

**SOME ISSUES IN THE NATIONAL INCOME
ACCOUNTS OF PAKISTAN**

(Rebasing, Quarterly and Provincial Accounts and Growth Accounting)

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CERTIFICATE

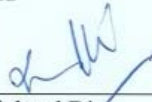
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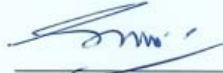
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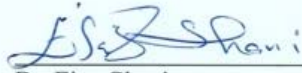
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To *Bhai Jan* Dr. Muhammad Khalid Arby who has been the continuous source of inspiration for me since my very first day at school

Some Issues in the National Income Accounts of Pakistan
(Rebasing, Quarterly and Provincial Accounts and Growth Accounting)

CONTENTS

Preface		i
Acknowledgment		iii
Executive Summary		iv
Executive Summary in Urdu (خلاصہ)		vii
Chapter 1	Introduction	1
Chapter 2	Review of Literature	7
Chapter 3	Rebasing of National Accounts	35
Chapter 4	Estimating Past Data of National Accounts at New Base	61
Chapter 5	Quarterisation of Annual National Accounts	91
Chapter 6	Provincialisation of National Accounts	99
Chapter 7	Analysis of Results	107
Chapter 8	Factorization of GDP: Capital Stock & Labour Inputs	155
Chapter 9	Factorization of GDP: Total Factor Productivity	163
Bibliography		167
Annexure A	Harvest Calendars of Crops	177
Annexure B	Issues in Estimates of Livestock Population	181
Annexure C	Derivation of an Expression for Initial Capital Stock	183
Annexure D	Time Series of National Accounts	185
Annexure E	Time Series of Capital Stock	249
Annexure F	Factorization of Real GDP Growth (1999-00 prices)	253

As a student of economics, I have a proclivity for exploring the underlying data generating processes of economic variables and it was by coincidence that I selected a topic of my taste for a PhD dissertation. My original proposal for the dissertation was related to Pakistan's experience of economic growth and capital flows. I had a plan to investigate empirically the relationship between growth and capital flows by using cointegration and error correction techniques; for this purpose I needed quarterly data to have a sufficiently large sample size. Although the data of capital flows were available on quarterly basis, the GDP was not. My supervisor Dr. A. R. Kemal suggested to estimating quarterly series of GDP as a separate exercise which could be used not only in my work but also would be available to other researchers. We estimated the quarterly GDP at constant prices of 1980-81 that was published in the form of a statistical paper by Pakistan Institute of Development Economics. Soon after our work, the Federal Bureau of Statistics (FBS) released new series of national accounts at new base year prices of 1999-00 for a period from 1999-00 to 2003-04. The rebasing of national accounts brought up new issues including converting the past series at new base year prices and re-estimating the quarterly series of GDP. Since during our earlier work on quarterly GDP I had gained some understanding of the estimation techniques of national accounts, I was naturally inclined to take such issues up and to do further research on national accounts of Pakistan. Thus, with the encouragement by Kemal Sahib, I changed my mind, gave up the earlier proposal and started thinking on national accounts issues for the purpose of my PhD dissertation.

Three major issues were identified which included re-estimating the past series of national accounts according to the new methodology and its re-basing from 1980-81 to 1999-00, quarterizing the new series, and estimating provincial accounts of national income. My co-supervisor Dr. Musleh-ud-Din was of the view that there should also be a section on the application of the new series of gross domestic product. It was suggested that total factor productivity may be worked out on the basis of the new estimates of GDP and its sub-sectors through growth accounting framework. Thus a detailed exercise on estimating capital stock and total factor productivity was included as a part of the dissertation.

The most difficult part of this project was to collect raw data for past thirty years relating to different economic activities at national and provincial levels. In pursuit of data, I had to visit a number of libraries and institutions like Pakistan Post Office, Oil and Gas Development Authority, Civil Aviation, Federal Bureau of Statistics, Pakistan Agriculture Research Council, Central Board of Revenue, Public Administration Research Centre, etc. Contrary to my fears, I was usually provided with welcome support by different institutions. However, very disappointing aspect has been the conditions of libraries I visited; lack of systematic record and missing publications are serious hurdles in the work of researchers.

The present dissertation is a blend of economics and statistical techniques. I have tried to make a systematic exposition of the concepts and techniques of compiling national accounts along with the issues I have taken up in the dissertation. I hope it will not only earn a PhD degree for me but also help the general readers in understanding the underlying data generation processes of economic variables and provide the researchers with consistent series of some of the key macro-aggregates for a sufficiently long period.

Acknowledgment

I am highly indebted to my thesis supervisor Dr. A. R. Kemal who has motivated me to embark upon this project and very generously bestowed me from his very long experience and deep understanding of the issues in national income accounts of Pakistan. I also wish to express highest gratitude to my co-supervisor, Dr. Musleh-ud-Din, for his encouragement on the one hand and critically examining my work on the other. Ishaq Rana at FBS has greatly helped me in understanding the techniques of compiling national accounts; his assistance is acknowledged gratefully. Two external referees of this dissertation deserve special gratitude for their very encouraging comments on my work and some useful suggestions. I would also appreciate the valuable assistance provided by Naqvi of PIDE library and Bashir Zia of SBP library during my search for old publications relating to the topic of my dissertation.

I owe special debt to Dr. Ishrat Husain, ex-governor of State Bank of Pakistan for providing me with an opportunity to do PhD by launching a very useful scheme of study leave for SBP employees. The members of the SBP Committee for PhD scholarship, Mushtaq A. Khan, Abdul Nasir, Mr. Riaz Riazuddin and Aftab Nadeem also deserve my special thanks for approving my name for the award of this scholarship.

Grateful appreciation is extended to all my colleagues at Pakistan Institute of Development Economics, and especially to Tahir Mahmood and Nadeem Hanif, whose genial company during the course of my studies bears long-lasting memories.

It is my pleasure to express my gratitude to my wife Mrs. Haleema Saadia and our children Zarnab, Omar, Ibrahim and Areeb, who supported me continuously by never complaining for my heedlessness towards them; instead they always applauded my efforts. I am also obliged to my parents; it is due to their blessings that I was able to complete this arduous work.

Having acknowledged the support tendered by the above mentioned persons, I would like to state that for any error found in the dissertation, only I am the responsible.

This dissertation takes on some important issues related with national accounts of Pakistan including (a) re-estimation of past series of national accounts (prior to the year 1999-00) to make it consistent with the new official series for years 1999-00 onward at new base year prices; (b) quarterisation of annual series of national accounts to remove one of the major stumbling block in research by making available high frequency data, (c) estimation of provincial accounts with new base year prices, and (d) estimation the contribution of total factor productivity (TFP) to economic growth with the new series of gross domestic product and its sub-sectors.

Thus by embarking upon the above mentioned issues, the dissertation contributes to the economic literature in the following respects:

- i) It provides a new set of national accounts at 1999-00 prices as well as at current prices for a period from 1970-71 to date consistent with the new official estimates for recent years.
- ii) It gives quarterly data of GDP and all its sectors/sub-sectors both at constant prices of 1999-00 and at current prices.¹ A by-product of this exercise is quarterly GDP deflator (with 1999-00=100) which was earlier not available in Pakistan.
- iii) It presents estimates of provincial GDP and all its sectors/sub-sectors covering all the provinces in a consistent framework.²
- iv) It provides series of gross fixed capital formation and capital stock estimated at disaggregated level and at prices of 1999-00.
- v) It estimates contribution of TFP, capital and labour to the growth of GDP and its sectors/sub-sectors (growth rates of new series at 1999-00 prices).

In its attempt to re-estimate the previous series at new base of 1999-00, the dissertation followed, to the extent possible, the same methodology as of the Federal

¹ Earlier work on quarterisation include Bengaliwala (1995) and Kemal and Arby (2004), however, both are at old base year prices of 1980-81 and available only at constant prices.

² Earlier work on provincialisation is Bengaliwala (1995) and Bengali and Sadaqat (2005), however, both are old base year prices of 1980-81.

Bureau of Statistics (FBS). Rather, it has improved upon FBS methodology in case of some sub-sectors including livestock and slaughtering by re-estimating population of different animals and the number of animals slaughtered with more logical techniques (detail discussion in chapter 4).

For quarterization of national accounts, maximum information available in official sources or in different studies have been used which include: harvest calendars of all major crops and most of the minor crops (with province level detail); seasonal patterns of milk production, fish catch, and timber; quarterly production of different minerals, manufacturing goods, and cement (for construction activities); seasonal pattern of utilities consumption; quarterly imports and financial indicators like M2; etc. Moreover, mechanical technique of quarterisation as proposed by Lisman and Sandee (1964) has also been used in case of some sub-sectors like Transport, storage & communication, ownership of dwellings and other services.

The provincial distribution of national accounts have been done by using some related indicators; however, provincial value added for sectors like crops, fishing, and mining & quarrying have been estimated directly by product approach just like national accounts.

In order to estimate the contribution of total factor productivity to growth, the dissertation has undertaken a detailed exercise of estimating the capital stock at constant prices of 1999-00 and skill-adjusted labour force – both the inputs for all sub-sectors of GDP. The non-parametric approach as suggested by Solow has been used in factorization of overall GDP growth as well as growth in all sub-sectors.

The results show that the series of national accounts estimated by this dissertation are fairly close to the official series for years 1999-00 to 2004-05, which gives a confidence to estimates of this dissertation for series prior to 1999-00.

It has been found that on average 21.8 percent of the annual GDP is produced in the first quarter (Jul-Sep) followed by the third quarter (Jan-Mar) with 25.2 percent of annual GDP. In the second quarter (Oct-Dec) the production of goods and services is

the highest at 26.9 percent. In the last quarter (Apr-Jun) production is also high with 26.1 percent of the annual.

The provincial distribution of gross domestic product shows that the Punjab holds the highest share in gross domestic product (52.3 percent); it is followed by Sindh (30.6 percent), NWFP (11.5 percent) and Balochistan (5.5 percent). However, over the years the Punjab's share has declined: during 1970s, about 54 percent of the country's GDP was being generated in the Punjab that declined to 51.8 percent in 2000s. On the other hand, shares of NWFP and Balochistan in total GDP have increased during this period; there is no significant change in the share of Sindh in total GDP during the period of 1970-2005.

The results of growth accounting exercise shows that average contribution of total factor productivity to GDP growth during the period 1970-2005 had been 1 percentage point. It was higher in 1970s and early eighties and remained below 1 percent in subsequent years with negative growth during the periods of late 1980s and late 1990s. However, resurgence in total factor productivity growth has been witnessed in recent years. Comparing the relative contribution of capital and labour, the results show that labour remained the biggest contributor to economic growth during 1970-2005; however, in recent years, capital contribution has surpassed the labour contribution.

پاکستان کی قومی آمدنی کے حسابات کے چند مسائل

(سال حوالہ کی تبدیلی، سہ ماہی اور صوبائی حسابات، اور شرح نمو کا تجزیہ)

محمد فاروق عاربی

یہ مقالہ پاکستان کے قومی حسابات سے متعلق چند اہم مسائل پر بحث کرتا ہے جو یہ ہیں: (ا) 1999-00ء سے پہلے کے قومی آمدنی کے اعداد و شمار کا تخمینہ تاکہ سال حوالہ کی تبدیلی کے بعد جاری کیے جانے والے سرکاری اعداد و شمار سے ان کی مطابقت پیدا کی جائے، (ب) قومی آمدنی کے سہ ماہی اعداد و شمار وضع کرنا تاکہ معاشی تحقیق میں پیش آنے والی ایک بڑی رکاوٹ دور ہو سکے، (ج) صوبائی آمدنی کے حسابات کا تخمینہ، اور (د) خام ملکی پیداوار اور اس کے ذیلی شعبوں کے نئے اعداد و شمار کی بنیاد پر معاشی شرح نمو کا تجزیہ اور اس میں عاملین کی اجتماعی پیداواریت (TFP) کے کردار کا جائزہ۔

چنانچہ مذکورہ بالا امور کا احاطہ کرتے ہوئے یہ مقالہ علم معاشیات میں درج ذیل حوالوں سے اضافہ کرتا ہے:

(ا) یہ 1970-71ء سے لے کر آج تک کے لئے قومی آمدنی کے نئے تخمینے پیش کرتا ہے جو 1999-00ء کی مستقل قیمتوں اور جاری قیمتوں دونوں کے لحاظ سے مرتب کیے گئے ہیں، اور حالیہ برسوں کے نئے سرکاری تخمینوں سے مطابقت رکھتے ہیں۔

(ب) یہ خام ملکی پیداوار اور اس کے تمام شعبوں/ذیلی شعبوں کے سہ ماہی اعداد و شمار 1999-00ء کی مستقل قیمتوں اور جاری قیمتوں دونوں کے لحاظ سے پیش کرتا ہے۔ اس کا ایک ضمنی فائدہ ملکی پیداوار کی بنیاد پر بنایا جانے والا قیمتوں کا سہ ماہی اشاریہ (GDP deflator) ہے جو اس سے قبل پاکستان میں دستیاب نہ تھا۔

- (ج) یہ مقالہ خام صوبائی پیداوار اور اس کے تمام شعبوں/ذیلی شعبوں کا تخمینہ پیش کرتا ہے۔
- (د) یہ خام معینہ سرمایہ سازی اور مختلف شعبوں میں کارفرما سرمایے کی کل مقدار کا تخمینہ بھی پیش کرتا ہے۔
- (ه) یہ مجموعی معاشی شرح نمو اور معیشت کے ذیلی شعبوں کی نمو میں اجتماعی پیداواریت، سرمائے اور محنت کے کردار کا تجزیہ کرتا ہے۔

اس مقالے میں نئے سال حوالہ کی بنیاد پر مرتب کیے جانے والے اعداد و شمار کے لئے وفاقی ادارہ شماریات کے طریقہ کار کو ممکنہ حد تک اختیار کیا گیا ہے۔ بلکہ بعض صورتوں میں وفاقی ادارہ شماریات سے بہتر طریقہ کار اختیار کیا گیا ہے، جیسے گلہ بانی اور ذبیحہ کے شعبوں کے لیے جانوروں کی تعداد اور ذبح شدہ جانوروں کی تعداد کا از سر نو اور زیادہ منطقی انداز میں تخمینہ لگایا گیا ہے (تفصیلی بحث باب 4 میں ہے)۔

سہ ماہی قومی حسابات کے لیے سرکاری اور دیگر ذرائع میں دستیاب زیادہ سے زیادہ معلومات کو استعمال کیا گیا ہے جن میں یہ باتیں شامل ہیں: تمام بڑی فصلوں اور اکثر چھوٹی فصلوں کی کٹائی کے موسموں کی (صوبائی سطح کی) تفصیلات، مختلف مہینوں میں دودھ کی پیداوار، مچھلیاں پکڑنے اور لکڑی کے حصول کے موسمیاتی انداز، معدنیات کی سہ ماہی پیداوار، مصنوعات کی تیاری، سیمنٹ کی پیداوار (تعمیراتی سرگرمیوں کے لیے) اور اشیائے صرف کے استعمال کے موسمیاتی انداز، سہ ماہی درآمدات اور زر وسیع جیسے مالی اظہاریے وغیرہ۔ مزید برآں بعض ذیلی شعبوں مثلاً ٹرانسپورٹ، ذخیرہ کاری اور نقل و حمل، مکانات اور دیگر خدمات کے سہ ماہی تخمینوں کے لیے لڑمین اور سیندی (1964ء) کا تجویز کردہ میکانیکی طریقہ اپنایا گیا ہے۔

قومی حسابات کی صوبائی تقسیم کے لیے بعض متعلق اظہاریے استعمال کیے گئے، تاہم فصلوں، ماہی گیری، اور کان کنی اور معدنیات جیسے شعبوں کے صوبائی اضافہ قدر کا تخمینہ اسی طریقے سے کیا گیا ہے جس طریقے سے قومی حسابات کا تخمینہ کیا گیا۔

نمو میں اجتماعی پیداواریت کے کردار کو جاننے کی غرض سے اس مقالے میں ایک تفصیلی مشق کی گئی ہے جس میں

1999-00ء کی مستقل قیمتوں پر سرمایے کی مقدار اور مزدوروں کی تعداد (مہارت کو ملحوظ خاطر رکھتے ہوئے) کا تخمینہ لگایا گیا ہے۔ حقیقی نمو کے مفصل تجزیے کے لیے سولو کا تجویز کردہ طریقہ استعمال کیا گیا ہے۔

نتائج سے معلوم ہوتا ہے کہ اس مقالے میں مرتب کیے گئے قومی آمدنی کے اعداد و شمار حالیہ برسوں کے لیے دستیاب سرکاری اعداد و شمار سے خاصی مماثلت رکھتے ہیں، جس کے سبب یہ اعتماد پیدا ہوا کہ 1999-00ء سے قبل کے اعداد و شمار کے حوالے سے بھی اس مقالے کے تخمینے درست ہوں گے۔

یہ بات معلوم کی گئی ہے کہ سالانہ خام ملکی پیداوار کا اوسطاً 21.8 فیصد پہلی سہ ماہی (جولائی تا ستمبر) میں اور 25.2 فیصد تیسری سہ ماہی (جنوری تا مارچ) میں پیدا ہوتا ہے۔ دوسری سہ ماہی (اکتوبر تا دسمبر) میں ایشیا اور خدمات کی پیداوار بلند ترین سطح 26.9 فیصد پر ہوتی ہے۔ آخری سہ ماہی (اپریل تا جون) میں بھی پیداوار زیادہ ہوتی ہے جو 26.1 فیصد کے مساوی ہے۔

خام ملکی پیداوار کی صوبائی تقسیم سے ظاہر ہوتا ہے کہ اس میں پنجاب کا حصہ سب سے زیادہ (52.3 فیصد) ہے۔ اس کے بعد سندھ (30.6 فیصد)، صوبہ سرحد (11.5 فیصد) اور صوبہ بلوچستان (5.5 فیصد) کا نمبر ہے۔ تاہم وقت کے ساتھ ساتھ پنجاب کا حصہ کم ہوا ہے: 1970ء کی دہائی میں ملک کی کل پیداوار کا تقریباً 54 فیصد پنجاب میں پیدا ہوتا تھا جو کہ 2000ء کی دہائی میں گر کر 51.8 فیصد رہ گیا۔ دوسری طرف اس عرصے کے دوران خام ملکی پیداوار میں صوبہ سرحد اور بلوچستان کے حصوں میں اضافہ ہوا ہے۔ تاہم سندھ کے حصے میں 1970ء تا 2005ء عرصے کے دوران کوئی نمایاں تبدیلی واقع نہیں ہوئی۔

نمو کے تجزیہ سے پتہ چلتا ہے کہ 1970ء تا 2005ء عرصے کے دوران معاشی شرح نمو میں اجتماعی پیداواریت کا اوسط حصہ ایک فیصدی درجے رہا۔ 1970ء کی دہائی اور 1980ء کی دہائی کے اوائل میں یہ نسبتاً بلند تھا اور بعد کے برسوں میں ایک فیصد سے کم رہا جبکہ 1980ء کی دہائی کے اواخر اور 1990ء کی دہائی کے اواخر میں اس کی نمو منفی رہی۔ تاہم اجتماعی پیداواریت کی نمو میں حالیہ برسوں کے دوران دوبارہ

اضافہ دیکھنے میں آرہا ہے۔ سرمائے اور محنت کے متعلقہ حصے کا موازنہ کرنے سے معلوم ہوتا ہے کہ 1970ء تا 2005ء عرصے کے دوران اقتصادی نمو میں محنت نے سب سے بڑا کردار ادا کیا، تاہم حالیہ برسوں میں سرمائے کا حصہ محنت کے حصے سے آگے نکل چکا ہے۔



1.1 Introduction

The national accounts constitute the most important source of information about the state and performance of the economy, in the same way as the operating and financial accounts of an individual firm convey information about the condition of that firm. They refer to a well defined set of aggregates measuring various aspects of economic activities, including production, consumption, investment, exports, imports, etc. The importance of reliable estimates of these aggregates cannot be overemphasized for the purpose of economic policy making. The indicators of economic performance like GDP growth, per capita income, index of productivity, etc., can only be computed when estimates of national income accounts (NIA) are available; and also the quality of such indicators depends on the quality of NIA. This is why every country prepares such accounts regularly, and in doing so tries to follow some standards to ensure quality and credibility of the accounts. In Pakistan, like many other countries of the world, the national accounts are prepared in accordance with the *System of National Accounts* (SNA), a framework devised by the United Nations and consisting of coherent and integrated accounts with internationally agreed definitions and rules.¹ Federal Bureau of Statistics (FBS) is the authority which prepares these accounts of Pakistan on annual basis.

Recently Federal Bureau of Statistics has brought major changes in the national income accounting which include changes in the price and quantity measurements of almost all the sub-sectors of the gross domestic product and investment accounts, and rebasing of the accounts from 1980-81 to 1999-00 (FBS, 2004). It has published new estimates of national income from 1999-00 onward. Since the changes are very significant, the past series of national income accounts which are based on 1980-81 prices have become inconsistent with the new series.² Thus the revision of base and

¹ There are three versions of the system of national accounts devised by UN so far: The SNA 1953, 1968 and 1993.

² The new estimate of nominal GDP for 1999-00 is Rs 3562 billion which is 21% higher than old estimates. The new estimate of real GDP for 1999-00, on the other hand, is 455% higher than the old one. Similar is the case with different sub-sectors of the GDP.

methodology, though highly desirable, has impeded the work of researchers who need a sufficiently long and consistent series of data for doing some meaningful analysis. Moreover, evaluation of the economic policies at different time periods also becomes difficult and so is the research based policies formulation if the consistent data set is not available.

Generally a series with two different base years is adjusted by using splicing technique which essentially assumes that the growth rates of the series remain unchanged with the change of the base. However, in the present case of national accounts of Pakistan, splicing will give highly misleading results because the gap between the two base years is very large; over this period of two decades, both the quantity weights and relative prices of the commodities have changed significantly.³ The growth rates of various aggregates of national accounts evaluated at 1999-00 prices cannot remain the same as of the same evaluated at 1980-81 prices due to significant changes in relative prices.⁴ Moreover, a number of new commodities have appeared in the markets like mobile phone and courier services, and a number of others have become obsolete. Thus the adjustment of the past data according to the new methodology and base needs a careful and detailed work.

In addition to the above mentioned methodological issues, there are also two other longstanding issues related with national income accounts of Pakistan; one is the product and income estimates at provincial level, and the other is the availability of high frequency (monthly or quarterly) data. The provincial income accounts, though not necessarily needed for the purpose of monetary and fiscal management or stabilization in prices and exchange rate, are very important for answering other types of questions including;

- What is the contribution of provinces to national output vis-à-vis their natural and human resources?
- Is the economic growth of the country balanced (i.e., is it spread evenly across the provinces)?

³ Splicing can be used in two cases; (a) the variable is single, i.e. not a composite of other variables, (b) the variable is composite but the relative prices (weights) of component variables have not changed.

⁴ As an example of changes in relative prices, note that wheat price to cotton price ratio during 1980-81 (the old base year) was 0.5, while it was 0.9 during 1999-00 (the new base year).

- Are provincial growth rates converging or diverging over time?
- What is happening to regional income disparities?
- In which sectors the provinces are performing well and which are underdeveloped?

In order to answer these and other questions related to regional economic development, and also to help provinces to construct their own development models, it is important to estimate gross provincial product (GPP). Provincial accounts can also prove to be useful for preparing provincial budgets and drawing up federal-provincial revenue sharing formulas on economic policy front and serve as a data base for economic research particularly in case of cross-sectional and panel studies.⁵

With regard to estimates of high frequency data, it may be noted that Kemal and Arby (2004) have recently quarterised the annual GDP and its sub-sectors at constant prices of 1980-81. However, there is a need to extend their work to new estimates of national income accounts at new base. Once the past data are adjusted according to the new methodology and new base, the revision of Kemal and Arby series would naturally be in order. The availability of high frequency data not only provide higher number of observations in quantitative works and thus improve their quality but also help identify and analyze the short-run and seasonal movements of economic activities. The seasonal movements have significant effects on the production, distribution, exchange and consumptions decisions of economic agents in the economy. It has also been argued that disaggregated data increase the likelihood of analytical accuracy in empirical works.⁶

1.2 Objectives of the Dissertation

This dissertation endeavors to address the above mentioned issues including estimation of past data of gross domestic product at new base of 1999-00 and disaggregating it into provincial and quarterly accounts. Moreover, as an application of the new series of economic growth rates, the contributions of capital and labour and total factor productivity (TFP) to growth would also be estimated.

⁵ See Graham and Romans (1971) and Bengali and Sadaqat (2005) for some uses of regional accounts.

⁶ See for example Orcutt et al. (1968).

This dissertation not only provides the researchers with new time series of gross domestic product at national and provincial level and with high frequency data but also contributes to enhance the knowledge of economic researchers regarding the compilation process of national accounts in Pakistan. It has explained, to the extent possible, the estimation technique of gross value added of various sectors of the economy, and also put together a lot of information relating to provincial economies and seasonal variations in Pakistan's economic activities.⁷ It can not be overstated that an understanding of the data generating process will increase the quality of data analysis. The specific contributions of the present dissertation to the economic literature are the following:⁸

- i) It provides a consistent set of national accounts at 1999-00 prices as well as at current prices for a period 1970-71 to date according to the new methodology.
- ii) It gives quarterly data of GDP and all its sectors/sub-sectors both at constant prices of 1999-00 and at current prices.
- iii) It presents estimates of provincial GDP and all its sectors/sub-sectors covering all the provinces in a consistent framework.
- iv) It provides series of gross fixed capital formation and capital stock estimated at disaggregated level and at prices of 1999-00.
- v) It estimates contribution of TFP, capital and labour to the growth of GDP and its sectors/sub-sectors (growth rates of new series at 1999-00 prices).

1.3 Structure of the Dissertation

In addition to this introductory chapter, the dissertation consists of eight other chapters. Chapter 2 presents a review of literature on national accounts including a description of different attempts made in Pakistan to improve national accounts estimation. Chapter 3 gives details of how rebasing of national accounts has been

⁷ Earlier studies on estimates of provincial and quarterly accounts include Bengaliwala (1995), Kemal and Arby (2004) and Bengali and Sadaqat (2005); however, these studies were based on old methodology (see chapter 2 of this dissertation for further review of these studies).

⁸ All the estimations mentioned here are limited to gross domestic product and its sub-sectors from supply side, i.e. agriculture, mining, manufacturing, services, etc. The other side of the national income accounts viz. consumption, gross fixed capital formation and net exports, shall be out of the scope of this study.

done in Pakistan. Chapter 4 consists of rigorous exercise of estimating the overall and sectoral gross value added at 1999-00 prices for a period from 1970-71 to 2004-05. The estimates have been made by using almost the same techniques as used by FBS for its annual accounts at new base. The next two chapters 5 and 6 present detailed descriptions of methodologies, assumptions and data used for quarterisation and provincialisation of national accounts respectively. The chapter 7 presents a detailed analysis of results of not only rebasing exercise but also of quarterisation and provincialisation. While summary tables relating to different sub-sectors of the gross domestic product have been reported in this chapter, the complete set of data at constant prices of 1999-00 and at current prices have been given in annexures. The last two chapters use the new series of national accounts in estimating sources of growth: chapter 8 presents estimation technique and results of new series of gross fixed capital formation and physical capital stock at constant prices of 1999-00, a time series of skill-adjusted labour force and estimates of factor shares; and chapter 9 presents a framework of growth accounting and estimates of total factor productivity.

The literature relevant to the subject of this dissertation has been classified into three groups; general literature on national income accounts, specific studies on Pakistan's national income accounts, and studies on total factor productivity; a review of these studies has been made in the following three sections of this chapter. Embedded in this review of literature is an account of historical development of national accounts both in general and in particular in Pakistan.

2.1 General Literature on National Accounts

2.1.1 Estimation of annual national accounts

The systematic compilation of economic data into national accounts ranks among the most important innovations in the social sciences. The first estimates of national income appeared in the seventeenth century in England and were prepared by William Petty and Gregory King.⁹ Studenski (1958) has given a detailed description of historical origin of the concepts and practices of accounts of national income and output. Drawing from Studenski, some of the key works of the early economists and statisticians in this field have been presented here. The first document on the subject was an essay called *Verbum Sapienti* by William Petty in 1665 that presented an estimate of the then current national income of England. Eleven years later, another article by the same author appeared with the title of *Political Arithmetick* which also presented estimates of England's national income and compared it with those of France and Holland. Another truly scientific attempt to estimate national income was made by Gregory King in his manuscript titled "Natural and Political Observations and Conclusions upon the State and Conditions of England" dated 1696. King used the terms of "annual income of the nations", "annual expense of the nation", etc. He also prepared separate estimates of per capita income, expenditure and savings for each social and economic class in England. In this way he obtained an estimate of the distribution of national income. Studenski has also reported the contribution of economists and statisticians belonging to other countries to the field of national

⁹ See Stone (1984) for original tables of Petty's estimates of income and expenses for year 1664 and King's estimates for year 1688.

income accounts; the most notable of them is Quesnay from France. He is generally acknowledged to have invented the money-product flow analysis of national income – the approach that is at the very core of modern economic analysis. He called his tabular analysis as “Tableau Economique” that was accepted by his followers as important an invention as Newton’s discovery of the law of gravitation (Studenski, 1958).

