1989-90.

Figure 1 shows that there were numerous fluctuations in the price of basmati rice during the period under analysis. The world prices were very high from 1987-88 to 1989-90 and from 1997-98 to 2006-07, so the values of PSEs during these periods were negative. This evidently reflects that support price and state trading were the main policies causing negative PSEs. These findings are consistent with Thomas and Orden (2004). The aggregate PSEs show that the Market Price Support (MPS) estimates are the dominant component of PSE. Figure 1 also shows that the support prices for producers of basmati rice remained close to the market price during the early years of analysis, but later on a clear difference was obvious. During the period 1990-91 to 1996-97, the values of export parity prices (used as reference prices) were less than or closer to the marketed prices; consequently PSEs showed positive values in these years.

Figure 1: Trends of Import Parity Price, Support Price and Wholesale Price of Basmati Rice in Pakistan

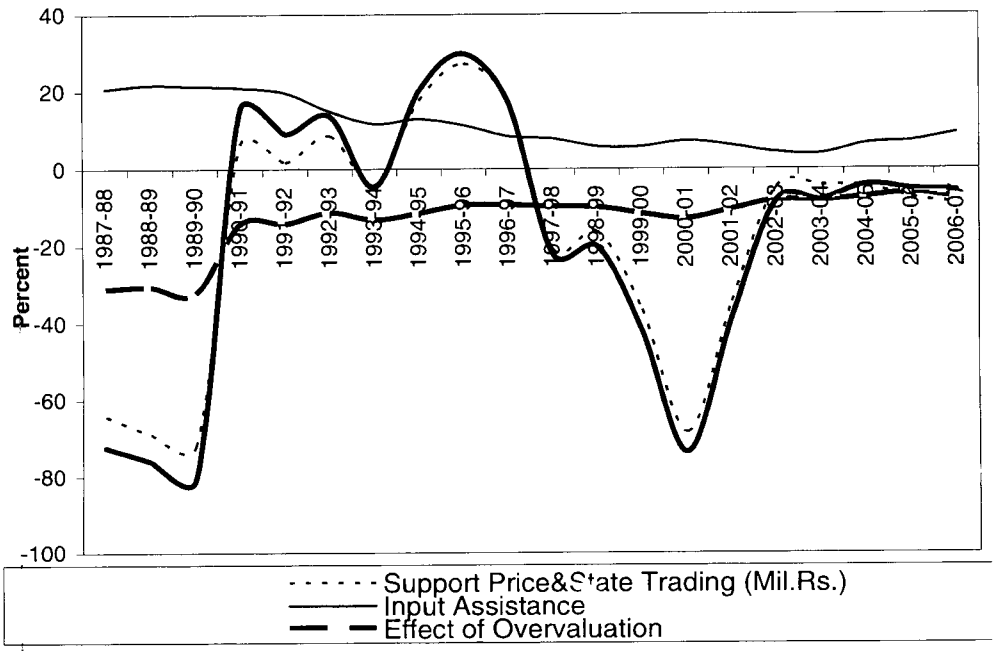


Source: Government of Pakistan -Agricultural Statistics of Pakistan (Various Issues)

The results showed that the government was providing positive input assistance, which varied from 9 percent to 20 percent. The input subsidies were reduced during the period from 1993-94 to 2003-04, but showed an increasing trend from 2004-05 to 2006-07. Annex-A shows a positive infrastructural subsidy all over the analyzed period but had a very small share in the value of total producer subsidy, varied from 1 to 3 percent. Currency exchange rate significantly influences the competitiveness of agriculture sector. The domestic producers benefit from devaluation since the returns in national currency increase (Shick, 2001). Thus, an overvalued exchange rate is detrimental to domestic producers. The effects of overvaluation of the exchange rate on the producers were negative throughout the period under analysis. It intensified the negative effect on producers, but failed to offset the positive effect for some years, which was mainly due to support prices and state trading policies.

Figure 2 shows the trend of different policy transfers estimated in the study. The positive assistance on input showed a declining trend, but had no significant share in the total PSEs. Figure 2 also explains that the main causes of positive or negative values of PSE were the support price and state trading. The effect of an overvaluation of the exchange rate could be seen as a mirror image of input-assistance policies.

Figure 2: The Share of Total Percentage PSE and Different Sources of Transfers for Basmati Rice in Pakistan



Source: Government of Pakistan -Agricultural Statistics of Pakistan (Various Issues)

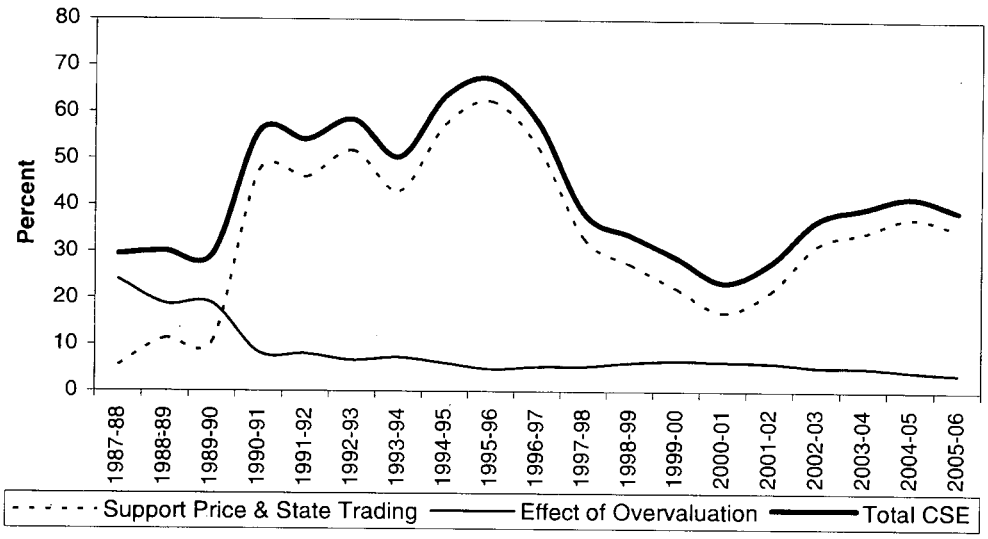
The values of total Producer Subsidy Equivalents were positive during 1990-91 to 1996-97 with the exception of -5 percent in 1993-94. In general, there was an increasing trend of support for basmati rice during 1990-91 to 1996-97, but after that the trend was reversed. The results were consistent with Ali (1992) and Ender (1991). The value of PSEs for U.S. rice crop peaked at 52 percent in 2001 and had averaged at 32 percent over the past 10 years (Wailes and Durand, 2005).

3.2 Consumer Subsidy Equivalent for Basmati Rice

The effect of different policies on consumers of basmati rice was measured through CSEs, presented in Annex-B. It was observed that CSEs were positive during the entire period of analysis (from 1987-88 to 2005-06). The highest value of CSEs was 67 percent in 1995-96.

Figure 3 describes the estimated percentage share of different policies of transfers and the total percentage CSEs. It is obvious from Figure 3 that level of support to the consumers has not significantly reduced. The gap between output price policy and total CSE was broad at the start, but later remained very small. In conclusion, price policy was the main instrument affecting the values of CSEs. The effect of macroeconomic policy (overvaluation of exchange rate) remained positive, but did not have a very significant share in the total percentage CSEs.

Figure 3: The Share of Different Sources of Transfers and Total Percentage CSE of Basmati Rice in Pakistan



Source: Government of Pakistan -Agricultural Statistics of Pakistan (Various Issues)

The highest level of transfers under the category of support price policy was 62 percent in 1995-96 and through macroeconomic policy it was 24

percent in 1987-88. In general, the consumers of basmati rice were significantly subsidized throughout the estimation period.

4. Pakistan's Position towards WTO Agricultural Trade Liberalization

Pakistan has taken considerable steps to open its economy to the outside world, although relatively weak infrastructure is a major constraint towards the growth of the economy. The country's strong position towards WTO agricultural trade liberalization was illustrated through PSEs calculation. Pakistan, perhaps, may not need to change national support price policies because its aggregate PSEs were negative. If world prices for cotton, sugarcane, rice and wheat rose as a result of the reduction of support in other countries, trade liberalization would be more beneficial due to the expansion of production at a least cost. Pakistan would benefit more than any other developing country under uniform and full implementation of WTO trade reforms.

5. Conclusions and Recommendations

The producer and consumer subsidy equivalents are used as approximate indicators of the magnitude of net subsidy from a policy. These variables attempt to measure the money value of explicit or implicit transfers to agricultural producers or consumers. The Government of Pakistan (GOP) intervened in production, marketing and trade of agricultural products, employing a set of complicated agricultural procurement prices and input subsidy policies. This study presented the calculation of PSEs and CSEs of basmati rice for the period of 1987 to 2007.

The extent of the implicit burden on the producers of basmati rice was maximum (82 percent) in the year 1989-90. The values of PSEs for basmati rice showed various fluctuations. There was an increasing trend of support for basmati rice during 1990-91 to 1996-97, but after that the trend was reversed. The value of PSEs was -74 percent in 2000-01. The consumers of basmati rice were also supported during the whole analysis period, but less than the wheat consumers. The highest value of CSEs for basmati rice was 67 percent in 1995-96.

The government was providing input assistance and infrastructural support, but these policies were unable to mitigate the negative effects of the price and macroeconomic policies. The input subsidies showed a declining trend from 20 percent in 1987-88 to 9 percent in 2006-07, which showed a general policy of withdrawing subsidies by the government. The level of transfers from the price support policy was 71 percent in 1988-89 and 6 percent in 2004-05. The support price and state trading policy and total CSEs had the same tendency, which clearly showed that output price policy was the major policy affecting the total value of CSEs. The consumers of agricultural commodities were the consistent beneficiaries of positive CSEs, with few exceptions. The conclusion of the study was, at best, tentative due to data limitations such as pricing, irrigation water, credit etc.

The overall results showed that assistance on input and small share of infrastructural support were the total positive transfers available to producers but the support provided under these categories showed a declining trend throughout the analysis. This reflected that the level of government's budget expenditure on agriculture was actually very small. A large impact of exchange rate disequilibrium was observed. Currency rates influenced greatly the competitiveness of agricultural production. The overvaluation of the exchange rate resulted in an additional tax on producers.

The support price and state trading policy, followed by the overvaluation of the exchange rate were the major sources of transfers affecting both producers and consumers. It can be concluded from the study that the actual level of support to the producers in Pakistan was very low and for consumers, the case was reversed.

Based on the analysis, the government needs to allow the market forces to work freely for the smooth functioning of the producer and consumer market. The concept of a market economy should be implemented in both resource and product markets and producers should not be taxed at the expense of consumers. All policies should be made considering the economic prices of crops to provide a level playing field to domestic producers.

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ANNEX- A
Producer Subsidy Equivalents (PSEs) for Basmati Rice in Pakistan

Item	Unit	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97
A. Production	Thou.MT	943	1099	1217	1220	1092	1124	1267	1352	1488	1564
B. Producer Prices	Rs/40 Kg.	141	135	136	143	158	190	194	192	231	296
	Rs/T.	3525	3375	3400	3575	3950	4750	4850	4800	5775	7400
C. Producer Value	Mil. Rs.	3325	3709	4138	4362	4313	5339	6145	6490	8593	11574
D. Policy Transfers To Producers											
1. Market Price Interventions											
a. Support Price and State Trading	Mil. Rs.	-2136	-2555	-2978	275	73	458	-254	1149	2332	2033
Percent of Producer Value	Percent	-64	-69	-72	6	2	9	-4	18	27	18
2. Assistance on Input											
a. Fertilizer	Mil. Rs.	200	168	252	151	70	97	17	9	6	-13
b. Credit	Mil. Rs.	65	71	78	85	94	103	112	123	134	146
c. Electricity	Mil. Rs.	60	62	60	65	67	69	72	70	77	80
d. Irrigation(O&M)	Mil. Rs.	354	474	444	563	567	498	507	619	726	730
e. Total	Mil. Rs.	680	775	837	864	798	767	708	825	943	943
Percent of Producer Value	Percent	20	21	20	20	19	14	12	13	11	8
3. Infrastructure											
a. Investment in Irrigation	Mil. Rs.	63	49	87	103	81	73	68	73	75	80
b. Extension	Mil. Rs.	18	22	25	30	35	40	46	52	58	65
c. Total	Mil. Rs.	81	70	112	133	115	113	113	124	133	145
Percent of Producer Value	Percent	2	2	3	3	3	2	2	2	2	1
4. General Taxes and Subsidies											
a. Land-Related Revenue	Mil. Rs.	-13	-11	-30	-34	-36	-37	-54	-59	-70	-85
Percent of Producer Value	Percent	-0.39	-0.29	-0.73	-0.77	-0.83	-0.69	-0.88	-0.92	-0.81	-0.73
5. Total Policy Transfer To Producers											
a. Total	Mil. Rs.	-1388	-1720	-2059	1238	950	1302	513	2039	3339	3037
Percent of Producer Value	Percent	-42	-46	-50	28	22	24	8	31	39	26
Transfers per Ton	Mil. Rs.	-1471	-1565	-1692	1015	870	1158	405	1508	2244	1942
E. Overvaluation of Exchange Rate	percent	19	18	18	15	14	13	13	14	13	11
F. Effect of Overvaluation	Mil. Rs.	-1031	-1135	-1329	-618	-612	-604	-811	-745	-809	-1080
Percent of Producer Value	Percent	-31	-31	-32	-14	-14	-11	-13	-11	-9	-9
G. PSE Including Overvaluation	Mil. Rs.	-2419	-2855	-3388	620	338	697	-299	1294	2530	1957
Percent of Producer Value	Percent	-73	-77	-82	14	8	13	-5	20	29	17

Source: Government of Pakistan -Agricultural Statistics of Pakistan (Various Issues)

Contd.

Item	Unit	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
A. Production	Thou.MT	1439	1687	1871	1701	1999	2304	2522	2554	2920	2493
B. Producer Prices	Rs/40 Kg.	297	362	358	302	361	471	479	483	486	490
	Rs/T.	7425	9050	8950	7550	9025	11775	11975	12075	12150	12250
C. Producer Value	Mil. Rs.	10685	15267	16745	12843	18041	27130	30201	30840	35478	30539
D. Policy Transfers to Producers											
1. Market Price Interventions											
a. Support Price and State Trading	Mil. Rs.	-2230	-2488	-6128	-8803	-6247	-1325	-1316	-1436	-2699	-2762
Percent of Producer Value	Percent	-21	-16	-37	-69	-35	-5	-4	-5	-8	-9
2. Assistance on Input											
a. Fertilizer	Mil. Rs.	-34	-55	-78	-102	-127	-154	-181	440	1044	1012.8
b. Credit	Mil. Rs.	159	172	186	201	217	234	251	269	287	307
c. Electricity	Mil. Rs.	83	87	90	94	98	102	106	110	115	120
d. Irrigation(O&M)	Mil. Rs.	608	650	741	708	862	950	957	1131	1046	1335
e. Total	Mil. Rs.	816	853	939	901	1049	1132	1132	1950	2492	2774
Percent of Producer Value	Percent		6	6	7	6	4	4	6	7	9
3. Infrastructure											
a. Investment in Irrigation	Mil. Rs.	78	91	103	100	120	132	232	510	631	650
b. Extension	Mil. Rs.	73	80	89	97	107	116	126	137	148	159
c. Total	Mil. Rs.	151	172	192	197	227	249	358	647	779	808
Percent of Producer Value	Percent	1	1	1	2	1	1	1	2	2	3
4. General Taxes and Subsidies											
a. Land-Related Revenue	Mil. Rs.	-83	-121	-132	-124	-140	-150	-161	-231	-279	-334
Percent of Producer Value	Percent	-0.77	-0.79	-0.79	-0.96	0.78	-0.55	-0.53	-0.75	-0.79	-1.09
5. Total Policy Transfer To Producers											
a. Total	Mil. Rs.	-1346	-1585	-5129	-7828	-5111	-94	13	930	293	486
Percent of Producer Value	Percent	-13	-10	-31	-61	-28	0	0	3	1	2
Transfers per Ton	Mil. Rs.	-935	-939	-2741	-4602	-2557	-41	5	364	100	195
E. Overvaluation of Exchange Rate	percent	8	9	9	8	8	8	8	7	6	7
F. Effect of Overvaluation	Mil. Rs.	-1044	-1521	-1958	-1668	-1912	-2216	-2501	-2278	-2254	-2322
Percent of Producer Value	Percent	-10	-10	-12	-13	-11	-8	-8	-7	-6	-8
G. PSE Including Overvaluation	Mil. Rs.	-2390	-3106	-7087	-9496	-7023	-2310	-2488	-1348	-1961	-1836
Percent of Producer Value	Percent	-22	-20	-42	-74	-39	-9	-8	-4	-6	-6

Source: Government of Pakistan -Agricultural Statistics of Pakistan (Various Issues)

ANNEX-B
Consumer Subsidy Equivalents (CSEs) for Basmati Rice in Pakistan

Item	Unit	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96
A. Consumption	Thou. T.	666	805	916	901	762	772	885	942	1045
B. Consumer Price	Rs./ T.	4560	5500	5800	6100	6970	8060	8770	9090	11270
C. Consumer Cost	Mil. Rs.	3035	4428	5313	5499	5314	6226	7763	8561	11773
D. Policy transfers to Consumers										
1. Support price and state trading	Mil. Rs.	165	501	556	2618	2449	3221	3348	4927	7346
2. Percent of Consumer Cost	Percent	5	11	10	48	46	52	43	58	62
3.Transfer per Ton	Rs./ T.	249	622	607	2905	3212	4170	3783	5231	7032
E. Effect of Overvaluation	Mil. Rs.	728	831	1001	457	427	415	567	519	568
Percent of Consumer cost	Percent	24	19	19	8	8	7	7	6	5
F. CSE including Overvaluation	Mil. Rs.	893	1332	1556	3075	2876	3637	3915	5446	7913
Percent of Consumer Cost	Percent	29	30	29	56	54	58	50	64	67

Source: Government of Pakistan -Agricultural Statistics of Pakistan (Various Issues)

Item	Unit	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
A. Consumption	Thou. T.	1089	943	1144	1284	1088	1329	1450	1555	1587	1906
B. Consumer Price	Rs./ T.	12850	13400	14500	15710	15350	15490	18070	19040	20190	20140
C. Consumer Cost	Mil. Rs.	13995	12630	16595	20169	16699	20587	26197	29601	32037	38383
D. Policy transfers To Consumers											
3. Support price and state trading	Mil. Rs.	7351	4171	4549	4474	2856	4439	8293	10168	12004	13464
4. Percent of Consumer Cost	Percent	53	33	27	22	17	22	32	34	37	35
3.Transfer per Ton	Rs./ T.	6750	4425	3975	3485	2625	3340	5720	6540	7565	7065
E. Effect of Overvaluation	Mil. Rs.	752	684	1032	1343	1067	1272	1394	1542	1415	1471
Percent of Consumer cost	Percent	5	5	6	7	6	6	5	5	4	4
F. CSE including Overvaluation	Mil. Rs.	8103	4855	5581	5817	3922	5711	9687	11710	13419	14935
Percent of Consumer Cost	Percent	58	38	34	29	23	28	37	40	42	39

Source: Government of Pakistan -Agricultural Statistics of Pakistan (Various Issues)

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A Causal Relationship between Economic Growth, Unemployment and Poverty: A Case Study of Pakistan

Tariq Hussain, M.Wasif Siddiqi and Parvez Azim*

Abstract: The study is aimed at testing the relationship between economic growth, unemployment and poverty using time series data for Pakistan from 1972 to 2006. Economic growth is one of the major concerns of the government and is considered to be a significant device for decreasing the level of unemployment and poverty. Unemployment and poverty are core and current issues which are widespread and have deep-rooted effects on the economy. Unemployment is a phenomenon in which human resources are underutilized or apparently utilized, but without any marginal contribution to the total output; this leads to poverty and other social problems. Poverty is both the cause and effect of many problems. The results of Two Stage Least Square (2SLS) unexpectedly showed that economic growth did not play any role in reducing unemployment and poverty in Pakistan.

Keywords: Economic Growth, Unemployment and Poverty
JEL Classification: O40, J64, I32

1. Introduction

Economic growth and the process of economic growth have remained important in every era. Lucas (1988) stressed on the exhaustive nature of economic growth. Economic growth is the ultimate device, which escalates the process of gross domestic product (GDP). Sustained growth will help to minimize the crucial issues of unemployment and poverty.

Unemployment has always been one of the major pushing factors forcing people to migrate from one place to another in search of jobs. From 1870 to 1914, people left Europe for the sake of jobs, of which two thirds went to the U.S. while the remaining one third went to Canada, Australia and New Zealand (Lewis, 1954). Classical and neoclassical economists stressed that unemployment is due to wage rigidities because of minimum wage laws and the bargaining power of trade and labour unions.

* The authors are, respectively, M.Phil. student at NCBA &E, Gulberg,Lahore; Associate Professor, Department of Economics, GC University, Lahore; and Foreign Faculty Professor, Department of Economics, GC University, Lahore.
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Keynesian school of thought is of the view that the root cause of unemployment is the lack of effective demand in the economy. Unemployment is classified into two main categories: equilibrium unemployment and disequilibrium unemployment. Unemployment could be further classified as voluntary and involuntary, seasonal, frictional, structural, regional, disguised and cyclical. Classical economists coined the term demand deficient unemployment; the Keynesians cyclical; Marxians Involuntary, or non-natural unemployment, which stressed the relevance of disequilibrium situation between supply and demand for labor (Brainard and Cutler, 1993).

Unemployment is caused by a large number of factors. Regional disparities play a significant role in increasing the intensity of unemployment. Unemployment accentuates poverty, both in rural and urban areas. The perception of poverty is not easy to capture. It is a complex, multidimensional and multifaceted concept. There is no ultimate universal definition and method to elaborate and understand this phenomenon completely. Poverty steals away the possibility to have a flourishing life.

A large number of theorists have offered their views to understand the sensitivity of poverty. Thompson and Gray (1995) present eleven conceptual patterns of poverty that include culture of poverty; exploitation; the time lag in the process of adjustment of technical and other changes in a dynamic economy; differential power among enterprises and groups; sub-class theory of racism; welfare capitalism; elite rule and geographic location; status attainment; orthodox economic theory; human capital; and economic segmentation theories.

The poverty issue is hard to comprehend. People from all walks of life have different approaches to poverty and have their own solutions to combat it. Some economists have also challenged the economic view that seeks to address poverty from the viewpoint of insufficient income. The main concentration was on income - the idea that more prosperous people had adequate food, shelter, and health care. It was believed that the problem of poverty would disappear with economic growth which in turn would lead to growth in household income. Unemployment and poverty move in tandem to add misery to the lives of poor people. Economic

growth and poverty reduction seems to be connected through employment. De Lathouwer (2001a) elaborated that more work automatically reduces poverty. It was based on the observation that countries with a greater number of working people have a lower poverty risk than those with non- working. But a high employment rate is not the ultimate key to reducing poverty. The Anglo-Saxon countries combine high employment presentation with reasonably high poverty rates. Scandinavian countries have been successful in combining high employment with low poverty rate (De Lathouwer, 2001b). The issues of unemployment and poverty are more crucial and serious in developing countries. The developing countries want to achieve high growth rates to minimize the problems of unemployment and poverty.

In the decade of the 1960s, when a large number of developing countries did achieve the overall U.N. growth targets, the level of living of the masses remained unchanged for most; this indicated that something was very wrong with this explanation of development (Todaro, 1997). Being a developing nation, Pakistan's growth is fairly akin to all emerging economies. In the early decades, Pakistan depended heavily on agriculture. It was a difficult task to stabilize the newly established State in the presence of more than ten million refugees, hostile behaviour of the Indian government and poor economic circumstances. In spite of all these hurdles, the country's journey to growth was satisfactory. A sustained growth target, however, could not be achieved due to war with India and drought for two successive years i.e. 1966 and 1967. In 1950s, Pakistan had similar resources of growth as its neighboring countries, but now it holds no comparison with the East Asian countries like Korea, Malaysia, and Singapore. At present, India is in a relatively better position regarding the growth of various economic indicators as compared to Pakistan.

Pakistan's growth performance has been considered as a development puzzle by some in the light of a number of perplexing factors that have existed along with rapid growth. These include: first, despite a high growth rate, social indicators remained poor - Pakistan was among the countries with the highest adult illiteracy rate and lowest primary school enrollment ratio; second, while Pakistan had been able to avoid high inflation, its fiscal deficit and balance of payments deficits had grown significantly large, contributing to a fairly rapid increase in its domestic

and external debt burden; third, notwithstanding progress in mobilizing domestic saving and raising the rate of investment, the saving and investment efforts remained at a relatively low level as compared to most of the other developing countries of the world; the domestic saving rate, in particular was strikingly low, falling below the average saving rate for the Africa Region. Table 1 shows the picture of growth of GDP, employment and poverty for Pakistan from the first Decade of Development to 2005-06.

Table 1: Growth Rate of GDP, Employment and Poverty in Pakistan (in percentage)

Indicator	1963-64 to 1969-70	1969-70 to 1976-77	1976-77 to 1987-88	1987-88 to 1992-93	1992-93 to 1998-99	1998-99 to 2001-02	2001-02 to 2005-06
GDP Growth Rate	7.20	4.80	6.70	4.80	4.20	3.20	6.1
Labor Force Growth Rate	1.70	3.50	2.50	1.90	3.60	2.50	3.6
Employment Growth Rate	1.50	3.40	2.50	1.50	3.40	1.60	4.05
Change in Poverty Level	40.20 to 46.50	46.50 to 30.70	30.70 to 17.30	17.30 to 22.40	25.70 to 32.60	30.60 to 32.10	29.17 to 28.18

Source: Asian Development Bank (ADB) Report, 2006 and Pakistan Economic Survey, Government of Pakistan, 2006-07.

There is fluctuation in growth rates. Labor force growth rate was noted to be more than the growth in employment. The proportion of working age cohorts increased from 53 percent in FY 86 to 56 percent in FY 03 (Economic Survey, Government of Pakistan, 2004-05) without making a dent in poverty. In the era of the 1980s, more modern and complex thoughts were added regarding poverty. Until the 1980s Pakistan had achieved significantly high economic growth rates, but failed to translate these into social gains, measured by education, health or income/consumption poverty reduction. However, during the 1980s and

early 1990s Pakistan achieved more rapid income/consumption poverty reduction than anywhere in the world except for East Asia, although progress on social indicators was less rapid. Judicious economic policies needed to be formulated and implemented to have substantial economic growth, reduce income disparity, and to improve human capital, health care, and basic needs. Trickle-down policies might have helped to reduce poverty in the country.

The remaining sections of the study are divided as: Section 2 presents a review of literature. Data sources and methodology are presented in Section 3. Section 4 presents empirical results about economic growth, unemployment and poverty. Conclusion and policy implications are presented in Section 5.

2. Review of Literature

There is extensive literature available on the issues of growth, unemployment and poverty. There are two main branches of growth theory: the neoclassical, founded on Solow's growth model and the theory of endogenous growth, which focuses on human capital and innovation.

Solow (1956) analyzed and contributed a new theory of economic growth. The neo-classical production function used labor and capital as the main factors of production. Marginal productivity of labor and capital would determine the real wage rate and interest rate, respectively. So the return to each factor would bring a full employment level. Once a stable growth path was established, no single factor like real wage or interest would damage the growth path significantly. No exact path of full employment was clearly mentioned; however, it provided a powerful theoretical counterpart to such difficult aspects.

The theory of endogenous growth paid attention to knowledge and innovation. Growth would take place automatically. These sources of growth were highlighted by a number of economists. Romer (1990), along with Grossman and Helpman (1994), used knowledge as a foundation of growth. Aghion and Howitt (1994) employed innovation as a source of growth. Economic growth plays a pivotal role in minimizing the crucial issues of unemployment and poverty.

Seers (1972) has analyzed the meaning of development and found its impact on human beings. Poverty, unemployment and inequality have been the main issues of mankind in almost every era. GNP was used as a yardstick to measure and compare economic progress, which in turn was used to measure real per capita income (in economic jargon it is also known as the standard of living). For poverty level measurement, monetary and nutritional approaches were used. Urban unemployment was used to determine the rate of unemployment. Size, race and region measures were used to show income inequality. Poverty and inequality in income distribution would be eliminated by setting targets of income for various sizes of families. International Financial Institutions (IFIs) were formed, but their role was not satisfactory. It was the need of the hour to work for humanity. Significant work was also done by Harrod (1939) and Domar (1946) on economic growth and unemployment.

Merz (1999) found time series evidence of unemployment flows in the U.S.A. for the period 1948-1996. Workers inflows and outflows remained a part of U.S. business cycles. Data of net unemployment flows were used from the last fifty years. It covered many booms and recessions. Granger causality test was applied. Structural breaks occurred around 1958 and 1970. U.S. unemployment flows and unemployment rates had been structurally stable. Structural breaks were associated with economic recessions. The unemployment flows and unemployment rates had followed a non-linear relationship. The highest peak was in the 1970s' and early 1980's, but no break was found after 1980.

Overman *et al.* (2002) found unemployment and regional inequalities to be the main issues faced by Europe. The study covered the period 1986-1996. Polarization occurred due to three reasons: a within-nation polarization of labor demand, a within-nation polarization of labor supply and a between-nation change in the labor market. The techniques of OLS and Instrumental Variable were used. The polarization of Europe had significantly changed the labor market condition. Clusters of low-skilled workers and badly performing industries were created and neighbor effects were strong not only within the nation but also outside the nation. Strong neighbor effect was useful to minimize unemployment.

Haq (2004) found the transition of poverty in Pakistan for the period 1998-99 to 2000-01, using Pakistan Socio-Economic Survey (PSES) longitudinal data. Poverty was evaluated by categorizing the poor into three main classes: the absolute poor, the transitorily poor and the non-transitory poor. It was found that poverty increased in both rural and urban areas of Pakistan. Twenty percent of the households of urban and rural areas were categorized as being absolutely poor, 16 percent of urban and 22 percent of rural households were transitorily poor and 26 percent of urban and 28 percent of rural were non-transitorily poor. This crucial situation caused a low overall enrolment in schools and the condition of girls was even more critical. The study suggested that government should focus on poverty reduction strategies like pro-poor growth policies and a microfinance strategy to minimize poverty.

Pakistan's growth experience presents a complex image. Burki (1996) found structural rigidities in the growth pattern of Pakistan. Pakistan's economy was proceeding along fault lines. These fault lines did not appear suddenly. Twelve main issues were highlighted. GDP growth rate remained 5.7 percent during the period 1950-70 but fell to 4.2 percent in the period 1990-96. The GDP growth rate was high in those decades due to foreign remittances and donations granted due to the country's geographical location. Living with 4 percent GDP growth rate per annum means 1 percent increase in per capita income yearly. Considerable reduction in poverty seemed very difficult because Pakistan's economic policymakers dealt with long run problems on a day-to-day basis. Pakistan had to face crises frequently on political, social, religious and economic grounds. For self-sufficiency and sustained economic growth, long run policies were deemed necessary to achieve the goals mentioned in the study.

3. Data Sources and Methodology

The analysis of this paper is based on time series data covering the period 1972-2006. The primary purpose of this research is to investigate the relation between economic growth, unemployment and poverty. The data is obtained from the Handbook of Statistics on Pakistan's Economy, 2005; various reports of the State Bank of Pakistan; and the Economic Survey of

Pakistan, 2006-07. The data on poverty is taken from Poverty Report (Jamal, 2004).

There are two basic methods to estimate simultaneous equations: least square method and maximum likelihood. The simultaneous equation model is estimated through two stage least squares (2SLS) (Basmann, 1957 and Sargan, 1958). The endogenous or dependent variable of one equation may emerge as independent. But it has also been observed that different variables in different equations may be mutually dependent. For the same reason, various variables used in this study are not independent of each other. The use of OLS will produce inconsistent result. Thus, 2SLS can be applied to an individual equation. This methodology is easy to apply as it only requires the number of exogenous or predetermined variables. The basic idea behind the 2SLS method is to replace the stochastic endogenous regressor with one that is non-stochastic and consequently independent of the error term (Asteriou, 2006). 2SLS estimation is carried out by single equation method. The estimation of a single equation is unaffected by the other equation of the system in 2SLS (Creel, 2006). It is consistent and asymptotically normal. This involves two stages. The structural form equations are given below:

$$Y_t = f(POV_t, UN_t, K_t, L_t, OP_t, FDI_t) \quad (1)$$

$$UN_t = f(Y_t, K_t, OP_t, HC_t, FDI_t, INF_t) \quad (2)$$

$$POV_t = f(UN_t, K_t, OP_t, HC_t, FDI_t, INF_t) \quad (3)$$

In this study, the variables, Economic Growth (GDP), Unemployment, Poverty, Capital, Labor, Openness of Trade, Human Capital, Foreign Direct Investment and Inflation are denoted by Y_t, UN_t, POV_t, K_t, L_t, OP_t, HC_t, FDI_t, and INF_t, respectively. GDP is used as a proxy variable for Economic Growth. Total volume of import and export is taken as a proxy variable for Openness of Trade. Gross fixed capital formation is taken as a proxy variable for Physical Capital and Human Capital is the weighted index of enrolment at different schooling levels. In the first stage, the explanatory endogenous variable is regressed on the instrumental variables in the reduced form. Thus, fitted values are obtained. In the second stage, the explanatory variable is replaced with its fitted value and

the dependent variable is regressed on the right-hand side fitted values and the predetermined values. There are certain methods to test the robustness of the model.

Empirical evaluation of growth theories started in the mid-1950. New directions were opened and modern variables were introduced in growth theories. Solow's (1956) growth model was evaluated and extended by Barro (1991). Mankiw *et al.* (1992) included human capital in the growth model.

$$Y_t = f(A_t, K_t, L_t, H_t) \qquad (4)$$

where Y_t = aggregate production (GDP), K_t = physical capital stock, L_t = employed labor force, H_t = human capital, t = time period and A_t is total factor productivity, determined by different economic factors. The study implicitly assumes that the effect of Capital, Labor, Trade Openness, Inflation, Foreign Direct Investment, Poverty and Unemployment work through A_t which can be written in a functional form as under:

$$A_t = f(OP_t, INF_t, FDI_t, POV_t, UN_t) \qquad (5)$$

By combining equation 4 with equation 5, we get:

$$Y_t = f(OP_t, INF_t, FDI_t, POV_t, UN_t, K_t, L_t, H_t) \qquad (6)$$

3.1 Growth Model

A growth model is given in equation (1). By converting this equation into estimation form, the growth model is as under:

$$Y_t = \alpha_1 + \alpha_2 UN + \alpha_3 POV + \alpha_4 K + \alpha_5 L + \alpha_6 OP + \alpha_7 FDI + \varepsilon_{1t} \qquad (7)$$

where α_1 is the intercept; α_2, α_3 α_4, α_5, α_6, and α_7 are the coefficients of Unemployment, Poverty, Capital, Labour, Openness to Trade and Foreign Direct Investment, respectively. ε_{1t} is the usual error term and independent of all independent variables. The subscript is dropped to avoid cluttering.