A further review of more classical work can be seen in Studenski (1958); we shall now jump over to the most prominent economist of the 20th century, Keynes who laid down the formal foundation of modern accounts with his booklet *How to Pay for the War* (1940) and whose followers contributed enormously to this subject (Heal and Kristrom, 2001). Although Keynes himself was not interested in compiling statistics, his theoretical work on economic phenomena at macro level led to a demand for official estimates of the national income and its components in United Kingdom. According to Hillinger (2003), Keynes also played a central role in the creation of the National Income and Product Accounts (NIPA) of US. The macroeconomic structure of his *General Theory* is reflected in the accounts and his political influence contributed much to their realization.

Among the followers of Keynes, James Meade began formally the task of compiling national income accounts and was joined by Stone, then a student of economics at Cambridge. Richard Stone received the Nobel Prize in 1984 for his work in setting up the accounts. The work of Stone and Mead came to the basis for the Accounts of Nations, to be further developed and refined with the development of the SNA. Stone also chaired a group at the League of Nations that subsequently prepared the 1953 edition of the System of National Accounts.

Vanoli (2005) presents a detailed history of national accounting along with an account of the evolution of the System of National Accounts and points out changes occurred in subsequent SNA’s. He records that the 1953 SNA was a set of six standard accounts. They were based on an underlying structure of production, appropriation, capital reconciliation and external transactions accounts for the sectors including private enterprises, public corporations, government enterprises, households and the

general government. The entries were arranged and consolidated so that each of the six standard accounts related to one of the familiar and important aggregates, such as national income. In 1968, the second version of national accounts system was introduced with more detail and elaboration of different concepts of national income. It included more tables and expanded form of existing ones to fulfill growing needs of economic analysis. The 1968 SNA was widely used by different countries in compiling their national accounts. In 1993, the new system SNA-1993 was launched which retained the theoretical framework of the 1968 SNA. It is not a matter of a radically new system.

The 1993 System of National Accounts is a conceptual framework that sets the international statistical standard for the measurement of the market economy.¹⁰ It is published jointly by the United Nations, the Commission of the European Communities, the International Monetary Fund, the Organisation for Economic Cooperation and Development, and the World Bank. The System of National Accounts consists of an integrated set of macroeconomic accounts, balance sheets and tables based on internationally agreed concepts, definitions, classifications and accounting rules. Together, these principles provide a comprehensive accounting framework within which economic data can be compiled and presented in a format that is designed for purposes of economic analysis, decision-taking and policy-making.

Being the most comprehensive macroeconomic standard, it also serves as the main reference point for statistical standards of related statistics such as the balance of payments, financial and government finance statistics. Being a conceptual framework, it does not attempt to provide comprehensive compilation guidance on how to make estimates nor is it descriptive in setting priorities which accounts and tables should be implemented or expresses norms on the frequency and format of their presentation. For practical compilation guidance, international agencies have developed separate handbooks like the handbooks of national accounting prepared by the United Nations Statistics Division.

¹⁰ Source: <http://unstats.un.org/unsd/sna1993/introduction.asp>.

Recent aspects of globalisation and the appearances of new economic phenomena have led to new topics that warrant a comprehensive rather than an incremental update of 1993 SNA. News and latest progress about the ongoing worldwide comprehensive update towards the 1993 SNA Rev.1 mandated by Statistical Commission in 2002 can be found in the United Nation's website.

The changes consist mainly of clarifications and adjustments of concepts and definitions and enlargement of the scope of the system. Moreover the 1993 SNA has been harmonized with other related statistical systems, e.g. the Balance of Payments Manual (fifth edition) compiled by the International Monetary Fund.

The improvement in national income accounts is a continuous process. Economists and statisticians of almost every country undertake exercises of analyzing the quality of data, expanding the scope of accounts and making them available at higher than annual frequency and shorter time lags. We shall quote some of the authors who worked on the subject either for a specific country or presented a general analysis on different dimensions of national accounts including greening¹¹, regionalising or quarterising the accounts.

Tuke and Ruffles (2002) show the effects of annual chain-linking on annual growth estimates for household final consumption expenditure (HHFCE), exports and imports of goods. Annual chain-linking (ACL) is a method for aggregating volume measures of economic growth to better reflect the changing structure of industry and patterns of expenditure. They conclude that the combined effects of ACL on HHFCE, imports of goods and exports of goods show some similarities to the effect of ACL on the output measure, as would be expected in a coherent set of national accounts. The differences are likely to be because this model represents only part of the expenditure measure. Soo and Zina (2003) have also developed techniques of annual chain-linking of gross domestic product for UK.

¹¹ The greening of national accounts refers to incorporating environmental aspects of production processes in estimating the aggregate production and income.

Heal and Kristrom (2001) analyze in detail the conceptual foundations of national income accounts and they also discuss the issues relating to environmental aspects of the accounts. They have discussed three issues which seem particularly strategic in the context of implementing green accounting procedures, viz., valuation of ecological services, valuation of stocks and Transboundary pollution. They have also focused on attempts to reformulate national income accounts – such as the UN’s proposed System of Economic and Environmental Accounts – and to its applications to particular countries.

Ando (2000) analyzes the national accounts of Japan and identifies where the reforms in accounts are most urgently required. Though the Japanese accounts follow the specifications of SNA 1968, a number of adjustments and modifications have been introduced in the system. However, there are inconsistencies in the data and mismatches between data appeared in different publications and between flow and stock data. He suggests a number of improvements in definitions and recording method of fiscal accounts, accounts of private financial and non-financial institutions which had a bearing on national income accounts.

Repetto et al. (1989) have drawn attention to the shortcomings of economic indicators. Using Indonesia as a case study, they conclude that the country’s reported economic growth throughout the 1970s and 80s would be cut in half if GDP calculations were modified to a so-called “Net” Domestic Product, taking timber, oil, and soil depletion into account. This study is by no means the first to point out major shortcomings in national income measurements, but it has sparked a considerable debate about “green accounting” – integrating environmental and economic accounts. There are also number of other authors who criticized conventional income accounts and emphasized the need for taking into account natural and environmental aspects like Eisner (1988), Nordhaus and Tobin (1972), Lintott (1999), Nordhaus and Kokkelenberg (1999), etc.

2.1.2 Estimation of national accounts at higher frequency

The quarterisation of the annual estimates of national income accounts is another field that attracted the attention of many economists. The necessity of a larger set of

observations in empirical work led the economists and statisticians to invent methods of disaggregating annual data into quarterly data. Lisman and Sandee (1964) propose a mechanical technique for constructing synthetic quarterly data based on past trends in the annual data which gives reasonable estimates of quarterly series. Their criteria for reasonableness were:

- i) The sum of the quarterly figures should, for each year, equal the given yearly total.
- ii) Symmetry considerations, in particular the requirement that if the yearly totals in three successive years are t_1 , t_2 , and t_3 , the quarterly figures for year 2 are the same but in reverse order from what they would have been had the yearly totals been t_3 , t_2 , t_1 (that is, had the yearly totals been reverse order).
- iii) Trend considerations, in particular the desire that if the yearly totals in three successive years rise by equal steps ($t_2 - t_1 = t_3 - t_2$), the quarterly figures during year 2 should also rise by equal steps (of length $0.1 * (t_2 - t_1)$).
- iv) Cycle considerations, in particular the requirement that $t_2 - t_1 = t_2 - t_3$ (for example, a sequence 80, 100, 80), the quarterly figures during year 2 should lie on a sinusoid.

Lisman and Sandee (1964) showed that these four requirements lead uniquely to the following formula for quarterisation.

$$\begin{bmatrix} x_{1t} \\ x_{2t} \\ x_{3t} \\ x_{4t} \end{bmatrix} = \begin{bmatrix} 0.073 & 0.198 & -0.021 \\ -0.010 & 0.302 & -0.042 \\ -0.042 & 0.302 & -0.010 \\ -0.021 & 0.198 & 0.073 \end{bmatrix} \cdot \begin{bmatrix} X_{t-1} \\ X_t \\ X_{t+1} \end{bmatrix}$$

Where X_t is annual figure in year t , and x_{jt} is quarterly figure in quarter j of year t .

This approach has a problem that no quarterly values can be inferred for the first and last year of the series. Boot et al. (1967) propose an alternative to address this

problem; however, as argued by Bloem et al. (2001) both the techniques of Lisman and Sandee (1964) and Boot et al. (1967) give the similar results.

Chow and Lin (1971) were the first to present a coherent econometric approach that handles interpolation and distribution problems for stock and flow variables. The basic idea of Chow-Lin technique is to find some GDP-related quarterly series and use best linear unbiased estimator to predict quarterly GDP figures such that the sum of quarterly figures match to annual aggregates. A similar multi-variate approach has been proposed by Somermeyer et al. (1976) which makes use of casual relationships to estimate quarterly values of an annually known variable. It assumes that quarterly values are weighted moving averages of annual values. The weights in this approach are estimated through a behavioral model by including variables with known quarterly values and known annual values. By imposing different constraints on the nature of weights and the unknown quarterly values an iterative procedure is applied to break annual values into quarterly components. It has been shown that the model performs well mainly where annual values of known variables follow a trend like pattern.

Fernandez (1981), and Litterman (1983) propose another approach that was based on Denton (1971) technique of minimizing a weighted quadratic loss function on the difference between the series to be estimated (e.g. GDP) and a linear combination of the observed related series. This strategy nests the Chow and Lin regression, but allows for more complicated assumptions about the driving process of the interpolated variable and the use of data in first difference.

Except the univariate mechanical technique like the one proposed by Lisman and Sandee (1964), other techniques require a larger set of data to undertake quarterisation. In case of developed economies, most suitable data in case of quarterisation of national accounts is often available at higher frequency like sales data, wages and salaries, tax returns, profits of firms etc. which can be used to get reasonable estimates of quarterly national accounts. However, it is important to note that despite the abundance of and variety of data sources in case of developed economies, recourse has often had to be made to interpolations and extrapolations on the basis of averages, moving averages, repeating preceding or succeeding

observations or even using simply judgments (Young, 1974). For example, the main basis of the Australian quarterly national accounts is stated to be interpolation based on various indicators which are not necessarily the constituent parts of the national accounts (Kennedy, 1969). In the United States also a significant part of the quarterly personal income is estimated through interpolation and extrapolation (Jaszi, 1965, and Brown, 1978).

A description of technique of estimating quarterly accounts in Netherland has been given by Jansenn and Algera (1988): an input-output table for each quarter is constructed with the row and column totals of the table representing the macroeconomic aggregates of the transactions in goods and services. The quarterly input-output table is obtained by a breakdown of the columns of the annual table into four quarterly columns on the basis of selected indicators and autonomous information related to the subject. In case of India, quarterly national accounts were estimated by Khetan and Waghmore (1972) for years 1951-52 to 1966-67.

The SNA 1993 also identifies some issues related to quarterly accounts which include:¹²

- i) When using the System for short-term analysis, annual accounts are not sufficient because they do not generally permit the various short-term movements to be followed as closely as necessary. On the other hand, relying only on the analysis of short-term indicators is not an adequate alternative for various reasons. These indicators are very often incomplete in terms of coverage, and economic interrelationships are not always easily understandable through them. Further, changes in annual national accounts figures and in the corresponding statistical indicators may differ. National accounts try to be exhaustive, and they result from a process of trade-off and adjustment between basic data which are not fully consistent. Consequently, quarterly accounts tend to be broadly used in conjunction with short-term indicators, either current statistics or subjective business surveys. They are

¹² See paragraphs 19.84 to 19.85 of SNA 1993.

increasingly implemented in developing countries as well as in developed ones.

- ii) No country establishes the complete system, including balance sheets, for every quarter. The coverage of quarterly accounts varies considerably from country to country. It consists in many cases of a calculation of GDP only, using a value added approach by broad economic categories, or a balance between GDP and its uses. At the other extreme, some countries try to cover most of current accounts and capital and financial accounts. As indicated above, quarterly accounts which are as complete as feasible may help overcome the difficulties of interpretation encountered with annual accounts in high inflation. Quarterly accounts for general government may facilitate the transition from fiscal year to calendar year when they are different.
- iii) Quarterly accounts are based on intensive use of short-term statistical indicators. Some data used for annual accounts – for example, accounting data – are not available more frequently. When they are, they may not be fully available in time for early estimates. However, short-term indicators should be used with caution. Combinations of these indicators may differ from the corresponding annual national accounts figures. For instance, the annual changes of industrial output measured through monthly or quarterly surveys may differ from the results of annual surveys, where establishments and products are generally better covered, and both may differ from national accounts, which have to make estimates for the missing items, to use additional data and to check the overall consistency of the accounts. Because short-term statistics must be adjusted when used for quarterly accounts purposes, the most specific contribution of quarterly accounts work to national accounting is the study, generally using econometric methods, of the relationship between annual accounts figures and corresponding short-term indicators.
- iv) Apart from deciding which parts of the system and what level of detail to use, quarterly accounts do not in general need adaptation of the conceptual framework. However, the correct definition and measurement of quarterly output requires much attention to be paid to the analysis of changes in inventories in general and work-in-progress in particular.

It may be noted that there is a common feature in the estimates of quarterly national accounts of both developed and countries and that is an extensive use of interpolation and extrapolation and different indicators in such estimates.

2.1.3 Estimation of regional income and product accounts

Although major focus of economists and policy makers has been on national accounts and developments of related concepts, definitions and techniques over time, regional accounts also acquired a status of a discipline in recent years. As argued by United Nations (1968) any system of national accounts could be sub-divided by region and in recent years a number of countries have been engaged in the construction of regional accounts. This development gives rise to a number of conceptual problems which are of only minor importance. However, there are also some practical problems associated with estimation of regional accounts that have been well documented by a number of studies.

Some of the problems have been identified by Hochwald (1957) who argues that economic transactions are defined in terms of ownership interests, operating in a national market under a national monetary system, rather than by regional boundaries. To the extent that the economic activities of these transactions are not confined to a particular region, serious problems of regional allocations may arise about the transactions to be included and classification of these transactions into regions in an exercise of preparing regional accounts.

Adler (1970) also confronted with some issues in case of regional accounting in Canada and noted that the major problem in the application of national accounts concepts to regional accounts is that certain flows of factor income and transfer payments which are net out nationally do not net regionally. This occurs because system of national accounts is designed to measure inter-institutional and inter-sectoral transactions that do not coincide with regional boundaries to the extent they do with the national borders. Some problems also occur in determining the economic region of origin of corporate profits, interest, flows of foreign trade, central government expenses, etc.

Another issue related to regional accounting is price differential as identified by some studies like Graham and Romans (1971) and Nair (1987) etc. Regional accounts estimates are primarily used to draw interregional comparisons of productive efficiency and standards of living. Herewith, it has to be taken into account that prices of factors and products, and changes in prices, are not uniform in all the regions across the country. Regional product or income, valued at national prices, can serve as an indicator of interregional productive efficiency. For comparisons of interregional standard of living differences, however, regional estimates have to be adjusted for interregional differences in the cost of living. The existing differences in per capita regional product or income are likely to change if the estimates are adjusted for interregional price differences. However, interregional cost of living indices are generally not available and their absence constitutes a major deficiency from a distributional point of view.

Capron and Thys-Clement (1992) address the methodological problems encountered in the building of regional accounts in Belgium. They offered a comparison with alternative choices concerning the regionalization of main aggregates made in some other countries. Wasserman (1967) presented alternative approaches for regionalization of French national income accounts.

SNA 1993 also gives an account of issues related to regional accounts; which says: ¹³

- i) Regional accounts are of special importance when there are important gaps between the economic and social development of the various regions of a country.
- ii) A full system of accounts at the regional level implies treating each region as a different economic entity. In this context, transactions with other regions become a kind of external transactions. External transactions of the region have, of course, to distinguish between transactions with other regions of the country and transactions with the rest of the world.

¹³ See paragraphs 19.88 to 19.96 of SNA 1993.

- iii) Three types of institutional units have to be considered in the context of regional accounts. Firstly, there are regional units, the centre of interest of which is in one region and most of their activities take place in this region. Among regional units are households, corporations whose establishments are all located in the region, local and state governments, at least part of social security and many non-profit institutions serving households (NPISHs). Secondly, there are multi-regional units, the centre of interest of which is in more than one region but does not relate to the country overall. Many corporations and a number of NPISHs are in this situation. Finally, a small number of units are national units, which means that their centre of interest is really not located geographically even in the sense of multi-regional location. This is the case of central government and may be the case for a small number of corporations (probably public), generally in a monopolistic or quasi-monopolistic situation, like the national railway corporation or the national electricity corporation.
- iv) Locating transactions of the regional institutional units does not raise any conceptual problem. These units are clearly regional resident units. Allocating the transactions of multi-regional units between various regions raises more difficulties. Even when these transactions are physically locatable, like output, it is necessary to actually value intra-corporate flows between establishments located in different regions. The System recommends including inter-establishments deliveries in the definition of output and this is especially important for regional accounts. A further consideration is that part of the transactions of multi-regional units is not, strictly speaking, regionalizable, in concept. This is the case for most property income and transactions in financial instruments. Consequently, balancing items of multi-regional units may not be unambiguously defined at the regional level for multi-regional units except value added and operating surplus. This means that, by definition, multi-regional institutional units may not be broken down in a number of regional institutional units.
- v) One could argue that the measurement problems for multi-regional corporations are very similar to those of multinational corporations. There is obviously some similarity between these two kinds of enterprises. However, in

the case of multi-national corporations, national legislation and other considerations generally lead to establishing different legal entities in different countries. Even if these legal entities are not fully independent and the valuation of their external transactions within the same multinational corporation is not based on true market values, these units fulfill the conditions necessary to be treated as institutional units in the System. Only foreign branches which are not established as separate legal entities are in more or less the same situation as establishments belonging to multi-regional corporations. However, in the accounts of the nation as a whole, they are few in number and play a marginal role. Conventions of measurement in their case do not have an important impact on national accounts results. Moreover they are generally obliged to submit certain data. In regional accounts, on the contrary, these units are very common.

- vi) The location of national institutional units raises more complex issues. In their case, breaking down their centre of interest between all the regions is conceptually dubious. Those units do not seem properly regionalisable. Of course, this does not mean that many transactions they carry out cannot be located in the regions, like sales of electricity and railway services or compensation of employees paid by central government. But it is not conceptually possible to regionalize their accounts totally. For instance, interest on the public debt payable by central government may not be geographically located (even when this interest is locatable when receivable by other units). The same is true for interest on their debt payable by national corporations. This probably leads to considering the introduction, in addition to the regions, of a kind of national sector, not allocated as such between the regions or constituting an extra region. This national sector would have establishments located in the regions.
- vii) One may think of allocating all transactions of multi-regional units or even national units between regions according to some rules of thumb. However, this should not be considered simply as a practical approximation. It implies a conceptual adaptation of the System. The reasons which prevent including a full sequence of accounts for establishments/industries in the central framework also forbid, in principle, completely distributing all institutional

units and their accounts between regions, which means, in principle, building up a full set of accounts for establishments.

- viii) These conceptual difficulties partly explain why no country establishes the complete System for every region. In most cases regional accounts are limited to recording production activities (with conceptual problems arising for locating some of them, like transportation and communication) by industry and more complete accounts for institutional sectors composed of regional units, like households and local and state government. Establishing accounts for goods and services and input-output tables by region does not raise unsolvable conceptual issues, deliveries to and from other regions being, of course, treated as exports and imports. However, the practical difficulties are very important in the absence of a sophisticated system of transport statistics.
- ix) Nonetheless regional accounts, even with the limitations mentioned above, are a very useful tool for economic policy. Partial regional accounts may be inserted in a set of regional statistical indicators on labour participation, unemployment, poverty, etc. The greater the contrast between the regions in a country, the more useful is such a system of regional indicators, including GDP per capita according to broad economic categories, household disposable income and household consumption per capita. It is up to the countries themselves to devise their own regional accounts and statistical indicators, taking into consideration their specific circumstances, data system and resources which might be devoted to this work.

Lahr (2000), while giving his comments on regional accounts, suggested that three principals should be followed while producing regional accounts from national accounts:

- i) When producing regional accounts from national accounts, use as much sectoral detail as there is available.
- ii) When 'regionalizing' national accounts, one assumes that technology is spatially invariant within a nation. This principle has been used by producers of industry-by-industry regional input-output models at least since Isard

(1951). This assumption allows the application of national Use Coefficient Matrices, albeit with some adjustment(s).

- iii) Regionalization typically should be performed on domesticated national accounts. Most means of quantifying interregional trade fail to account for national exports originating from the region of study or for imports to a nation destined to the region of study. The regionalization schemes typically cannot account for international trade, especially imports. Thus, most regionalization methods must be applied on top of the domestication of national technology.

2.2 Studies on Pakistan's National Accounts

The first estimates of national accounts of Pakistan were prepared by the Economic Advisor's Office in 1949. On the setting up of the Central Statistical Office (CSO) in 1950, the job was transferred to CSO, now Federal Bureau of Statistics (FBS). The earlier estimates were limited to national product by industrial origin and were unsatisfactory in terms of their coverage and techniques. The earlier system of national accounts in Pakistan was reviewed thoroughly by a committee of experts on the national accounts headed by Henry J. Bruton who prepared the first report of its kind (Bruton 1962).

The Bruton committee not only reviewed the existing practice of compiling national income accounts but also presented a number of recommendations to improve them; they also recommended, among others, to estimate province-wise accounts and discussed issues related to such estimation. However, if their recommendations are compared with actual practice, one finds that many of their recommendations had been ignored by Central Statistical Office. It will be useful to reproduce the list of the recommendations given by the committee to improve the national accounts system in Pakistan.

Bruton committee's Recommendations

- i) The national accounts should cover annual periods from July to June.
- ii) The national accounts should contain separate estimates for each province (East and West Pakistan) and aggregate estimate for the country as a whole.
- iii) The estimates should be presented in both, current and constant, prices.

- iv) Central Statistical Office should present each year an integrated set of national accounts consisting of the following estimates:
 - a. National product (i.e., distribution by industries)
 - b. National expenditure (i.e., consumption and investment expenditure)
 - c. National income by type of organization
 - d. National income by distributive sharesThe Committee regards tables (a) and (b) above as the minimum number of tables for the presentation of national accounts. However, it is strongly recommended that in due course all accounts be included.
- v) Each of these estimates should be prepared in accordance with the United Nations manuals on national accounts and with detailed recommendation presented in the subsequent parts of this report.
- vi) All estimates should be published together with the relevant supplementary tables and explanatory notes indicating the methods and accuracy of the estimates.
- vii) Estimates for each current year should be put together with the data for the past years in the form of time series.
- viii) The time series of estimates should be followed by a broad analysis of changes in the size, structure and distribution of the national economic aggregates. This analysis should concern itself with the past trends in the national accounts as well as with likely developments in the year ahead with a view towards providing a better understanding of Pakistan's economic development.
- ix) All the statistics, notes, and analysis as described in paragraphs (i) – (viii) above should be published annually by the Central Statistical Office under the title National Accounts of Pakistan indicating years covered by this publication.

Although the statistical agency could not implement all the recommendation, the usefulness of these recommendations cannot be overstated. Non-implementation of the recommendations has resulted into many handicaps in analytical work. For example, had the national accounts be available by type of organization (i.e. private enterprises, government, households, etc.) and by type of distributive shares (i.e.,

wages, farm income, rent, interest, etc.), the quality and quantity of economic research in Pakistan would have been manifold than at present.

Another important recommendation which was ignored was providing the accuracy of estimates; such information helps researchers to determine the level of confidence in their analysis. However, it is to the credit of Pakistan's statistical agency that it is compiling and publishing annual accounts almost regularly. Apart from the data series, the Federal Bureau of Statistics has also published certain documents giving detail of estimation technique like Gross National Product of Pakistan 1980-81 base (FBS 1989), National Accounts of Pakistan, Rebasing from 1980-81 to 1999-00 (FBS 2004) and number of brochures on national accounts. However, details of methodology have not been provided in fully transparent manner in these documents according to the spirit of the recommendation (vi) of the Bruton Committee. For example, Reviewing the latest publication by the FBS on the subject, i.e. National Accounts of Pakistan, Rebasing from 1980-81 to 1999-00 (herein after called Rebasing Book), one cannot find pit/well head prices of three core mining items viz., coal, crude oil and natural gas; similarly detail information of obtaining benchmark estimates of electricity, gas & water supply, public information and defence and social, community and personal services are missing in this report.

In April 1963, the President of Pakistan appointed a National Income Commission with the terms of reference of examining available data and the requirements for compilation of national accounts, recommending ways and means of collection of accurate and fuller data required for this purpose, and to give appropriate recommendations to improve national accounts compilation. The commission was headed by Mr. Abdul Qadir, former minister of finance, government of Pakistan. Some of the major findings and recommendations of the commission were the following:¹⁴

- i) There was a great and immediate need for setting up an integrated system of national accounts, followed by input-output accounts. For this purpose, steps

¹⁴ See Government of Pakistan (1965)

would have to be taken to collect basic data through special sample surveys and other means.

- ii) The provincial government should collect variety-wise production and price data for all major crops where price differentials are substantial and provide the same to the Central Statistical Office (CSO).
- iii) The coverage of production index was proposed to expand from existing 32 items with revision in weights that reflected true contribution of an industry in the sector.
- iv) A census of distributive trade was suggested to be conducted in order to estimate the contribution of wholesale and retail trade in gross value added.
- v) Value added in Postal Life Insurance should be included in banking, insurance and real estate sector.
- vi) Provincial accounts separately for West and East Pakistan should be compiled by Central Statistical Office. The CSO should also initiate a study for measuring the comparative purchasing power of the rupee in the two provinces and in different regions of each province.
- vii) The commission also proposed a number of other special studies and surveys to improve the system of national accounts.

The system of national account was also reviewed by a mission from World Bank in 1969 as a part of its overall assessment of statistics in Pakistan (International Bank for Reconstruction and Development, 1970).¹⁵ The mission gave its recommendations for institutional strengthening of the federal and provincial statistical system which also included renaming the CSO as Federal Bureau of Statistics.

After almost twenty years of the formation of the first National Income Commission, another committee was formed under the chairmanship of Mr. A.G.N. Kazi, Governor, State Bank of Pakistan in 1984 to review the present methodology for preparation of National Accounts and to propose improvements. On the recommendation of Kazi committee, national accounts were compiled at new base of 1980-81 (see FBS, 1989 for detail of changes in new estimates) along with number of

¹⁵ The mission visited Pakistan during October to November 1969 and submitted its report in 7 volumes one of which was related to national accounts and non-agriculture sector.

other changes brought in compilation techniques like construction sector for which the use of cement production in estimating value added of construction was replaced with value added coefficients applied on investments taking place in different sectors. The Kazi committee also formed a number of technical sub-committees for different sectors. The recommendations of these committees were incorporated in new series of national accounts at 1980-81 prices.

For a long period of time the national accounts in Pakistan had been valued at constant prices of 1980-81. Realizing the need to update the base of accounts and to improve existing methodology, a technical committee on national accounts (TCNA) was formed under the chairmanship of Dr A.R. Kemal, then Chief Economist at Planning & Development Division on July 01, 1997. The Kemal's TCNA recommended to change the base from 1980-81 to 1995-96; it also pointed out short comings in the present system of national accounts and offered a number of recommendations to improve the accounts. A brief description of the recommendations of this committee is the following.

Kemal's TCNA Recommendations

- i) The dichotomy of major crops and minor crops should continue but may be recomposed according to changed output profile.
- ii) Output of crops may be augmented by acceding to non-reporting areas as well.
- iii) Subsistence output of fruits and vegetables may be estimated.
- iv) Re-authentication of the ratio of by-products to the crops is needed.
- v) Development of the ratios of harvest prices to current prices for input-output table is required.
- vi) Conversion of wholesale prices into harvest prices of minor crops.
- vii) Input valuation in terms of seed rate, irrigation water, draught power, pesticides & fertilizer, wastage & transport charges, depreciation and agricultural services for each crop may be attempted.
- viii) Double deflation with appropriate selection of deflators may be used to determine input-output structure of the sector.
- ix) The data availability and adequacy in the realm of agricultural inputs, quantum and prices of agriculture. By products and crop-wise value addition should be

addressed with the help of Agricultural Crop Reporting Provincial Departments, Agriculture Price Commission and Research Organizations in the country.

- x) Possibilities should be explored to collect data for estimation of quarterly accounts.
- xi) Research studies should be conducted to estimate the subsistence output of crops, variety-wise production of mango and apple, under estimation of the output of banana, valuation of tube well (electric/diesel) water, improved seed rate, use of organic fertilizer, valuation of ploughing & planking cost, agricultural services and wastage.
- xii) Productivity factor may explicitly be accounted for in estimation of agricultural output.
- xiii) Separate estimates of AJK may also be attempted.

A number of above recommendations are still to be implemented. However, recently the FBS has changed the base from 1980-81 to 1999-00. For the purpose of this change of base, the Federal Bureau of Statistics has undertaken or commissioned a number of studies on different aspects of the national accounts under a Research & Case Studies (RCS) project,, which include:

In-House Studies by FBS own Staff:

1. Fishing
2. Shipping
3. Community, Social, Personal and New Emerging Services
4. Livestock
5. Mining & Quarrying
6. Public Admin & Defence
7. Slaughtering
8. Water Supply
9. Transport excluding Shipping
10. Financial & Insurance
11. Producer Price Index
12. Electricity & Gas

13. Agricultural Crops
14. Non-Profit institutions for Households
15. Construction
16. Large-scale Manufacturing
17. Supply & Use Table (SUT) 1999-2000

Out-sourced Studies:

1. Wholesale & Retail Trade, Hotels & Restaurants
2. Forestry
3. Savings in Pakistan
4. Depreciation Rates in Pakistan
5. Small-Scale Manufacturing
6. Capital Formation in Pakistan

In addition to above studies, FBS also conducted a census of software industry and related services in Pakistan (FBS 2002). In general these studies presented latest raw data on relevant sectors, developed the estimates of gross output, input, gross value added and gross fixed capital formation. The studies also recommended new indicators (new benchmark values of old indicators) of constant growth being used in some sectors. The contribution of emerging economic activities like computer software, hardware installation & maintenance, mobiles phones, etc. to gross domestic product was also estimated by these studies.

Coming towards the quarterly national accounts in Pakistan, Bengaliwala (1995) made the first comprehensive attempt to estimate quarterly values of real gross domestic product at constant prices of 1980-81 and its sub-sectors for the period 1971-72 to 1989-90. The study applied product approach for commodity producing sector and income approach for services sector by using both direct and indirect data sources and subjective information about the seasonal patterns in the economy. Although the study adopted various suitable allocators to quarterise a number of sub-sectors of the economy, it just divided annual value added of a number of other sub-sectors into four equal parts; such sectors included livestock, mining and quarrying, communications, ownership of dwelling and public administration and defence – the

combined share of these sectors in total GDP is 22 percent on average; it implies no seasonal variations have been assumed for more than one fifth of the GDP which seems implausible.

Haq (1999) also undertook an exercise of quarterisation of GDP independently which was similar to Bengaliwala (1995); the series though publicly not available exhibited similar seasonal pattern as Bengaliwala (1995) series.

Recently a study was undertaken by Kemal and Arby (2004) on quarterisation of annual GDP of Pakistan, which presents the quarterly estimates of GDP and its sub-sectors using the maximum available information on the seasonal pattern of economic activities and keeping the technique as close to annual accounts as possible. However, their estimates of quarterly GDP are also at constant prices of 1980-81 like Bengaliwala (1995) and Haq (1999). However, the technique they adopted can be applied to national accounts with base prices of other years.

Bengaliwala (1995) also attempted to estimate regional values of real gross domestic product at constant prices of 1980-81 for the period from 1971-72 to 1989-90. His work was extended to year 1999-00 by Bengali and Sadaqat (2005) by using the same methodology. It is learnt that some estimates of GDP in provinces of Punjab and NWFP have also been made under some international donor's projects; however, the results of such studies are not publicly available.

2.3 Literature on Total Factor Productivity

Economists are often keen in exploring what causes economies to grow over time. The possible sources of economic growth are increase in the level of inputs like labour and capital and some technological changes that enable the given level of inputs to produce more. The impact of technological change is usually referred to as Total Factor Productivity (TFP) in the literature, and economists have used a number of approaches to measure the TFP. Although the economic theory of productivity measurement goes back to the work of Jan Tinbergen (1942)¹⁶, Solow's work (1957) was the foundation of formal models and empirical exercises on the sources of

¹⁶ Quoted by Hulten (2000) and (OECD, 2001).

economic growth. Solow's neoclassical growth model gave the theoretical framework for quantifying the contribution of total factor productivity (TFP) and traditional inputs to the growth of gross domestic product (GDP). Hulten (2000) has provided a biographical review of different techniques and concepts relating to productivity measurement including classical work on the subject like Jorgenson and Griliches (1967, 1972), Hall (1968), Hulten (1973), Griliches (1973), Denison (1962, 1972), Diewert (1976), etc. We shall review some of the empirical studies undertaken in recent years for certain individual or group of countries.

Young (1995) in his thought provoking paper analyzes the historical patterns of output growth, factor accumulation and productivity growth in the newly industrializing countries of East Asia, i.e., Hong Kong, Singapore, South Korea and Taiwan. He found that contribution of total factor productivity to overall economic growth was 0.2 percentage points in Singapore, 1.7 in Korea, 2.3 in Hong Kong and 2.6 in Taiwan. In case of manufacturing industries it ranged from a low of -1.0 percent in Singapore to a high of 3 percent in Korea. His main conclusion was that similar productivity growth also occurred in other countries but with lower growth rates than East Asian countries; thus the productivity growth rate does not explain the growth experience of these countries; instead it is capital accumulation that upheld high growth rates. Collins and Bosworth (1996) reinvestigate the issue of the sources of East Asia's rapid Growth in output by extending their research to seven countries. The empirical framework is provided by a set of growth accounts that decompose the growth in output per worker from 1960 to 1994 into the contributions from the accumulation of physical and human capital and a residual measure of the change in total factor productivity. They find that TFP contributed 0.8 percentage points to the per worker output in Indonesia, 1.5 in Korea, 0.9 in Malaysia, -0.4 in Philippines, 1.5 in Singapore, 1.8 in Thailand, 2 in Taiwan, and 1.1 in East Asia as a group during the period 1960-94. The central result of their study reinforces Young's and others studies who have concluded that TFP growth played a small role in East Asian success.

Senhadji (1999) conducts a growth accounting exercise for 88 countries for a period of 1960-94 and tried to find sources of cross-country differences in total factor productivity level. He grouped the 88 countries into six regions and assumed that

production functions are identical across countries within regions but different among countries across regions. Unlike many other studies that used non-parametric approaches, he adopted parametric approach by estimating production function through Fully-Modified (FM) estimator developed by Phillips and Hansen (1990) and Hansen (1992). His results show that contribution of TFP to growth rate of real GDP was 0.79 in East Asia, 0.91 in South Asia, -0.52 in Africa, 0.75 in Middle East and North Africa, -0.24 in Latin America, 0.83 in industrial countries and 0.23 in the world as a whole during the period of 1960-94 (setting the value of $\alpha = 0.4$ in Cobb Douglas production function, $Y = AK^\alpha(LH)^{1-\alpha}$; he has also reported results with other estimates of α). He concluded that initial conditions, terms of trade shocks, economic and political stability explain the differences of TFP among different groups of countries.

Klenow and Rodriguez-Clare (1997) offer new evidence related to the debate on relative importance of productivity and capital (physical and human) accumulation in explaining the international differences in levels and growth rates of output. Using their own estimates of human capital, they found that productivity differences account for half or more of level differences in 1985 GDP per worker. They also carried out growth accounting and found that differences in productivity growth explain the majority of growth rate differences across countries. Their development level or growth accounting exercise was based on a sample of 98 countries including Pakistan; they worked out TFP growth for Pakistan as 2.68 during the period 1960-84 which is higher as compared with the results of other studies on Pakistan.

Similar results have been obtained by Easterly and Levine (1999) through more rigorous research and use of superior techniques. They documented five stylized facts of economic growth, i.e., (i) The “residual” rather than factor accumulation accounts for most of the income and growth differences across nations, (ii) Income diverges over the long run, (iii) Factor accumulation is persistent while growth is not persistent, (vi) Economic activity is highly concentrated, with all factors of production flowing to the richest areas, (v) National policies exert a large influence on long-run economic growth rates. They conclude that major empirical regularities of economic growth emphasize the role of total factor productivity growth. The TFP residual

accounts for most of the cross-country and cross-time variation in growth. Income across countries diverges over the long-run, which is incompatible with the neoclassical model stressing capital accumulation (with diminishing returns) as the main source of growth. Growth is highly unstable over time, while factor accumulation is more stable, which certainly emphasizes the role of “something else” in explaining variations in economic growth. They also note that national policies influence long-run economic growth even after controlling for transitional dynamics; this further suggests a key role for productivity growth. Moreover, it has been shown that all factors of production flow to the richest areas, suggesting that they are rich because of high productivity rather than high capital stock. Finally, they note that divergence of per capita incomes and the concentration of economic activity suggest that technology has increasing returns.

Guha-Khasnobis and Bari (2000) analyze the growth performance of South Asia through a descriptive analysis as well as in a growth accounting framework. They also study the determinants of growth in these countries. In their analysis, the role of capital accumulation in GDP growth came out quite strong. They also find that TFP, if not very large in absolute terms, was significant enough in a relative sense (i.e., in terms of its percentage contribution to GDP growth). In particular, they find that across countries and periods, higher growth rates of TFP were associated with higher GDP growth rates. They find that the factors that had contributed to higher growth in East Asia, but in which South Asia have been lagging behind, include schooling, openness, strength of institutions, and government spending. The openness factor explains most of the TFPG difference between East and South Asia.

There are also a number of studies analyzing the productivity trends in individual countries. For example, Hu and Khan (1997) have examined the sources of Chinese economic growth and found that contrary to the tradition, efficiency was the driving force behind the Chinese economic boom, with sharp productivity increases explained by economic reforms that started in 1978. Amin (2002) estimates contribution of TFP growth for Cameroon during 1961-97 using both parametric and non-parametric approaches. The results show that over the period, the total factor productivity (TFP) vary around zero for all three sectors, with the means for the period being 0.0501 for

agriculture, 0.0473 for industry and 0.0389 for services. He finds that the contribution of the growth of factor inputs is greater than the contribution of total factor productivity, with capital input playing a larger role. However, the results do show high growth rate of total factor productivity, thus suggesting the potential and growing importance of TFP in the growth process. Mrkaic (2002) has measured the dynamics of TFP in Slovenia by assuming a Cobb–Douglas production function for the period 1992 to 2000. Deviating from usual practice of estimating capital stock series through perpetual inventory method (PIM), he estimated the capital stock by exploiting the condition that the marginal product of capital must be equal to the user cost of capital (the real interest rate plus the rate of depreciation). The method allowed him to determine the dynamics of TFP in Slovenia by using time series data on net investment, employment and real interest rates, all of which were readily available and measured with reasonable accuracy. The results of his study showed that TFP in Slovenia grew fast in the early 1990s, and that the growth slowed significantly and reached negligible annual rates in the second half of the 1990s (in the range of -0.02 to 0.009). Fukao (2003) analyze the impact of foreign direct investment on total factor productivity of Japanese firms. In order to do so, he compares the performance of foreign-owned firms with that of domestically-owned firms, using micro data of Japanese firms in the manufacturing sector for the period of 1994-1998. The results regarding the overall comparison between foreign-owned and Japanese companies showed that foreign-owned companies enjoyed 10% higher TFP as well as higher earnings and returns on capital. The implications of these results are that foreign-owned firms in Japan possess superior technologies than their domestically-owned counterparts due to access to the parent's intangible asset and that Japan was benefiting from inward FDI.

In case of Pakistan also a number of studies explored the status and role of productivity for overall and sectoral growth of gross domestic product. Cheema (1978) reports gains in productivity in manufacturing industries of Pakistan for the 1959-70 period. He observes rather erratic trends in productivity gains arising from sharp fluctuations in the capital stock. In view of the fact that he used CMI data without making any adjustment for under-coverage of the firms and understatements of capital, such results were hardly surprising. Kemal (1978) reportes gains in

productivity in manufacturing sector over the period of 1960s; these estimates are also based on CMI data, however, adjusted for both under-coverage and understatement of capital stock. The study finds that over 1959-60 to 1969-70 period, total factor productivity in manufacturing industries increased at a rate of 5.06 percent. The gains in productivity estimated through Cobb-Douglas and CES production functions are also quite similar to those estimated through the ratio method. The study also found some evidence on capital saving bias in the technical change in Pakistan. Capital saving bias in 1960-70 period, however, has been a reflection of an increase in capital utilization rather than the development of capital augmenting technical change. Ahmed (1980a, 1980b) examines changes in productivity in manufacturing industries of Pakistan. He selects a sample of those firms which has provided CMI data for all the years. He also points out gains in labour productivity, though the level of productivity continued to be low. Wizarat (1981) estimates technological change in Pakistan's agriculture and concluded that productivity declined over the 1954-60 period, increased slightly over the 1960-65 period, and very rapidly in the 1965-70 period (with a rate of 6.9 percent per annum). Technical change contributed as much as 84 percent to the growth of value added in this period. While her results were quite interesting, they suffer from various problems especially those relating to incomplete data of capital stock. Islam (1991) also studies trends in productivity in case of agriculture and showed that over the 1950-83 period, productivity gains explained 34 percent of the increase in value added in agriculture. The gain had been smallest in the 1950-55 and 1970-78 periods, i.e., 12 and 17 percent respectively and had been the highest in the 1965-70 periods, i.e., 55 percent.

Looking at the overall growth of output in Pakistan, Burney (1986) estimates sources of growth for the entire economy and concluded that whereas in the sixties, residual accounted for more than half the increase in value added, its significance fell in the seventies and by 1979-80, it was less than one quarter. However, it increased subsequently to one third in the 1980 to 1985 period. Burney's estimates also suffer from the poor data on capital stock. He seems to have overestimated the capital stock in 1959-60 which yielded lower growth rates of capital in sixties. This is in sharp contrast to the fact that investment in 1964-65 has been the highest in Pakistan.

Kemal (1992) estimates the contribution of total factor productivity and capital and labour to growth rates of gross value added (or output in case of agriculture and manufacturing) during the period of 1950-91. His results show that on average the contribution of TFP growth was negative (-0.56) during this period; however, there are some periods when it was positive including the period of fifth plan 1978-83 (0.91), the period of sixth plan 1983-88 (0.74) and the period of seventh plan 1988-91 (0.88). The contribution of total factor productivity to the growth of agricultural output growth was estimated at 0.94 for the period of 1950-91; 1.1 to the growth of manufacturing output during the same period; and -0.5 to the growth of other sectors of the economy (taking together).

Kemal et al. (2002) estimate total factor productivity (Solow Residual) in case of Pakistan for the period from 1964-65 to 2000-01. They estimate TFP for the whole economy as well as for the agriculture and mining and manufacturing sub-sectors. Whereas TFP grew by 1.66 percent for the whole economy, sectoral growth rates in TFP stood at 0.37 percent and 3.21 percent respectively for agricultural and mining and manufacturing sectors. The results show that Total Factor Productivity has contributed 31.26 percent to the aggregate growth, 9.57 percent to growth in agricultural output, and 50.27 percent to the growth in the manufacturing sector.

All the above studies on Pakistan's economy used old data and attempted to examine only few sectors of the economy. In the present dissertation, we have used the latest data set with improved techniques of estimating physical capital stock and skill-adjusted labour input and examined the trend in the contribution of total factor productivity in overall GDP and all its sub-sectors.

3 Rebasing of National Accounts

National income and product accounting is one of the major branches of national economic accounting in a country, which illuminates some important aspects of the structure, working and performance of the economy. All countries are compiling national income and product accounts that include the key aggregates like consumption, investment, gross domestic product, gross national income, etc. The national accounts aggregates are estimated both at current and constant prices: the current estimates are the national income and product valued at prices prevailing in the same year for which estimates are being made, while constant estimates are national income and product valued at some base year prices. The national accounts aggregates at constant prices provide very useful indicators for measuring real growth in the economic activities because they exclude the impact of price changes on overall value of these aggregates. However, the base year prices selected for valuing national accounts aggregates tend to become progressively less relevant as the pattern of relative prices changes over time (see Box 3.1 on impact of changes in relative prices at the end of this chapter). Therefore it is necessary to update the base period to adopt weights that are more consistent with current conditions.

There are also some other important reasons for revision of base year including changes in the production structure in the economy over a period of time; appearance of new products in the market due to continuous developments and innovations; disappearance of a number of other products due to changes in taste or availability of better alternatives; and non-comparability of goods and services between far apart periods due to quality changes. Furthermore, on the final demand side as well structural changes do appear in the consumption patterns and utilization and acquisition of capital goods. All these factors justify that it is absolutely desirable to rebase the national accounts series periodically. As the changes in structure of production or consumption appear almost continuously, it further justifies more frequent rebasing. Rebasing on an annual basis and annual chaining of volume

indices¹⁷ would of course be the most ideal proposition as recommended by the SNA 1993. The SNA 1993 argues that annually-reweighted chain volume measures should be compiled to aid the analysis of economic statistics as they provide better indicators of volume growth than base-weighted constant price estimates for most economic statistics relating to production and expenditure. However, such an index requires additional basic data on quantities and prices.

3.1 Technique of Rebasing of National Accounts

Rebasing of national accounts series refers to replacing the old base year used for compiling the constant price estimates to a new and more recent base year. The process starts with new estimates of ingredients of national income and product at the most detailed and basic level along with a collection of prices of goods and services prevailing in a typical year (base year) and performing the aggregation from this detailed level to the main national accounts aggregates. It is almost impossible to apply a single method to estimate constant price value of all economic activities at their basic levels; therefore, national accountants use different approaches for different economic activities. Three main approaches are used for this purpose: revaluation, deflation, and volume extrapolation. As an illustration of these approaches, consider national accounts with existing base year of 1980-81¹⁸ which is to be rebased to a new base year 1999-00; the following steps are involved at a detailed compilation level:

1. For the economic activities or aggregates of which volume (quantity) measures are available, the constant price estimates are obtained by *revaluation*. In this case, a change of base year involves replacing the 1980-81 prices currently used with 1999-00 prices for the same items. For example, rebasing of major and minor crops, and mining and quarrying can be done by revaluation technique (details are given in relevant sections below).

¹⁷ The annual chain volume index allows the base year to be updated every year instead of every five or ten years as is the case with fixed weight measures. Calculations are carried out in previous years' prices and aggregated to give chain volume measures.

¹⁸ A financial year in Pakistan starts in July and ends in June; thus the year 1980-81 refers to July 1980 to June 1981.

2. For the economic activities or aggregates that are usually initially estimated at current prices and their constant price estimates are obtained through *deflation*, a change of base year involves changing the reference period from 1980-81 to 1999-00 for the deflators used at the most detailed level. An example for rebasing by deflation is finance and insurance sector.
3. There are some economic activities or aggregates for which it is difficult to estimate their values every year; thus based on some quantity indicators their constant price estimates are obtained through *volume extrapolation*. Under this approach, a change of base year involves changing the period from which the levels are being extrapolated. Volume extrapolation is commonly done either by: (i) multiplying the current price value in the base period with a volume index (with the base period as reference period) showing the change from base period, or (ii) multiplying the constant price estimate for the previous year with a volume indicator showing the change from the previous year. In case Pakistan, rebasing of value added of small-scale manufacturing and ownership of dwelling are examples of volume extrapolation.

3.2 Re-basing in Pakistan before 1999-00

The estimates of national income in Pakistan were initially prepared only in current prices by the Central Statistical Office. However, with the inception of First Five Year Plan, a need was felt for an objective measure of economic growth.¹⁹ Emphasis, therefore, shifted from current to constant prices as the base of estimation. During the first three or four years following the publication of the estimates for 1948-49, prices fluctuated widely and consequently in 1954 it was decided that the price base for the new constant series should be the average of 1949-50 to 1952-53 prices. The new estimates were only available for years 1949-50 onward; consequently the very first estimate of national account for the year 1948-49 was not comparable with those in subsequent years. With the adoption of constant price estimates, the current price series was discontinued which was re-introduced in 1963.

In 1963, with report of the National Income Commission the national accounts were re-based at 1959-60 prices. The gross value added in all the sectors was revalued at

¹⁹ See Government of Pakistan (1965) p 16.

prices of 1959-60 for the years 1959-60 onward. However, no exercise was done to rebase national accounts for years prior to 1959-60. The rebased series for past years was made available in 1968 with the publication of a book titled 25 Years of Pakistan in Statistics 1947-1967.

Further change of base for national accounts could be undertaken in mid 1980s after a couple of failed attempts to change the base from 1959-60. In 1972-73, FBS undertook an exercise for switching over the base from 1959-60 to 1969-70. These estimates were presented before the National Accounts Committee but could not be adopted due to inconsistencies in the estimates of manufacturing sector. The Committee directed the FBS to prepare estimates with 1975-76 base. A comprehensive work plan was then prepared for improving the existing data series and plugging in the statistical gaps. Some surveys such as wholesale and retail trade, small and household manufacturing industries were conducted for this purpose. The estimates with base 1975-76, on improved data availability, concepts and methodology were prepared for the year 1975-76 through 1983-84 and presented before the Committee but the same too could not be adopted due to persistent inconsistencies. It was 1989, when FBS succeeded to change the base of national accounts from 1959-60 prices to 1980-81 prices in the light of the recommendations of A.G.N. Kazi Committee (FBS, 1989). The FBS released new estimates of national accounts for the years 1980-81 onward at new base and once again no attempt was made at that time to re-base the past series. All the statistical publications continued to report two sets of data on national accounts; one based on old methodology for years up to mid 1980s with constant prices of 1959-60 and the other based on new methodology for years 1980-81 onward with base prices of 1980-81. Then in 1998, a consistent historical series of national accounts at base prices of 1980-81 was published in a book titled 50 Years of Pakistan in Statistics (4 volumes). In this publication, the old series was converted at new base by a method of splicing which implies no detailed exercise was made to re-price the economic activities in different sectors.

As per recommendations of the A.G.N. Kazi Committee, the national accounts were to be again re-based after 10 years and the new base had to be 1990-91. As pointed

out in FBS (2004), attempts were made to change the base year first to 1990-91 and later to 1995-96. These attempts, however, failed for one reason or the other. The result was that national accounts estimates based on benchmark of 1980-81 became antiquated and could not capture the true structure and parameters of economic and technical/technological changes which had occurred during the last twenty years.

The issue of rebasing the national accounts estimates, therefore, gained prime importance. The Annual Plan Coordination Committee (APCC) meeting held in March 1997 considered this issue and recommended to improve and rebase the national accounts of Pakistan to make the GDP and investment figures more realistic. Accordingly, a Technical Committee on National Accounts (TCNA) was constituted in the Federal Bureau of Statistics (FBS) for improvement and rebasing of national accounts of Pakistan. This committee was headed by Dr. A. R. Kemal, Director, Pakistan Institute of Development Economics (PIDE). Eight technical sub-committees were further set up to assist the Committee to look into the sectoral issues individually. The committee examined the sectoral inadequacies of existing practice, examined the constraints and proposed an action plan to bring national accounts estimates in line with the latest accounting framework of 1993 UN System of National Accounts (SNA). The Committee also proposed to conduct a number of studies to ensure methodological improvements and data adequacy. As result of such concerted efforts, the FBS could develop new series of national accounts in year 2004 with a new base of 1999-00 prices. It released new base series of national accounts for years 1999-00 onward; and like its past practice no attempt was made to re-base the past data. The features of this latest re-basing have been described in the following section.

3.3 Re-basing of National Accounts in 1999-00

After a gap of about 20 years, the Federal Bureau of Statistics (FBS) undertook an exercise to re-base the national accounts from 1980-81 to 1999-00. During this exercise, it not only changed the base for constant price estimates of national accounts but also improved estimation techniques of value added in a number of economic

sectors. A description of methodology adopted by FBS to re-base different sub-sectors of gross domestic product is given below.²⁰

3.3.1 Agriculture

Agricultural related activities are growing of crops, harvesting and threshing, growing of trees & logging, fishing, breeding and rearing of animals and poultry, production of milk, eggs, dung, raw wool etc. For the purposes of computation of value added estimates, the sector has been divided in to the following four sub sectors.

- Crops
- Livestock
- Fishery
- Forestry

Major and Minor Crops: The contribution to the gross domestic product (GDP) of agricultural crops has been estimated by product approach.²¹ It involves estimation of gross value of products and by-products, estimation of inputs like seed, fertilizer, pesticides, water and agricultural services viz. tractors and draught power for ploughing, planking, sowing, harvesting and thrashing etc.

The estimates of production of major and minor crops²² are obtained from different agencies like Provincial Department of Agriculture, Agriculture Extension and Crop Reporting Services. The estimated output of by-products of major crops is obtained as percentages of the respective crops products collected as subsidiary information through objective crop cutting surveys supplied by Provincial Directorates of Agriculture and Crop Reporting Services. The harvest prices of respective crops have been obtained from the Provincial Departments of Agriculture, Department of Agriculture Extension, Directorate of Crop Reporting, Provincial Economic and

²⁰ This section is based on FBS (2004) "National Income Accounts of Pakistan: Rebased from 1980-81 to 1999-00".

²¹ In the product approach, goods and services produced in the economy are measured; in the income approach, compensations to factors of production are aggregated. Theoretically, both the approaches give the same result.

²² Major crops include wheat, cotton, sugarcane, rice, jowar, bajra, gram, sesamum, barley, maize, tobacco, rapeseed & mustard; minor crops include different types of vegetables, fruits, pulses and condiments.

Marketing Department.²³ For some of minor crops, where no harvest prices from any source were available, wholesale prices compiled and issued by the Department of Agriculture Marketing & Grading and Provincial Departments of Economics and Marketing have been used after netting out the effect of trade and transport margins.²⁴

With the rebasing of crops already covered in national accounts, the FBS also included other crops for the first time in the estimation of gross value added of crops sector like strawberry, mushroom, betel leaves, tea, henna (myrtle), flowers and foliage, and number of vegetables. The estimates of gross production at new base of 1999-00 were also improved in terms of using more relevant prices. For example, in the old series the WPI for wheat (released) was used also for most of the by-products of major crops such as gram bhoosa, rice husk, bajra and Jowar stalks, maize pith etc., while in new estimates, by-products of different crops have been valued at their own prices.

Some changes in estimation of intermediate inputs were also observed in new estimates. For example, the value of seed used, in the 1999-00 based estimates is more than double, while that of fertilizer is significantly less than the 1980-81 based estimate. Under the re-basing exercise, the value of seed at new base was worked out on the basis of crop-wise area sown in each province and per acre use of seed. The seed rates have been compiled on the basis of information made available by the Provincial Departments of Agriculture, Agriculture Extension, Crops Reporting, Agricultural Price Commission and Agriculture Seeds and Supplies Corporations. The quantity of seed by crops so derived has been multiplied by the corresponding prices prevailing in the year 1999-00. The major element in the increase of value of seeds is the higher prices of improved seeds. FBS has collected the prices from the Provincial Agriculture Departments, Provincial Economics and Marketing Departments, Department of Crop Reporting. For the certified seed, data of Federal Seed Certification and Registration Department have been used. For wheat, rice, cotton and

²³ In the old series, benchmark estimates of harvest prices of 1980-81 were extrapolated with the WPI due to non-availability of any reliable data.

²⁴ Trade and transport margins are based on a study on Wholesale and Retail Trade conducted by Federal Bureau of Statistics.

sugarcane the information contained in the reports of Agriculture Prices Commission have been utilized.

On the other hand, the value of fertilizer has been estimated on the basis of data on variety-wise quantity and value of fertilizer sold to the farmers. The National Fertilizer Development Centre, Ministry of Planning and Development; Fertilizer Imports Department, Ministry of Food and Agriculture, Fertilizer Development Cell, Agriculture Seed and Supplies Corporation, Provincial Bureaus of Statistics, have supplied the information on sale, stock and consumption of fertilizer. The information on off take/consumption of fertilizer in product tons and nutrient tons, and its value have been compiled on provincial basis by source of availability. The new benchmark estimates have been obtained from National Fertilizer Development Center, Planning and Development Division, which they have worked out for each item separately. Value of the fertilizers, in 1980-81 based estimates, had been calculated from extrapolated benchmark prices. The index of WPI used for fertilizers is more than 800 percent, while WPI, for the same period, of active ingredients of pesticides was 350 only. Thus the old estimates were highly overestimated due to unrealistically high prices.