4. Empirical Results

4.1 Growth Model

In order to better understand the method of 2SLS, estimation is carried out step by step. In the first step K, L, FDI, OP, POV, UN, α_1 and AR (1) are regressed on growth. The results of OLS and 2SLS are given in Tables 2a and 2b, respectively. Since in case of simultaneous equation, OLS estimators are not consistent or efficient, this study has utilized 2SLS estimation to overcome the drawbacks of OLS estimation in simultaneous equations. The variables K and UN are statistically insignificant and have positive coefficient signs. These variables have no important role in economic growth. The variables L, OP, FDI and POV are significant and only FDI has a negative coefficient sign. POV has a positive relation with growth. The rich becomes richer due to growth. With an increase in growth, it is widely believed that unemployment and poverty is reduced. Conversely, the results of this study show that this does not hold true for Pakistan.

Table 2a: Growth Model Results (OLS)

Variables	OLS			
	Coefficient	Std. Error	t-statistic	Prob.
K	-0.6206	0.7319	-0.847	0.4042
L	858.1	438.1	1.959	0.061***
FDI	-17.97	4.097	-4.28	0.0002*
OP	3.342	0.452	7.392	0.0000*
POV	279.44	167.28	1.670	0.1068
UN	2512.36	2402.42	1.045	0.3053
A_1	-2728.30	11660.8	-2.340	0.0272**
AR(1)	0.2653	0.2204	1.2037	0.2395

Note: *, **and*** indicate the level of significance at 1 percent, 5 percent, and 10 percent, respectively.

Table 2b: Growth Model Results (2SLS)

Variables	2SLS			
	Coefficient	Std. Error	t-statistic	Prob
K	0.0618	0.3493	0.177	0.8609
L	1308.10	208.46	6.274	0.0000*
FDI	-17.78	1.5228	-11.6	0.0000*
OP	2.98	0.2006	14.88	0.0000*
POV	393.76	72.43	5.436	0.0000*
UN	-310.49	963.92	-0.32	0.7502
A_1	-39650	5049.11	-7.85	0.0000*
AR(1)	0.5099	0.1997	2.553	0.017**

Note: * and ** indicate the level of significance at 1 percent and 5 percent, respectively.

4.1.1 Significance of the Model

The F values of OLS and 2SLS show that model is highly significant. The tabulated value is 3.12 at the 5 percent level of significance. The calculated values of ANOVA from the OLS and 2SLS are 316.9 and 3031, respectively. These values show that the model is significant.

a) Order of Identification

For order condition, the following formula is used:

$$K - k \geq m - 1$$

where:
K = Number of predetermined variables in the model.
k = Number of predetermined variables in the equation to be identified.
m = Number of endogenous variables in the equation to be identified.

$$\begin{aligned} K - k &\geq m - 1 \\ 6 - 4 &\geq 3 - 1 \\ 2 &= 2 \end{aligned}$$

The model is correct as the number of excluded exogenous variables is equal to the number of included endogenous explanatory variables (Greene, 2006).

b) Rank Condition

For identification, rank condition is used. Rank condition is applied to examine the identification of equation (1). This condition fulfills both the necessary and sufficient conditions. The coefficients of the variables are given in Table 3.

Table 3: Coefficients of the Variables

Equation	1	Y	UN	POV	K	L	OP	HC	FDI	INF
Eq 1	$-\alpha_0$	1	$-\alpha_2$	$-\alpha_3$	$-\alpha_4$	$-\alpha_5$	$-\alpha_6$	0	$-\alpha_8$	0
Eq 2	$-\beta_0$	$-\beta_1$	1	0	β_4	0	β_6	$-\beta_7$	$-\beta_8$	$-\beta_9$
Eq 3	$-\gamma_0$	0	$-\gamma_2$	1	$-\gamma_4$	0	$-\gamma_6$	$-\gamma_7$	$-\gamma_8$	$-\gamma_9$

By striking out the row of coefficients of variables and the columns of non-zero coefficients in equation (1) is shown in the form of a determinant as Δ_1:

$$\Delta_1 = \begin{vmatrix} -\beta_7 & -\beta_9 \\ -\gamma_7 & -\gamma_9 \end{vmatrix} = \beta_7 \gamma_9 - \beta_9 \gamma_7 \neq 0 \text{ as } \beta_7 \gamma_9 \neq \beta_9 \gamma_7$$

Since Δ_1 is non-zero, it indicates that rank or sufficient condition for identification also fulfills to apply 2SLS.

4.1.2 Serial Autocorrelation

a) Durbin Watson (D-W) Test

D-W test is carried out to test autocorrelation. The value of Durbin Watson test is 1.870417, which shows that there is no positive or negative autocorrelation between the residuals.

b) Breusch-Godfrey (BG) Test

Breusch-Godfrey Test (Breusch, 1978) is performed for serial correlation. There is no considerable evidence of serial correlation in the residuals. So the null hypothesis of no serial correlation in the residuals cannot be rejected.

4.1.3 White Heteroskedasticity Test

White Heteroskedasticity Test is carried out to check the null hypothesis that there is no heteroskedasticity in the variances of residuals. Chi-square and F-statistics show that there is no heteroskedasticity in the residuals (Table 1).

Table 4: Serial Correlation and White Heteroskedasticity

Serial Correlation	F-statistic	0.077571	Probability	0.782907
	Chi-squared	0.105170	Probability	0.745711
White Heteroskedasticity	F-statistic	1.682869	Probability	0.143045
	Chi-squared	16.66756	Probability	0.162536

4.1.4 Hausman Simultaneity Test

Simultaneity test is carried out to test whether an endogenous regressor is correlated with the error term. In this test, the estimated error term is obtained to include as an independent variable in the same structural equation. The result of this test shows that the variable is significant in the given and projected regressions, so there is a problem of simultaneity. The values of Hausman Simultaneity Test of growth and poverty and growth and unemployment are 0.0000 and 0.0083, respectively.

4.2 Unemployment Model

The Kooros (2006) model of general unemployment is used in this study. Macroeconomic variables with significant effects on unemployment movements are used. Budget Deficit, Inflation and Wages are the variables used in the above mentioned model. In this study, Capital, Foreign Direct Investment, Openness of Trade, Inflation, Human Capital and Growth are used as independent variables.

FDI has played an important role in economic growth. Hermes and Lensink (2000) found the significant impact of FDI on growth. Inflation has both positive and negative effects on growth. Studies by Levine and Zervos (1993) and Sala-i-Martin (1997) suggested that inflation was not a robust determinant of economic growth. Sachs and Warner (1995), Levine and Renelt (1992), and Vamvakidis (2002) found significant role of openness of trade in economic growth. Human capital is the main element of growth in endogenous growth model. A large number of studies have found evidence that human capital is an important factor of economic growth (Barro, 1991; Mankiw *et al.,* 1992). Abbas and Foreman (2007) found the significant role of human capital in economic growth. An unemployment model is developed as equation (2). By converting it into estimation form, the unemployment model is as under.

$$UN_t = \beta_1 + \beta_2 Y_t + \beta_3 K_t + \beta_4 OP_t + \beta_5 HC_t + \beta_6 FDI_t + \beta_7 INF_t + \varepsilon_{2t} \quad (8)$$

where β_1 is intercept and all other βs are coefficients of the respective variables.

4.2.1 Empirical Results of the Unemployment Model

All variables are insignificant in the OLS results. Unemployment is used as a dependent variable in 2SLS. The results are presented in Tables 5a and 5b. All the variables are statistically significant in the 2SLS which are insignificant in OLS. The variable Y is significant and has a positive coefficient sign which shows that with the increase of growth, unemployment will also increase. In theory, it is believed that unemployment should have a negative relation with growth but the result of this study gives us the positive relation between unemployment and growth. This is due to the adoption of capital intensive techniques.

Table 5a: Unemployment Model Results (OLS)

Variables	OLS			
	Coefficient	Std. Error	t-statistic	Prob
K	2.39E-05	5.24E-05	0.45644	0.6519
FDI	-0.000319	0.000382	-0.8346	0.4115
OP	-7.76E-06	6.02E-05	-0.1288	0.8985
HC	-0.096797	0.371185	-0.2607	0.7963
INF	0.002585	0.009306	0.27779	0.7834
Y	8.65E-06	1.31E-05	0.65960	0.5153
B_1	59.98782	2620.722	0.02289	0.9819
AR(1)	0.998631	0.060791	16.42	0.0000*

Note: * indicates the level of significance at 1 percent.

Table 5b: Unemployment Model Results (2SLS)

Variables	2SLS			
	Coefficient	Std. Error	t-statistic	Prob
K	0.000297	6.59E-05	4.515	0.0001*
FDI	0.001551	0.000287	5.401	0.0000*
OP	-0.000363	4.48E-05	-8.094	0.0000*
HC	0.487352	0.220056	2.214	0.036**
INF	-0.010923	0.005274	-2.071	0.049**
Y	7.88E-05	7.51E-06	10.48	0.0000*
B_1	0.082053	0.154323	0.531	0.5998
AR(1)	-0.587009	0.176825	-3.319	0.0029*

Note: * and ** indicate the level of significance at 1 percent and 5 percent, respectively.

4.2.2 Significance of the Model

To test the goodness of fit, ANOVA is essential. The F values of OLS and 2SLS show that a model is highly significant. The tabulated value of F-statistic is 2.32 at 5 percent level of significance. The values of ANOVA for OLS and 2SLS are 64.46 and 117.12, respectively.

a) Order of Identification

For order condition the following formula is used.

$$K - k \geq m - 1$$

where:
K = Number of predetermined variables in the model.
k = Number of predetermined variables in the equation.
m = Number of endogenous variables in the equation.

$$K - k \geq m - 1$$
$$6 - 5 \geq 2 - 1$$
$$1 = 1$$

The number of excluded exogenous variables is equal to the number of included endogenous explanatory variables (Greene, 2006) so the model is correct.

b) Rank Condition

Rank condition is used for identification. Rank condition is applied for identification on equation (2). Rank condition performs both necessary and sufficient conditions. The coefficients of the variables are given in Table 6.

Table 6: Coefficients of the Variables

Equation	1	Y	UN	POV	K	L	OP	HC	FDI	INF
Eq 1	$-\alpha_0$	1	$-\alpha_2$	$-\alpha_3$	$-\alpha_4$	$-\alpha_5$	$-\alpha_6$	0	$-\alpha_8$	0
Eq 2	$-\beta_0$	$-\beta_1$	1	0	β_4	0	β_6	$-\beta_7$	$-\beta_8$	$-\beta_9$
Eq 3	$-\gamma_0$	0	$-\gamma_2$	1	$-\gamma_4$	0	$-\gamma_6$	$-\gamma_7$	$-\gamma_8$	$-\gamma_9$

By striking out the row of coefficients of equation (2) and the columns of non-zero coefficients, equation (2) is shown in the form of determinant as Δ_2:

$$\Delta_2 = \begin{vmatrix} -\alpha_3 & -\alpha_5 \\ 1 & 0 \end{vmatrix} = \alpha_3 0 - 1\ \alpha_5 \neq 0 \quad \text{as} \quad \alpha_3 0 \neq 1\ \alpha_5$$

Since Δ_2 is non-zero which indicates that rank or sufficient condition for identification also fulfills to apply 2SLS.

4.2.3 Serial Autocorrelation

a) Durbin-Watson (D-W) Test

D-W test is carried out to check for serial correlation. The value of D-W test is 1.981437 which shows that there is no positive or negative correlation.

b) Breusch-Godfrey (BG) Test

Breusch-Godfrey Test (Breusch, 1978) for serial correlation in residuals is performed. Serial correlation in the residuals is not found. So it is suggested that the lag structure is appropriate and the model is correct.

4.2.4 White Heteroskedasticity Test

This test is used to check the null hypothesis that there is no heteroskedasticity in the residuals. The values of chi-square and F-statistic show that there is no evidence of heteroskedasticity (Table 7).

Table7: Serial Correlation and White Heteroskedasticity

Serial Correlation	F-statistic	1.322277	Probability	0.261066
	Chi-squared	1.707956	Probability	0.191251
White Heteroskedasticity	F-statistic	1.202424	Probability	0.343005
	Chi-squared	13.84707	Probability	0.310581

4.3 Poverty Model

Sawhill (1988) used several factors to explain the persistence of poverty in the U.S.A. Demographic Changes, Growth, Human Capital and Income Transfer are used as independent variables. Following the same pattern in this study, Capital, Foreign Direct Investment, Openness of Trade, Inflation, Human Capital and Unemployment are used as independent variables. A poverty model is developed in equation (3). By converting it into estimation form, the poverty model is as under:

$$POV = \gamma_1 + \gamma_2 UN + \gamma_3 K + \gamma_4 OP + \gamma_5 HC + \gamma_6 FDI + \gamma_7 INF + \varepsilon_{3t} \quad (9)$$

where γ_1= Intercept and all other γs are coefficients of the respective variables.

4.3.1 Empirical Results of the Poverty Model

The results of OLS and 2SLS are given in Tables 8a and 8b, respectively. The variables K, FDI, HC and INF are insignificant in OLS. In 2SLS result all the variables are significant except HC. The variable OP has a negative coefficient sign as expected. An addition in OP will result in a decrease in poverty. The important finding is that with the increase of poverty, unemployment is also increased. Poverty has a positive relation with unemployment and our results also suggest that there is positive relation between these variables.

Table 8a: Poverty Model Results (OLS)

Variables	OLS			
	Coefficient	Std. Error	t-statistic	Prob
K	0.000165	0.000295	0.5604	0.5800
FDI	0.001507	0.001628	0.9259	0.3630
OP	-0.000453	0.000188	-2.4082	0.0234**
HC	-0.256651	2.081400	-0.1233	0.9028
INF	0.006359	0.052534	0.1210	0.9046
UN	2.282725	1.014728	2.2495	0.0332**
γ_1	23.88362	5.022975	4.7548	0.0001*
AR(1)	0.890789	0.039379	22.6201	0.0000*

Note: * and ** indicate the level of significance at 1 percent and 5 percent, respectively.

Table 8b: Poverty Model Results (2SLS)

Variables	2SLS			
	Coefficient	Std. Error	t-statistic	Prob
K	0.001337	0.0003	3.841	0.0008*
FDI	0.003925	0.001358	2.889	0.008**
OP	-0.000900	0.000189	-4.760	0.0001*
HC	2.332221	1.551403	1.503	0.1458
INF	0.123255	0.037289	3.305	0.003**
UN	3.279208	0.812568	4.035	0.0005*
γ_1	12.43946	5.872621	2.118	0.044**
AR(1)	0.897835	0.026957	33.30	0.0000*

Note: * and ** indicate the level of significance at 1 percent and 5 percent, respectively.

4.3.2 Significance of the Model

To test for model fit, ANOVA is essential. The values of F-statistic of OLS and 2SLS show that the model is highly significant. The tabulated value of F-statistic is 2.32 at 5 percent level of significance. The values of ANOVA for OLS and 2SLS are 17.95 and 159.68, respectively.

a) Order of Identification

For order condition the following formula is used:

$$K - k \geq m - 1$$

where:
K = Number of predetermined variables in the model.
k = Number of predetermined variables in the equation.
m = Number of endogenous variables in the equation.

$$\begin{aligned} K - k &\geq m - 1 \\ 6 - 5 &\geq 2 - 1 \\ 1 &= 1 \end{aligned}$$

Since the number of excluded exogenous variables is equal to the number of included endogenous explanatory variables (Greene, 2006), the model is correct.

b) Rank Condition

Rank condition is used for identification. Rank condition is applied for identification of equation (3). This condition fulfills both necessary and sufficient conditions. Table 9 shows the coefficients of the variables:

Table 9: Coefficients of the Variables

Equation	1	Y	UN	POV	K	L	OP	HC	FDI	INF
Eq 1	$-\alpha_0$	1	$-\alpha_2$	$-\alpha_3$	$-\alpha_4$	$-\alpha_5$	$-\alpha_6$	0	$-\alpha_8$	0
Eq 2	$-\beta_0$	$-\beta_1$	1	0	β_4	0	B_6	$-\beta_7$	$-\beta_8$	$-\beta_9$
Eq 3	$-\gamma_0$	0	$-\gamma_2$	1	$-\gamma_4$	0	$-\gamma_6$	$-\gamma_7$	$-\gamma_8$	$-\gamma_9$

By striking out the row of coefficients of equation (3) and the columns of non-zero coefficients of equation (3), the determinant Δ_3 is given as:

$$\Delta_3 = \begin{vmatrix} 1 & -\alpha_5 \\ -\beta_1 & 0 \end{vmatrix} = 1(0) - \beta_1\alpha_5 \neq 0 \quad \text{as} \quad 1(0) \neq \beta_1\,\alpha_5$$

Since Δ_3 is non-zero, it indicates that rank or sufficient condition for identification is fulfilled to apply 2SLS.