The value of water, in the revised benchmark estimates, is higher due to proper valuation of tube-well water while in the old series value had been extrapolated by index. In the revised series the transport charges and wastage has declined. The cost of water has been estimated separately for canal water and tube well water. Canal water data have been obtained from Indus River System Authority, Ministry of Water and Power; Agriculture Water Management Department Punjab; Irrigation and Power Department, Sindh; Provincial Agriculture Departments NWFP and Balochistan; Agriculture Prices Commission, Ministry of Food and Agriculture; Planning and Development Division; and Agriculture Statistics of Pakistan. Data/Information available with Provincial Boards of Revenue, and WAPDA was also reviewed for reconciliation of the data between the different sources.

The cost of other intermediate inputs like ploughing, planking and sowing through tractor and draught power has been estimated on the basis of per acre cost of crops

derived from the different studies conducted by Agricultural Price Commission, Planning and Development Division.

Livestock: After crops, livestock is another important sub-sector of agriculture²⁵ which includes the value of livestock products and draught power. The sub-sector has been further divided in to the following broad categories.

- Net sale of animals (for slaughtering)
- Natural growth of animals
- Livestock Products
 - Milk Production
 - Draught Power
 - Dung and Urine
 - Wool and Hairs
 - Poultry Products

In old base estimates, slaughtering activities were included in agriculture sector but in new estimates these are excluded from agriculture and included in manufacturing in line with the SNA 1993. The gross output of the livestock sub-sector is valued at producers' prices and is equivalent to the total production of the livestock products multiplied by their respective prices.

The net sales were previously ignored in the livestock but presently these are being incorporated as per 1993 SNA recommendation. The estimates of net sales are made as a product of prices on animals prevailing during 1999-00 and number of animals sold for slaughtering. The natural growth of animals was also ignored in old base series of national accounts which has now been incorporated. The animals in livestock are divided as under according to their age specific groups, i.e. adult and young males and females. The young males and females with the age one year and below have taken as a part of natural growth in a particular year.

For the valuation of livestock products, i.e. milk, dung and urine, wool and hairs, and poultry products, quantities have been taken from agricultural statistics of Pakistan

²⁵ In recent years, the direct contribution of livestock in gross domestic product has become even higher than crops.

and prices have been taken from the Agriculture and Livestock Products, Marketing and Grading Department. Number of birds and eggs has been taken from the Livestock Division and prices for chicks and other inputs have been collected from Poultry Research Institute (PRI).

Draught power has been subject to decreasing trend due to mechanization of agriculture sector and replacement of non-mechanized road transport with light transport vehicles like auto rickshaws and motor cycle rickshaws. However the use of animal for power is in practice. The estimate of draught power has been developed by comparing the output with the equivalent work done by mechanized power. While in the old base of 1980-81, the benchmark contribution of draught power was estimated on the basis of expenditure to maintain work animals like fodder, stalks, salt and medicine.

The inputs of livestock are mainly derived from Agriculture sector. Emphasis on better rearing and catering, intensive use of medicines and health care services, and commercialization of dairy farming has led to diversification of input structure. The shift-in farming structure has brought about the use of expensive fodder and other inputs. For the intermediate consumption, fodder, medical care, transportation, interest, value of chicks, poultry feed etc. have been taken in to consideration.

Fishing: The third sub-sector of agriculture is fishing which covers commercial and subsistence fishing in ocean, coastal and offshore waters and inland waters. This includes catching, tackling and gathering of fish from rivers, canals, lakes, fish farms, ponds and inundated tracts. The data on quantity and value of commercial and subsistence fishing (inland and marine) have been obtained from Marine Fisheries Department, Ministry of Food & Agriculture, and from the Provincial Fisheries Departments. The value of marine fish catch is reduced by 6.5% for auction charges so as to arrive at the value at factor cost. The auction value of inland fish is doubled to cover the under-reporting on inland fishing as recommended by Kazi Committee in 1986. The estimates are based on annual catch of inland and marine fishing and their respective base year prices. Under the re-basing exercise for fishing, the estimate of fishing cost as 36 percent of total output of marine fishing continued as it was in the

case of old estimates. However, in new estimates 16 percent of land fishing output was also deducted as input cost whereas no such deduction was made in old estimates at 1980-81 base. The input cost at the rate of 16 percent was recommended by the FBS inland fishing survey.

Forestry: The forestry is the last sub-sector of agriculture which covers the activities of logging and gathering of uncultivated forest products classified into two large groups:

- major products comprising industrial wood such as timber and firewood.
- minor forest products including a large number of heterogeneous items such as ephedra, grazing, resin, medicinal herbs etc.

In the 1980-81 base methodology, data on public sector forests being used were collected from the Provincial Chief Conservators of Forests, whereas for the private sector forests and non-forests areas, ratio of timber supply as 73% and firewood as 99% of total consumption of the forest output had been applied.

On the other hand, in the new estimates at 1999-00 base, consumption approach has been used for estimating the gross value added of forestry. The consumption of forest output for the household sector is estimated from the Household Integrated Economic Survey (HIES) 1998-99 and industrial use from Census of Manufacturing Industries (CMI) 1995-96 and survey of Small and Household Manufacturing Industries (SHMI) 1996-97. The use of timber in construction is also taken from construction survey 1993-96, adjusted with three years trend. As no inputs have been estimated, the same output is being used as value added.

The estimates of timber have been developed from the consumption side. In this exercise 35% is used as trade and transport margin to convert the purchaser's price into producer's price. 25% is deducted for smuggling. 25% input costs have been taken in respect of timber and firewood. The major user of firewood is household sector. Firewood is also used in large and small scale manufacturing sectors. The

estimates of firewood have been developed from the consumption side taking all possible care of double counting and inline with the recommendations of 1993 SNA.

One of the outputs of forestry and logging consists of the timber felled, prepared into logs and transported by logging establishments to the purchasers of the timber. The gathering of wild berries, fruits, seeds and thatching grass; charcoal burning; and rough-cutting of timber for firewood or building poles are also considered to be forestry activities. Such produce available in Pakistan forests has been included.

3.3.2 Industry

The industrial sector comprises of mining and quarrying, manufacturing (large scale, small scale & slaughtering), construction, and electricity, gas & water supply sub-sectors. As mentioned earlier, the slaughtering was a part of livestock in old base estimates; however, in new estimates it has been included in manufacturing as per SNA 1993 recommendations. A detailed description of re-basing of value added in industrial sub-sectors is given below.

Mining and Quarrying: In case of mining and quarrying, the Federal Bureau of Statistics has changed the methodology of estimating both the output in this sector and intermediate cost for producing this output in addition to changing base year prices from 1980-81 to 1999-00. Previously, the value addition in the mineral sector was concentrated in three principal minerals, i.e., coal, natural gas and crude oil. These three minerals accounted for about 82% in the total value addition in the mineral sector. To estimate the revised benchmark 1999-00 estimates of value addition, the mining and quarrying sector has been re-classified according to ISIC Revision III and PSIC Revision II²⁶. The composing elements of the sector are as under:

- Coal Mining
- Crude Oil Mining
- Natural Gas Mining

²⁶ ISIC is United Nations' International Standard Industrial Classification and PSIC is Pakistan Standard Industrial Classification.

- Other Minerals
- Surface Minerals
- Allied Services of Minerals Exploration

Product approach is used for estimating the value added in coal, crude oil & natural gas, other minerals and surface minerals while income/cost approach was used to estimate the benchmark value addition in allied services. As regards the intermediate cost, in the 1980-81 base, 20 percent fixed input cost was deducted from the total gross output to arrive at gross value added. Now for the base 1999-00, the separate input cost ratios by mineral items have been calculated which are as 23.92 percent for coal, 23.18 percent for crude oil and natural gas, 21.02 percent for surface minerals, 46.5 percent for allied services and 20.8 percent for other minerals. The gross value added is the balancing item in the production account of SNA 1993. For the revised base estimates gross output is calculated at producer prices for each mineral category and, intermediate cost at purchaser prices. The 1980-81 based GVA estimates were grossly underestimated in crude oil & natural gas and other minerals while the surface mineral and allied services were entirely missing.

Manufacturing: The manufacturing that is the largest sub-sector of industry has been divided further in to the following three sub-groups:

- Large-scale Manufacturing
- Small-scale Manufacturing
- Slaughtering

Large-scale Manufacturing: The large-scale manufacturing covers the establishments registered under Section 2(j) and 5(i) of the Factories Act, 1934, whereas small-scale manufacturing includes all such manufacturing establishments not covered thereunder. Section 2(j) refers to the factories which employ 20 or more workers on any working day during the year and use power in their manufacturing operation. Section 5(i) pertains to factories wherein a manufacturing process is carried on or ordinarily carried on whether with or without the use of power wherein ten or more workers are working there in or have worked there on any day of the 12 months

immediately preceding. The data on large scale manufacturing establishments is collected through census of manufacturing industries by the joint efforts of Federal Bureau of Statistics, Provincial Directorate of Industries & provincial bureaus of statistics. The census data has been used to derive benchmark estimates. According to SNA 1993, Liquid Petroleum Gas (LPG) is also included in this sub-sector.

As per old base methodology, the 1980-81 benchmark estimates of Large-scale Manufacturing were prepared on the data supplied by 1980-81 (CMI) after adjustment for non-response, under-reporting and under-coverage. However, other reports of CMI prepared later on were not being used subsequently for estimation of annual estimates of value added in respect of large scale manufacturing establishments. The methodology applied in the 1980-81 base estimates of national accounts implicitly assumed that the cost structure had not changed over a period of time, which was not true. Changes in value added from one year to the next may differ from the changes in the gross value of production because of un-appropriate changes in input cost. To overcome this problem, Kazi Committee had specifically recommended for conducting annual survey of selected large scale manufacturing establishments, which is yet to be started. Indirect method was being used to project the year-to-year value added on the basis of Quantum Index of Manufacturing Industries (QIM). Estimates at constant factor cost were converted into current factor cost by applying a specific constructed Wholesale Price Index (manufacturing). In the absence of any reliable data on depreciation, a flat rate of 10% of gross value added is applied to arrive at net value added.

The new benchmark estimates for the year 1999-00, on the other hand, are based on latest CMI 2000-01 as decided by the National Accounts Committee. The data of CMI 2000-01 has been decomposed into two strata i.e. stratum-1 comprised of public limited companies listed / unlisted and stratum-2 others (individual ownership, partnership and private limited companies). The data of stratum-2 has been raised on the basis of ratio of employment reported in CMI 2000-01 to total employment of the frame of LSMI study 1999-00 with adjustments for 2000-01. The data of stratum-1 public limited companies has not been raised but gaps have been filled-in from LSMI study 1999-00.

Small-scale manufacturing: In case of small-scale manufacturing industries, there is no change in the methodology in new base estimates except that a new growth rate fixed for every year has now being used. The FBS conducted the latest Small and Household Manufacturing Industries survey 1996-97 which gave the figure for value addition of small-scale industries at Rs. 97,773 million at current factor cost. The same constant factor cost figure was raised by the growth rate of 5.31 for the year 1997-98. The study conducted by Quaidian Economic Consultants, Quaid-i-Azam University, Islamabad in 1999-2000 estimated the growth rates of 6.86 percent and 7.51 percent for the years 1998-99 and 1999-00 respectively which were applied to estimate the benchmark figures for GVA of small scale industries. To compute the value addition for the subsequent years, the fixed growth rate of 7.51 percent has been used as recommended by the study.

Slaughtering: According to the latest accounting framework the slaughtering industry relates to manufacturing whereas the livestock is a part of agriculture sector. The products i.e., meat, hides, skins, bones, and blood etc. constitute slaughtering. In order to estimate value addition in slaughtering industry, the FBS takes quantities of beef, mutton and poultry meat from the published Agricultural Statistics of Pakistan. Net sale of animals in the livestock sub-sector is taken as input for slaughtering. Livestock division provides number of animals sold for slaughtering during the year 1999-00 (the new base year). Output consists of meat and byproducts like fats, hides/skins, bones, blood, edible offal etc. The prices of these products have been taken from Marketing & Grading Department. The value added in slaughtering industry has been derived by the product approach. For the estimation of poultry meat, data in terms of quantity and prices of meat have been obtained from the Poultry Research Institute and livestock division. The prices are recorded by the Marketing & Grading Department, Karachi, in some major cities of Pakistan.

Construction: This sector covers land and construction of all type of buildings, roads, bridges, railway lines, utility lines (telecommunication lines, power lines, and pipe lines), waterways, dams as well as repairs and maintenance of such infrastructure. The estimates of the sector have been developed on the basis of the expenditure, incurred

by the establishments undertaking the construction or the contractors or the sub-contractors and are also purchasing the material. The data on expenditure on construction of these activities have been obtained from data set of GFCF of all sectors of economy. The data of population census 1998 regarding the number of houses in different categories have been used. The input structure, provided by a study on construction conducted by FBS, has been applied. Gross output has been estimated from the demand side, allowing for estimates of own account construction. The coefficients of the value added components have been used to derive the GVA of all activities of construction separately. The following uses of construction output are identified:

- Gross fixed capital formation originating from construction including:
 - Land improvement
 - Construction of residential and non-residential buildings
 - Other construction (roads, railways, utility lines, airports/runways, dams, pipelines, waterways etc)
- Intermediate use by industries: This relates to repairs and maintenance of non-residential buildings and other physical infrastructure.
- Household final consumption expenditure on repairs and maintenance of dwellings

The total amount of intermediate consumption by branch is also calculated on the basis of findings of the study on construction. In the new base series the katcha building in housing sector and segregation of roads by type have also been added.

Electricity, Gas and Water Supply: This sector covers the whole range of electricity generation, transmission & distribution and gas transmission and distribution. Moreover, the new base estimate also covers water works and supply as recommended in SNA 1993. The following is the sub-classification and coverage of the sector:

- Electricity generation, transmission and distribution by public sector agencies (e.g., WAPDA, KESC)

- Independent power plants (IPPs)
- Captive power plants (CPPs)
- Small hydel power units
- Gas transmission and distribution
- Compressed natural gas (CNG)
- Water works & supply

In the new estimates, a number of improvements have been made with respect to all sub-sectors in terms of enhancement in the coverage, estimation methodology and availability of data, as discussed below.

Electricity Sub-Sector: Water & Power Development Authority (WAPDA) and the Karachi Electric Supply Corporation (KESC) are the biggest sources of energy generation and distribution. Pakistani as well as multi national companies also work as independent power plants (IPPs) units under the license issued by the government of Pakistan. The IPP units generate electricity and sell the product to WAPDA and KESC, which distribute with their networks. The Small hydel dams/micro hydel projects are situated in NWFP. These units are covered for the first time in the national accounts estimates.

Gas Sub-Sector: The activities in the Gas sub-sector are the transmission and distribution of the natural gas. For the existing estimation the data is collected from Sui Northern Gas (SNG), Sui Southern Gas (SSG) and BOC Gas Companies; these three companies were considered as the sole distributors of the natural gas. Therefore, value addition was computed on the basis of these three companies only. Now Petroleum Gas (LPG) and Compressed Natural Gas (CNG) stations have also been established and operating throughout the country. LPG is included in large scale manufacturing sector but CNG is included in this sub-sector.

Water Supply: For the purpose of GVA estimation, the sector has been divided into three sub-sectors.

- Irrigation Water (Canal and Tube well water)

- Domestic Water
- Commercial/ Industrial Water

The GVA estimates of electricity, gas and water supply have been compiled through product approach. Accordingly gross output/gross sale of energy plus other income have been taken as gross output on basic prices which means transport & trade margins and indirect taxes have been eliminated from the gross output. Intermediate consumption (purchaser prices) has been deducted from gross output to arrive at gross value added at basic prices. The putative formula has been used to compute gross value added: the difference of gross output and intermediate input at producer price.

3.3.3 Services

This sector consists of Transport, storage and communications, Wholesale and retail trade and hotels and restaurants, Finance and insurance, Ownership of dwellings, Public administration and defence, and Social, community and private services. Detail of each sub-sector is given below.

Transport, Storage and Communications: Transport, storage & communications sector consists of:

- Pakistan railways
- Water transport
- Air transport
- Pipeline transport
- Road transport
- Mechanized
- Non-mechanized
- Communications²⁷
- Storage

²⁷ Email is also a fast spreading mode of communication; however, there are no guidelines available to estimate its contribution to the gross domestic product of a particular region. It could be another satellite account which requires attention of national accountants in their future research.

The transport sector includes passengers and freight transport, whether scheduled or unscheduled by rail, road, water or air including all auxiliary activities such as terminal and parking facilities, cargo handling, storage, besides postal and telecommunication activities. To prepare the estimates on transport and communications in accordance with latest accounting framework and on new base of 1999-00, a study was conducted by FBS on intra-city road transport, freight container services, travel agencies, courier services and inland water transport. Tour operators and travel agents sector was also covered through study. Data regarding courier activities have been provided by the source agencies. Inter and intra city transport has been finalized with National Transport Research Centre (NTRC) experts. A small survey was conducted to determine GVA per boat and the findings have been applied to the inland water transport sector. Un-registered part of non-mechanized road transport has been adjusted according to the number of animals of respective categories.

Wholesale & Retail Trade and Hotels & Restaurants: The activities included in this sector are:

- Wholesale and retail trade including imports
- Purchase & sale agents and brokers
- Auctioning

In the old base methodology (of 1980-81), the estimates of national accounts of Pakistan were computed by applying commodity flow method. In 1980-81 benchmark estimates, SNA 1953 (and to some extent SNA 1968) were followed, where the output of wholesale and retail trade was measured by the value of trade margins realized on goods purchased for resale. The flows of domestic products and imported goods provided information on marketed portion of various commodities domestically produced and imported. The trade mark-ups separately for agricultural commodities, manufactured items and imported goods have been derived from various surveys and studies. The major difficulty with this sector was the lack of disaggregation. Wholesale and retail activities were rarely estimated separately. Ratios of trade margins and marketed surplus remained constant since two decades. The gross

margins used in the 1980-81 base series of national accounts were estimated on the basis of different inquiries.

For re-estimating the value added of this sector at new base, a study on wholesale and retail trade was conducted through which trade margins and marketable surplus by commodity was computed which have been used as new benchmark (with base year 1999-00). Regarding the hotel and restaurant sub-sector, the study treated hotels and restaurants as separate strata and provided new benchmark estimates for value addition by these services.

Finance and Insurance: This sector consists of State Bank of Pakistan, Other depository corporations and financial intermediaries, insurance corporations and pension funds. The approach used for obtaining new base estimates of gross value addition by these institutions has been described below:²⁸

State Bank of Pakistan: This sub-sector consists of the central bank. The data on different components of output, inputs, wages & salaries, depreciation and GFCF has been collected from the State Bank of Pakistan. The gross value added of State Bank of Pakistan has been compiled using production approach for the year 1999-00. Intermediate consumption includes the value of all the goods or services used as inputs into subservient activities such as purchasing, sales marketing, accounting, data processing, transportation, storage, maintenance, security etc.

Other Depository Corporations: This sub-sector consists of deposit money corporations and others. The deposit money corporations consist of nationalized Pakistani banks, private domestic commercial banks, specialized banks and foreign commercial banks. The others consist of cooperative banks, development financial institutions, investment banks and leasing companies. The requisite data have been obtained from concerned banks which consist of

²⁸ The SNA 1993 recommends using financial intermediation services indirectly measured (FISIM) by which a difference between interests received from different sectors of the economy and interest paid to different entities/individuals is used for estimated value added of financial institutions. However, this approach needs a large set of data that are currently not available in Pakistan.

output, intermediate cost, wages & salaries, depreciation and gross fixed capital formation for the year 1999-00.

Other Financial Intermediaries: The institutions included in other financial intermediaries are discount & guarantee houses, housing finance companies, venture capital companies, investment companies, modaraba companies, exchange companies (money changers) and mutual fund companies etc. Mostly these companies in Pakistan are privately operated. The data has been collected on questionnaires through mail enquiry and from the annual reports of the institutions.

Insurance Corporations and Pension Funds: Insurance companies are generally incorporated, entities, and provide life, accident, sickness, fire, casualty or other forms of insurance. Data regarding the balance sheet, the revenue and profit and loss accounts available from the annual reports of the insurance companies coupled with data collected through questionnaire have been used for preparation of the GVA. The estimates of GVA of employees' old-age benefit institution have also been included first time. The gross value added has been calculated adding wages & salaries and depreciation, because this institution is working on no-profit/no-loss basis as a welfare government department.

The data of discount & guarantee houses, venture capital, investment companies, exchange companies, Postal Life Insurance Company and employees' old-age benefit institutions have been compiled first time in new base estimates.

Ownership of Dwellings: The estimates of value added in this sector by old methodology were measured by the rent accruing from ownership of dwellings, rented as well as self-occupied. This required cumulative increase of houses and their respective rent. The numbers of occupied houses in urban and rural areas had been taken from the Housing Census, 1980. The estimates of annual average rentals for urban areas were derived from the rent survey of 45 urban towns conducted by FBS. As no survey was conducted in the rural areas the rentals for rural areas had been

taken from the Household Income & Expenditure Survey, 1984-85 that were deflated for benchmark year, 1980-81, on the basis of the changes in urban rent survey results. A deduction of 37.5% for rural and 22.5% for urban, as per practice followed by Excise & Taxation Department, was made from gross rentals to account for repairs and maintenance. To compute the value added estimates for subsequent years, inter-census housing growth separately for urban and rural areas had been applied to the number of dwellings in the benchmark. Average monthly rent for urban areas separately for each year was taken from FBS rent survey. In case of rural areas, rent had been derived as percentage of urban rent. The value added so derived for the years 1980-81 onward is at current prices, which had been deflated by rent index to arrive at constant prices. Due to non-availability of rents after 1985-86, the constant estimates were projected on a constant growth rate of 5.29%.

The new base estimates also have been based on the above methodology, i.e., value added are measured by the rent accruing from ownership of dwellings, occupied. However, the requisite information for estimating new benchmark have been obtained from latest Housing Census, 1998. The estimates of annual average rentals for urban and rural areas have been derived from the rent survey of 1998 conducted by FBS. The intermediate consumption by the type of houses has been estimated through survey undertaken by National Accounts in August 2002. For the subsequent years, the GVA at constant cost will be estimated on the basis of extrapolation of base year estimation by the growth of incremental houses.

Public Administration & Defence: National Accounts estimates on general government cover budgetary data of the federal government defence services, provincial government, district governments, tehsil and municipal administrations and cantonment boards documents. 1980-81 based estimate of the value added in Public Admin & Defence consisted of three components:

- The emoluments of the government employees compiled from the budgets of federal, provincial and local governments, which are subsequently revised on the basis of the revised estimates, published in the subsequent budget.

- Rent of the government owned and occupied buildings were assumed to be 10 percent of the wage bill.
- The rate of depreciation was assumed to be 5 percent of the aggregate of the wage bill and imputed rent.

On the basis of reclassification made on the lines of SNA 1993, uniform and liveries, bonus and cash awards for meritorious services, not included previously, have been valued in the wages and salaries estimates. Besides, depreciation at 5% of fixed assets has been added to workout gross value addition of the sector.

Social, Community and Private Services: Income arising in the social, community and personal services consists of income of persons engaged in private education, medical & health services and other household and community services. Expenditure approach has been applied to estimate the contribution of services sector in national economy which involves collection of data on number of service establishments classified by type of service and data on components of value added (value of sales and services, cost incurred during the process of rendering services, wages paid to the employees, operating surplus etc) and gross fixed capital formation.

FBS had carried out a number of surveys of important service establishments namely educational institutions, medical & health, advertising, accounting, auditing & book keeping and recreational services in the benchmark year 1980-81 which provided valuable data on various components on per worker value added. The number of persons employed in services sector by occupational group had been derived from the tabulation of Population Census 1981. The two components provide the basis for computation of value added estimates for the benchmark year. For subsequent years annual average compound growth rate of per worker wage is applied. An allowance of 15% for under reporting has been added in the gross value added. CPI General is used as deflator to derive estimates at current factor cost. An account of 5% is made to account for depreciation.

For revised base estimates new services have also been covered, like: Hardware, software and computer based information technology (IT) services which consist of

mainly in designing customized software. A large number of computer programmers, hardware and software engineers are engaged in this activity. The frame of Pakistan Software and Hardware Association (PASHA) was used.²⁹ A study was also conducted by FBS which estimated value addition by activities such as legal, accounting, bookkeeping and auditing activities, tax consultancy, market research and public opinion polling, business and management consultancy architectural and engineering activities and related technical consultancy, private investigation and security activities etc. Also included in this base are the activities of education, private general and specialized hospitals, sanatoria, preventoria, rehabilitation centres, leprosaria, dental centres and other health institutions that have accommodation facilities. The record of Pakistan Medical and Dental Council is the source. National Council for Tibb and Pakistan Homeopathic Medical Council are the sources for other health activities. For the social work with and without accommodation activities, a number of orphan houses, committees, commissions, trusts, welfare organizations and NGOs providing services in one or more of the activities were covered. Activities of business, employers and professional organizations, chambers of commerce and industry, trade unions, private cooperative societies registered with Registrar Cooperative Societies have also been covered. The estimates include Writers Forum and Gilds, unions of journalists, associations of medical professionals, photographers, barbers, launders, real estate agents, insurance agents, clerks etc. Recreational, cultural and sporting activities and other activities have also been covered in new base estimates which were earlier ignored.

Thus it is clear from the above discussion that the recent rebasing of national accounts of Pakistan (from base year 1980-81 to 1999-00) is not just re-pricing of the economic activities but there is also expansion in coverage and improvements in method of estimation. This is an additional reason why simple splicing may render inappropriate results for estimation of national accounts for past years, prior to 1999-00. In the next chapter, a detailed methodology is given to estimate a consistent series of national accounts for past years.

²⁹ There is also a large number of small and informal IT practitioners involved in both hardware and software solutions. These are spread all over the country including small cities and are outside the PASHA frame. A comprehensive study or survey is needed to estimate the value addition generated by these units.

Box 3.1: Impact of Changes in Relative Prices

Let Z be an aggregate of national accounts with two components X and Y such that $Z_{at} = p_a X_t + q_a Y_t$ or $Z_{at} = q_a [r_a X_t + Y_t]$ for year t valued at prices of base year a ; p_a and q_a are base year prices of X and Y respectively and $r_a = \frac{p_a}{q_a}$ is relative price of X in

base year a . Suppose the base year is changed from a to b . Thus the value of Z at new base is: $Z_{bt} = q_b [r_b X_t + Y_t]$ while r_b is relative price of X_t in base year b and q_b is price of Y_t in the base year b . Let we have to convert an old value of Z for a year say $t-1$ to new base by splicing with the following splicing factor:

$$s = \frac{Z_{bt}}{Z_{at}} = \frac{q_b [r_b X_t + Y_t]}{q_a [r_a X_t + Y_t]} = \left(\frac{q_b}{q_a} \right) R, \text{ where } R = \frac{r_b X_t + Y_t}{r_a X_t + Y_t}$$

We know the value of Z for year $t-1$ at prices of old base year a , i.e. $Z_{at-1} = q_a [r_a X_{t-1} + Y_{t-1}]$ and wish to know the new value at prices of the base year b that should be:

$$Z_{bt-1} = q_b [r_b X_{t-1} + Y_{t-1}]$$

By splicing we have an estimate of Z_{bt-1} as below:

$$\hat{Z}_{bt-1} = s \cdot Z_{at-1} = \left(\frac{q_b}{q_a} \right) \cdot R \cdot q_a [r_a X_{t-1} + Y_{t-1}] = q_b \cdot R [r_a X_{t-1} + Y_{t-1}]$$

It can easily be seen that $\hat{Z}_{bt-1} = Z_{bt-1}$ only if $r_a = r_b$, i.e. the relative prices in two base years are the same. However, in case of rebasing of national accounts in Pakistan, the relative prices have changed significantly as there is a space of twenty year between the two bases. Thus splicing method is less likely to give accurate results, and should be used with utmost care especially when dealing with the composite variables or aggregates.

As described in the previous chapter, the Federal Bureau of Statistics has not only changed the base of the national income accounts of Pakistan but also has changed the methodology of measuring value added of a number of sectors of the economy. Although it has been publishing new base accounts for the period starting from 1999-00 onward, neither has it released the rebased past series of national accounts, nor any volume and price indices are available that can be used to chain link the past data with new series. An attempt has been made in this chapter to re-estimate the past series of national accounts at new base year prices and consistent with the new methodology adopted by the FBS. In the subsequent sections, techniques in detail for estimating the series of sub-sectors of agriculture, industry and services sectors at new base of 1999-00 have been described along with discussion on data issues³⁰.