4.3.3 Serial Autocorrelation

a) Durbin-Watson (D-W) Test

D-W test is carried out to check for serial correlation. The value of D-W test is 1.955404, which shows that there is no positive or negative correlation in residuals.

b) Breusch-Godfrey (BG) Test

Breusch-Godfrey Test (Breusch, 1978) for serial correlation in residuals is performed. Serial correlation in the residuals is not found. It is suggested that the lag structure is appropriate and the model is correct.

4.3.4 White Heteroskedasticity Test

White Heteroskedasticity test is performed to check whether there is heteroskedasticity problem in residuals. The chi-square and F-statistic show that there is no heteroskedasiticity in residuals (Table 10).

Table 10: Serial Correlation and White Heteroskedasticity

Serial Correlation	F-statistic	1.688611	Probability	0.205640
	Chi-squared	2.151209	Probability	0.142458
White Heteroskedasticity	F-statistic	1.551036	Probability	0.179519
	Chi-squared	16.04029	Probability	0.189398

5. Conclusions

Economic growth is an imperative means of minimizing the problems of unemployment and poverty. This study investigated the relationship between growth, unemployment and poverty for the period 1972-2006. 2SLS method is used to test the growth model. By applying 2SLS, it is found that the variables L, FDI, OP and POV are statistically significant and the variables K and UN are not significant. The variable K has no role in growth. It is found that poverty has a positive relation with growth in Pakistan. Growth has no significant role in minimizing unemployment and poverty. The results of the unemployment model show that all variables are statistically significant. When unemployment increases, inflation falls. But with the increase of growth, unemployment is not decreased and growth has positive relation with unemployment due to the adoption of capital intensive techniques. In the poverty model, all variables are statistically significant except HC. When unemployment increases, poverty also increases. Jamal *et al.* (2003) explained that poverty increased following the 1988 Structural Adjustment Lending (SAL) package from the World Bank and IMF up to 1999. In the 1970s output growth was not too high (2.0 percent) but it was encouraging and so was employment (2.1 percent). This development altered in the 1980s, when output growth on average was higher (3.9 percent), and employment growth remained a little lower (1.9 percent). In 1990s output growth continued at a slightly lower rate of 3.3 percent and employment growth was also low at 1.6 percent (Majid, 2000). Sustained growth with trickle-

down and labor-intensive policies could reduce the problem of unemployment and poverty in the country.

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The Grand Macroeconomics Circular Tour: From 'The Classics' To Keynes, and Back Again

Roy H. Grieve*

Abstract: Having noted the fundamental difference between the pre-Keynesian (Classical) and Keynesian conceptions of the working of a macroeconomic system - from one perspective, that aggregate demand naturally accommodates itself to supply, and from the other, that planned aggregate demand is the key determinant of the level of activity – this paper goes on to draw attention to the fact that the pre-Keynesian vision has re-emerged as the conventional wisdom expounded in mainstream textbooks, a development intimately bound up with the adoption of the highly problematic AD/AS model as the expository framework of choice.

Keywords: Keynes General Theory, Classical Economics, Involuntary Unemployment, AD/AS model
JEL Classification: E0, B1, B22, E13

1. Introduction

The recent storm – hurricane, indeed - which has hit the world economy bringing financial crisis, falling output and sharply rising unemployment along with the threat of general deflation has called into question the validity of much of contemporary macroeconomic theory. Conventional mainstream economics has, in recent years, been teaching that great macroeconomic disruption, such as experienced in the inter-war period, is a thing of the past – attributable to bungling mismanagement – and that today, by contrast, given more sophisticated theory and better economic management, we can safely relax in the confidence that modern advanced economies can be expected to operate at, or deviate only very temporarily from, their "natural" - that is to say, full employment - level of activity. Optimism as to the benevolent working of market forces has been the keynote; not much seems to have been learned from the recent economic troubles of Japan. When, however, in the autumn of 2008, the financial

* The author is a Professor at Department of Economics, University of Strathclyde, Glasgow, Scotland. His email address is roygrieve@btinternet.com

roof appeared to be falling in, and commentators began to forecast for the world economy a Japanese-type slump – indeed a re-run of the Great Depression of the 1930's – the name of Keynes was increasingly mentioned. Keynes was now suddenly remembered as the author of practical and relevant ideas which might again, as they did seventy years ago, provide understanding and guidance as how to cope with conditions of collapsing activity across the world economy. However, for anyone seeking enlightenment on the nature of Keynes's ideas, a difficulty is that the Keynes vision of the working of the macro economy has largely disappeared from the mainstream textbooks. What, we may ask, has happened to it?

This article sketches, in broad terms, the changing course of mainstream macroeconomic thinking (with reference to developed economies) on the causes of, and remedies for, unemployment. Beginning with the traditional "Classical" conception (which has shown remarkable powers of survival) we note how, from the late 1930s, that corpus of theory was supplanted by the Keynesian analysis. The Keynesian conception, although for some time dominating the scene, has itself over the last thirty odd years, been pushed very much into the background as old ideas of the pre-Keynesian, Classical sort (albeit in fashionable modern dress) have come back strongly into vogue. We take the view that this rehabilitation of pre-Keynesian thinking represents a retrograde step: if contemporary economic problems are to be understood and handled effectively, it is, we believe, to the Keynesian tradition that a return must be made. The full extent of this Classical revival needs to be recognized and the essential features of Keynes' vision be brought back out of Neoclassical shadows into the light of day.

2. Classical Optimism with Respect to Aggregate Demand: Old Style

In the early years of the nineteenth century, when the effects of technological and industrial change in boosting productive capacity were becoming evident, there arose amongst those with an interest in economic affairs a debate as to the possibility of a "general glut" – a state of overproduction relative to demand for output across all industries within the economy. Was there a danger, it was asked, that ability to produce

could exceed willingness of the community to buy the product, thus giving rise to a chronic problem of unemployment?

A fierce controversy developed. On the one hand, proponents of what was to become the orthodox view (Say, James Mill and Ricardo) were confident that no problem of general excess supply could arise: they rejected out-of-hand the alternative - "heretical" - view (Malthus, Chalmers and Sismondi) that "too much" investment might be undertaken, causing such expansion of productive capacity as to outrun the growth of demand. While it was of course recognized that the oversupply of any individual commodity could occur, a *general* state of overproduction across the economy – an autonomously-occurring deficiency of demand for output relative to capacity to produce - was deemed impossibility. Advocates of this position cited "Say's Law" - the proposition that the very act of supplying goods to the market implies a corresponding volume of demand - arguing that a producer was desirous either of consuming his own product or of exchanging it for the products of others. Essentially, the view was that the desire to purchase could not itself fail to keep up with the volume of goods produced; even if savings were made out of current income, such saving was not seen as "non-spending": income saved was expected naturally to flow to production of producer's goods.[1] While it was admitted that monetary disturbances such as reduction in the note issue, or an increased demand for cash in hand in a crisis, could give rise, at least temporarily, to unemployment, the orthodox view of such events was that these did not accord with the "heretical" notion of an autonomously occurring want of demand – a "general glut".

In the early 19th century debates about the possibility of an overall deficiency of demand, it was the Say-James-Mill view, propounded and reiterated with the authority of Ricardo and J. S. Mill, which carried the day. As Keynes put it a hundred years later in one of his "purple passages" (1936, p.32):

[1] 'When the propertied classes turn their income into capital [i.e. save] they do not thereby annihilate their power of consumption; they do but transfer it from themselves to the labourers to whom they give employment" (Mill, 1868).

> *"The idea that we can safely neglect the aggregate demand function is fundamental to the Ricardian economics, which underlie what we have been taught for more than a century. Malthus, indeed, had vehemently opposed Ricardo's doctrine that it was impossible for effective demand to be deficient; but vainly. For, since Malthus was unable to explain clearly (apart from an appeal to the facts of common observation) how and why effective demand could be deficient or excessive, he failed to furnish an alternative construction; and Ricardo conquered England as completely as the Holy Inquisition conquered Spain. Not only was his theory accepted by the city, by statesmen and by the academic world but controversy ceased; the other point of view completely disappeared; it ceased to be discussed. The great puzzle of "Effective Demand", with which Malthus had wrestled, vanished from economic literature. You will not find it mentioned even once in the whole works of Marshall, Edgeworth and Professor Pigou, from whose hands the Classical theory has received its most mature embodiment. It could only live on furtively, below the surface, in the underworlds of Karl Marx, Silvio Gesell or Major Douglas."*

3. Classical Optimism with respect to Aggregate Demand: Neoclassical Style

Despite the fact that (from its emergence in the 1870s) neoclassical economics differed in certain other significant respects from Classical political economy, with respect to the issue of aggregate demand and Say's Law, the Ricardian conception was – as Keynes emphasized in the passage just quoted - carried through into the marginalist era, though given a characteristically neoclassical twist. The rationalization now brought forward was to justify the confident presumption that the value of planned demand naturally tends to equalize with the value of output produced at the rate of interest which serves to equate savings and planned investment.

In the neoclassical era, as had not been the case in Classical times, the balancing of savings and investment was recognized as problematical rather than simply automatic; the problem was, however, seen as resolved through the operation of the price (that is, interest rate) mechanism. It was held that establishment of the "natural" rate of interest (equating savings

and investment) ensured equilibrium in the "loanable funds" market, thus achieving recirculation, as effective demand for output of whatever portion of current income was reserved as savings.

Neoclassical writers did, however, allow that the malfunctioning or slow operation of this mechanism could give rise to short-term variations in employment and output. If, for instance, a change was perceived in investment prospects, the *natural* rate would alter to maintain equality between savings and investment. The trouble was that the *actual* rate obtained in the market, and to which agents responded, was the "money" rate as set by the banks; if the banks were slow in adjusting their rate to the change in investment conditions, the money rate would fail to move with the natural rate, resulting in an excess or deficiency of investment above or below savings. The understanding was that, if the money rate happened to fall short of the natural rate, the excess of planned investment over savings would induce increased bank lending; alternatively, if the money rate was too high, and savings exceeded intended investment, the money supply would fall. The volume of spending would then increase or decrease with such changes in the quantity of money.

What happened next with respect to employment and output, following an increase or decrease in spending, was held to depend on conditions of labour supply – specifically, on the extent to which money wages responded to the change of prices induced by the alteration (positive or negative) in monetary expenditure. If money wages responded immediately and fully to the change in prices, real wages would remain as before, and so consequently would employment and output: the only effect of the disturbance would be on the level of prices. But if commodity prices altered more quickly than money wages, as considered the more likely outcome, the real wages would be affected causing changes in employment and output. The interpretation of this situation was that if money wages failed to keep pace with variations in commodity prices, and real wages therefore rose or fell, the real terms on which labour was being offered for employment were therefore shifting, with a direct effect on the quantity of labour taken into employment. [2]

[2] In terms of the conventional neoclassical labour market diagram (drawn in real wage / employment space) this scenario – money wages failing to keep pace with price changes - is represented by a shift of the labour supply curve relative to the labour demand

In time, of course, once the money rate caught up with the natural rate, and real wages were restored to their "proper" value, activity would return to its normal level. Cyclical unemployment associated with such a sequence of events could be classified as *frictional.*

It was, however, evident to Professor Pigou that the abnormally high and prolonged unemployment being suffered in Britain in the inter-war period represented something other than the regular fluctuations of the trade cycle as experienced in earlier years. Pigou's diagnosis (*Theory of Unemployment, 1968*) was that the distressing contemporary situation could be explained only as the result of an unduly high level of real wages; Pigou surmised that, after the dramatic changes in prices and money wages during the war and immediate post-war years, the level of money wages had settled down in an inappropriate relationship to the level of commodity prices.

In other words, it was supposed that workers, in maintaining the going level of money wages, and so of real wages, were pricing themselves out of employment. The consequent unemployment could be described as being, in effect, *"voluntary"* (attributable to the decisions of the workers themselves). The remedy proposed was, naturally, a cut in real wages. Pigou, apparently taking it for granted that the interest rate mechanism would ensure equality of planned spending with the value of output produced, was confident that employment would then increase; as with lower wages, firms could be expected to move down their labour demand schedules. It was specifically on Pigou's *Theory of Unemployment* that Keynes set his sights as the work which constituted the fullest and most explicit statement of what he understood to be the "Classical" position.

In summary, the pre-Keynesian orthodoxy (in both the "old Classical" period and in the neoclassical era) assumed that the real value of total spending naturally – given money wage and price flexibility - tended to match the productive capacity of the economy. Neoclassical theorists understood the level of employment to be determined within the labour market – it being assumed that the labour market operated just like any

function (marginal product of labour schedule), thus altering the point of intersection of the two curves, and the volume of employment determined in the labour market.

other market. With both labour demand and supply represented as functions of the real wage, the quantity of labour employed is established at the point of intersection of these two curves. The terms on which labour is offered for employment are the critical factors in explaining the current level of employment. Changes in spending were held to affect output and employment normally only temporarily and only if the initial response on the supply side was imperfect. The high unemployment and low output characteristics of the ongoing slump conditions of the interwar years were, however, attributed by Professor Pigou to the unprecedented circumstance of a *persisting* departure of conditions of labour supply from a norm consistent with full employment.

4. The Keynes Theory

By the mid-1930s Keynes had eventually arrived, he believed, at an understanding of what was wrong with the traditional approach and what was needed in its place. The short introductory chapter of the *General Theory* (1936) indicates a radical ("revolutionary") agenda:

> *"I have called this book the General Theory of Employment, Interest and Money, placing the emphasis on the prefix general. The object of such a title is to contrast the character of my arguments and conclusions with those of the Classical theory of the subject, upon which I was brought up and which dominates the economic thought, both practical and theoretical, of the governing and academic classes of this generation, as it has for a hundred years past. I shall argue that the postulates of the Classical theory are applicable to a special case only and not to the general case, the situation which it assumes being a limiting point of the possible positions of equilibrium. Moreover, the characteristics of the special case assumed by the Classical theory happen not to be those of the economic society in which we actually live, with the result that its teaching is misleading and disastrous if we attempt to apply it to the facts of experience."*

As Keynes saw the situation, the Classical theory failed to engage with the real world conditions of the time – it failed to provide a believable explanation of the major contemporary economic problem, that of high and persistent unemployment. The Classical theory was, in his opinion, incapable of comprehending what had gone wrong:

> *"In addition to "frictional" unemployment, it (the Classical theory) is also compatible with "voluntary" unemployment due to the refusal or inability of a unit of labour, as a result of legislation or social practices or of combination for collective bargaining or of slow response to change or of mere human obstinacy, to accept a reward corresponding to the value of the product attributable to its marginal productivity. But these two categories of "frictional" unemployment and "voluntary" unemployment are comprehensive. The Classical postulates do not admit the possibility of the third category which I shall define as "involuntary" unemployment."*
>
> (Keynes, 1936, p.6)

Keynes' explanation of the occurrence of *involuntary* unemployment depended on his identifying aggregate demand for output, *not* the conditions of labour supply, as the key determinant of the levels of production and employment within the economy. Aggregate demand was no longer treated as a "tame" variable, ultimately tied to the value of supply. Keynes argued that if there happened to be insufficient demand within the system to justify the full employment of the workforce, workers would find themselves, against their wishes, out of a job – without any action by them to alter their terms of employment. The problem was not, as Pigou viewed it, one of wages, but that of the volume of real planned demand for output. Involuntary unemployment occurs with want of demand relative to production capacity.

Keynes rejected both rationalizations previously offered for not worrying about the adequacy of aggregate demand. He saw aggregate demand as independent of supply, as an unstable and unreliable factor reflecting the planned expenditure of consumers and investors: there was no guarantee, as old authorities such as Ricardo and J. S. Mill had supposed, that the very act of production implied demand - that the value of planned expenditures would naturally and automatically match the value of output produced. Neither, Keynes argued, could reliance be placed on the neoclassical notion of the "interest rate mechanism": according to his new theory of liquidity preference, the role of interest rate was to reconcile asset preferences and demands in the financial markets, and not to equate the value of the flow of spending on new capital goods with the value of current saving.

This new conception of the working of the economy was expounded via a (then) novel macroeconomic model in which levels of output and employment depended on the total volume of demand, which was broken down into its aggregate component elements, the determination of each of which was analyzed. Keynes' 'consumption function' postulated, for the first time, a key link between current income and the volume of consumption spending. With consumption (and savings) dependent on income, Keynes was able to explain how the economy responded to changes in demand through changes in output and employment, and why such fluctuations in activity, although potentially severe, were nevertheless constrained within a certain range. In dealing with (and he emphasized that this was crucial) a world of uncertainty, Keynes attached particular importance – because of its potential instability - to investment as a critical component of demand, stressing the dependence of investment on subjective factors of confidence and expectations, factors liable to sudden and substantial revision. In times of particular uncertainty and perceived danger of loss, investors would avoid commitment to illiquid assets – such as new investment goods, preferring to keep their options open by reserving unspent money or borrowing power. The volume of effective demand, therefore, would fall and the initial contraction would amplify through the multiplier process.

In the Keynesian model of the income-expenditure system it was through changes in the level of activity that any imbalance arising between aggregate demand and the volume of current output was eliminated: output would (according to the circumstances) rise or fall, bringing the savings (leakage) from the circular flow of income and expenditure into balance with investment (injections), until planned investment and savings were again equal. Changes in output and employment were represented as the natural, equilibrating responses of the economy to changes in demand, not viewed as a temporary aberration.

5. Involuntary Unemployment

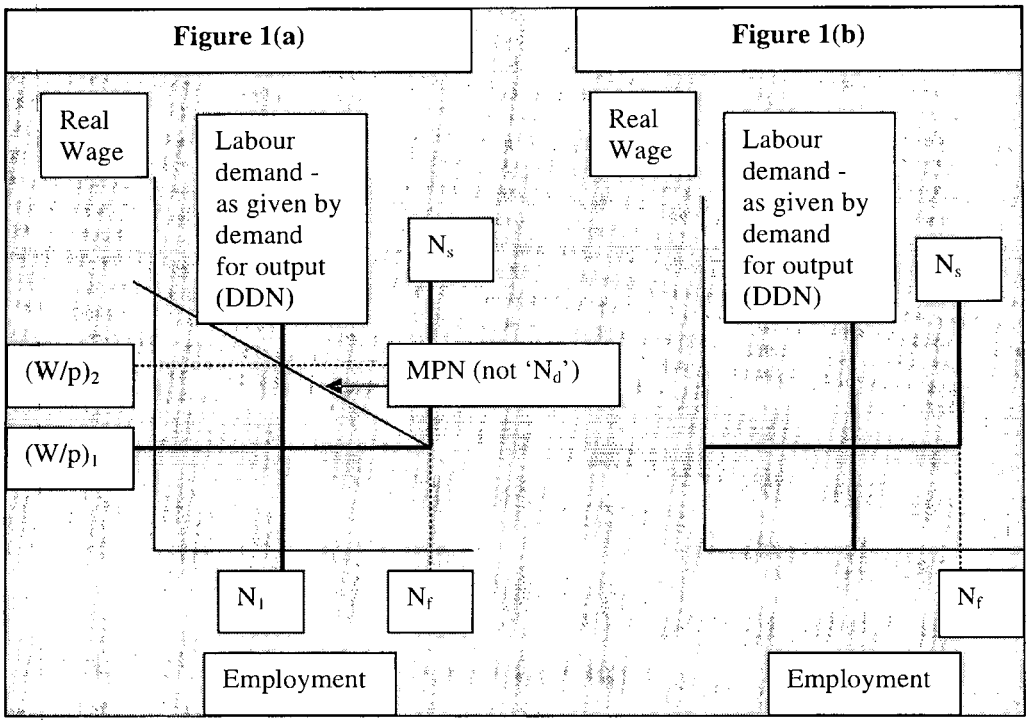
Let us now focus our attention on Keynes' concept of involuntary unemployment. Keynes' identification of this hitherto unrecognised category of unemployment follows directly from his abandonment of the old, complacent view that aggregate demand could be relied upon – at

least in due course - to match supply. As we have seen, Keynes emphatically rejected the notion of aggregate demand being a "tame" accompaniment of aggregate supply, determined by labour market conditions. What happens to output and employment reflects what is happening to the independent, potentially unstable, variable of aggregate demand. In explaining variations in employment, it is therefore necessary to look to conditions beyond the labour market – to the prevailing conditions in the product markets. Demand for labour, that is to say, is recognised as "derived demand" – derived from the demand for output which justifies the employment of labour in production. With a general deficiency of demand recognised as possible, the consequence of such a deficiency emerges in the labour market as involuntary unemployment. As Keynes saw it, this is something that happens to workers as passive victims: demand for output varies causing unemployment to rise or fall without the workforce having done anything to bring these changes about. Demand-deficient unemployment is strictly 'involuntary': in terms of the labour market diagram, labour is 'off its supply curve'. (See Figure 1 for the graphics of the Keynes model of the labour market.)

Consider firstly Figure 1(a). Quantities of labour demanded and supplied are measured along the horizontal axis and the real wage on the vertical axis. The labour supply curve is drawn with a reverse-L shape; this accords with the form suggested by Pigou, indicating that a given labour supply is available at a particular "stipulated" real wage rate. (As already mentioned, Pigou's diagnosis of the cause of high unemployment in the inter-war period was simply that labour was insisting on a rate in excess of that consistent with full employment.) The downward-sloping marginal product of labour (MPN) schedule is shown; in neoclassical terms, this is identified as the labour demand function, but in Keynes' terms, if such a curve appears at all, it indicates only a relationship between employment (as the independent variable) and wages (the dependent variable). The Keynes labour demand curve is the vertical line labelled "DDN" (derived demand for labour). A word of explanation is necessary here. Given that the demand for labour in Keynes model is a derived demand, employment is not determined endogenously (as it is in the neoclassical theory) within the labour market at the intersection of the marginal product of labour and labour supply schedules; from Keynes' perspective employment,

reflecting conditions in the product markets, need not be at the level corresponding to the intersection of these curves. In Figure 1(a) the level at which employment is established is indicated by the position of the vertical line DDN, which represents the constraint on labour demand, set by the state of demand in the commodity markets. In the Keynes model, DDN replaces the MPN curve as the 'labour demand function'.

Figure 1: Keynes Model of the Labour Market.



Consider the sequence of events brought about by a fall in effective demand for output. Starting with a situation of full employment ($N = N_f$), suppose a decrease in demand: the vertical line DDN shifts to the left, indicating a fall in the (derived) demand for labour. With the decline in economic activity, demand-deficient or involuntary unemployment emerges – seen in the diagram as the gap between the quantity of labour now demanded (N_1) and the quantity available for employment (N_f). In the *General Theory,* Keynes supposed that in these circumstances, as levels of production and employment are reduced, firms would be moving

down their positively-sloped short-run supply curves, so that, with fixed money wages and falling commodity prices, real wages would tend to rise [from $(W/p)_1$ to $(W/p)_2$]. He stressed that this increase in real wages was the natural consequence – a merely incidental side-effect - of the contraction of activity and was in no way a causative factor. In the opposite circumstances of expansion, with firms moving up their supply curves, prices would tend to rise, and with fixed money wages, real wages would fall to some extent. Again, this was seen as no more than a side-effect of the real causative factor, the change in conditions of demand for output.

Unfortunately, given the somewhat complicated rationalisation of the labour market situation that Keynes felt himself obliged to provide in the *General Theory*, commentators have sometimes – mistakenly – supposed that Keynes did associate changes in employment with changes in labour supply conditions, such that the labour supply curve was moving along the MPN schedule. Let us, in the interest of getting a clear picture of what Keynes actually had in mind with respect to this crucial matter, try to unravel this complication.

When writing the *General Theory,* Keynes was under the impression that, as predicted by standard neoclassical analysis, real wages would vary inversely with employment over the trade cycle. He thus presumed that when employment was falling, real wages would be rising, and, *vice versa*, when employment was increasing, real wages would be falling. While this may look as if Keynes was staying with the conventional neoclassical diagnosis that shifting labour supply conditions were responsible for increase and decrease in employment, he was *not* intending any such interpretation. What he did suppose was that workers would knowingly accept some (small) changes in real income over cyclical fluctuations without varying the amount of labour they offered for employment. That is to say, with a recession developing, workers (if still in employment) would (naturally) accept any small reduction in the cost of living they happened to experience: in these circumstances, the supply of labour would not be expected to increase. Correspondingly, with job conditions improving in recovery, workers would not resist some (slight) increase in the cost of living brought about by a general tendency of prices

to rise, a tendency affecting everyone. Neither under conditions of falling or of rising employment did Keynes suppose conditions of labour supply to be altering. He was quite definite that changes in employment occurred because of changes in the demand for labour, and not because of changes in the terms of labour supply.[3]

An account along these lines was given by Keynes in the *General Theory*. However, questions were soon asked as to whether real wages actually did move in the counter-cyclical manner predicted by the standard theory. Investigation revealed not only that the empirical record did not support the neoclassical prediction, but that Keynes, relying on Alfred Marshall's report on the issue, had been misled by Marshall's selective interpretation of the evidence available.

We need to return to Figure 1, specifically to Figure 1(b). Figure 1(b) depicts the simplified scenario which, in the light of new evidence, Keynes was, by 1936, prepared to accept. It appeared to be the case that, over cyclical fluctuations, no inverse relationship between employment and real wages as had been presumed to exist, actually did exist. That being so, Keynes realised that there was no need to tell the complicated story, told in the *General Theory*, of real wages and labour supply, as had then been deemed necessary to accord with the supposed facts of the matter. If no regular cyclical variations in real wages had to be accounted for, Keynes could tell a much more straightforward story – *that employment varied with changes in demand for output.* With no wage changes involved, there would then be no room for any misunderstanding that Keynes believed labour supply changes went along with changes in employment. Although the 1939 story was simpler than the 1936 version, the concept and explanation of involuntary unemployment remained, in principle, exactly as before. In both of Keynes' accounts, involuntary unemployment occurred because the demand for labour altered relative to a given supply of labour.

[3] As represented in the diagram (Figure 1a), the assumed indifference of the labour force to changes in the real rate of wages over these fluctuations in demand and employment, the horizontal section of the labour supply curve could be represented by a broad band covering the area between $(W/p)_2$ and $(W/p)_1$ – indicating the supply of labour to be unaffected, *in the postulated circumstances*, by wage changes within these limits.

It is clear that by 1939 there was no excuse for hanging on to the old Classical idea that, for employment to vary in the short run, the labour supply curve must shift to permit a necessary alteration of the real wage; nevertheless, seventy years later, that idea still seems very much to be at the fore in mainstream textbook literature.

In the *General Theory,* Keynes turned the traditional theory of output and employment on its head - his key theoretical insight – with direct policy relevance - being that within the economy the line of causation runs from conditions in the product markets to the situation in the labour market, and not – as traditional theory presumed - *vice versa.* Most importantly, the dominant economic problem of the day was recognized as one of *involuntary* unemployment, with its resolution to be found in stimulating aggregate demand, not in cutting wages.

6. After Keynes

In due course, indeed pretty quickly, the Keynesian theory became established as the new orthodoxy: a completely novel body of economic analysis – modern macroeconomic theory - developed. Prominent in this new literature was the Hicks (1937) - Hansen (1953) IS/LM model which, integrating the income-expenditure and monetary elements of Keynes' system in a convenient diagram, was generally accepted as satisfactorily representing the essentials of the Keynesian conception. For more than thirty years, certainly until the late 1960s, Keynesian theory, although not unchallenged, formed the basis of mainstream macroeconomics.

The challenges to mainstream Keynesian orthodoxy that emerged in the first thirty odd years, although coming from sometimes hostile traditionalists, nevertheless implied acceptance of the essential Keynes proposition that aggregate demand was what mattered with respect to the determination of output and employment. The fact that attention was directed to the state of aggregate demand rather than, as in earlier times, to the level of real wages or to disparity between the "natural" and money rates of interest, indicated just how generally and profoundly thinking had been changed by the publication of the *General Theory.*

7. The 'Wealth Effect'

One critical line of argument explored by theorists, reluctant to accept the revolutionary Keynesian implication that the economy lacked any reliable "self-righting" capability, was built on the notion of a "wealth" or "Pigou effect": providing a possible automatic rescue-mechanism for an economy sunk in heavy unemployment. The thesis was that lower prices would increase the real value of the nominal money stock, thus generating a positive wealth effect on household spending; if, the argument went, prices could fall far enough, then aggregate demand would be boosted to full employment level, regardless of any liquidity trap or interest inelasticity of investment demand. It was, however, explicitly recognized by theorists who investigated the potential of this real-balance mechanism (Pigou himself, Patinkin - not to mention Keynes, who had earlier given careful attention to the possible consequences of deflation) that the weakness of the wealth effect on consumption, and even more importantly, the *negative* effects on demand – rising indebtedness, expectations of further deflation - likely to result from a *process* of deflation, ruled the real balance effect out of court as a practical equilibrating mechanism. It was agreed that a decline of money wages in a depression might well make things worse rather than better. Patinkin's summing up on the issue is worth noting (Patinkin, 1959):

> *"The automatic adjustment process of the market is too unreliable to serve as the practical basis of a full-employment policy. In other words, though the real balance effect must be taken account of in our theoretical analysis, it is too weak – and, in some cases, too perverse – to fulfill a significant role in our policy considerations."*

Despite Patinkin's emphasis that the dynamic complications of a deflationary process implied a critical question about the *stability* of equilibrium, all too often in recent macro theorizing, his caveat about the attainability of equilibrium has simply been ignored and replaced by a facile presumption that downward price flexibility is enough to ensure full employment.[4]

[4] In the light of such "Pigou effect"/ pro-deflation arguments in the macro literature, it is ironic that the Japanese authorities, trying to achieve recovery, are extremely anxious to

8. The AD/AS Model

Over the last thirty or forty years the macroeconomic theory presented in mainstream textbooks has undergone a key change. The adoption of AD/AS as the expository model of choice – taking the place previously occupied by IS/LM - has provided the vehicle by which a pre-Keynesian conception of the working of the macro system has been imported into, and established within the mainstream of textbook teaching. Utilization of AD/AS has not only brought a powerful resurgence of pre-Keynesian modes of thinking, it has had the further effect of obscuring and confusing the issue as to the nature of the fundamental difference of vision which separates the Keynesian and Classical conceptions.

The principal contemporary challenge to the Keynes theory comes from the resuscitation, via the AD/AS model, of neoclassical employment theory of the pre-Keynesian sort.[5] This strand of thought probably goes back to Phelps' (1967) and Friedman's (1968) reinterpretation, in the era of "stagflation", of the (short-run) Phillips curve as showing employment changes as a function of price and wage changes, rather than *vice versa*. The thesis advanced by Phelps (1967) and Friedman (1968) was that the negatively-sloped Phillips curve relationship, as they interpreted it, obtained only in the short run on account of wage rigidity or temporary misperceptions by the workforce about the real value of money wages. It was argued that, in the longer term, with these disturbing factors absent, spending changes would have an effect only on prices and not on employment and output. From this treatment of prices, wages and employment the now conventional macroeconomic aggregate supply (AS) curve was developed - the AS curve being shown as positively-sloped in the short run if wage rigidity or errors were taken to apply, and vertical in

escape deflation. The recent Japanese experience of deflation (prices actually falling) must surely have gone some way to disabusing macroeconomists of the previously held notion that a process of deflation can be regarded as a route to recovery from recession. A falling price level, far from boosting demand, may bring a cumulative worsening of the situation as the incentive not to spend becomes progressively stronger.

[5] Critics of the fashionable AD/AS model include Barro and Grilli (1994); Colander (1995); Grieve (1996; 1998); Moseley (2009); Nevile and Rao (1996); and Rao (1991; 1998; 2007).

the long run when "proper" responses to demand disturbances were supposed to be made.

This account of fluctuations in employment and output, told in terms of short and long run AS curves, is of course based on the old pre-Keynes conception that employment is determined in the labour market at the point of intersection of the labour demand (marginal product of labour) and labour supply schedules. From this perspective, variations in employment can occur in the short run only if conditions of labour supply alter (i.e. if, in terms of the familiar diagram, the labour supply curve shifts); if these conditions do not change, no matter what happens to aggregate demand, employment and output will not be affected. Such a representation of the labour market has no room for the notion of involuntary unemployment, with labour "off its supply curve" on account of a deficiency of demand for output. Likewise, for the validity of this labour market model it is required that Say's Law holds good: any increase in labour supply (rightward shift of the supply curve) must automatically be accompanied by a corresponding increase in the demand for output. Thus, the presently fashionable macroeconomic AS curve represents, without any doubt, a reversion to a pre-Keynes conception of the working of the labour market.

The other element of the current AD/AS model, the AD function, is, from a Keynesian viewpoint, equally suspect. As already mentioned, the original proponents of a wealth / real-balance effect never imagined that a significant and reliable functional relationship existed between changes in the price level, particularly in the downward direction, and effective demand for output. It was disregarded as of negligible practical significance. But nowadays, in the neoclassical macro literature, the downward-sloping AD curve is presented, *without qualification or reservation*, as representing (just as reliably as the downward-sloping demand curve for an individual commodity) a functional relationship between the level of prices and aggregate demand. It is not that those who make use of this function have considered, and found an answer to, the problems of which earlier writers were aware – the fact of the matter is that these difficulties with the AD function have simply been ignored. Nevertheless, in contemporary neoclassical macro theory, this

questionable AD curve (as a component of the AD/AS model) comes to represent the Keynesian contribution.

There is a further, fundamental problem with the AD/AS model. Not only are the individual AD and AS curves, each by its very nature, suspect; it turns out that it is not logically possible to combine them into one model. The incompatibility of the curves – the impossibility of their being brought together as component parts of a single, coherent model becomes evident when we understand that neither curve is actually what it purports to be. These curves are *not* - despite the labels attached to them - macroeconomic equivalents of the demand and supply functions of micro theory.

AD derived from IS/LM is not a demand function at all: what it actually shows (putting aside the unconvincing nature of the postulated relationship) is a relationship between price level and the *equilibrium level of activity*, rather than between price and *demand*. It has been suggested (Colander, 1995) that this function may more properly be designated an "aggregate equilibrium curve", since it depicts possible states of macroeconomic equilibrium according to the level of prices, *ceteris paribus*. If we return to the neoclassical AS curve, it will be observed that it is also, in effect, an "aggregate equilibrium curve", as it too depicts possible price level-output combinations at which the economy might be in equilibrium with aggregate demand equal to aggregate supply. (As labour market model implies the validity of Say's Law, it must be the case that for every price level, real wage rate, and state of labour supply represented along the curve, demand for output must be such as to justify that level of employment.)