4.1 Agriculture

There are four sub-sectors included in the agriculture sector, viz., crops (major and minor crops), livestock, fishery and forestry. The gross value added of these sub-sectors has been estimated by product approach. We have used the same methodology as adopted by FBS. However, in some cases, where detailed information was not available, we have resorted to certain proxies or some realistic assumptions.³¹

4.1.1 Major crops

There is no difference in terms of coverage of crops in the old (1980-81) and the new (1999-00) methodologies; both treat the twelve crops as major crops which are rice, wheat, barley, jowar, bajra, maize, gram, cotton, sugarcane, rapeseed & mustard, sesamum, and tobacco. The new estimates have been made by applying 1999-00 prices as base prices on the quantity of respective crops. The value added of major

³⁰ Although we have made some improvements over FBS estimates of value added in some sub-sectors, the coverage of economic activities remains the same as by FBS. Thus the new series also underestimates the actual size of the economy in Pakistan. There is a need to document the informal sector by more efforts on the part of FBS in collecting primary data.

³¹ It may be noted that use of proxies and assumptions is not uncommon in national accounts compilation; FBS also uses proxies in estimating value added of different sectors as mentioned subsequently in relevant sections.

crops at new base is 360 percent higher than that at old base of 1980-81; this is primarily due to price changes, the impact of quantity changes is only 11 percent. The dominance of price impact has stemmed from significant increase in prices of crops; e.g., wheat prices has increased by 470 percent in 1999-00 over that in 1980-81, cotton price increased by 150 percent during this period, prices of rice and sugarcane increased by 330 percent and 270 percent respectively. The impact of quantity changes came from revised assumptions about by-products and improvements in measuring inputs; the basic data of crops production is the same in both the methodologies as reported in Agriculture Statistics of Pakistan.

The basic data of crops production (province wise) have been obtained from Agriculture Statistics of Pakistan and the following procedure has been followed to make the old series of value added in major crops consistent with the new methodology.

Output value of major crops at constant prices of 1999-00 is given below.

$$Y_t = \sum_{j=1}^{12} (P_{j0} \cdot Q_{jt}) + \sum_{j=1}^{12} (\tilde{P}_{j0} \cdot b_j Q_{jt}) \quad (4.1)$$

Y_t = gross output value of major crops in year t

Q_{jt} = physical output of crop j in year t

P_{j0} = base year (1999-00) price of crop j

\tilde{P}_{j0} = base year (1999-00) price of by-product of crop j

b_j = ratio of by-product to principal crop j

The physical output of each crop has been taken from various issues of Agricultural Statistics of Pakistan and base year prices have been taken from Rebasing Book published by FBS (FBS, 2004). The ratios of by-products to principal crops have also been reported in the Rebasing Book. In order to work out value added, the input cost valued at 1999-00 prices is needed. The input of crops sector is classified into

different heads; the overall estimate of each of it is then bifurcated into major and minor crops as given in Table 4.1.

Table 4.1 Distribution of Inputs into Major and Minor Crops		
Input Heads	%Share of	
	major crops	minor crops
Overall	78	22
Seed	85	15
Fertilizer	75	25
Pesticides & insecticides	76	24
Water	73	27
Ploughing, planking & sowing	81	19
Transport charges	77	23
Wastage	74	26

Source: FBS (2004)

Two types of changes may have occurred in the value of inputs measured in new methodology viz., changes in prices and changes in quantity measurement. The changes in prices are obvious as base year

has been changed from 1980-81 to 1999-00. Although changes in quantity measurement may be less obvious, in reality there are differences in measurement as reported by FBS (2004). The detailed information to estimate the values of all the inputs according to new methodology is not available; however, the total value of inputs for years starting from 1980-81 to 1994-95 is available in FBS publication on national accounts (FBS 1995). The following technique has been used to adjust the old series of inputs for both the price and quantity changes³² (see Box 4.1 for a description of adjustment technique).³³

$$N_{it} = A_i \cdot B_i \cdot \tilde{N}_{it} \quad (4.2)$$

with $A_i = p_{i0} / \tilde{p}_{i0}$, and $B_i = (q_i / \tilde{q}_i)_{99-00}$

N_{it} = value of input i as per new methodology (at new base price) in year t

\tilde{N}_{it} = value of input i as per old methodology (at old base price) in year t

A_i = adjustment factor for prices of input i ; which is the ratio of new base price (p_{i0}) to old base price (\tilde{p}_{i0})

B_i = adjustment factor for quantity of input i ; which is the ratio of quantity during 1999-00 measured by new methodology ($q_{i,99-00}$) to the same measured by old methodology ($\tilde{q}_{i,99-00}$)

³² The old series of input for years 1995-96 onward has been estimated through extrapolation.

³³ This technique gives reliable results in case of a singular variable. In a composite variable case, it can be used if there is no change in relative prices and quantity weights of its components.

Given (4.1) and (4.2), the value added of major crops as per new methodology at constant prices of 1999-00 can be measured as follows.

$$V_t = Y_t - \sum_i g_i \cdot N_{it} \quad (4.3)$$

Where g_i is the share of major crops in input i (as given in Table 4.1).

Value added of major crops at current prices according to the new methodology has been worked out by applying major crops deflator on its values at constant prices (as done by FBS); the deflator has been constructed on the basis of wholesale price index³⁴ of each individual crop³⁵ as described below.

$$P_{kt} = \sum_j w_{jt} \cdot P_{jkt} \quad (4.4)$$

$$P_t = \frac{1}{4} \sum_k P_{kt}$$

P_{kt} is quarterly deflator and P_t is annual deflator of major crops; P_{jkt} is quarterly wholesale price index of crop j and w_{jt} is share of crop j in total output in year t . The annual value added at current prices (\hat{V}_t) has then been worked out as follows.

$$\hat{V}_t = P_t \cdot V_t \quad (4.5)$$

4.1.2 Minor crops

In the new methodology the coverage of minor crops has been increased by including a number of crops which were absent in the old estimates. The past data for all the new crops are not available in published sources; however, the crops for which the data are available have the dominant share in new estimates (more than 90 percent). Thus the new series of gross value added of minor crops has been estimated by

³⁴ FBS is now using producer price index; however such an index is not available for past years. However, the use of WPI will not affect the results very much as the movements in the two indices of an individual crop are expected to be similar.

³⁵ The wholesale price index of sesamum is not available, so wholesale price index (general) has been used for it.

focusing on these crops.³⁶ The value of other crops has been estimated on pro rata basis, i.e. the output value of included crops at new base has been blown up by the share of additional minor crops in overall value during 1999-00. Thus the gross value of output of minor crops at new base prices is the following.

$$Y_t = \frac{1}{1-\alpha} \left(\sum_j P_{j0} \cdot Q_{jt} \right) \quad (4.6)$$

Y_t = gross output value of minor crops in year t

Q_{jt} = physical output of crop j in year t ($j = 1$ to 18)

P_{j0} = base year (1999-00) price of crop j

α = share of additional minor crops in total value added during 1999-00.

The value of different inputs has been estimated by using the share of minor crops in total inputs as estimated in section 4.1.2. Thus the value added of minor crops at constant prices of 1999-00 has been worked out as follows.

$$V_t = Y_t - \sum_i (1 - g_i) \cdot N_{it} \quad (4.7)$$

Value added of minor crops at current prices has been worked out by applying minor crops deflator on its values at constant prices (as done by FBS); the deflator has been constructed on the basis of wholesale price index of each individual crop³⁷ by following the same technique as used for major crops.

4.1.3 Livestock

In the new methodology, natural growth and net sales of animals have been included for the first time in the livestock sector, while the slaughtering that was earlier covered under livestock has now been moved to manufacturing sector. Thus the new estimates of gross value added in livestock include the following items.

³⁶ The crops included in the exercise are mash, masoor, mung, mattar, other pulses, tomato, potato, other vegetables, groundnuts, soybean, sunflower, safflower, canola, linseed, castroseed, mango, banana, apple, citrus fruits, dates, guava, apricot, peach, pears, plums, grapes, pomegranate, almonds, chillies, onion, garlic, turmeric, ginger, gouarseeds, fodder crops, and sugarbeet,

³⁷ The wholesale price index of some minor crops is not available, so wholesale price index (general) has been used for them.

1. Natural growth of animals
2. Net sales
3. Milk production
4. Draught power
5. Dung & urine
6. Wool & hair
7. Poultry

The methodology used to estimate the gross output value under above heads is discussed below.

1. Natural Growth:

Natural growth is worked out by multiplying the base year prices of animal to the number of animals below 1 year age. The animals included are cattle, buffaloes, sheep, goats, camels, horses, asses and mules. The base year prices have been obtained from the Rebasing Book and the population of animals from four livestock censuses in 1972, 1976, 1986 and 1996; and interpolated the census figures for inter-census years. Here it is not out of place to mention that the time series of the population of different animals and their sub-categories as estimated by this study are different to the estimates of Ministry of Food, Agriculture and Livestock (MinFAL) as reported in Agricultural Statistics of Pakistan. The MinFAL series of livestock population has sudden jumps in different years and they show such trends in certain kinds of animal that are not consistent with general observations (see Annexure B for detailed description of problems with MinFAL estimates and an account of the approach adopted in this study).

2. Net Sales:

The gross value of net sales has been worked out as product of base year prices of adult animals and number of animals sold for slaughtering. The number of animals sold for slaughtering in a year (t) has been calculated as follows:³⁸

³⁸ This formula assumes that there is no natural death of animals, which is not very strong as usually animals are slaughtered when there is a fear of their death.

$$S_{it} = L_{it-1} + N_{it} - L_{it} \quad (4.8)$$

S_{it} = number of slaughtered animals of kind i in year t

L_{it} = total number of animals of kind i in year t

N_{it} = number of New born animals of kind i in year t .

The kinds of animals included in the estimates of Net sales are cattle, buffaloes, sheep, goats and camels. The base year prices for these animals have been taken from the Rebasing Book.

3. Milk Production:

The total value of milk production has been estimated according to the technique used by FBS as given in Table 4.2 (for 1999-00). The gross output of milk for the national accounts is that part of milk production which is used as human consumption. A formal representation of this technique is given below.

$$Y_t = \sum_i (u_i \cdot P_{ui}^o C_{it} + (1 - u_i) \cdot P_{ri}^o C_{it}) \quad (4.9)$$

$$C_{it} = c_i \cdot m_i \cdot M_{it}$$

Y_t = gross output of milk

u_i = share of urban areas in total consumption of milk of animal i ; $1 - u_i$ is that of rural areas

P_{ui}^o = base year price of milk of animal i in urban areas

P_{ri}^o = base year price of milk of animal i in rural areas

C_{it} = Total consumption of milk of animal i .

c_i = ratio of milk consumption to production from i^{th} animal

m_i = production of milk per animal i

M_{it} = number of milch animal i in year t

i stands for kind of milk animal, i.e., cow, buffalo, sheep, goat and camel.

The parameters m_i and c_i , have been worked out from annual data of milk production and consumption reported in Agricultural Statistics of Pakistan.

	Cows	Buffaloes	Sheep	Goats	Camels
Number of milch animals (000 #)	6815	8733	13595	25755	297.5
Milk production (000 ton liter)	10049	21138	679.75	2575.5	1334.68
Production/animal (m_i)	1.47	2.42	0.05	0.10	4.49
Milk consumption (000 ton liter)	8039.2	16910.4	30.6	585.9	667.3
Consumption / production (c_i)	0.8	0.8	0.045	0.2275	0.5
Urban consumption ($\alpha_i = 0.25$)	2009.8	4227.6			
Price (Rs/ton)	15672	16413			
Value (Rs million)	31498	69388			
Rural consumption (0.75)	6029.4	12682.8	30.6	585.9	667.3
Price (Rs/ton)	9000	9000	9000	9000	5000
Value (Rs million)	54265	114145	275	5273	3337
Total Value	85762	183533	275	5273	3337
Grand Total – all animals combined (Rs million)	278,180				
Source: Rebasing Book					

4. Draught Power:

The output value of draught power is based on the number of work animals in a given year and assumed contribution of an animal in ploughing. Table 4.3 gives the technique of benchmark estimate of draught power used by FBS; the same has been replicated for all previous years.

	Bulls	Bullocks	
Number of work animals (000)	3651	182	
1% for road transport	36.51	1.82	
2% for brick movements	73.02	3.64	
Number of Animal available	3541.47	176.54	
Number of days in a year	365	365	
off work days (rain, slack season)	115	115	
Number of days available	250	250	
Labour charges (rupees):			21000
- in kind	19500		
[65 mund wheat; @Rs300 per mund]			
- others	1500		
Labour charges per day (21000/365) – approx.			60
Tractor charges per day for plough 1/2 acres			70
The same work is done by 1 labour + two animals in half a day; thus if Tractor is replaced by draught power then;			
Labour charges for half a day			30
Animal charges (2 animals) per day			40
Animal charges (1 animals) per day			20
Value of draught power per day = animal charges	20	20	
Value of draught power per animal per annum	5000	5000	
Total draught power (# of work animal * 5000)	17707	883	18590
Source: Rebasing Book (FBS 2004)			

5. Dung & Urine

For value of dung and urine also we have followed the FBS methodology. There are different ratios of dung & urine for adult and young animals as given in Table 4.4.

6. Wool & hair

In case of wool and hair also the FBS methodology has been used. The technique of benchmark estimates has been given in the Table 4.5 which has been replicated for all the previous years.

Table 4.4 Technique for Benchmark Estimate of Gross Output Value of Dung & Urine								
		Number of animals (000)	Wet dung per animal (Kg)	Dry dung per animal (Kg)	Price of dry dung (Rs / ton)	Produced wet dung	Produced dry dung	Gross output (Rs mln)
Buffaloes	A	14059	28	6.75	250	143683	34638	8659
	Y	8610	14	3.5	250	43997	10999	2750
Cattle	A	14750	24	6	250	129210	32303	8076
	Y	7254	12	3	250	31773	7943	1986
Sheep	A	17084	2	1.2	250	12471	7483	1871
	Y	7000	1	0.45	250	2555	1150	287
Goat	A	31765	1	0.6	250	11594	11594	2899
	Y	15661	1	0.6	250	5716	3430	857
Camel	A	595	20	5	250	4344	1086	271
	Y	180	10	2.5	250	657	164	41
Total		116958				386000	110789	27697

A = adult; Y= young; Source: Rebasing Book (FBS 2004)

Table 4.5 Technique for Benchmark Estimate of Gross Output Value of Wool & Hair										
	#of animals (000)	Wool per animal (Kg)	Hairs per animal (Kg)	Average price of wool (Rs/Kg)	Average price of hairs (Rs/Kg)	Production of wool (ton)	Production of hairs (ton)	Value of Wool (Rsmln)	Value of hairs (Rsmln)	Total value (Rsmln)
Sheep	17084	2.3		26		38920		1011.9		1012
Goats	31765		0.6		25		18000		450	450
Camels	595	2		26		1190		30.9		31
Horses	270		0.8		25		216		5.4	5
Mules	146		0.8		25		116.8		2.9	3
Total	49860					40110	18332.8	1042.9	458.3	1501

Source: Rebasing Book (FBS 2004)

7. Poultry

The gross output value has been estimated by splicing, i.e., projecting benchmark estimates backward by applying growth rates of old series. In the new methodology, the value of different types of poultry products like broilers, layers, breeders, desi poultry, etc., have been estimated separately for which past data are not available.

However, the new estimates of poultry value added at prices of 1999-00 (Rs 27.4 bln) are very close to the old estimates at the same year price (Rs 27.8 bln) which implies there is no significant difference in the overall quantity of poultry products measured by the two methodologies. Moreover, the relative prices of different kinds of poultry products are unlikely to change significantly, so the splicing method for this case may give us reasonably good estimates.

The gross value added of livestock at constant prices has been estimated by deducting livestock inputs from total gross value of outputs as estimated above. The input has been estimated by using the input-to-output ratios in the benchmark estimates.³⁹ As given in the Rebasing Book, the poultry input cost is 36.2% of gross output value of poultry; and for other items, the input cost is 21.2% of their output values.

The gross value added of livestock as estimated above is at constant prices of 1999-00; it has been converted into current prices by using wholesale price index. We have applied wholesale price indices of milk, eggs and chickens for output value of milk, eggs and chickens; and wholesale price index of meat for all other items.⁴⁰

4.1.4 Fishing

Fishing includes inland fishing and marine fishing. The estimates at old and new methodologies are different on account of input costs. Earlier no input costs had been deducted from inland fishing, whereas 16 percent of output value is now being deducted as input cost in the new methodology. In case of marine fishing, 6.5% of output value is now being deducted as auction charges in order to arrive at the value at factor cost. Moreover 36% of the output value at factor cost continues to be deducted as input cost. Taking into account such methodological changes, the estimates of fishing value added for past years at prices of 1999-00 have been made as follows.

³⁹ The same ratio is taken for all years as price indices of output and input may move together and there may not be very significant changes in feeding or other inputs patterns of livestock.

⁴⁰ The constant prices estimates of all the sub-sectors of the GDP have been converted into annual and quarterly estimates at current prices by using the same approach as used for major and minor crops; the approach consists of 4 steps: (i) get (or construct) a relevant deflator on quarterly basis, (ii) make annual deflator as average of quarterly deflator, (iii) convert quarterly and annual value added at constant prices into those at current prices by using relevant deflator, and (iv) adjust quarterly series to maintain additivity.

$$V_t = (2 \times Q_t \times 34.75 \times 0.84) + (M_t \times 16.43 \times 0.64 \times 0.935) \quad (4.10)$$

V_t = value added of fishing at constant prices of 1999-00

Q_t = quantity of inland fish caught

M_t = quantity of marine fish cost

Data of inland and marine fish catching have been obtained from Agricultural Statistics of Pakistan. The base year prices and ratios for input costs have been taken from the Rebasing Book. The value added at current prices has been estimated by applying wholesale price index of fish on constant price value added.

4.1.5 Forestry

The forestry includes value added of timber, firewood and minor forest products. We have taken benchmark estimates of the three components from the Rebasing Book and retained their respective old growth rates for estimating gross output value in past years at 1999-00 prices.⁴² The value added has been estimated by deducting 25% of timber and firewood from gross output value (as done by FBS). These estimates are at constant prices, have been converted into current prices on the basis of wholesale price indices of timber and firewood.⁴³

4.2 Industry

The industrial sector consists of four sub-sectors including mining & quarrying, manufacturing, construction, and electricity, gas, and water supply. The manufacturing sector has been further disaggregated into large-scale manufacturing, small-scale manufacturing and slaughtering. The slaughtering is the new addition as a separate sub-sector in recent estimates of national income accounts; earlier it was part of livestock. The value added of industrial sector has been estimated through product approach. A detail description of each sub-sector is given below.

⁴¹ 34.75 and 16.43 are base years prices of inland and marine fish respectively in rupees/kg. The quantity of inland fish is doubled in these calculations to adjust underreporting (of 100 percent).

⁴² Both the old and new methodologies uses quantum index numbers of forest components for estimating forestry value added for years other than benchmark.

⁴³ For this purpose a composite index has been constructed on the basis of individual indices of timber and firewood and their respective shares in value added as weights.

4.2.1 Mining and quarrying

The new estimates of the value added of mining and quarrying at 1999-00 prices are based on three principal minerals, i.e., coal, natural gas and crude oil and more than thirty other minerals. The past data set of mining output is available only for 24 items (including coal, gas and crude oil) in the Statistical Year Book. The data are province-wise and constitute 88% of the new estimates of the output value of mining and quarrying. We have estimated the past series of output value of this sector on the basis of these 24 items and their respective base year prices; the value of the rest of the items has been estimated on pro rata basis. The new estimates also cover allied services and exploration (AS & E) and surface mineral like bajri, ordinary sand, etc., past information for which is not available in published sources. We have, therefore, used fixed ratios worked out from benchmark data. The value added has been estimated by deducting input costs from output; we have used the same input-to-output ratio as used by FBS (Table 4.6). It may be noted that in new estimates, input ratios are different for different types of minerals while in the old methodology, 20 percent input cost was deducted for all minerals.

Minerals	Old base (1980-81)	New base (1999-00)
Coal	20	23.91
Crude oil & Natural gas	20	12.78
Surface minerals	Not covered	21.00
Allied services	Not covered	46.50
Other minerals	20	20.75

Source: Rebasing Book

The value added at constant prices of 1999-00 has been converted at current prices by using a composite wholesale price index of coal and natural gas; the index has been worked out on the basis of individual wholesale price indices of coal and natural gas and their weights.⁴⁴ The weights of coal (W_c) and gas (W_g) have been worked out as follows:

$$W_c = \frac{S_c}{S_c + S_g} \quad (4.11)$$

$$W_g = 1 - W_c$$

⁴⁴ The wholesale price index of crude oil is not available; the indices for diesel oil, motor spirit, etc., are available but only for last three to four years; this is why we used coal and gas indices only.

S_c and S_g are respective shares of coal and gas in total mining output.

4.2.2 Manufacturing

In new methodology, manufacturing consists of three sub-sectors:

- i. Large-scale manufacturing
- ii. Small-scale manufacturing
- iii. Slaughtering

i) Large-scale manufacturing

The new estimates of value added for years 1999-00 onward has been made on the basis of new benchmark value for the base year and new weights for different industries in quantum index of large-scale manufacturing. The weights are based on latest census of manufacturing industries (CMI), i.e. 2000-01. For the purpose of estimating past series, this study has worked out a new series of the quantum index of large-scale manufacturing on the basis of industry-wise production data as reported in various issues of Monthly Statistical Bulletin of FBS. The available set of weights are for 1980-81 and 1999-00; for the period prior to 1990, 1980-81 weights have been used and for the period from 1990 onward, the new weights of 1999-00 have been used. The index number thus conducted has then been used in turn to estimate value added at new base by applying its growth backward on new benchmark estimates of LSM, i.e.:

$$LSM_t = \prod_{i=t}^{-1} (1 + g_{t-i})^{-1} \cdot LSM_0 \quad (4.12)$$

LSM_0 = benchmark estimates of value added at new base in year 1999-00

LSM_t = value added at new base in year t (earlier than 1999-00)

g_t = growth rate of quantum index of manufacturing (1999-00=100)

t ranges from -27 to -1 such that -27 is year 1970-71 and -1 is year 1998-99.

We have applied wholesale price index of manufacturing to convert constant price estimates into current price estimates.

ii) *Small-scale manufacturing*

The gross value added of small-scale manufacturing is estimated by FBS by applying some fixed growth rates on benchmark value. The growth rates used for this purposes are given in Table 4.7. The past series of gross value added at new base has thus been estimated on the basis of new benchmark value and given growth rates, i.e.:

Table 4.7 Growth Rates of Small Scale Manufacturing	
Period	% Growth rate
1972-73 to 1987-88	8.4
1988-89 to 1997-98	5.31
1998-99	6.86
1999-00 to 2003-04	7.51
Sources: FBS (1995, 1998, and 2004)	

$$SSM_t = \prod_{i=t}^{-1} (1 + h_{t-i})^{-1} \cdot SSM_0 \quad (4.13)$$

SSM_0 = benchmark estimates of value added at new base in year 1999-00

SSM_t = value added at new base in year t (earlier than 1999-00)

h_t = growth rate of small-scale manufacturing as given in Table 4.7

t ranges from to -27 to -1 such that -27 is year 1970-71 and -1 is year 1998-99.

The wholesale price index of manufacturing has been used for converting the series into current prices.

iii) *Slaughtering*

As mentioned above, slaughtering was earlier part of livestock sector; now it has been classified as manufacturing in line with recommendation of SNA 1993. The products included in slaughtering are the following:

- i. meat
- ii. animal fats
- iii. hides & skins
- iv. guts / casings
- v. bones & blood
- vi. edible offal
- vii. head & trotters
- viii. horns & hooves

The quantities of these products have been taken from Agricultural Statistics of Pakistan; the base year prices have been taken form Rebasing Book. The inputs of slaughtering are net sales of animals as estimated in livestock section, poultry inputs and other inputs like fees. For poultry inputs we have used the benchmark ratio of

input-to-poultry output, and for other inputs we have used the benchmark ratio of input-to-total output. Thus the value added at constant prices of 1999-00 will be as below.

$$V_t = (1 - \sigma) \sum_j P_{j0} Q_{jt} - NS_t - \rho \cdot Y_{pt} \quad (4.14)$$

V_t = Value added of slaughtering at constant prices of 1999-00

P_{j0} = base year price of product j of slaughtering

Q_{jt} = quantity of product j of slaughtering in year t

NS_t = Net sales in year t at prices of 1999-00

Y_{pt} = Value of poultry output in year t at prices of 1999-00

ρ = Benchmark ratio of poultry input-to-poultry output

σ = Benchmark ratio of other input-to-total output

The gross value added computed as above is at constant prices of 1999-00, it has been converted to the same at current prices by using the wholesale price index of meat.

4.2.3 Construction

Construction value added is estimated by FBS by applying some coefficients on construction-related investment expenditures (gross fixed capital formation) in different sectors;⁴⁵ in the new methodology such coefficients are different than those in old methodology (see Table 4.8). On the basis of available information, we have estimated the past data at new base in the following three steps:

1. worked out construction-related investment expenditure (\tilde{E}_{jt}) by reverse-engineering from old series of construction value added (\tilde{V}_{jt}) and old coefficients ($\tilde{\mu}_j$)
2. used splicing to convert construction-related investment in each sector at new base

⁴⁵ Investment expenditures can be divided into two groups: construction-related like erecting a building, and non-construction like installing machinery. The construction related expenditure, on the other hand, consists of payments to factors of production and purchase of intermediate goods like cement, iron rod, etc. The construction value added excludes intermediate goods from total construction-related investment expenditure. The coefficients given in the Table 4.8, which are based on different studies and experts opinion, represent the value added part of the total construction-related investment.

3. applied new coefficients (μ_j) on new series of construction-related investment expenditure (E_{jt}) to estimate value added of construction at new base (V_{jt})

Expressing formally, the construction value added at the new base has been worked out as;

$$V_t = \sum_j V_{jt} = \sum_j \mu_j \cdot \left(\frac{E_j}{\tilde{E}_j} \right)_{1999-00} \cdot \tilde{E}_{jt} \quad (4.15)$$

$$\tilde{E}_{jt} = \tilde{V}_{jt} / \tilde{\mu}_j$$

Table 4.8 Construction Coefficients		
Items	Old coefficients	New coefficients
Land improvement	0.45	0.44
Buildings		
- Residential	0.42	0.31
- Non-residential	0.42	0.39
Canals	0.33	0.44
Drainage	0.25	0.45
Gas pipeline	0.25	0.44
Power lines	0.25	0.11
Roads, streets, highways	0.45	0.31
Railway tracks, runways	0.25	0.12
Telecom lines	0.25	0.33
Tube well	-	0.37
Other construction	0.33	0.37

The value added of construction at constant prices of 1999-00 as estimated above has been converted into that at current prices by using workers' wage index following FBS technique. The series of wage index has been derived from old series of value added of construction at current prices and constant prices; its base has been changed to 1999-00. This index is at annual basis; we have used seasonal variations in quarterly wholesale price index of building materials to derive quarterly wage index.⁴⁶

4.2.4 Electricity, gas and water supply

In old methodology, value added of this sector consisted of electricity and gas distribution while the new methodology not only expands the coverage of electricity and gas distribution but also includes water supply in this sector.

⁴⁶ Quarterly index is needed to convert quarterly estimates at current prices as will be discussed in next unit.

In case of electricity, Water & Power Development Authority (WAPDA) and the Karachi Electric Supply Corporation (KESC) are the biggest sources of energy generation and distribution. The Independent Power Plants (IPPs) also sell their product to WAPDA and KESC. Moreover the small hydel dams/micro hydel projects, situated in NWFP, are also covered in this sector. The activities in the gas sub-sector are the transmission and distribution of the natural gas.⁴⁷

The FBS estimates gross value added of this sub-sector by product approach. The gross output/gross sale of energy plus other income have been taken as gross output on basic prices which means transport & trade margins and indirect taxes have been eliminated from the gross output. Intermediate consumption (purchaser prices) has been deducted from gross output to arrive at gross value added at basic prices. We have taken the benchmark value added of electricity and gas distribution at 1999-00 prices as estimated by FBS and worked out the past series using growth rates of respective series at old base.⁴⁸

The water supply includes the canal water, tube-wells, domestic supply and commercial and industrial supply; the growth rates of the following variables have been used to estimate the gross value added of the four heads of water supply for past years.

- canal water availability at farm gate
- number of tube-wells
- number of houses
- number of commercial and industrial establishments

The growth rates of the above variables have been applied backward on benchmark estimates of canal water, tube-well, domestic and commercial water supply respectively.

⁴⁷ CNG is also included in this sub-sector by FBS while LPG is covered in large-scale manufacturing.