When the two curves are set together to form the standard AD/AS model, we have – quite literally - a theoretical nonsense. Each curve in itself, each being in its own terms an "aggregate equilibrium curve", indicates an equilibrium state of the economy in terms of output and the price level. The two curves cannot in fact properly be put together - the fashionable AD/AS model is in fact an illegitimate attempt to combine the incompatible.

As we have already said, there is no way by which these two stories of the determination of output and employment across the economy can be put together as components of a coherent model: any attempt to do so can only produce (quite literally) nonsense. In an earlier paper the present author (Grieve, 1998) cited Barro and Grilli's (1994) succinct verdict on the AD/AS construction. It remains worth quoting.

> *"The main problem with the AS/AD framework is that the various pieces of the analysis are contradictory. The AD curve reflects the underlying IS/LM model . . . The AS curve assumes that producers (and workers) can sell their desired quantities at the going price, P. That is why the quantity supplied rises when P increases relative to P^e (the expected price level). This set-up is inconsistent with the Keynesian idea – present in the IS/LM model and therefore in the AD curve – that producers and workers are constrained by aggregate demand in their ability to sell goods and services."*

9. The AD/AS Model Is Unusable

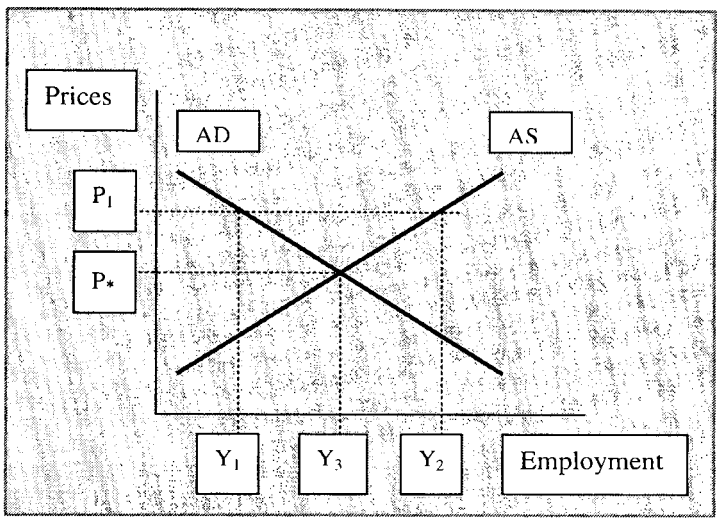
If the AD/AS model is not self-consistent – and it is not - attempts to employ it in macroeconomic exposition cannot but run into trouble. The construction is essentially unusable. Consider a couple of illustrations.

The application of AD/AS to demonstrate the short and long term effects on output and the price level of demand or supply-side shocks to the system is of course routine. It is explained in such cases that when an existing equilibrium situation is disturbed, excess demand or supply emerges, prices and quantities adjust, and eventually a new equilibrium is established – presumably, in the longer term, with employment again at the "natural rate" and the price level higher or lower than before.

Moseley (2009) has drawn attention to the inconsistency revealed when attempts are made to model out-of-equilibrium states in terms of the AD/AS diagram. Take a situation (see Figure 2) such that the going price level (P_1) is understood to exceed the equilibrium price level (P_*) at which AD and AS intersect. Note what the diagram indicates *AD and AS are read as being what they are – aggregate equilibrium curves.* According to AD, at P_1 output is Y_1 and at the same time, according to AS, with price at P_1, output is Y_2. Remembering that quantities of Y measured along the

horizontal axis are not in fact quantities demanded (corresponding to a demand function) as distinct from quantities supplied (corresponding to a supply function), but quantities of output at which aggregate demand is equal to aggregate supply, the model depicts a nonsense situation. Output cannot simultaneously be Y_1 and Y_2. Furthermore, analysis of adjustment to the equilibrium envisaged as attainable at (P_*, Y_3) is precluded by the indications that for the equilibrium level of price (P_*) to be attained, inspection of AD indicates that output must rise, while inspection of AS implies that to reach P_*, output must fall. The model evidently makes no sense. With the curves interpreted as loci of aggregate equilibria, "equilibrium" and "disequilibrium" have no meaning with respect to relationships between AD and AS. It is of course the (attempted) embodiment within the same construction of two incompatible aggregate equilibrium curves that generates this incoherence.

Figure 2: AD/AS Diagram



Alternatively, suppose AD/AS show a state of full employment equilibrium, with P and Y established as corresponding to the intersection of AD with the long-run (vertical) AS curve. In this case, both curves – both underlying theories of output and employment – predict equilibrium at the same P, Y combination. But even that state of affairs doesn't imply

compatibility of the two parts of the AD/AS model – the correspondence of predictions is merely coincidence: the underlying theories and explanations of how the economy is in the position in which it is are at odds with each other. The account implied by AD is that aggregate planned demand – as determined by confidence and expectations – happens to be consistent with the output produced by the fully-employed workforce; the quantity of labour offered for employment being taken as given. On the other hand, the theory reflected in the AS curve explains the full employment state as the outcome naturally to be expected when, within the labour market, adjustment to a full equilibrium is inhibited neither by wage stickiness or misunderstanding regarding the real value of money wages. In other words, the workforce has ensured its full employment by adopting the appropriate 'wage policy'. This ambiguous, incoherent, analysis can be of no value as an aid to understanding the working of the economy.

10. Working with AD/AS: Extremely Dirty Pedagogy

The incoherent character of the AD/AS model poses insuperable difficulties to using it – as it stands – as a teaching aid. Yet it is widely used in the textbooks. Its employment is made possible by – not to put too fine a point on it - what can only be described as very dubious means. Textbook authors have displayed considerable ingenuity in adapting to what would appear to be an impossible situation and devising ways of working with – or perhaps we should say, of appearing to work with - the AD/AS construction.

One dodge, by which textbook authors have sought to make AD/AS usable is to treat the model as if comprised of demand and supply functions, analogous to micro demand and supply curves, showing quantities demanded and supplied, not aggregate output, as functions of price (Mankiw, 2000; Gordon, 2006; Froyen, 2008).

This procedure has been defended by Kennedy (1998) as perfectly proper "dirty pedagogy". Simplifying, the dodging of complications ('dirty pedagogy') may be legitimate as an introductory means of conveying the essence of difficult theories. What, however, is involved here, using diagrams labelled in terms of AD/AS but at the same time telling a 'story'

which interprets the curves as indicating demand and supply as functions of price, and not – what AD and AS, as derived, really do show, and what they are labelled as showing - goes, we judge, beyond all legitimate bounds. Confusion is inevitable. If textbook authors can only manage to make use of the AD/AS model by, in effect, abandoning the foundations on which it is built and pretending that it is something other than what it actually is, they would, it is suggested, be better advised simply to scrap the construction.

To pretend that AD and AS are just ordinary micro demand and supply functions writ large is one 'fudge' by which textbook authors seek to get round the obstacle that, in attempting to combine within one framework two incompatible theoretical visions, the AD/AS model is inevitably incoherent and unusable. Another strategy (fudge) adopted by textbook writers (who may not, in fact, appreciate fully what they are doing) for coping with that problem is to focus on just one of the two macro theories embodied in the AD/AS construction, thereby pushing the incompatible alternative theory out of the picture. This outcome is of particular significance to our review of developments in the field of macroeconomics: what in practice happens with 'storytelling' in terms of AD/AS is that the pre-Keynesian (Classical) theory of output and employment, as embodied in the AS curve, comes to the fore, while the Keynesian theory (unsatisfactorily represented by the AD curve) is, to all intents and purposes, neutralised. Real effective demand as the key determinant of the level of activity (and with it the concept of involuntary unemployment) falls out of the picture: the conclusion generally presented is that in the long term, given wage and price flexibility, the economy can be expected to adjust to the 'natural rate' of unemployment as determined by the conditions of labour supply.

Consider "storytelling" via the AD/AS model. To make the model usable – although the reader is not warned of the trick being pulled - the curves are (as is the textbook convention) treated as being ordinary micro-type demand and supply functions. Starting from an equilibrium position with employment at the 'natural rate', a disturbance, typically an increase in the money supply, is postulated so that the AD curve shifts to the right, giving a temporary equilibrium with higher prices and output somewhere

up the positively-sloped short run AS curve. The interpretation is that with increased spending, money wages – either because of misperceptions or of institutionally determined stickiness[6]- fail to keep pace with rising commodity prices. As real wage falls, employment (determined at the point of intersection of the marginal product of labour and labour supply schedules) and output increase. Subsequently, over time, money wages adjust to the rising cost of living, causing prices to rise further, but eventually money wages catch up on prices, bringing the real wage and employment back to their original levels. Equilibrium is restored when prices and money wages have risen sufficiently to bring the real value of monetary expenditure back into line with the quantity of output produced when employment is at the natural rate. Here, we have sketched a story in terms of a temporary boost to activity – which is how it is usually told in the textbooks – but of course an equivalent story can be told of a negative shock and recovery, with falling real wages serving to increase employment and a falling price level bringing the real value of expenditure back to the full employment level.

This analysis, employing the theory built into the AS curve - whichever way the story goes - evidently constitutes a straightforward pre-Keynes account of the occurrence and resolution of a temporary deviation from the normal state of full employment. Variations in employment are explained as due to temporarily shifting conditions of labour supply; price level adjustments keep the real value of spending in line with the employment at the "natural rate".

What has happened to the Keynesian theory of demand? Note that the only thing the story just presented requires, with respect to demand (given its tacit, Say's Law, underpinning), is merely some relationship to link together the price level, real balances and spending. In fact (in terms of the graphics) a simple quantity theory rectangular hyperbola would do the needful, predicting the extent to which the price level must rise to achieve the equilibrium real value of spending. In the AD/AS model, we have instead the AD curve, but all that curve is left to do is play the secondary role of determining the magnitude of the change in prices necessary to

[6] Mankiw (2000) suggested four possible factors for making an imperfect supply side response: sticky wages, sticky prices, misperceptions concerning wages, misperceptions concerning prices.

match the real value of monetary spending with the level of output as determined in the labour market. There is no place here for an alternative theory which explains employment as determined by a factor independent of supply conditions in the labour market – that is to say, by real effective demand. While the AD curve is of course notionally based on Keynesian foundations, as it is used in this context, its Keynesian ancestry is effectively neutralised: the only message it carries here is that total expenditure is a 'tame' variable, the real value of which can always be reliably adjusted by appropriate change of the price level to accommodate whatever volume of output, corresponding to the given conditions of labour supply, is offered for sale on the market.

Having thus arrived at a traditional, "Classical" understanding of the determination of employment and output, we might as well then forget about the notion of planned real demand being something of significance. With Keynes theory 'crowded out' of the story, out also goes the concept of demand-deficient involuntary unemployment; whatever employment is envisaged from the perspective of the AD/AS model can only be frictional (presumed in time to be self-correcting) or voluntary.

We have, it would appear, returned to this pre-Keynes vision of the working of the macro economy not because the Keynesian theory has been assessed and found wanting on theoretical or empirical grounds – not at all. Rather it seems to be the case that we have drifted into this position through failure to understand just what differentiates the Keynesian from the Classical theory (The erroneous classifications of ideas as "Keynesian" or "Classical", all too frequently found in the literature, testify to a lack of proper awareness of the positions actually held by earlier writers – Keynes included). Authors who should have known better have been happy to adopt the old Classical labour market theory of unemployment as embodied in the AS curve, and, apparently seeing its use as allowing the analysis to be extended beyond the fix-price world of IS/LM, supposed it possible to accommodate that model with the Keynesian theory of effective demand. AD/AS thus found its way into the literature in the guise of a synthesis of the Keynesian treatment of demand with a complementary analysis of supply. But once AD/AS is brought into play, with the emphasis on supply-side behaviour, the analysis inevitably

takes on a Classical character. As we have seen, once fluctuations in employment and output are attributed to misperceptions or wage stickiness, no room is left for the Keynes theory that it is the state of effective demand and not problems with the terms of labour supply that matters.

11. Further Terminological (And Conceptual) Confusion

So, AD/AS derived from different and incompatible theoretical bases, when put to use in contemporary textbooks, manages in practice to lose from sight the Keynesian tradition of macro theory and leave us with a single analysis of a 'Classical' character. Let us conclude this discussion by noting an unfortunate quirk of misinterpretation which results from this situation, and which illustrates the powerful potential for confusion generated by the use of AD/AS. Given that, according to the standard exposition via AD/AS, the only theoretical game in town is the essentially pre-Keynesian conception that employment is determined within the labour market (at intersection of MPN and labour supply schedules), and given too an awareness that some difference of view exists between 'Classical' and 'Keynesian' perspectives, we consequently find the term 'Classical' interpreted as denoting a pre-Keynesian conception which supposes perfect price flexibility, and the term 'Keynesian' taken to mean (again) a pre-Keynesian conception (there being no alternative model available) but in this case a pre-Keynesian conception which assumes a degree of inflexibility of money wages and/or prices.

Thus, for instance, we find the authors of well-regarded textbooks using the adjective 'Keynesian' to describe, in contrast to a 'Classical' system characterised by perfect wage and price flexibility, an economy with sticky wages and/or prices which, following a disturbance, takes some time to return to full employment.

> *"The Classical supply curve is based on the belief that the labour market works smoothly, always maintaining full employment of the labour force. Movements in the wage are the mechanism through which full employment is maintained. The Keynesian aggregate supply curve is instead based on the assumption that the wage does not change much or at all when there is unemployment, and thus that unemployment can continue for some time."*
>
> (Dornbusch and Fischer, 1990, p.225)

> *"We can now see the key difference between the Keynesian and Classical approaches to the determination of national income. The Keynesian assumption . . . is that the price level is stuck . . . the Classical assumption that the price level is flexible . . . The price level adjusts to ensure that national income is always at the natural rate. The Classical assumption best describes the long run . . . The Keynesian assumption best describes the short."*
>
> (Mankiw, 1994, p.275)

We suggest that such remarks reveal a lamentable want of historical awareness. It may be appropriate therefore to conclude these notes on the AD/AS model and the consequences of its uncritical use by drawing attention to some observations deriving from an earlier era – the thoughts of a distinguished authority - on the subject of how the economy responds to macroeconomic disturbances. Note how closely the views of this earlier author correspond to what modern textbooks identify as the 'Keynesian' version of macroeconomic theory. Before going any further, we ought to say that the authority we are about to quote is Professor Pigou, whose 1968 work *The Theory of Unemployment* Keynes described as 'the Classical theory in its most formidable presentment'.

It is of some interest and significance to set Pigou's views on the attainment of long-run equilibrium of the economy, together with what he has to say about short-term responses to macroeconomic disturbances, against modern analyses of the same issues.

With regard to long-run equilibrium, Pigou held that the employment situation depended, given production conditions, simply on the terms of labour supply. In the short run, with changes occurring in demand for final output, disequilibrium was to be expected, but in the longer term,

once things had settled down, provided there existed 'free competition' in the labour market, real wages would be sure to have adjusted to the value appropriate to 'nil unemployment'.

> *"Changes in the state of demand (for labour) are, of course, relevant, but, once any given state of demand has become fully established, the real wage-rates stipulated for by workpeople adjust themselves to the new conditions."*
>
> (Pigou, 1968, p.248)

(As already mentioned, the peculiar problem of the inter-war years, according to Pigou, was that in the absence of perfectly free competition in the labour market, the 'wage policy' chosen by labour was such as to fix the real wage at a level too high for the achievement of 'nil unemployment').

So, as regards the long run state of affairs, Pigou's view would seem to accord with the modern neoclassical belief that the free working of the labour market will establish the 'natural rate' of unemployment. With respect to the short term, again the Pigouvian theory is echoed in contemporary thinking on unemployment. What we find in Pigou is an account of just the sort of stickiness in wage adjustment which, in the present-day textbook literature, is viewed as the distinctive characteristic of the Keynesian analysis. Here Pigou (1968) is explaining how money wage stickiness amplifies the impact of spending changes on employment: 'There is', he remarks, 'always a resistance on the one side or the other to wage changes appropriate to demand changes.' He refers to what he calls 'factors of inertia' operating on both sides of the labour market: these make employers reluctant to raise wage rates when conditions improve, and employees resistant to wage cuts when activity is declining.

> *"Thus, except in periods of very violent price oscillations, employers in general fight strongly against upward movements in money rates of wages and workpeople themselves against downward movements. Money wage-rates show themselves highly resistant to change."*

So much for the assumption of perfect wage and price flexibility typically attributed by textbook authors to the Classical writers. Pigou (1968) continues:

> *"These factors of inertia, which, in an economy where wage-rates were always contracted for in kind, would tend to keep real wages stable in the face of changing demand, in a money economy tend to keep money wages stable. . . . In general, the translation of inertia from real wage-rates to money wage-rates causes real rates to move in a manner not compensatory, but complementary, to movements in the real demand function. Real wage-rates not merely fail to fall when the real demand for labour is falling, but actually rise; and, in like manner, when the real demand for labour is expanding, real wage-rates fall."*

Compare the above with the textbook (AD/AS model) account of labour market adjustment with sticky wages – presented as a specifically Keynesian scenario. But here we find in *The Theory of Unemployment* an eminent pre-Keynesian Classical author – perhaps the pre-eminent Classical authority on the matter – offering the same sticky-wage explanation of the occurrence of temporary unemployment as in the present-day textbook literature is attributed to Keynes. It is as if Keynes' whole devastating critique of "Classical" thinking on macroeconomics had never been. The quite extraordinary thing is that the textbooks employing AD/AS not only succeed in losing the Keynes theory, they even manage to tell their readers that the Pigou theory – which was the direct target of Keynes's attack in the *General Theory* – is the Keynes theory.