⁴⁸ A better alternative could be to estimate gross value added by using sales of electricity and gas, new base prices and intermediate costs; however, this could not be done because past data of intermediate costs were not available. However, as the changes in relative prices within the electricity sub-sector and within gas sub-sector are unlikely the use of splicing can give us good quality estimates.

The gross value added as estimated above is at 1999-00 prices which has been converted to current prices by using wholesale price index of fuel & lighting for electricity and gas and general wholesale price index for water supply.

4.3 Services

The services sector consists of six sub-sectors including (i) trade, hotels & restaurants, (ii) transport, storage & communication, (iii) finance and insurance, (iv) ownership of dwelling (v) public administration and defence services, and (vi) social, community and personal services. The gross value added of almost all services is estimated by FBS through income approach. For some services growth rates of certain indicators or some fixed growth rates are applied on benchmark estimates to get gross value added in years other than the base year.⁴⁹ Where possible, we have estimated gross value added by income approach. However, in cases where necessary information is not available, we have applied growth rates of closely related variables on benchmark estimates. Detail of our methodology for each of the sub-sectors is given below.

4.3.1 Trade, hotels & restaurants

This sector consists of value added in three types of services, viz., wholesale and retail trade of domestically produced goods, trade of imported goods, and hotel and restaurants services. In the old methodology, hotels and restaurants were not covered under this sector.⁵⁰ The value added is estimated by applying trade margins on domestic production and imports. These margins have been changed significantly in the new estimates of value added (Table 4.9). Thus, in order to make the past series consistent with the new estimates, new trade margins on domestic production and imports have been incorporated while estimating the past series of value added of this sector at new base. For the period prior to 1980-81, the benchmark margins of 1980-81 have been used; for the period beyond 1999-00, the new benchmark margins of 1999-00 have been used; while for the period in-between 1980-81 and 1999-00, trade margins have been interpolated by using the two benchmark ratios.

⁴⁹ For example growth in number of houses is used for ownership of dwelling; fixed growth rates are used for services like real estate, non-profit institutions serving households (NPISH), etc.

⁵⁰ Hotels were, however, covered in community, social and personal services sector in the old methodology.

The value added of hotels and restaurants has been estimated by using information about hotel industry in different hotel surveys undertaken by Tourism Division of Government of Pakistan. The formal description of the technique applied to make new estimates of gross value added of wholesale and retail trade for past years is given below.

$$V_t = \sum_j \alpha_{jt} \cdot \beta_{jt} \cdot Y_{jt} + (U_t)^{-1} \sum_k \pi_{kt} \cdot \theta_{kt} \cdot M_{kt} + VH_t \quad (4.16)$$

$$\hat{V}_t = \omega_t \sum_j \alpha_{jt} \cdot \beta_{jt} \cdot Y_{jt} + \sum_k \pi_{kt} \cdot \theta_{kt} \cdot M_{kt} + \hat{V}H_t \quad (4.17)$$

V_t = value added of trade at constant prices of 1999-00

\hat{V}_t = value added of trade at current prices

Y_{jt} = output value at 1999-00 prices of different items of domestic production ⁵¹

α_{jt} = marketable surplus as percent of output value of domestic products

β_{jt} = trade margins as percent of output value of domestic products

π_k = marketable surplus as percent of import of category k ⁵²

θ_k = trade margins as percent of import of category k

M_{kt} = import of category k in year t

U_t = unit value index of imports with 1999-00 as base year

VH_t = Gross value added of hotel and restaurants at constant prices

$\hat{V}H_t$ = Gross value added of hotel and restaurants at current prices

ω_t = wholesale price index with 1999-00 as base year

The data needed for above calculation consist of (a) domestic production at new methodology which we already have as outcome of this dissertation, (b) imports and unit value index of imports which is available in FBS publications, and (c) trade margins, tradable surplus ratios and wholesale price index which are also available in FBS publications (d) gross value added of hotel and restaurants which have been estimated as described below.

⁵¹ like rice, wheat, cotton, pulses, meat, etc., (or value added in case of manufacturing)

⁵² The imports are classified into three categories viz., imports of consumer goods, capital goods and raw material.

Table 4.9 Trade Margins for Domestic Production & Imports				
Items/Commodities	Bench Mark 1980-81		Bench Mark 1999-00	
	Marketable Portion	Trade Margin	Marketable Portion	Trade Margin
Major Crops				
Rice	80	14	88	18.5
Wheat	60	14	76	15.5
Sugarcane	10	18	33	20.5
Cotton	100	18	98	19.5
Barley, Jowar, Bajra,	45	14	80	22
Maize	50	14	85	16.5
Gram	40	14	72	18
Rapeseed & mustard, canola	70	18	93	16.5
Sesamum	70	18	85	22
Tobacco	60	22	40	19.5
Dry Fodder	30	18	70	14.5
Minor Crops				
Pulses	45	14	65	18
Fruits	90	31	96	38.5
Vegetables	90	35	93	30
Green Fodder	10	18	48	16
Other minor crops	90	18	94	21.5
Livestock				
Milk	60	19	78	24
Poultry & Eggs	90	32	94	17.5
Other Products	90	32	98	25.5
Fishing	100	33	99	37.5
Forestry	100	44	94	30
Manufacturing				
Large Scale	100	46	97	42
Small Scale	80	51	89	48.5
Slaughtering	90	32	97	26.5
Imports				
Consumer goods	100	16	95	24.5
Capital goods	55	16	68	19.5
Intermediate goods	55-75	16	72	22.5

Source: Rebasing Book (FBS, 2004)

There have been three surveys on hotel industry in different years. The Tourism Division, Government of Pakistan undertook two surveys, one in 1979 and the other in 1984 on this industry. A third survey was undertaken in 2000 by Ministry of Minorities, Culture, Sports, Tourism and Youth Affairs. These surveys reported province wise information of hotel industry on, total receipts, operating surplus, establishment cost, etc. We have used this information to work out gross value added by income approach during these years. The average growth rate of value added, adjusted for inflation, between these years has been used to estimate the series of value addition by applying this growth on benchmark estimates of 1999-00.

4.3.2 Transport, storage & communication

Transport, Storage & Communications sector consists of the following services:

1. Pakistan Railways
2. Water Transport
3. Air Transport
4. Pipeline Transport
5. Road Transport
6. Communications
7. Storage

The gross value added of these services is estimated through income approach which combines compensation to employees, depreciation and gross operating surplus together. In the new estimates, coverage has been extended to courier services, mobile phones, tour operators, travel agents, pipeline transport, etc. We have used a number of indicators to estimate the gross value added of this sub-sector in years prior to 1999-00. The new methodology covers four modes of transportation viz., railway, air, pipeline, water and road transport.

We have estimated GVA of railway by combining surplus/deficit, staff expenses and depreciation as reported in various issues of Statistical Year Book. This approach gives us GVA at current prices which is deflated by consumer price index to get constant GVA at 1999-00 prices.

The gross value added of air transport for past years is estimated by backward application of growth in passengers (both domestic as well as international) embarked and disembarked at Pakistani airports⁵³ on the new benchmark estimates of 1999-00 (Rs 29,557 million).⁵⁴ The required data were obtained from various issues of annual reports of Civil Aviation Authority.

⁵³ Passengers in transit were also included.

⁵⁴ The air transport also includes cargo transport; however, assuming a constant ratio of average cargo per passenger and a constant output-to-input ratio, we have used growth in air passenger as proxy for growth in gross value added of air transport.

The third mode of transport included in the new methodology of FBS is pipeline transport. Pipeline transport activities of institutions like PARCO, Asia Petroleum Limited, etc., are included in this sub-sector. We have estimated its gross value added by backward projecting the benchmark estimates in 1999-00 (Rs 6,230) on the basis of annual growth rate of oil consumption (quantity in tonnes).⁵⁵ The data on oil consumption were obtained from various issues of Pakistan Economic Survey.

Water transport is another important service covered in this sector. It includes services of number of institutions like Pakistan National Shipping Corporation, Karachi Port Trust, Port Qasim, different types of boats, Eng. Vopak Terminal, shipping, forwarding & clearing agents, etc. We have estimated past series of gross value added separately for PNSC, KPT, Port Qasim by back-application of growth rates of gross earnings of PNSC (deflated by CPI), cargo handled at KPT, cargo handled at Port Qasim respectively on their respective benchmark estimates.⁵⁶ The Pakistan Economic Survey and Statistical Year Books are sources of data required for these estimates. For boats we have applied the growth rates of old series on new benchmark estimates.

The gross value added of rest of the items in this mode of transport has been estimated on pro-rata basis: Let the sum of the value added of PNSC, KPT, Port Qasim, Boats is $V1_t$ in period t ; the value added of other institutions is $V2_t$; and $\theta = \left(\frac{V2}{V1} \right)_{1999-00}$ in the base year (1999-00). Then $V2_t = \theta \times V1_t$ for all t .

The road transport is the highest contributor in the gross value added of this sector. We have used growth in the number of vehicles on road to project the past series. The gross value added of different types of vehicles were estimated separately. The vehicles covered in this exercise are buses, trucks, wagons, pickups, delivery vans, taxis, rickshaws, NLC and non-mechanized transport. The data of vehicles on road were obtained from various issues of Pakistan Economic Survey.

⁵⁵ The underlying assumptions are constant input to output ratio in this service and equality of growth rates of oil transported and consumed.

⁵⁶ The growth rates of gross earnings are equal to growth rates of gross value added when we take a constant output to input ratio.

The communication sub-sector includes gross value added of PTCL, mobile phones, Pakistan Post Office, courier services, etc. Given the benchmark estimates of the contribution of PTCL in gross value added during 1999-00 (Rs 51,413 million), we have projected it backward by using the growth in the number of telephone connections. The gross value added of mobile phones for previous years is also estimated on the basis of mobile phone connections. The data on the mobile phone connections were obtained from reports of PTA for period 1995-96 to 1997-98 and from Pakistan Economic Survey 2004-05 for subsequent years. We extended the data set backward up to 1991-92 (the year when the first mobile company, Instaphone started its operation on commercial basis) on pro rata basis. The gross value added of PTCL has been estimated by backward application of growth in telephone connections on benchmark estimates; various issues of Statistical Year Book were the sources for PTCL telephone connections.

The gross value added of Pakistan Post Office for the period 1970-71 to 2004-05 was worked out by using income approach as done by FBS. It was estimated by adding establishment cost, depreciation and operating surplus (deficit). The required data were obtained from various issues of annual reports of Pakistan Post Office. For courier services, we have no information except benchmark estimate of their gross value added in 1999-00 and the fact that pioneer courier company TCS started its operation in May 1983. Using the benchmark estimates of Rs 5,797 million in 1999-00 and taking 1982-83 as first year, we have interpolated the gross value added by using the simple exponential function $V_t = (t)^\beta$ where t is equal to 1 for the year 1982-83 and 18 for 1999-00. By solving the function, we get the value of β as 2.9979. The properties of this function are such that it suitably explains the expansion of courier services in Pakistan; the absolute value grows exponentially with time and as the volume increases, the growth rate declines with time.

As assumed by FBS, the gross value added of storage is 2% of that of trade; we have adopted the same assumption in our estimates.

Combining value added of all the three categories described above, we get an estimate of trade, storage and communication at constant prices of 1999-00. In order to convert

these estimates into current prices, we have used consumer price index (transport and communication group).

4.3.3 Finance & insurance

In the new methodology, coverage of financial institutions has been extended to discount houses, venture capital companies, exchange companies, etc. The gross value added is estimated by product approach whereby intermediate consumption is deducted from gross output. The same estimates can equivalently be obtained by income approach, i.e., by adding wages and salaries, depreciation and gross profit (or deficit). We have used the income approach separately for different groups of financial institutions to work out their contribution in the sector's gross value added during the past years. Detail of various groups of financial institutions is given below.

The State Bank of Pakistan alone contributes 30 percent of total value added of this sector. The benchmark estimate of its value added for the year 1999-00 is Rs 39,201 million. We have worked out gross value added for years prior to 1999-00 by adding establishment cost, depreciation and net surplus available⁵⁷ as reported in various issues of Banking Statistics of Pakistan. These estimates are at current prices which have been converted at constant prices of 1999-00 by deflating them by CPI (as per practice of FBS).

The other major contributor to the value added of finance and insurance sector is banking sector which includes domestic and foreign scheduled banks (with share in value added of 39%). The benchmark estimate of value added of all scheduled banks was Rs 52,145 million in 1999-00. Their value added for past years has been estimated by adding up salaries, depreciation and pre-tax profits as given in various issues of Banking Statistics of Pakistan. These estimates have been deflated by CPI to arrive at value added at constant prices of 1999-00.

The same approach has been adopted in case of specialized banks and cooperative banks. Data source for these institutions is also Banking Statistics of Pakistan. The institutions included in this group are Agricultural Development Bank of Pakistan

⁵⁷ Adjusted for exchange gain or loss

(now Zarai Tarqati Bank Ltd.), Industrial Development Bank of Pakistan, Punjab Provincial Cooperative Bank and Federal Bank for Cooperatives.

The other group of financial institutions is DFIs which includes PICIC, Pak-Kuwait Investment Company, Pak-Libya Holding Company, Saudi-Pak Industrial & Agri. Investment Company, NDFC and Bankers Equity Limited, etc., which contributes 6 percent to the gross value added of the sector. Detailed information about DFIs necessary for working out their gross value added is not available, thus we have used growth rate of total assets of these institutions and applied them at benchmark estimates of gross value added in 1999-00. The other institutions covered in finance and insurance sector are HBFC and other housing finance companies, insurance companies, leasing companies, investment bank and modaraba companies, etc. For HBFC, the growth rates in advances and investment during past years have been applied on bench-mark estimate of 1999-00. The required data for DFIs and HBFC are available in Banking Statistics of Pakistan. For leasing companies, investment banks, modarabas and insurance, we have applied growth of respective market-capitalization (deflated by CPI) on benchmark estimates. For rest of the institutions (with share of less than one percent in total value added of finance & insurance sector), we have used growth rate of market-capitalization of finance (overall) as proxy of growth of gross value added. The data sources for these working are various issues of Index Numbers of Stock Exchange Securities (SBP publications).

4.3.4 Ownership of dwellings

The estimates of value added in this sector are measured by the rent accruing from ownership of dwellings. This requires cumulative increase of houses and their respective rent. To prepare new estimates of value added, FBS has taken the number of occupied houses in urban and rural areas from the Housing Census, 1998. The estimates of annual average rentals for urban and rural areas have been derived from the rent survey of 1998 conducted by FBS. The intermediate consumption by the type of houses has been estimated through survey undertaken by National Accounts in August 2002. For the subsequent years, the FBS estimates gross value added at constant cost on the basis of extrapolation of base year estimation by the growth of incremental houses. In this dissertation, the value added of this sector has been

estimated by applying growth in imputed rent on benchmark estimates for 1999-00; thus this technique not only incorporates the growth of incremental houses but also changes in their rent which capture the quality differences in housing units. The exercise has been done at provincial level due to the reasons that there are wide variations in average rent in provinces, and also one of the objectives of this dissertation is also to work out provincial value added. The value added for the country is thus the sum of those of provinces as expressed below.

$$DW_t = \sum_p \frac{DW_{p,t+1}}{(1+h_p)} \quad (4.18)$$

$DW_{p,t}$ = estimates of value added in province p during year t

DW_t = total value added in Pakistan at new base in year t

h_p = inter-census growth rate of number of imputed rent in province p

The benchmark estimate of value added for each province has been estimated by distributing overall benchmark estimates of FBS into provinces according to their share in imputed rent (for detail see section 6.3.4). The estimates as obtained above have been converted into current prices by applying house-rent index.

The data needed for this exercise has been taken from two housing censuses of 1980 and 1998, Housing, Economic and Demographic Survey 1973' and Survey of Rent in District Headquarters of Pakistan 1986, all published by FBS.

4.3.5 Public administration and defence

In the old methodology, gross value added of this sector included wages and salaries of government employees, rent on government owned and occupied buildings (assumed fixed at 10% of wage bill) and depreciation at the rate of 5% of the wage bill. On the other hand, gross value added in the new estimates includes wages and salaries, uniform and liveries, bonus and cash awards for meritorious services, and depreciation at the rate of 5% of public fixed investment. In order to adjust the past data according to these changes, we apply splicing on the old series of wages and salaries (a component of value added of old series). The total value added for this sector has been worked out by adding depreciation, which is 5% of public fixed

investment, into the spliced series of wages and salaries. Thus the gross value added in this sector is the following.

$$V_t = \tilde{W}_t \cdot \left(\frac{W}{\tilde{W}} \right)_{99-00} + 0.05 \times \tilde{I}_t \cdot \left(\frac{I}{\tilde{I}} \right)_{99-00} \quad (4.19)$$

V_t = value added at constant prices as per new methodology

\tilde{W} = wages and salaries in old series at constant prices

$\left(\frac{W}{\tilde{W}} \right)_{99-00}$ = ratio of wage and salaries measured by two methodologies in 1999-00

\tilde{I} = public fixed investment (in general government sector) as per old methodology

$\left(\frac{I}{\tilde{I}} \right)_{99-00}$ = ratio of public fixed investment measured by two methodologies in 1999-

00

The above estimates are at constant prices which have been converted to those at current prices by inflating them with CPI.

4.3.6 Social, community and private services

Income arising in the social, community and personal services consists of persons engaged in private education, medical & health services, computer related activities, recreational activities and other household and community services. The old methodology did not include computer related services, real estate services and services of non-profit institutions serving households (NPISH). However, it included hotel services which are not part of the new estimates under this sector. Keeping in view these changes we have estimated the gross value added of this sector for past years as follows.

$$V_t = \tilde{U}_t \cdot \left(\frac{U}{\tilde{U}} \right)_{99-00} + C_t + E_t + N_t \quad (4.20)$$

V_t = value added of SCP services at constant prices as per new estimates

\tilde{U} = value added of SCP services excluding hotel at constant prices as per old methodology

U = value added of SCP services excluding hotel, computer related services, real estate, NPISH, etc. as per new estimates

$\left(\frac{U}{\tilde{U}}\right)_{99-00}$ = ratio of the two values measured in 1999-00

C_t = value added of computer related services at 1999-00 prices

E_t = value added of real estate services at 1999-00 prices

N_t = value added of NPISH at 1999-00 prices.

The value added of computer related services has been estimated by applying back the growth rate of imports of computer related equipment (deflated by unit value index) on benchmark estimates of 1999-00.⁵⁸ Data of imports of computer related equipment were obtained from UNCTAD CD-ROM of trade data (2004); SITC code is 752. For value added of the other two components viz., real estate and NPISH, we have applied the fixed growth rates of 3.53 percent and 6.81 percent respectively as used by the FBS.

⁵⁸ The FBS has recently conducted a census of software industry and related services and estimated benchmark gross value added for year 1999-00. However, such a survey or similar information are not available for past years. So we have used the growth in import of computer related equipment as a proxy for growth in computer related services.

Box 4.1 Adjustment Technique

Let N_{at} and N_{bt} are two different values of a variable in a given year t ; both have been measured by two different methodologies and valued at two different base year prices such that:

$$N_{at} = P_a \cdot Q_{at} \quad (\text{B4.1})$$

$$N_{bt} = P_b \cdot Q_{bt}$$

The values of N_{bt} are known for all t but the value N_{at} is known only for base year a .

We wish to estimate N_{at} for other years. For the year a , a link can be established between the two series, i.e.,

$$\frac{N_{aa}}{N_{ba}} = \frac{P_a \cdot Q_{aa}}{P_b \cdot Q_{ba}} = A \cdot B \quad (\text{B4.2})$$

where $A = P_a / P_b$; $B = Q_{aa} / Q_{ba}$

In principal, Q_{at} and Q_{bt} measure the same quantity in the same unit, so $B = 1$ for all t . A is constant for all t and is known. Thus the new series N_{at} can be estimated from the second series (N_{bt}) as follows.

$$N_{at} = A \cdot N_{bt} = \left(\frac{P_a}{P_b} \right) \cdot P_b Q_{bt} = P_a \cdot Q_{at} \quad (\text{B4.3})$$

However, in the present case of rebasing of national income accounts in Pakistan, Q_{at} and Q_{bt} are not necessarily the same because there are improvements and changes in measurement techniques, so $B \neq 1$. However, we can still estimate the new series (N_{at}) if it is assumed that B is constant for all t , such that:

$$B = \left(\frac{Q_{aa}}{Q_{ba}} \right) = \left(\frac{Q_{at}}{Q_{bt}} \right) \quad \forall t \quad (\text{B4.4})$$

Thus the new series can be estimated as

$$N_{at} = A \cdot B \cdot N_{bt} \quad (\text{B4.5})$$

National income accounts in Pakistan are compiled by FBS on annual basis; there are no official estimates of higher frequency data (e.g. quarterly) available in Pakistan. There are however, some unofficial estimates of quarterly data like Kemal and Arby (2004) who have recently quarterised GDP along with its sub-sectors for years 1971-72 to 2002-03; earlier Bengaliwala (1995) estimated quarterly series for years 1971-72 to 1989-90. Both the studies give quarterly national accounts at constant prices of 1980-81. The present study offers quarterly national accounts at new base of 1999-00 prices. The study adopts Kemal and Arby (2004) methodology to quarterise the new series of GDP and its sub-sectors at 1999-00 prices as estimated in previous chapter of the dissertation.⁵⁹ Their methodology has been extended or modified according to the needs of the new methodology of annual estimates. In the next three sections, we have outlined the methodology adopted for three sectors viz., agriculture, industry and services.

5.1 Agriculture

5.1.1 Major crops

Quarterly gross value added (GVA) of major crops has been worked out on the basis of the following three kinds of information:

- i. Quarterly Harvest Calendar of each crop in each province
- ii. Province-wise production of each crop
- iii. Annual value added of each crop

The quarterly value added at 1999-00 prices has been calculated as follows with the assumption that input-to-output ratio in a quarter is the same as that in a given year.

$$V_{kt} = \left(\frac{V_t}{Y_t} \right) \cdot Y_{kt} \quad (5.1)$$

V_t = value added in year t at new base

⁵⁹ As described in chapter 2, Kemal and Arby (2004) technique is more detailed and comprehensive compared with Bengaliwala (1995), though, in essence both are the same.

V_{kt} = value added in quarter k and year t

Y_t = value of output in year t at new base

Y_{kt} = value of output in quarter k and year t , computed as follows

$$Y_{kt} = \sum_j \sum_p [W_{jkp} (P_{j0} + b_j \cdot \tilde{P}_{j0}) Q_{jpt}] \quad (5.2)$$

W_{jkp} is weight of quarter k for production of crop j in province p such that $\sum_k W_{jkp} = 1$,

P_{j0} is base price of crop j , \tilde{P}_{j0} is base price of by-product of crop j , and Q_{jpt} is physical production of crop j in province p . The data used for quarterisation are the same as used in rebasing exercise of chapter 4 of this dissertation except for harvest calendar⁶⁰; this calendar is obtained from FBS and reported in Annexure A. The above quarterly estimates are at constant prices of 1999-00. In order to convert them at current prices, we have used quarterly wholesale price index of crops; the computation of the index has already been described in chapter 4, section 4.1.1. The quarterly value added of major crops at current prices (\hat{V}_{kt}) can be worked out as follows.

$$\hat{V}_{kt} = P_{kt} \cdot V_{kt} \quad (5.3)$$

However, there is a snag: the sum of \hat{V}_{kt} as calculated above is not necessarily equal to \hat{V}_t (the annual value added for t as estimated by equation 4.5 in chapter 4). Therefore, in order to maintain additivity (i.e. sum of quarterly value added should be equal to annual value added), we have adjusted quarterly estimates at current prices by adding one fourth of the difference ($\hat{V}_t - \sum_k \hat{V}_{kt}$) to each quarter.

5.1.2 Minor crops

Quarterly estimates of value added of minor crops have been worked out by using the above technique of major crops except that harvest calendar used is related to minor crops. The harvest calendar of minor crops has been obtained from the FBS (see Annexure A). The quarterly estimates of gross value added of minor crops at current

⁶⁰ Harvest calendars of crops have been prepared by the FBS for each province on the basis of recording the output in the quarter in which it is harvested. There is a conceptual problem with such calendar that it does not take into account activities related with sowing of a typical crop which may have occurred in some other quarters. However, these calendars have practical advantages in using them for quarterisation.

prices have then been worked out by applying wholesale price index of individual crops to constant price estimates of minor crops; the technique is the same as described above for major crops.

5.1.3 Livestock

The quarterly distribution of livestock value added has been undertaken by applying Kemal and Arby (2004) methodology whereby gross output of milk has been distributed in the four quarters with ratios 17.5%, 35%, 30% and 17.5% respectively and the rest of the output of livestock is quarterised uniformly as given below.

$$\begin{aligned}
 V_{1t} &= V_{4t} = V_t \cdot (0.175m_t + 0.25(1 - m_t)) \\
 V_{2t} &= V_t \cdot (0.35m_t + 0.25(1 - m_t)) \\
 V_{3t} &= V_t \cdot (0.30m_t + 0.25(1 - m_t))
 \end{aligned}
 \tag{5.4}$$

m_t is share of milk in total gross output of livestock, V_{1t} , V_{2t} , V_{3t} , and V_{4t} are value added in quarter one, two, three and four respectively. The quarterly wholesale prices indices of fresh milk, eggs, chickens and meat have been used for converting constant price estimates into quarterly current price estimates (for detail see section 4.1.3).

5.1.4 Fishing

Annual value added of fishing has been quarterised on the basis of average seasonal pattern for marine and land fish as worked out in an in-house study on fishing by FBS. The seasonal factors are 0.2012, 0.3069, 0.2365 and 0.2554 for marine fish in the respective four quarters; and 0.1121, 0.2735, 0.3498 and 0.2646 for land fish in respective four quarters. The quarterly wholesale price index of fish has been applied for estimates at current prices.

5.1.5 Forestry

For quarterly distribution of value added, we have used coefficients estimated by Quaidian Economic Consultants (2001) in a study on Forestry for FBS. These coefficients are 0.2009, 0.2561, 0.2882, 0.2548 for quarter one, two, three, and four respectively. The quarterly wholesale price indices of timber and firewood have been used for current prices estimates.

5.2 Industry

5.2.1 Mining & quarrying

The quarterly output value of mining and quarrying has been computed by applying 1999-00 prices on quarterly production of 24 mining items covering 88% of the total output value of this sector. For rest of the ingredients, the combined seasonal factors of 24 items have been used. The input costs have been deducted from quarterly output value at the rates mentioned in Table 4.6 of chapter 4; with this we get quarterly estimates of value added of mining & quarrying at constant prices of 1999-00. These estimates have then been converted into current prices on the basis of quarterly composite wholesale price index of coal and natural gas (for detail see section 4.2.1). The data on quarterly production of mining items have been taken from monthly statistical bulletin of FBS.

5.2.2 Manufacturing

Large-scale and Small-scale Manufacturing: Quarterly value added of manufacturing has been calculated by using Kemal and Arby methodology, i.e. by applying the seasonal factors of the quantum index number of large-scale manufacturing. However, in this case the quantum index number is self constructed on the basis of new weights and new base (1999-00). The quarterly value added at current prices has been estimated by using wholesale price index of manufacturing.

Slaughtering: Annual value added of slaughtering both at constant and current prices has been distributed into four quarters according to the coefficients derived in the study by FBS on slaughtering industry (FBS, 2002f). These coefficient are; 18%, 25%, 35%, and 22% for quarter one, two, three and four respectively.

5.2.3 Construction

We have used seasonal variations in cement production for quarterisation of the gross value added of construction at constant prices. Adopting from Kemal and Arby, we have proceeded as follows.

$$\begin{aligned}
V_{1t} &= V_t * C_{4t}/C_t \\
V_{2t} &= V_t * C_{1t}/C_t \\
V_{3t} &= V_t * C_{2t}/C_t \\
V_{4t} &= V_t * C_{3t}/C_t
\end{aligned}
\tag{5.5}$$

Where V_{kt} is value added of construction in quarter k and year t ; V_t is annual value added in year t ; C_{kt} is production of cement in quarter k and year t ; and C_t is annual production of cement in year t . The quarterly estimates at constant prices thus obtained have been converted into current prices by using quarterly wage index. As already mentioned in section 4.2.3, the wage index is available at annual basis; we have generated a quarterly series of this index by applying seasonal factors of quarterly wholesale price index of building material.

5.2.4 Electricity, gas and water supply

The gross value added of electricity and gas has been quarterised on the basis of quarterly factors as given in the Study on Electricity & Gas (FBS, 2002h), and the same of water supply has been quarterised on the basis of quarterly seasonal factors of canal, tube-well, domestic and commercial water supply as reported in the Study on Water Supply (FBS 2001). The quarterly gross value added as estimated above is at 1999-00 prices which has been converted to current prices by using quarterly wholesale price index of fuel & lighting for electricity and gas and general wholesale price index for water supply.