12. Conclusions: 'Right Back Where We Started From'

The above phrase succinctly makes the point of this paper: that despite the supercession seventy years ago of traditional "Classical" macroeconomic analysis by Keynes' revolutionary new theory, in the contemporary textbook literature, dominated by the AD/AS model, the old ideas of the pre-Keynes era are enjoying a revival. Into the bargain confusion exists as to the characteristics of the rival Keynes and Classical visions.

These old ideas were in their time found unable to provide adequate understanding and guidance to policy-makers. There is no reason to suppose that the present day version of that conventional wisdom, as expounded via the AD/AS model, is any more able to supply a relevant

theoretical foundation on which understanding of current problems can be based.

Once again the false optimism of the Classical theory informs the mainstream vision of the working of the macro economy. Once again it is being taught that the natural state of the economy is one of full employment. Unemployment is represented as an essentially short-run, frictional phenomenon occurring only if the supply-side response to changes in spending is imperfect: when in due course the errors in question are corrected and the rigidities relaxed, activity and employment are expected to return automatically to their "natural" (full employment) levels. There is no room here for the idea of involuntary unemployment, persisting as long as demand for output is depressed by want of business and consumer confidence. Fortunately, however, it appears that in the current crisis policy-makers have not been content to rely on the AD/AS model's prediction that market responses to a macroeconomic disturbance will readily return the economy to the "natural rate". The fact that in order to generate additional demand, substantial fiscal intervention (to an unprecedented degree by the US government), accompanied by monetary expansion, have been considered essential and suggests a lack of faith in the facile predictions of the standard textbook model.

The AD/AS model implies also that the consequences of a sharp monetary contraction can be countered by a fall in the price level sufficient to make up for the reduced real value of the money supply and of nominal spending. As we have seen, the conventional analysis (despite objections powerfully expressed) finds no problem – indeed quite the opposite - with the notion that deflation is capable of boosting the real value of spending to the full employment level. The theoretical recommendation seems totally out of touch with reality: the dangers of deflation are completely ignored. From a different perspective, the urgent desire to *avoid* deflation, expressed by those concerned about the practicalities of macroeconomic management in current circumstances, is strikingly at odds with the textbook recommendation. Note the following observations by an informed commentator on the Japanese experience (Makin, 2006):

> *"Deflation is dangerous. The nightmare of a deflationary spiral arises from the fact that when prices fall more rapidly, the real cost of borrowing rises. With a zero interest rate and 1 percent deflation, the real cost of borrowing is 1 per cent. If inflation intensifies to 2 percent, the real cost of borrowing rises to 2 percent, while the demand to hold cash strengthens because the rise in deflation represents a rising, risk-free, tax-free return on cash. The move into cash further depresses spending and thereby further intensifies deflation. The real cost of borrowing keeps rising, imparting an accelerating drag on the economy. . . . As noted, a deflationary spiral produces a sharp increase in the demand for liquidity that, if not satisfied by the central bank, will be satisfied by households and businesses selling goods and services, thereby intensifying the deflationary spiral."*

We conclude (1) that there is no doubt that use of the AD/AS model is dragging macroeconomic analysis backwards into a past era; and (2) that, in consequence of this retrogression, the conception of the working of the macro system all too often propounded in the textbooks is of little relevance – and is recognized as such - for the purposes of understanding and tackling contemporary macroeconomic problems.

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Terrorism and Economic Growth: A Case Study of Pakistan

Muhammad Nasir, Ankasha Arif, Faiz Ur Rehman and Muhammad Salman Tariq *

Abstract: Terrorism has become a burning issue, capturing the attentions of everyone ranging from the general public to scholars. Researchers from all fields of academia have identified various reasons for the origin of this problem. Economists too are actively involved and have contributed tremendously to the literature on this issue. One school of thought, led by Gurr (1970) believes that economic conditions such as lower income and relative deprivation are the basic causes of terrorism. On the other hand, it is believed that terrorism has a negative impact on economic growth. Theoretically, through the channel of domestic and foreign direct investment it can affect long term growth. Looking at the current scenario in Pakistan, which is a victim of some of the worst terrorists attacks in the form of suicide attacks in great numbers as well as facing a declining growth, it is important to find out whether there exists any causality between terrorism and economic growth or vice versa. For this purpose we apply VAR model as well as other causality tests with the inclusion of important control variables identified in literature for the time period 1972-2006. Interestingly, we find that neither unidirectional nor bidirectional causality exist between terrorism and economic growth in Pakistan.

Keywords: Growth, Causality, Foreign Direct Investment
JEL Classification: O4, C1, F2

1. Introduction

The massacre of September 11, 2001 has drawn the world's attention to a new challenge known as terrorism. The policies of many countries

* The authors are, respectively, Lecturer, Department of Economics, Kohat University of Science and Technology, Kohat; M.Sc. student and Lecturer, Department of Economics, Quaid-i-Azam University, Islamabad, and M.Sc. student, Pakistan Institute of Development Economics (PIDE), Islamabad. The email address of the corresponding author is nasirawan84@yahoo.com
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changed such that along with the aim of achieving macroeconomic sustainability, the countries have to redirect their budget towards the control and the damage caused by violent attacks. Terrorism also spoils the image of countries irrespective of whether the factors causing such activities are internal or external. Furthermore, economic activities in many countries are badly affected by these incidents. Foreign direct investment and local investment in these counties have not increased to the extent they should have been owing to the uncertainty caused by terrorism.

In a country like Pakistan where there is already a shortage of funds in nearly all sectors, now budget has to be allocated towards safety measures as well. Security measures at borders and within the country are big concerns these days. Pakistan is viewed as a country providing shelter to terrorists without any evidence and as a place where any incident can occur at any time. In addition, the concept of religious extremism is weakening our international standing. Because of this, the confidence level of the world in our country has decreased tremendously.

Unfortunately, on the one hand, Pakistan is a prime victim of terrorism; on the other hand, the performance of its economic variables is not heartening either. This leads one to assume that there may be some causal relationship between economic performance and terrorism. There is an increasing debate on the degree of terrorism affecting economic growth and whether economic growth can help reduce terrorist activities or not. It is commonly believed that with an increase in economic activities, per capita income of the residents of a country increases and, hence, increases the opportunity cost of those involved in terrorist activities. This, consequently, leads to a reduction in terrorism. Hence, growth is expected to affect terrorism negatively.

It is also believed by researchers that an increase in terrorist activities has a negative impact on the economic performance of a country since incidents of terrorism reduce the flow of foreign direct investment as well as destroy the tourism industry. Thus, these days, terrorism is a very important and complicated issue for Pakistan and the well-being of the people of this ill-fated country in the current scenario is a vital issue. The above reasons motivate us to investigate the impact of terrorism on growth as well as the effect of growth on terrorism in Pakistan. In

addition, different control variables are also included in our analysis to check the relationship between terrorism and growth in the presence of these control variables.

2. Literature Review

There are mainly two schools of thought regarding the cause of terrorism. Gurr (1970) leads one, while Tilly (2004) leads the other. Gurr (1970) is of the view that "relative deprivation" is the main cause of terrorism. Tilly (2004), on the other hand, believes that political structure is related to violent activities. Hamilton and Hamilton (1983) in their study of sixteen countries for the period 1968-1978, find that the probability of an increase in violent activities increases when the country is poor, has less educated and repressed masses and is democratically open. In another study, Muller (1985) finds out that political violence is affected more strongly by income inequality, the inverted U-curve effect of regime repressiveness. Muller and Seligson (1987) find that political violence is aggravated more by unequal income distribution instead of unequal land distribution. Landon and Robinson's (1989) study was based on fifty-one developing countries from 1968-1972. They found that multinational companies have an important role in creating income inequality in the domestic economy, which causes political violence in that country. Schock's (1996) findings are important in that he concludes that separatist potential and economic inequality and weak political structure have a strong positive impact on political violence.

Enders and Sandler (2000) investigated the impact of terrorism on net foreign direct investment in the cases of Spain and Greece. They found that terrorism has a large negative significant impact on net foreign direct investment. Improvement in the degree of civil liberty and independence of the bureaucracy affect investment greatly and economic growth is influenced in the short run by confiscation risk and political terror, whereas in the long run, corruption affects it badly. Results suggest that advancement in economic security has the tendency to raise the private investment by 0.5 to 1 percent of GDP in short and medium term and up to 0.5 to 1.25 percent in the long run. Collier and Hoeffler (2001) examined the reasons of civil wars between 1960 and 1999 and found that provision of opportunity is more accountable than grievances for

rebellion. Krueger and Maleckova (2003) collected primary data from 1357 Palestinians through public opinion polls in West Bank and Gaza Strip in 2001. They pondered over the link between education, poverty and terrorism and found that people who were living above the poverty line and were educated, participated more in Hezbollah. In an empirical study, Abadie (2004) computed different measures of "terrorism risk" for the years 2003-04. He found that political freedom, along with some geographical and climatic factors, is a significant but non-monotonic determinant of terrorism. Testas (2004) found that income per capita, literacy, state repression, and civil war are important determinants of transnational terrorism in thirty-seven Muslim countries.

Eckstein and Tsiddon (2004) investigated the consequences of terror on the Israeli economy by using VAR model. The study revealed that terrorism reduces output, investment, net exports and consumption. Government revenues are directed more towards security provisions instead of other programs which could help the economy prosper. Private investment and consumption is crowded out. Per capita output would have been 10 percent higher in Israel if security concerns were not there. Terrorism has both short and long run impacts. The impact of development on domestic and transnational terrorism in 179 countries was investigated by Bloomberg and Hess (2005). It was found that in high income countries, along with development, rate of transitional terrorism was high, while in lower income countries, economic progress was negatively related to transitional terrorism. In both countries, domestic terrorism reduced as economic progression took place. Piazza (2006) empirically tested the popular "Rooted-in-Poverty" hypothesis by studying the relationship between economic, political and demographic variables and terrorism. He used the data of ninety-six countries from 1986 to 2002. He found that terrorism and the above mentioned economic variables had no significant relationship. But population, ethno-religious diversity, increased state repression and structure of party politics do play an important role in such activities.

Winston (2007) argued that financial markets, global tourism and airline industries are affected by terrorism in the short run. Security risk has a long-term impact including decreased confidence of consumers and investors, which have deeply affected the capital market, increased risk premiums in the asset market and caused resource reallocation towards

precautions against terrorism. The trends of technology innovation are changing. Concentration on the development of technology is increasing which could help fight against terrorism. Gaibulloev and Sandler (2008) studied the impact of domestic and transnational terrorism on growth of income per capita from 1971-2004 for 18 Western European countries. Transnational terrorism has a larger impact on growth as compared to the domestic sort. There are a number of ways in which growth is affected: the increase in government expenditure is directed more towards security issues, and private consumption and investment is crowded out of the economy.

In expansionary period, terrorism affects economy more severely than in a recession while the impact of economic activity is significant on terrorism only in recession. A non-linear and endogenous relationship exists between terrorism and economic activity and advancement in economic activity does not assure a fall in political conflict.

3. Theoretical Considerations

Over the past few years, a rapid change has occurred in the world's economic and political scenario owing to an increase in terrorist activities. Terrorism can be defined as "the premeditated use or threat of use of extra-normal violence or brutality by sub-national groups to obtain a political, religious, or ideological objective through intimidation of a large audience, usually not directly involved with the decision making" (Enders and Sandler, 2000). In the light of above, one can propose that there is a bi-directional relationship between terrorism and economic growth. In explicit words, it is believed that terrorism and economic growth affect each other negatively. Terrorism affects economic activities in various ways. First, incidents of terrorism adversely affect the trust level of investors. Local investors lose their confidence in the home market and consider it a better option not to invest under the given circumstances in the country but to opt for foreign markets. Foreign direct investment reduces as foreign investors think that the opportunity cost of investment would be greater. In their view expected returns in the future are at stake. Investment reduction leads to a decrease in the future stock of capital of a country. The nation would have less capital to work with, so the prospect

of future development reduces. Furthermore, human capital is also affected as there is a high psychological cost of bearing stress.

Secondly, terrorism affects the quantity and pattern of government spending. A significant portion of valuable resources of the government, which would otherwise be used for developmental purposes, are directed towards the control of terrorist incidents. In addition, this also leads to an increase in government expenditures and crowding out of private investment that could promote growth. Thus, the expenditures are switched from consumption and investment to the provision of security. Hence, the cost of providing security is borne at the social expense of resources.

Thirdly, terrorists also target the infrastructure of a country and try to destroy it. Since infrastructure itself is a part of capital, more adverse effect is seen on economic growth. Again, expenditure is shifted towards the rebuilding of worthy capital asset which is destroyed during such activities. In addition, attacks on small level private businesses also lead to unemployment. For example, in the Federally Administered Tribal Areas (FATA), and Swat and other districts of NWFP, Taliban destroyed video and CD shops, and threatened to and did kill people who were in police, making them unemployed and destroying their businesses.

Fourth and most importantly, when security personnel like police and military are the target of terrorist attacks then of course the world perceives the country as a threat to the world's peace and does not encourage foreign visits to that country. Tourism is an important source of foreign exchange for a developing country like Pakistan, whose exports are almost half the amount of its imports. In addition, tourism also stimulates other economic activities such as hotel business, transportation, and travel guiding. Terrorism affects tourism badly since tourists do not feel safe in that country. This has happened in Pakistan due to internal conflicts and terrorist attacks; the number of tourist visits has greatly reduced, especially in the northern areas like the Swat valley. After the Marriott massacre in Islamabad in September 2008, the tourism industry in Pakistan is almost completely destroyed. Hence terrorism, by negatively affecting tourism, adversely affects growth.

These are some of the channels through which terrorism affects growth and development negatively. But if there is economic growth in a country, it also has a negative affect on terrorism. As is evident from above mentioned literature, from the economic side poverty and inequality are the main sources of terrorism. So when there is economic growth in a country, it will increase the per capita income of the people of that country. A rise in income will reduce deprivation and increase the opportunity cost of being involved in terrorist activities. This leads to a reduction in terrorist incidents. In this channel we implicitly assume that there is no or very low income inequality and the fruits of growth reach everyone. But is this the case in reality as well? Thus, to capture the effects of other factors, we also make use of some control variables that include poverty, inequality, inflation, investment, education and repression. This will also be helpful in showing the robustness of our results.

4. Data and Variables

The main objective of this paper is to investigate the causality between terrorism and economic growth in Pakistan. For this purpose, we take the data from 1972 to 2006 of different variables.[1] The variable which is used as a proxy of terrorism is the number of terrorist incidents (Inc) occurring in the country. Gross Domestic Product Growth (GDPG) is calculated from the data of Gross Domestic Product per year to show economic growth in the country. Different control variables are introduced into the model step-by-step to capture the effects of these variables. These variables are Poverty (Pov), Inflation (Inf), Investment (Inv), Literacy (Lit), Inequality (Ine), and Repression (Rep).

Three different sources of data were used for the incident variable to have a deeper insight of the actual figures. The main source for incident variable is a study "Violence and Terrorism in South Asia: Chronology and Profiles 1971-2004 (Ahmar, 2005)". This study is undertaken by the

[1] The years 2007 and 2008 were not included for the reason that in these two years, the terrorist incidents were very high which could disrupt our analysis. Secondly, the data for various variables such as terrorist incidents were not available for the whole year of 2008 by the time we were doing this analysis.

name of "Non-Traditional Security" funded by the Ford Foundation and sponsored by Regional Centre for Strategic Studies (RCSS), Colombo, Sri Lanka and Program on Peace Studies and Conflict Resolution (PPSCR), Department of International Relations, University of Karachi. This source of data is used for the period 1972-2004. The second source used is "Memorial Institute for Prevention of Terrorism (MIPT)" for the years 2005 and 2006. Last source is Global Terrorism Database (GTD). Among the values obtained from all three sources, the highest value of incidents is selected for a particular year. The growth rate of Gross Domestic Product is used to show the economic progress of the country.

Poverty is a socio-economic variable, which is measured through the Head Count Index (HCI). Data for HCI is taken from various issues of the Economic Survey of Pakistan (Government of Pakistan). Consumer Price Index is used to find inflation. Adult Literacy Rate is the most common measure for education. Gross Fixed Capital Formation is used for investment variable. Data for all these variables are taken from World Development Indicators (World Bank, 2007). Inequality is measured by the Gini Coefficient, which measures the extent to which the distribution of income among individuals or households within an economy deviates from a perfectly equal distribution. World Institute for Development Economic Research (UNU-WIDER, 2008) is our source of data for income inequality. For both poverty and inequality, annual data for entire period of analysis is not available. Hence, we use interpolation to fill the data gaps. The most important political variable is repression. We use the "Freedom House" measure of political rights and civil liberties for repression. Freedom House assigns each country and territory a numerical rating on a scale of 1 to 7 for political rights and an analogous rating for civil liberties; a rating of 1 indicates the highest degree of freedom and 7 the least amount of freedom.