5.3 Services

5.3.1 Trade, hotels & restaurants

The trade margins and ratio for marketable portion as used in annual estimates have been used also for quarterly estimates of value added of this sector. For quarterly estimates at constant prices, the margins have been applied on quarterly imports and domestic production at constant prices. The gross value added of hotels and restaurants has been quarterised on the basis of seasonal pattern of room occupation as reported in Hotel Industry in Pakistan – Survey 2000. The constant price estimates of domestic production related trade and hotels have been converted in to current

prices by applying quarterly wholesale price index (general) and trade related with imports have been converted into current prices on the basis of quarterly unit value index of imports (base 1999-00).

5.3.2 Transport, storage & communication

Annual value added of this sector has been quarterised by applying Lisman and Sandee (1964) method which derives a smooth continuous quarterly time series from the annual data using the following disaggregating formula:

$$\begin{bmatrix} x_{1t} \\ x_{2t} \\ x_{3t} \\ x_{4t} \end{bmatrix} = \begin{bmatrix} 0.073 & 0.198 & -0.021 \\ -0.010 & 0.302 & -0.042 \\ -0.042 & 0.302 & -0.010 \\ -0.021 & 0.198 & 0.073 \end{bmatrix} \cdot \begin{bmatrix} X_{t-1} \\ X_t \\ X_{t+1} \end{bmatrix} \quad (5.6)$$

Where X_t is annual figure in year t , and x_{jt} is quarterly figure in quarter j of year t .

The quarterly consumer price index of transport and communication group has been used to convert constant price estimates of this sector into current price estimates.

5.3.3 Finance & insurance

Following Kemal and Arby technique of quarterisation, we have quarterised net profit of financial institutions on the basis of seasonal factors of M2; establishment cost and depreciation is distributed into four quarters equally.⁶¹ The quarterly consumer price index has been used to convert constant price estimates into current price estimates.

5.3.4 Ownership of dwellings

Lisman and Sandee (1964) technique has been used for quarterisation of annual series at constant prices as done by Kemal and Arby (2004). The quarterly house rent index has been used to convert constant price estimates into current price estimates.

⁶¹ The combined seasonal factors of SBP, scheduled banks and specialized banks have been used for other financial institutions.

5.3.5 Public administration & defence

This sector consists of two components, viz., wages and salaries of government employees, and depreciation. While we have uniformly distributed depreciation into four quarters, wages has been distributed by factors 0.244, 0.244, 0.256, and 0.256 for respective quarters as derived by Kemal and Arby. The current price estimates have been obtained by using quarterly consumer price index.

5.3.6 Community, social & personal services

Lisman and Sandee (1964) technique has been used for estimating quarterly value added of this sector at constant prices. For current price estimates, we have used a composite deflator based on consumer prices indices of Cleaning, Laundry & Personal Appearance group and Recreation, Entertainment & Education group.⁶²

⁶² The two groups of consumer price index have weights of 5.4 and 3.12 in overall CPI; we have used these weights to form a composite index for this sector.

This chapter attempts to disaggregate Pakistan’s GDP into provinces’ GDP on the basis of available information at provincial level. The basic plan of disaggregation is to estimate the extent of economic activity taking place within the boundaries of a province. The provincial gross value added in certain sub-sector have been estimated in the same manner as for Pakistan level estimates, i.e. direct estimation by product approach; for example major and minor crops, livestock, fishing, mining, etc.⁶³ While gross value added in other sub-sectors has been estimated by disaggregating the Pakistan’s GDP national on the basis of some allocators. Detail of technique used for each sector has been given in the following three sections.

6.1 Agriculture

6.1.1 Major crops

As mentioned above, the provincial estimates of output value of major crops at constant prices of 1999-00 have been made by using the same technique as used for annual national estimates of Pakistan. The provincial value of output and value added have been estimated as below:

$$\begin{aligned}
 Y_{pt} &= \sum_j [(P_{jp0} + b_j \cdot \bar{P}_{jp0}) Q_{jpt}] \\
 V_{pt} &= Y_{pt} - \sum_i g_i \cdot d_{ipt} \cdot N_i
 \end{aligned}
 \tag{6.1}$$

Where g_i is the share of major crops in input i as given in Table 4.1, d_{ipt} is provincial share in input i , and N_i is the total value of input i of crops. Provincial shares in the inputs have been computed on the basis of distribution of closely related indicators or some fixed ratios. The input value of seeds has been distributed into provinces according to the provincial shares in total crops production; fertilizer and pesticides have been distributed according to the consumption of fertilizer by provinces (as reported by Agricultural Statistics of Pakistan) and other inputs are distributed

⁶³ National price deflators have been used for all the provinces due to unavailability of provincial price indices. While the use of the same prices may not affect the results significantly in case of commodity producing sectors due to the tendency of price equalization with free mobility of goods across the regions, the provincial value added of services sector may be affected.

according to fixed ratios for provinces as used in Rebasing Book for the year 1999-00 (Table 6.1).

	Punjab	Sindh	NWFP	Balochistan
Water	0.6797	0.1873	0.0389	0.0941
Ploughing & planking	0.6970	0.1813	0.0822	0.0395
Transport charges	0.6808	0.2315	0.0621	0.0256
Wastages	0.6726	0.2123	0.0650	0.0501
Source: Rebasing Book (FBS, 2004)				

6.1.2 Minor crops

Like major crops, the value added of minor crops has also been provincialised on the basis of province wise production data and base year prices, i.e.

$$Y_{pt} = \sum_j P_{jp0} \cdot Q_{jpt}$$

$$V_{pt} = Y_{pt} - \sum_i (1 - g_i) \cdot d_{ipt} \cdot N_i \quad (6.2)$$

g_i is the share of major crops in total input.

6.1.3 Livestock

The gross value added of livestock has been provincialised according to the shares of provinces in livestock population. For each of the products of livestock, we have used the population of relevant type of animals; for example, provincial distributions of cows, buffaloes, sheep, goats and camels have been used in case of milk, provincial distribution of work animals have been used for draught power, and so on (see Table 6.2 for detail).

Items	Basis for Provincial Distribution
Natural Growth	Provincial distribution of livestock population
Net Sale	Provincial distribution of Animal sold for slaughtering
Milk	Provincial distribution of cows, buffaloes, sheep, goats, camel
Draught Power	Provincial distribution of work animal
Dung & Urine	Provincial distribution of livestock population
Wool and Hair	Provincial distribution of sheep and goats
Poultry Products	Provincial distribution of poultry

6.1.4 Fishing

The gross value added of fishing has been provincialised on the basis of provincial output of land and marine fish as reported in Agriculture Statistics of Pakistan (various issues). The formula used for this purpose is the same as for national value added in fishing sector (as described in chapter 4, equation 4.10). The following equation gives the provincial value added, and by construction the sum of the provincial value added becomes equal to the national value added.

$$V_{pt} = (2 \times Q_{pt} \times 34.75 \times 0.84) + (M_{pt} \times 16.43 \times 0.64 \times 0.935)^{64} \quad (6.3)$$

V_{pt} = provincial value added of fishing at constant prices of 1999-00

Q_{pt} = quantity of inland fish caught in province p

M_{pt} = quantity of marine fish cost in province p

Data of inland and marine fish catching have been obtained from Agricultural Statistics of Pakistan. The base year prices and ratios for input costs have been taken from the Rebasing Book. The value added at current prices has been estimated by applying wholesale price index of fish on constant price value added.

6.1.5 Forestry

The provincialisation of forestry value added has been done on the basis of revenue earned by forest departments of provinces; the required information has been taken from Agricultural Statistics of Pakistan.

6.2 Industry

6.2.1 Mining & quarrying

As mentioned in section 4.2.1, provincial data of production of 24 mining items are available in Statistical Year Book. Thus exactly the same technique has been used as described in section 4.2.1 for provincial estimates of the value added of mining and quarrying.

⁶⁴ 34.75 and 16.43 are base years prices of inland and marine fish respectively in rupees/kg. The quantity of inland fish is doubled in these calculations to adjust underreporting (of 100 percent).

6.2.2 Manufacturing

i) *Large-scale & Small-scale Manufacturing*: Share of provinces in value added as reported in Census of Manufacturing Industries (CMI) of various years have been used to provincialise the new estimates of LSM value added. Similarly, in case of provincialisation of gross value added of small-scale manufacturing, the shares of provinces in value added as reported by Census of Small-scale & Household Manufacturing Industries (CSHMI) of various years.⁶⁵

ii) *Slaughtering*: The output value of different products of slaughtering has been provincialised on the basis of provincial population of relevant kind of animals, i.e.

- beef is provincialised on the basis of population of cattle and buffaloes
- mutton on the basis of sheep and goats,
- camel meat on the basis of camels,
- poultry meat on the basis of poultry population,
- skin (sheep & goat) on the basis of sheep & goat,
- hides on the basis of cattle and buffaloes
- all other products on the basis of provincial distribution of total meat.

6.2.3 Construction

The indicators used for provincialisation of construction value added have been given in the following table.

Items	Indicators (Data Source)⁶⁶
Land improvement	Number of houses in provinces (weighted sum of kacha, semi-pucca and pucca houses; weights are relative rents)
Buildings	
Drainage	
Canals	Development Expenditure on Irrigation by provinces
Gas Pipeline	Gas transmission in km in provinces
Roads, Streets, Highways	Length of roads
Railway tracks, Runways	Length of railway route
Telecom lines	Number of telephones
All other items	The combined distribution of above items

⁶⁵ Both CMI and CSHMI are available for selected years; for the decade of 1970s we have used average ratios worked out from censuses undertaken in this decade, for 1980s we have used average ratios worked out in the decade of 1980, and so on with the assumption that the industrial structure is less likely to change in a decade period.

⁶⁶ There are some gaps in data series which have been filled on pro rata basis.

6.2.4 Electricity, gas and water supply

The gross value added of electricity and gas has been provincialised on the basis of provinces shares in consumption of electricity and gas, as reported in various issues of Energy Year Books. The gross value added of water supply has been provincialised on the basis of provincial shares in area irrigated by canal water, number of tube-wells, number of houses and number of commercial and industrial establishments. Province wise irrigation by canal water and number of tube wells have been taken from Agricultural Statistics of Pakistan, number of houses from housing and population censuses, and number of commercial and industrial establishments have been obtained from various issues of Annual Establishment Enquiry.

6.3 Services

6.3.1 Trade and hotel & restaurants

We have applied the same trade margins and tradable surplus ratios for provinces as used for national estimates. We already have provincial domestic production with us; the imports to the country have been provincialised on the basis of the following indicators:

- Imports of consumers goods: share of provinces in urban population
- Imports of capital goods: provincial share in industry
- Imports of raw Material: provincial share in industry

The trade margins for imports have then be applied on provincial estimates of imports to estimate import related value added of trade.⁶⁷

The value added of hotels and restaurants have been provincialised on the basis of provincial shares in years of 1979, 1984, 2000 for which surveys of hotel and restaurants are available; the shares have been kept constant for inter-survey years.

6.3.2 Transport, storage & communication

The provincialisation of this sector is undertaken on the basis of a number of different indicators of which provincial distribution is available. The gross value added of

⁶⁷ Here is a caveat, while we have provincialised trade related to national level of imports, trade of commodities coming from other provinces could not be estimated due to unavailability of data series of inter-provincial commodity flows.

Pakistan Railway is provincialised on the basis of length of railway routes in each province. The routes in kilometers are reported in different issues of the provincial development statistics.

The provincial distribution of gross value added of air transport is undertaken on the basis of all passengers handled at airports located in each province. Airport-wise information of passengers has been obtained from annual reports of Civil Aviation Authority. The gross value added of pipeline transport is distributed into provinces on the basis provincial oil consumption. The province-wise oil consumption has been obtained from various issues of Pakistan Energy Year Book.

In case of the gross value added of water transport, we have allocated 100% value added of PNSC, KPT, Port Qasim and others to Sindh. The value added of boats has been allocated to the four provinces on the basis of distribution of number of boats in each province. The province-wise numbers of boats are obtained from various issues of Agricultural Statistics of Pakistan.

The gross value added of road transport is provincialised on the basis of number of vehicles registered in provinces. The number of registered vehicles in each province has been obtained from Statistical Year Books. The provincial distribution of non-mechanized transport is undertaken on the basis of provincial population of camels, horses, asses and mules which are available in Agricultural Statistics of Pakistan.

The gross value added of telecommunication sector is distributed into provinces on the basis of number of telephones in each province. Such numbers are given in different issues of provincial development statistics. The gross value added of postal services is provincialised on the basis number of postal employees in each province; annual reports of Pakistan Post Office are the sources. The provincial distribution of storage is undertaken on the basis of provincial gross value added of trade which has already been estimated in a separate exercise.

6.3.3 Finance & insurance

The gross value added of finance and insurance has been provincialised on the basis of provincial distribution of employees working in financial institutions. The information about this distribution is obtained from various issues of Annual Establishment Enquiry published by FBS. The latest such enquiry is available for the year 1989-90; for later years, we have used the same year's distribution.

6.3.4 Ownership of dwellings

Provincial distribution of imputed rent on dwellings has been used for provincialisation of value added of this sector. The imputed rent has been computed by multiplying the number of houses with average rent for different categories of houses viz. pucca, semi-pucca and kutchra which have been obtained for each province from different housing and rent surveys as mentioned in section 4.3.4. Formally, the computation of imputed rent in a province is expressed as:

$$R_p = \sum_k (r_{kp} \times H_{kp}) \quad (6.4)$$

where R_p is total imputed rent in province p , r_{kp} is average rent of category k of a house in province p and H_{kp} is number of houses in k category in province p . The share of a province in imputed rent is then used to provincialise the benchmark estimate of gross value added of ownership of dwelling in 1999-00. i.e.,

$$DW_{p,bm} = \left(\frac{R_p}{\sum R_p} \right) \times DW_{bm} \quad (6.5)$$

where DW_{bm} is benchmark value addition of ownership of dwelling in 1999-00 as estimated by FBS. The gross value added of years other than 1999-00 has been estimated by applying annual compound growth rates in imputed rent on benchmark estimates of 1999-00 at provincial level.

6.3.5 Public administration and defence

We have made two parts of value added of this sector; value added of federal government and value added of provincial government. The value added of federal government has been provincialised by the distribution of federal employees on

provincial basis. These information are available in periodic census reports of Public Administration Research Centre, Cabinet Secretariat, Government of Pakistan. The other part has been distributed into provinces on the basis of provincial expenditure on general government obtained from various issues of Statistical Year Book.

6.3.6 Social, community and private services

The gross value added of sector has been provincialised on the basis of provincial distribution of employees working in such services as reported by various issues of Annual Establishment Enquiry published by FBS.

The techniques of re-basing the national accounts and their decomposition in quarters and provinces as described in previous chapters have been applied on data from 1970-71 to 2004-05. This chapter gives an analysis of results and compares our results with official estimates at old base for the period 1970-71 to 1998-99 and at new base for the period 1999-00 onward. Also a comparison of quarterisation and provincialisation of national accounts as undertaken in this study has been made with those of Bengaliwala (1995) and Bengali and Sadaqat (2005).

7.1 Gross Domestic Product

The estimates of national accounts by this study are generally very close to those of FBS for the period 1999-00 onward except in case of some sub-sectors (details of which have been given in relevant

	Present study's estimates	FBS estimates	% Difference
1999-00	3,516,973	3,562,020	-1.3
2000-01	3,600,378	3,632,091	-0.9
2001-02	3,720,350	3,745,118	-0.7
2002-03	3,893,462	3,922,307	-0.7
2003-04	4,179,058	4,215,582	-0.9
2004-05	4,553,747	4,577,061	-0.5

sections). A comparative statement of estimates of overall gross value added is given in the Table 7.1.1 which shows that FBS estimates of GDP are slightly overestimated as compared to this study though the difference between the two series is just around -1 percent.

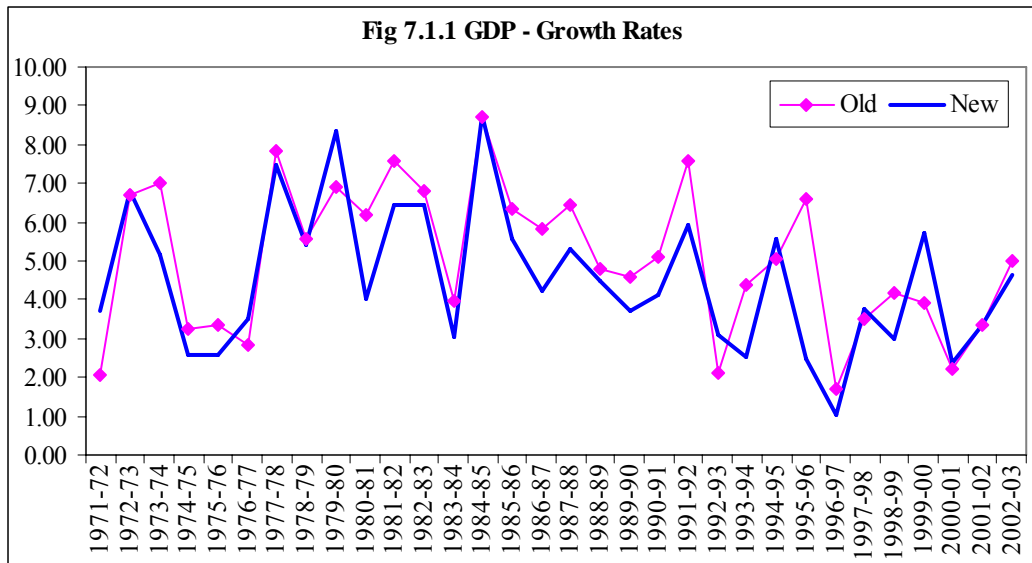
Compared with the growth rates of the old series (1980-81 base), the new growth rates follow the same pattern over time (Fig 7.1.1); however, the actual rates are different which may

	Old Base (1980-81)	New Base (1999-00)
1970-75	4.8	4.6
1975-80	5.3	5.5
1980-85	6.6	5.8
1985-90	5.6	4.7
1990-95	4.8	4.2
1995-00	4.0	3.2
2000-05*	3.5	5.3
Overall	5.0	4.7

* Growth of old base data is for 2000-03

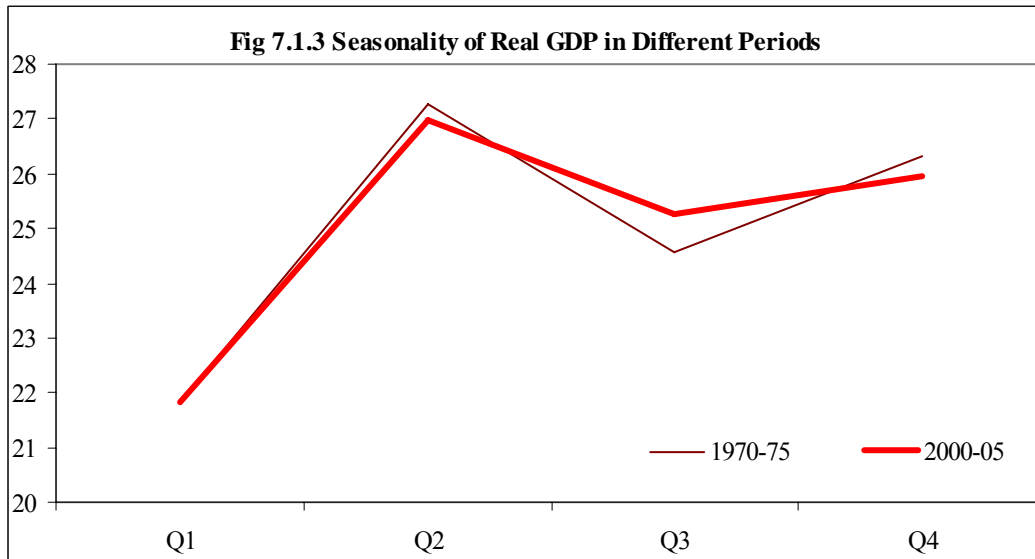
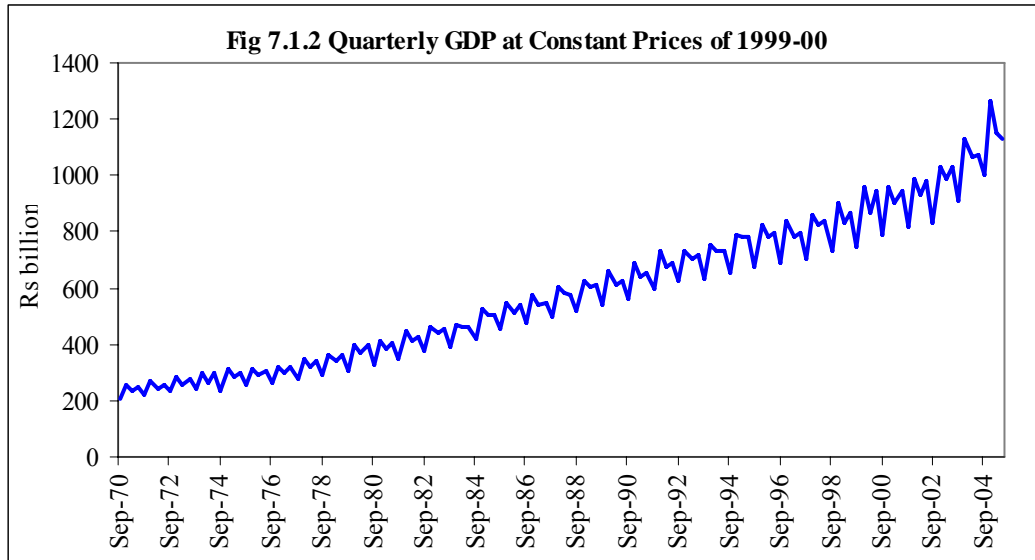
be due to changes in relative prices and quantity weights in different sectors. It is also observed that the decade of 1980s remains the high growth era while the decade of 1990s comes out as low growth period according to new base estimates (Table 7.1.2).

While the new growth rates are almost equal to old growth rates for the decade of 1970s, these are lower for the decade of 1980s and 1990s.



The results of quarterisation of national accounts show that on average 21.8 percent of the annual GDP is produced in the first quarter (Jul-Sep) followed by the third quarter (Jan-Mar) with 25.2 percent of annual GDP (Table 7.1.3). In the second quarter (Oct-Dec) the production of goods and services is the highest at 26.9 percent. In the last quarter (Apr-Jun) production is also high with 26.1 percent of the annual. Fig 7.1.2 shows a time series of quarterly GDP since September 1970, it is evident that the seasonal pattern has changed slightly over the years (see also Fig 7.1.3). This result is consistent with Kemal and Arby (2004) which showed that seasonality in GDP had declined over time.

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun
1970-75	21.8	27.3	24.6	26.3
1975-80	21.5	26.8	25.1	26.6
1980-85	21.5	26.8	25.5	26.1
1985-90	22.1	26.8	25.4	25.7
1990-95	22.1	26.7	25.5	25.8
1995-00	21.8	27.0	25.2	26.0
2000-05	21.8	27.0	25.3	25.9
Overall	21.8	26.9	25.2	26.1



The seasonal pattern as estimated by the present study are different to the one estimated by Bengaliwala (1995). According to Bengaliwala, the highest production of goods and services takes place in the fourth quarter with a seasonal factor of 28.1 percent and the second quarter is second in the ranking (Table 7.1.4). However, the first quarter remains a quarter of lowest economic activities in Bengaliwala as in the present study.

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun
GDP	21.8	27.5	22.7	28.1
Agriculture	17.1	32.3	13.5	37.1
Major crops	9.7	40.4	7.1	42.8
Minor crops	33.4	18.4	16.2	31.9
Livestock	24.2	22.5	24.5	28.7
Fishing	21.2	36.8	21.1	20.9
Forests	30.3	20.1	19.9	29.7
Mining & Quarrying	25.7	25.2	24.8	24.3
Manufacturing	22.1	26.1	27.7	24.2
Construction	22.2	24.9	26.2	26.7
Electricity & gas distribution	25.5	24.7	24.2	25.6
Transport, storage & communication	23.0	23.3	25.8	27.9
Wholesale & retail trade	25.0	26.1	24.2	24.7
Banking & insurance	24.6	25.4	25.1	24.9
Ownership of dwellings	25.6	25.2	24.8	24.4
Public administration & defence	25.9	25.3	24.7	24.2
Other services	23.2	25.0	25.8	26.0

The provincial distribution of gross domestic product shows that the Punjab holds the highest share in gross domestic product (52.3 percent); it is followed by Sindh (30.6 percent), NWFP (11.5 percent) and Balochistan (5.5 percent). However, over the years the Punjab's share has declined; during 1970s, about 54 percent of the country's GDP was being generated in the Punjab that declined to 51.8 percent in 2000s. On the other hand, shares of NWFP and Balochistan in total GDP have increased during this period as shown in the following table; there is no significant change in the share of Sindh in total GDP during the period of 1970-2005 (Table 7.1.5).

	Punjab	Sindh	NWFP	Balochistan
1970-75	54.9	30.0	11.1	4.1
1975-80	53.6	30.8	10.7	4.9
1980-85	51.4	31.7	11.3	5.6
1985-90	51.4	31.1	11.6	5.9
1990-95	51.6	30.1	11.7	6.6
1995-00	51.7	30.0	12.0	6.3
2000-05	51.8	30.9	12.0	5.4
Overall	52.3	30.6	11.5	5.5

The provincial distribution of gross domestic product as estimated by this study is significantly different to that estimated by Bengali and Sadaqat (2005). According to Bengali and Sadaqat, the share of the Punjab was 53.2 percent of total GDP during 1972-2000 period and it has increased over time (Table 7.1.6). The share of Sindh was 31.3 percent on average during 1972-00 and it has declined during 1990s. The shares of NWFP and Balochistan have also declined over time. In addition to the difference in base year prices used by the two studies, the difference of results can also be explained by application of different techniques of provincialisation at sectoral level as discussed in detail in the relevant sub-sections of this chapter in pages ahead.

	Punjab	Sindh	NWFP	Balochistan
1972-75	52.8	30.8	11.8	4.6
1975-80	53.7	30.5	11.4	4.4
1980-85	52.5	32.0	11.4	4.0
1985-90	52.4	32.1	11.6	3.9
1990-95	53.5	31.3	11.0	4.1
1995-00	54.0	30.5	11.6	3.9
Overall	53.2	31.3	11.4	4.1

	Punjab	Sindh	Balochistan	NWFP
GDP	53.2	31.3	11.4	4.1
Agriculture	58.5	25.0	11.3	5.2
Major crops	62.6	24.5	11.4	1.4
Minor crops	59.0	20.2	8.5	12.4
Livestock	59.2	22.9	12.6	5.2
Fishing	5.9	75.1	0.3	18.7
Forests	29.2	8.0	61.6	1.3
Industry	48.9	37.7	10.2	3.2
Mining & Quarrying	34.2	40.5	6.1	19.2
Manufacturing	48.6	41.5	8.6	1.3
Construction	53.0	28.8	12.1	6.1
Electricity & gas distribution	46.6	30.2	15.9	7.3
Services	52.0	32.0	12.1	3.9
Transport, storage & communication	49.8	37.7	8.5	4.0
Wholesale & retail trade	47.4	33.1	16.3	3.2
Banking & insurance	48.0	42.7	7.5	1.8
Ownership of dwellings	57.2	28.3	9.5	5.0
Public administration & defence	55.4	28.1	11.4	5.1
Other services	58.5	24.4	12.7	4.3

Although the Punjab's share in GDP in absolute terms is the highest, the distribution of per capita GDP is entirely different. The present study finds that Sindh is the richest province in terms per capita GDP and there is significant increase in per capita output during the period; in early 1970s, average per capita GDP (at constant prices of 1999-00) in Sindh was Rs 21.3 thousand that increased to Rs 35.2 thousand in 2000s (Table 7.1.8). The province second on the this scale is Balochistan; it has average per capita output of Rs 28.8 thousand during 2000s, which has increased by over 80% from a level of Rs 16 thousand in early 1970s. The Punjab and NWFP have per capita income of Rs 24.3 thousand and 23.4 thousand during 2000s respectively.

	Punjab	Sindh	NWFP	Balochistan	Pakistan
1970-75	14.7	21.3	13.3	16.3	16.1
1975-80	15.7	23.1	13.8	17.7	17.2
1980-85	17.6	27.1	16.7	21.4	19.9
1985-90	20.2	30.3	19.4	26.0	22.7
1990-95	21.9	31.5	21.0	31.5	24.5
1995-00	22.6	32.0	21.9	31.1	25.2
2000-05	24.3	35.2	23.4	28.8	27.0
Overall	19.6	28.6	18.5	24.7	21.8

The relative position of provinces at the scale of per capita income as comes out from our results is consistent with household integrated economic surveys of different years. As Table 7.1.9 shows, Sindh has been the richest province in terms of average household income per month, followed by NWFP or Balochistan. the Punjab has been at either third or fourth position in the ranking of provinces according to per household income.