5. Methodology

The methodology that we follow is the VAR (Vector Auto Regression). Initially, we consider only two variables: Terrorism (Inc) and Growth (GDPG), with the appropriate lag lengths chosen using Schwarz Information Criterion (SIC). However, for further analysis we introduce various other variables which are considered to be the potential

determinants of these variables, step by step in order to purify the results. The basic underlying model is given as follows:

$$Inc_t = \alpha + \sum_{j=1}^{k} \beta_j \, \text{Inc}_{t-j} + \sum_{j=1}^{k} \gamma_j \, \text{GDPG}_{t-j} + \mu_{1t} \quad \ldots\ldots\ldots (1)$$

$$GDPG_t = \phi + \sum_{j=1}^{k} \theta_j \, \text{Inc}_{t-j} + \sum_{j=1}^{k} \lambda_j \, \text{GDPG}_{t-j} + \mu_{2t} \quad \ldots\ldots\ldots (2)$$

where μ_{it} is an identically and independently distributed random variable with mean equal to zero. Equation (1) says the terrorism in period t depends on its own lag as well as on the lag values of economic growth and on a random variable. Likewise, equation (2) shows that economic growth depends on its previous values along with the lag values of terrorist incidents and a purely random variable. We are interested in investigating the direction of causality and the time span of the impact of a shock to the random terms on growth and terrorism. For this purpose, we use Impulse Response Functions (IRF).

Furthermore, following Barros (2003), Enders and Sandler (2000), and Sandler (2000) Granger Causality Test is used to check the causality between terrorism and economic growth. This test was applied with and without control variables. Since the built-in command of Granger Causality Test in Eviews does not allow for more than two variables, we make use of the OLS technique along with the Wald Test for imposing restriction. The logic behind this procedure, however, is the same. After a variable is regressed on its own lags as well as the lags of other variables that also include the control variables, one tests the null hypothesis using Wald Test that the coefficient of the other relevant variable is not significantly different from zero. If this hypothesis is accepted, it is said that the other variable does not Granger-cause the underlying dependant variable. Furthermore, only those lags were selected at which Schwarz Information Criterion (SIC) values were the smallest.

6. Results and Interpretation

6.1 VAR Results

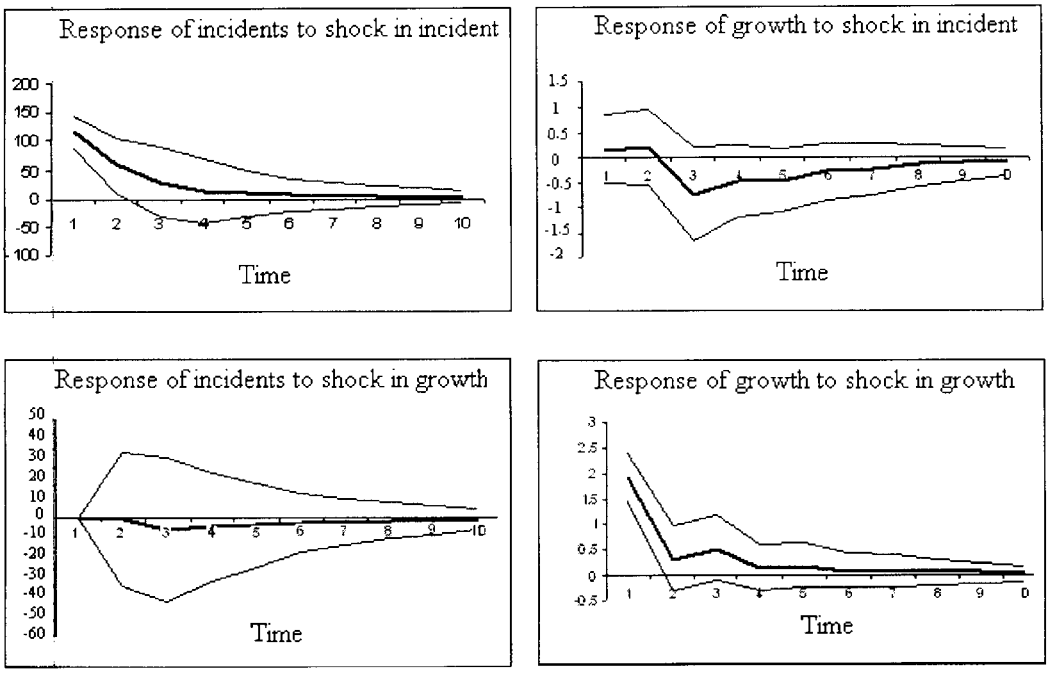
This section discusses the results of the causality between incidents and economic growth.[2] For this purpose, initially we give shock to incidents and find the impact on incidence and growth. Then shock is given to growth to find the impact on incidence and growth. Furthermore, some important control variables such as Poverty, Inflation, Investment, Literacy, Inequality and Repression are included step by step in order to check the robustness of the results. In the following lines, we briefly describe our results.

Initially, the effect of one standard deviation shock to incidents on incidents and GDP growth was observed. It was found that an increase in incidents had a positive and persistent effect on terrorism which gradually dampened in the fourth and fifth years. In addition, a rise in incidents had a negative, but slightly significant impact on growth which started in second year, reached maximum in third year and reduced onwards. It is important to note that growth was not affected by terrorism in the same period. There is a valid economic logic behind this late response of growth to terrorism. One can explain this late response by looking at the channels through which terrorism affects growth. In the mentioned channels, the first three worked in the long run while the fourth channel took almost no time to work. For example, when there are terrorist attacks in a country and investors start losing their confidence, they need some time to make their investment decisions. Even after they make the decision to move their capital out of the country, it is still a time-taking process to move it out from a real production sector such as the manufacturing sector. That is why economists say that, in the short run, capital is an immobile factor. Growth in a period depends on the capital stock available at the start of that period. So a reduction in investment in

[2] There is an issue of whether the variables in a VAR need to be stationary. Sims (1980), and Stock and Watson (1990) recommend against differencing even if the variables contain a unit root. They argue that the goal of a VAR analysis is to determine the interrelationships among the variables, not to determine the parameter estimates. The main argument against differencing is that it "throws away" information concerning the co-movements in the data (such as the possibility of co-integrating relationships). Similarly, it is argued that the data need not be de-trended (Enders, 2004).

one period will decrease the stock of capital for the next period. Similarly, the decision to increase government spending for security purposes is a time-taking process due to lengthy bureaucratic procedures. Likewise, a terrorist does not blow up entire infrastructure in one attack. Rather, it is done slowly to capture the attentions of the masses for a longer period. However, in the fourth channel, tourists have to make only one decision: not to go to this country. Despite this discussion, however, from Figure 1, our interest may be limited only to the direction of causality due to very slight significance of this result.

Figure 1: Responses of Incidents and Growth to One Standard Deviation Innovation in Incidents and Growth



The effect of one standard deviation innovation in growth was also noted. It was observed that a rise in economic growth in Pakistan had no effect on incidents. A slight negative impact was seen in the second and third years, but was insignificant as the standard deviation was quite high. It showed that either growth may not be a good determinant of terrorism or there might be some other factors which had a strong impact on incidents.

On the other hand, a rise in growth had a positive and significant impact on growth for some considerable period of time.

The above results show that both growth and terrorism are affected by their previous values. However, the impact of growth on terrorism is highly insignificant, whereas the effect of terrorism on growth is slightly significant. This requires us to check the robustness of our results by introducing other potential determinants of growth and terrorism identified by the literature.

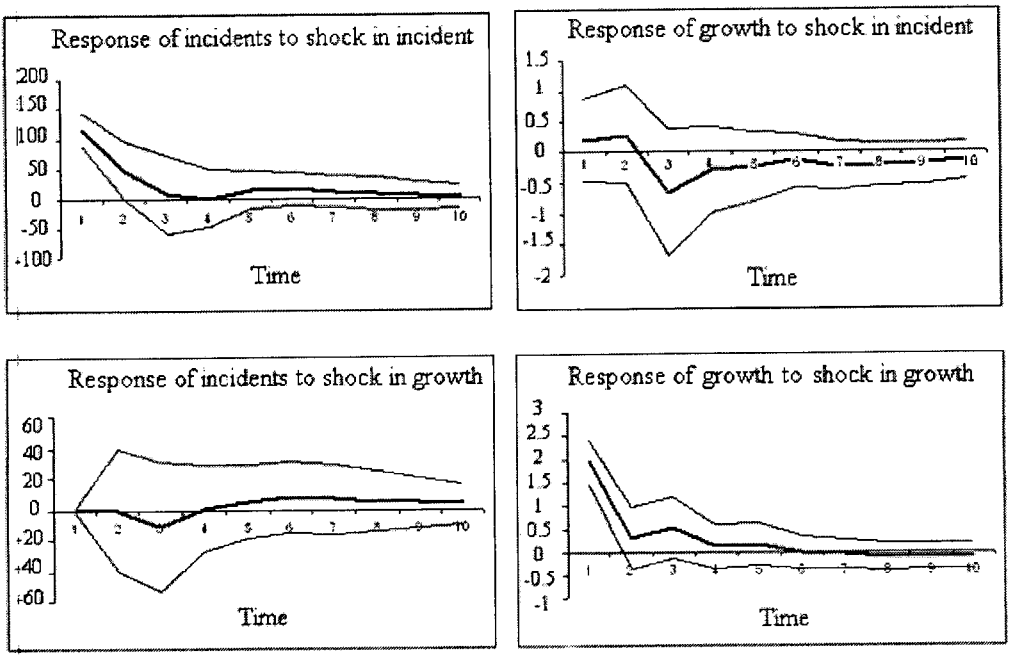
6.2 Robustness

In order to assess the robustness of the results presented in the above Section, we introduce various control variables. The impact on results of these controls was examined by adding a control variable stepwise. These control variables are: Poverty, Inflation, Investment, Literacy, Inequality and Repression and they are introduced in the said sequence. However, we discuss here only two results: when one control variable is introduced and when all the six control variables are included since the results in the presence of other controls do not differ from these results.

The effect of one standard deviation shock in incidents on incidents and GDP growth was observed in the presence of one control variable. It was found that an increase in incidents had a positive and significant effect on incidents as was the case in the absence of control variables. Interestingly, it can be seen that the impact of terrorism on growth was statistically insignificant in the presence of control variables, though the impact was again negative. The reason may have been that some of the variation in growth was now explained by poverty. Economic growth may have been negatively related to poverty since poverty was a hurdle in the way of human resource development. It could be a reason why poverty makes people more frustrated. People might be attracted towards these activities as the opportunity cost of life decreases for these people. Including the first control showed that incident had a negative but significant impact in second-to-fifth year growth. This effect was the same as that without the inclusion of the control. Moreover, the effect of one standard deviation innovation in growth was noted. It was observed that a rise in economic growth in Pakistan had no effect on incidents. On the other hand, a rise in

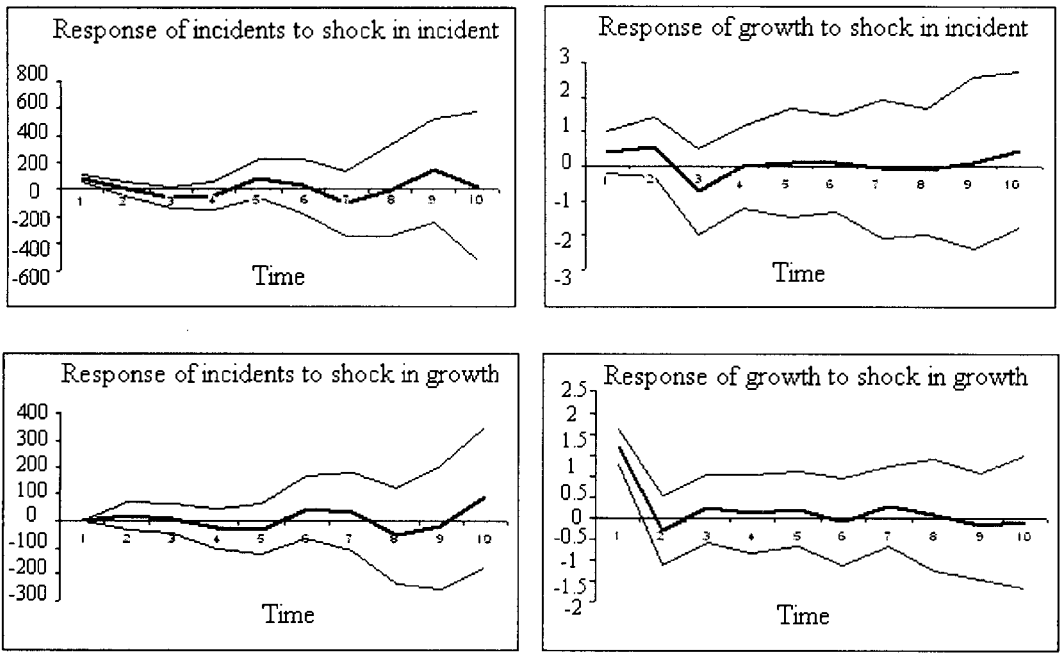
growth had a positive and significant impact on growth for some periods (Figure 2).

Figure 2: Responses of Incidents and GDPG to One Standard Deviation Innovation in Incidents and GDPG in Presence of One Control Variable



Now the effect of one standard deviation shock in incidents on incidents and GDP growth was observed in the presence of six control variables. One can observe that neither growth responded to terrorism nor was terrorism significantly affected by growth. This showed the fact that in Pakistan, terrorism was not affected by growth, but by other determinants such as inequality and political repression. On the other hand, growth was dependant much on its conventional determinants rather than on terrorism (Figure 3). We found similar results for control variables as well. This showed the robustness of our results that in Pakistan there is no causality between incidents and GDP growth. That means there is neither unidirectional nor bidirectional causality between terrorism and economic growth.

Figure 3: Responses of Incidents and GDPG to One Standard Deviation Innovation in Incidents and GDPG in Presence of Six Controls



6.3 Granger Causality Test

To further check the validity of our results, we use Granger Causality Test. The results of this test are given in Table 1. As is obvious from Table 1, the evidence of the effect of terrorism is found only in the absence of control variables. However, this result may not be considered highly significant. These results match with the VAR results where this effect vanishes in the presence of control variables.

Table 1: Results of Granger Causality Test

Null Hypothesis	Lags	Control	F-Stats	Probability
Terrorism does not Granger Cause GDPG	1	0	3.728901	0.0624
GDPG does not Granger Cause Terrorism	2	0	0.645393	0.5318
Terrorism does not Granger Cause GDPG	1	1	0.361416	0.5521
GDPG does not Granger Cause Terrorism	1	1	0.115685	0.7361
Terrorism does not Granger Cause GDPG	1	2	1.425096	0.2419
GDPG does not Granger Cause Terrorism	1	2	0.670115	0.4195
Terrorism does not Granger Cause GDPG	1	3	0.029541	0.8647
GDPG does not Granger Cause Terrorism	1	3	0.192740	0.6639
Terrorism does not Granger Cause GDPG	1	4	0.073034	0.7890
GDPG does not Granger Cause Terrorism	1	4	0.371010	0.5474
Terrorism does not Granger Cause GDPG	1	5	0.059469	0.8092
GDPG does not Granger Cause Terrorism	1	5	1.053316	0.3139
Terrorism does not Granger Cause GDPG	1	6	0.579084	0.4535
GDPG does not Granger Cause Terrorism	1	6	4.080238	0.0538

Note: Order of the control variables is Poverty, Inflation, Investment, Literacy, Inequality and Repression.

Similarly, the impact of growth on terrorism can be observed only in the presence of all control variables. However, this is significant at 5 percent level of significance. This was what we obtained in the VAR as well. Hence, Granger Causality Test supports the VAR results of no causality between economic growth and terrorism.

7. Conclusions

In the light of above analysis, it can be concluded that neither growth nor terrorism affect each other in the case of Pakistan. The question is, why? How can we justify our results in the presence of the theoretical channels identified above? In the following lines, we will try to answer this question.

The channels identified above are important and theoretically plausible. We need to identify the reasons why they did not work in case of Pakistan. The first reason, which is also the limitation of this study, can be that we are only considering the number of terrorist attacks and not their intensities. Till 2002, we have not faced the intensive terrorist attacks although few exceptions were there. Secondly, even after 2003, when the number and intensity of terrorist attacks increased, FDI continued to come to Pakistan not due to its economic policies, but rather as a reward for the so-called "War on Terror". Most of the FDI during this period came from the US and its allies. In addition, after September 11, 2001, most Pakistanis shifted their money to Pakistan. This prevented the first channel from working, as the capital stock had not declined to the extent to which it otherwise would have. Thirdly, our infrastructure was not devastatingly destroyed till 2006. Fourthly, our tourism industry had not been much affected before the military operation in Swat valley in NWFP. Even if it was, tourism is not a significant proportion of our Gross Domestic Product. Lastly, the government, in 2006, had shifted tremendous amount of development resources towards security purposes. On the other hand, the reason why terrorism was not affected by growth is simply that growth itself does not assure the equal distribution of income. In spite of the fact that there was high growth in Pakistan in the first six years of the new millennium, poverty and income inequality did increase during this period.

Hence, it may be concluded that we need to focus our attention on other determinants of terrorism and growth as well and try to get rid of the evil of terrorism by finding out its root causes and uprooting them before these channels start working.

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