	Punjab	Sindh	NWFP	Balochistan	Pakistan
1979	956	1,181	1,148	1,020	1,032
1985-86	1,800	2,170	1,855	1,745	1,889
1996-97	3,255	4,375	3,343	3,436	3,509
2001-02	6,847	8,074	6,821	7,705	7,168
2004-05	9,488	10,413	9,395	8,849	9,685

* HIES stands for Household Income and Expenditure Survey for years 1979, and 1985-86, for subsequent years the name of this survey is Household Integrated Economic Survey.

Looking at the growth rates of GDP in provinces, Table 7.1.10 shows that Balochistan had been the fastest growing province up till mid 1990s; however, its GDP growth declined significantly since then with negative average growth during second half of 1990s. Bengali and Sadaqat (2005) also find similar growth trend in Balochistan. The province of Sindh has been the second fastest growing area with an average GDP growth of 5 percent followed by NWFP (4.9%). The province of the Punjab has been the slowest growing region during this period. The results may be expected as the provinces with low level of absolute GDP grew faster as compared with those with higher level of GDP. Looking at the average growth rates across time we can observe convergence of provincial growth rates in 1990s; growth rates in 2000s are also almost the same in provinces except Balochistan wherein unfavorable weather conditions of early 2000s affected badly the economic conditions of this province.

	Punjab	Sindh	NWFP	Balochistan	Pakistan
1970-75	4.5	4.7	2.6	10.0	4.6
1975-80	4.6	6.5	6.1	7.5	5.5
1980-85	5.2	6.0	6.2	9.4	5.8
1985-90	4.7	3.8	6.3	5.5	4.7
1990-95	4.4	3.8	3.6	6.5	4.2
1995-00	3.6	3.2	3.4	-0.4	3.2
2000-05	4.9	6.4	5.4	2.9	5.3
Overall	4.6	4.9	4.9	5.8	4.7

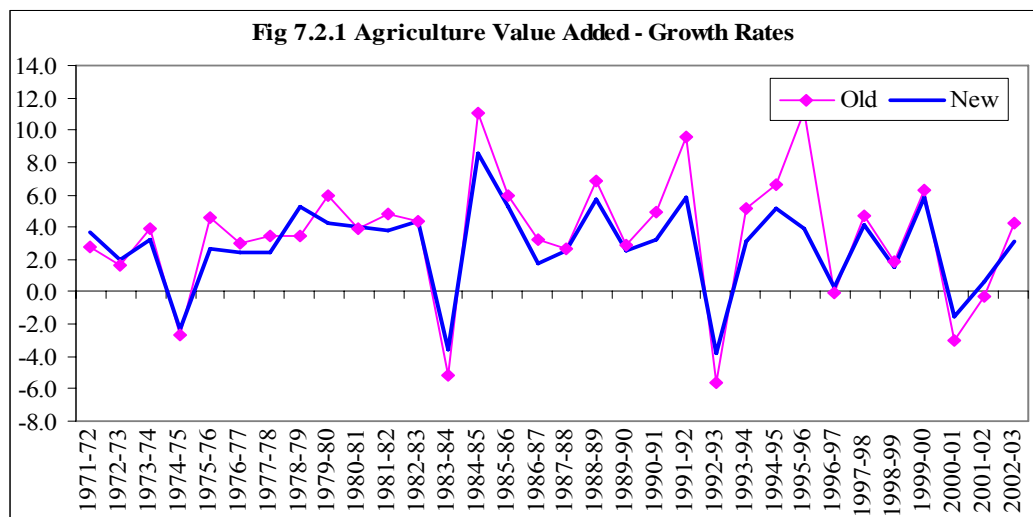
7.2 Agriculture

The gross value added of agriculture sector at 1999-00 prices as estimated by FBS is highly overestimated as compared with estimates of this study. There is a difference of more than 5 percent between the two estimates (Table 7.2.1). This difference is solely due to livestock value added which is grossly overestimated by FBS as argued and explained in detail in section 7.2.3 (coming next). It is interesting to note that the impact of this overestimation of agriculture on overall GDP has been cancelled out by underestimation in industry.

	Present study's estimates	FBS estimates	% Difference
1999-00	873148	923609	-5.5
2000-01	859370	903499	-4.9
2001-02	864912	904433	-4.4
2002-03	891430	943223	-5.5
2003-04	909138	964827	-5.8
2004-05	977889	1029845	-5.0

Compared with old series of national accounts at 1980-81 prices, it is evident that growth rates of agricultural value added at new base prices are different to those at old base (Fig 7.2.1). However, the pattern of movements in both the series is quite a similar. Thus the changes in relative prices have though changed the growth rates in different years, the trend of agriculture value added is almost similar.

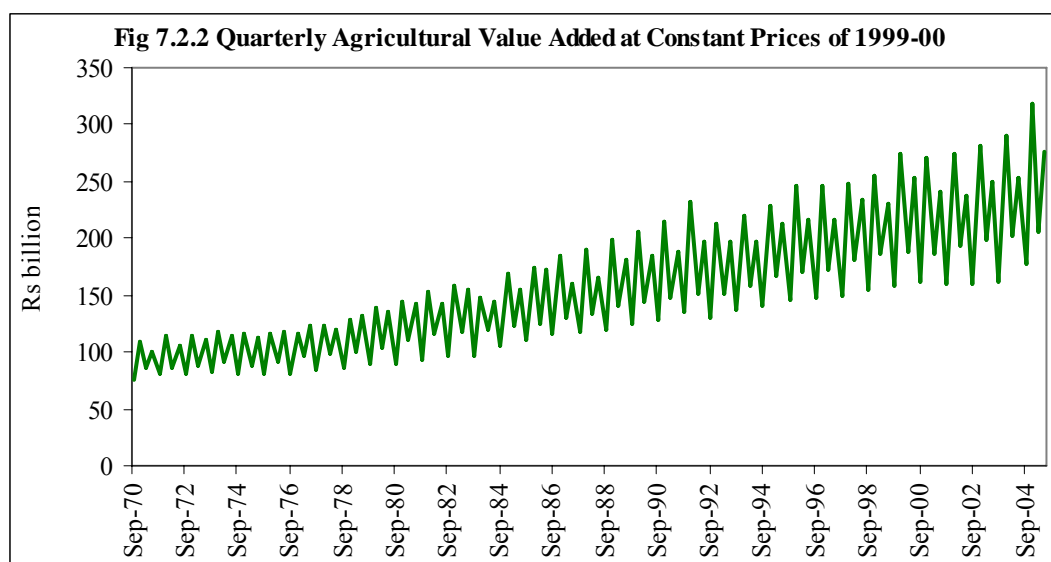
The seasonal pattern of agricultural value added shows that 30.5 percent of the value addition takes place in the second quarter which is the quarter of cotton production in Pakistan, followed by the fourth quarter, the quarter of wheat and gram, wherein 28.2 percent of the total value addition takes place (Table 7.2.2). A time series of quarterly value added in agricultural sector is exhibited in Fig 7.2.2 which shows regular ups and downs along with an upward trend in the series. These seasonal factors are significantly different to those computed by Kemal and Arby (2004) for agriculture value at old base of 1980-81. According to Kemal and Arby study, 33.7 percent of the annual value addition is produced in second quarter (about 3 percentage points higher than the estimates of the current study) followed by fourth quarter with 25.6 percent (about 3 percentage points less than estimates of the current study). This indicates significant changes in relative prices.⁶⁸



⁶⁸ As already given an example of changes in relative prices in chapter 1, note that wheat price to cotton price ratio during 1980-81 (the old base year) was 0.5, while it was 0.9 during 1999-00 (the new base year). A higher relative price of wheat could be a major reason for increase in the share of fourth quarter in agriculture value added.

Table 7.2.2 Real Value Added in Agriculture - Seasonal Factors (%) (1999-00 prices)				
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun
1970-75	20.5	29.3	22.5	27.7
1975-80	19.4	28.9	22.6	29.1
1980-85	18.7	29.9	22.8	28.6
1985-90	19.1	30.9	21.9	28.0
1990-95	18.9	31.3	21.9	28.0
1995-00	18.6	31.2	22.0	28.2
2000-05	18.3	31.9	21.9	28.0
Overall	19.1	30.5	22.2	28.2

As expected, the provincial distribution of agriculture value added shows that the Punjab contributes the highest share to total agriculture, less than its half is contributed by Sindh, less than half of Sindh's share is contributed by NWFP and the lowest contribution is by Balochistan (Table 7.2.3). Vast cultivable land, efficient size of land holdings and better water availability have made the Punjab the most value yielding province. However, looking at the dynamics of agriculture value added, it appears that the share of the Punjab overtime has declined. During early 1970s, the Punjab contributed 63 percent of total value added of agriculture which declined to 58 percent during years 2000s. On the other hand the shares of Sindh and Balochistan have increased. The share of NWFP remained stagnant around 11 percent through the period.



	Punjab	Sindh	NWFP	Balochistan
1970-75	63.0	22.3	11.2	3.5
1975-80	61.8	23.3	10.5	4.4
1980-85	59.8	23.5	11.1	5.6
1985-90	60.6	22.0	11.4	6.0
1990-95	59.9	21.9	11.1	7.1
1995-00	57.8	24.1	10.6	7.5
2000-05	58.3	24.3	11.3	6.1
Overall	60.2	23.1	11.0	5.7

The results of this study are broadly similar to Bengali and Sadaqat (2005) both in terms of provincial contributions to agriculture value added and their dynamics (Table 7.2.4).

	Punjab	Sindh	NWFP	Balochistan
1972-75	58.3	23.4	12.9	5.4
1975-80	60.8	22.8	11.4	5.1
1980-85	59.4	24.7	11.5	4.5
1985-90	57.7	25.8	11.6	4.8
1990-95	58.1	25.6	10.7	5.6
1995-00	56.8	27.0	10.3	5.8
Overall	58.5	25.0	11.3	5.2

The growth in provincial value added in agriculture shows that Balochistan had been the fastest growing province during the period 1970-05 followed by Sindh (Table 7.2.5). The average growth rates both in the Punjab and NWFP had been almost the same – below the national average of 3 percent.

	Punjab	Sindh	NWFP	Balochistan	Pakistan
1970-75	1.9	0.9	-0.5	9.3	1.6
1975-80	2.5	5.6	3.2	6.4	3.4
1980-85	3.4	2.1	4.0	9.6	3.4
1985-90	3.5	2.7	5.9	3.8	3.6
1990-95	2.6	2.8	1.0	7.8	2.7
1995-00	3.1	5.6	2.3	-1.9	3.1
2000-05	2.5	1.9	2.0	3.0	2.3
Overall	2.8	3.2	2.7	5.3	2.9

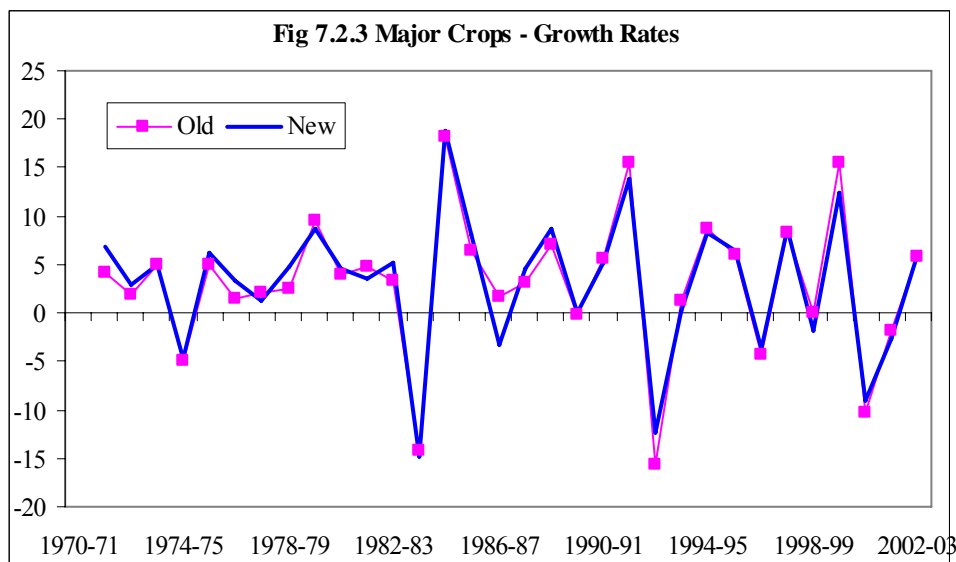
7.2.1 Major crops

A comparison of our estimate and FBS estimates of gross value added of major crops at constant prices of 1999-00 are given in Table 7.2.6. The table shows that there is almost no difference between the two estimates which gives a great deal of confidence

Table 7.2.6 Major Crops: Comparison of Estimates (Rs million) (1999-00 prices)			
	Present study's estimates	FBS estimates	% Difference
1999-00	342,004	342,200	-0.1
2000-01	310,914	308,474	0.8
2001-02	302,923	300,911	0.7
2002-03	321,331	321,038	0.1
2003-04	328,607	327,057	0.5
2004-05	384,443	385,119	-0.2

on estimates of this study for past years at new base of 1999-00.

Compared with the growth rates of old series (at 1980-81 base), the new growth rates have similar trend over the years (Fig 7.2.3).



The seasonal pattern of value added of major crops mainly depends on two key crops of Pakistan, viz., cotton and wheat. More than two third of major crops value added takes place in second (cotton season) and fourth (wheat season) quarters. During 1970s, about 33 percent of the annual value added in major crops was produced in the second quarter which increased to 37.6 percent in years 2000s (Table 7.2.7). On the other hand fourth quarter has maintained its share of above 40 percent in annual value added. The gross value added of the major crops is the lowest in the first quarter (9 percent).

Table 7.2.7 Major Crops: Average Seasonal Factors (1999-00 prices) %				
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun
1970-75	10.1	34.7	15.4	39.8
1975-80	8.8	32.3	16.0	43.0
1980-85	8.4	33.9	15.4	42.3
1985-90	9.9	36.4	13.0	40.7
1990-95	9.5	36.7	13.1	40.7
1995-00	9.1	36.1	13.5	41.3
2000-05	9.1	37.6	12.3	41.0
Overall	9.3	35.4	14.1	41.2

Coming towards the provincial distribution of the gross value added of major crops, it is found that it is highly concentrated in the Punjab with 68 percent of the total value added coming from this province. The province of Sindh produces about 21 percent of the total major crops followed by NWFP (7.8%) and Balochistan (2.7%). Over the years the share of the Punjab and Balochistan have increased while those of Sindh and NWFP have declined (Table 7.2.8).

Table 7.2.8 Major Crops: Average Shares of Provinces (1999-00 prices) %				
	Punjab	Sindh	NWFP	Balochistan
1970-75	66.5	24.0	8.5	1.0
1975-80	66.3	23.8	8.7	1.2
1980-85	63.9	24.3	8.6	3.2
1985-90	68.6	20.2	8.1	3.2
1990-95	69.7	18.8	7.9	3.6
1995-00	68.3	21.1	7.0	3.6
2000-05	74.7	16.8	5.5	3.0
Overall	68.3	21.3	7.8	2.7

In terms of growth rates, Balochistan has showed the highest average growth in major crops during the period of 1970-2005 (Table 7.2.9). As the outcome of crops entirely depend on weather conditions so it is hard to find any systematic movements in the growth rates over time.

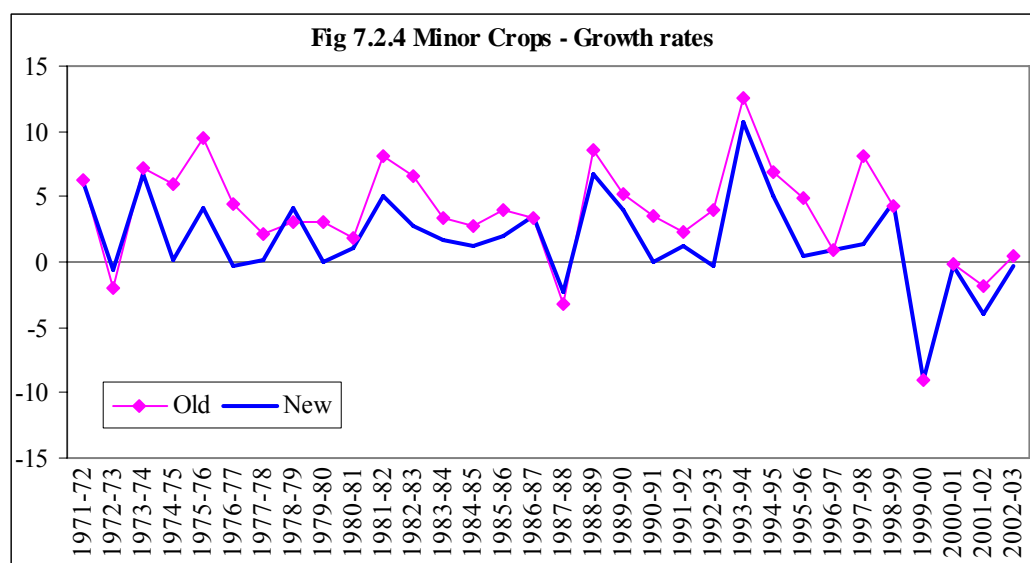
Table 7.2.9 Major Crops: Average Growth Rates (1999-00 prices) %					
	Punjab	Sindh	NWFP	Balochistan	Pakistan
1970-75	3.3	2.5	5.6	10.0	3.2
1975-80	4.4	5.2	3.0	17.6	4.5
1980-85	5.7	0.1	1.7	21.0	4.1
1985-90	3.2	1.8	4.5	7.4	3.0
1990-95	3.3	5.1	0.6	8.2	3.3
1995-00	2.9	-0.3	-4.8	-5.8	1.3
2000-05	6.5	3.0	3.4	5.1	5.7
Overall	4.1	2.5	2.0	9.2	3.5

7.2.2 Minor Crops

A comparison of the gross value added of minor crops as estimated by this study and that by FBS for the period 1999-00 to 2004-05 has been given in Table 7.2.10. Although there is no difference between the two estimates for benchmark year (1999-00), there are differences for other years. These differences, though small, may be due to lower coverage of minor crops in this study due to lack of past data for all minor crops as compared with the coverage by FBS.

	Present study's estimates	FBS estimates	% Difference
1999-00	125,680	125,679	0.00
2000-01	125,274	121,673	2.96
2001-02	120,199	117,217	2.54
2002-03	119,910	119,359	0.46
2003-04	121,863	124,121	-1.82
2004-05	128,137	127,822	0.25

Comparing the new growth rates (at 1999-00 prices) with old ones, Fig 7.2.4 shows that new rates are generally lower than old ones.



The disaggregation of minor crops value added into four quarters reveals that the highest production of minor crops takes place in the first quarter (36%) and the lowest production is in the fourth quarter (19%). These results are sensible as the period when major crops are not grown, minor crops are grown in order to maintain the flow of income for farmers to some extent.

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun
1970-75	38.4	18.1	23.6	20.0
1975-80	36.8	19.5	24.0	19.7
1980-85	35.6	20.4	25.1	18.9
1985-90	36.2	20.4	25.0	18.4
1990-95	36.6	20.4	24.6	18.3
1995-00	35.9	20.8	24.6	18.8
2000-05	35.9	20.4	24.4	19.3
Overall	36.1	20.4	24.7	18.8

According to the disaggregation of value added into provinces, the Punjab has the major share in minor crops (55 percent) followed by Sindh (24.3 percent), Balochistan (12%) and NWFP (8.7%). As shown in Table 7.2.12, the share of both Sindh and the Punjab have declined overtime while that of Balochistan showed more than 100 percent increase in the period of 35 years (1970-2005).

	Punjab	Sindh	NWFP	Balochistan
1970-75	60.3	28.7	5.9	5.1
1975-80	55.5	29.8	8.3	6.4
1980-85	55.8	27.9	8.5	7.8
1985-90	56.1	25.2	9.2	9.5
1990-95	55.2	20.7	8.7	15.5
1995-00	53.1	20.7	7.8	18.4
2000-05	55.0	23.4	9.3	12.4
Overall	55.0	24.3	8.7	12.0

As in the case of major crops, Balochistan has showed highest growth rates also in minor crops (5%). Sindh and the Punjab have witnessed an average growth of less than 2 percent in gross value added of minor crops. Although average growth rate in Balochistan is high, there are wide variations in the growth rates (Table 7.2.13).

	Punjab	Sindh	NWFP	Balochistan	Pakistan
1970-75	2.6	0.9	11.5	23.6	3.1
1975-80	-0.5	4.0	6.8	4.4	1.6
1980-85	3.5	-0.7	0.9	8.3	2.4
1985-90	2.5	1.6	5.5	6.4	2.8
1990-95	2.4	-2.5	1.7	18.2	3.4
1995-00	0.3	5.1	0.9	-7.8	-0.4
2000-05	0.5	-0.2	0.4	2.0	0.4
Overall	1.7	0.9	1.9	5.0	1.7

7.2.3 Livestock

There are significant differences in the livestock value added as estimated by this study and that by FBS. The main difference lies in different population of animals used in the two estimates. The estimation technique of livestock population as adopted in this study along with problems with population used by FBS (estimates of MinFAL) is given in Annexure B. The Table 7.2.14 outlines difference in different heads of the two estimates for benchmark year (1999-00). The overall difference in gross value added is 11.9 percent.

	Present studies estimate	FBS estimate	Difference	
			absolute	%age
Natural Growth	19863	39569	-19706	-49.8
Net Sales	73667	128757	-55090	-42.8
Milk	292348	278178	14170	5.094
Draught Power	15963	18590	-2627	-14.1
Dung & Urine	28145	27698	447	1.615
Wool & Hair	1509	1501	8	0.566
Poultry	42932	42933	-1	-0
Gross Value	474428	537226	-62798	-11.7
Inputs	107019	120106	-13087	-10.9
Value Added	367409	417120	-49711	-11.9

Some specific reasons for these differences are given below.

Natural Growth:

Gross value of Natural growth has been calculated by applying base year prices of young animals (Reference: FBS 2004, Annexure 20) on population of animals of age less than 1 year. In census data, population with age of less than one year is available only for sheep and goats; for other animals, less than 3 years population is reported. This study has worked out less than one year population as one third of the less than 3 years population which does not seem implausible. However, FBS (2004) estimates this population (for the year 1999-00) as below:

Cattle:

Actual number of young bulls < 3 years of age = 3844

FBS estimate of young bulls < 1 year of age = 3005(78%)

Actual number of young cows < 3 years of age = 3410
FBS estimates of young cows < 1 years of age = 2544 (85%)

Buffaloes:

Actual number of young bulls < 3 years of age = 3674
FBS estimates of young bulls < 1 year of age = 3131 (85%)

Actual number of young buff < 3 years = 4936
FBS estimates of young buff < 1 years = 3613 (73%)

These ratios are unbelievable (almost 2/3 of total population of less than 3 years); these are also not consistent with FBS's own study on Livestock, p 14 & 21 (FBS, 2002e).

There also seems another error in FBS estimates; Annexure 20 of Rebasing Book (FBS, 2004) reports number of sheep and goats below 1 year age as 12,468 and 27,601 respectively which are significantly higher than those given in its own table of Annexure 18 of the same book.

→ Thus due to overestimation of population less than 1 year by FBS, its estimates are higher than our estimates.

Net Sales

Sales of animals can be for two purposes, i.e. for slaughtering and for activities within livestock sector (e.g. draught power, breeding, milk, transport, etc). In "Net sales", sale for slaughtering is included. We have worked out number of animals slaughtered in a year as below;

$$S_t = Y_{t-1} + X_t - Y_t$$

Where S_t is animal slaughtered in year t , Y_{t-1} is number of animals during previous year, X_t is number of animals born during year t (animals of age less than 1 year), and Y_t is total number of animals during year t .

With this logical formula, our number of animal slaughtered for the year 1999-00 comes out to be 24843 while FBS uses a number of 43950 (Annexure 19 of Rebasing Book) which is very high. This number is not consistent with FBS own publication on Slaughtering, page 12 (FBS, 2002f). We have also cross-checked Provincial Development Statistics and found our estimates closer to them.

→ Due to gross overestimation by FBS of number of slaughtered animals, its estimates of Net Sales are very high as compared with this study

Milk

→ The estimates of this study are higher than FBS estimates because its estimated population of milk animals is higher (as indicated in Annexure B).

Draught Power

→ On the other hand, this study estimates number of animals used for draught power less than that by FBS (as indicated in Annexure B).

Dung & Urine

→ Dung & urine is also estimated according to the methodology given in the Rebasing book. However, our estimates are slightly higher, possibly due to higher population of adult animals.

Wool & Hair

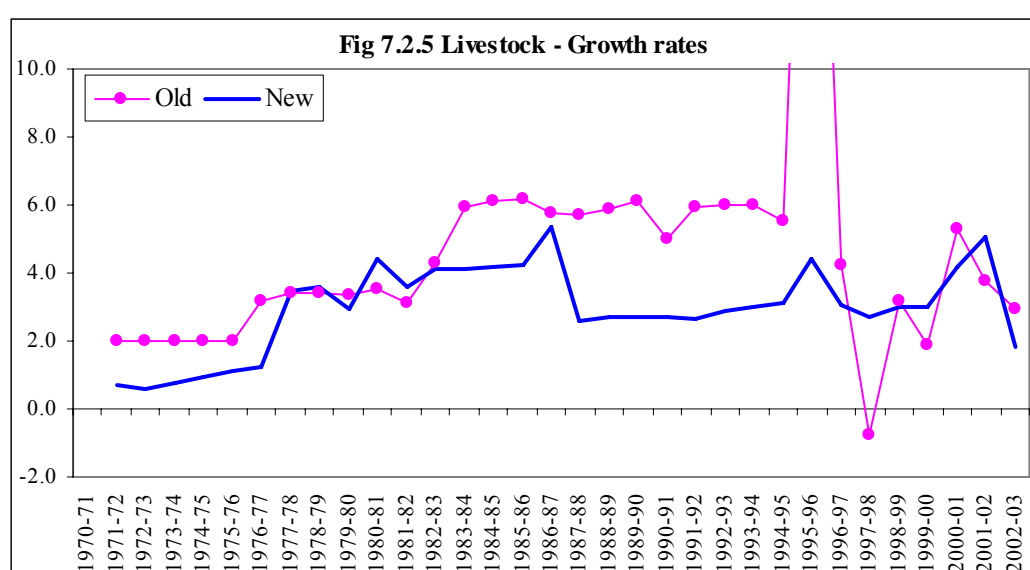
→ The methodology is the same as given by Rebasing book; thus estimates are also similar.

Poultry

→ Value of Eggs and chickens and ducks at 1999-00 prices are worked out on the basis of splicing; the two estimates are almost the same.

The livestock value added estimated by this study is also different from old estimates of FBS at base 1980-81; the reason being the same, i.e. different estimates of animal population. These differences are reflected in growth rates of value added given in Fig

7.2.5. In the old series, the growth rate in 1995-96 was very high (26.4 percent) which was only due to the fact FBS did not adjust its previous estimates in the light of new census of livestock population conducted in 1996. More specifically, prior to 1996, FBS had been extrapolating livestock population on the basis of inter-census growth rate of 1986 over 1976 (the two census years). When the numbers of new census of 1996 were available, it simply adopted it from year 1996 onward which caused a sudden jump in its estimates of value added. There is no reason to believe that livestock population suddenly increased by more than 26 percent in a single year. Thus the present study takes into account these changes which resulted in plausible growth rate of livestock value added for this year.



The variations in livestock value added within a year mainly depend on the seasonal pattern of milk production which is a dominant item in this sector. Thus the highest production of livestock sector is in second and third quarters with shares of 31% and 28% respectively as the milk production increase in winter season (Table 7.2.15). Livestock production in each of the first and last quarters is 21 percent.

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun
1970-75	21.2	30.0	27.5	21.2
1975-80	21.0	30.3	27.6	21.0
1980-85	20.8	30.7	27.8	20.8
1985-90	20.7	30.8	27.9	20.7
1990-95	20.5	31.0	28.0	20.5
1995-00	20.5	31.1	28.0	20.5
2000-05	20.3	31.3	28.1	20.3
Overall	20.6	30.9	27.9	20.6

According to provincial distribution of livestock value added, the share of the Punjab comes out the highest (55 percent) followed by Sindh (24 percent), NWFP (13.5 percent) and Balochistan (7%). Over the years, the shares of the Punjab and NWFP have declined while the shares of Sindh and Balochistan have increased.

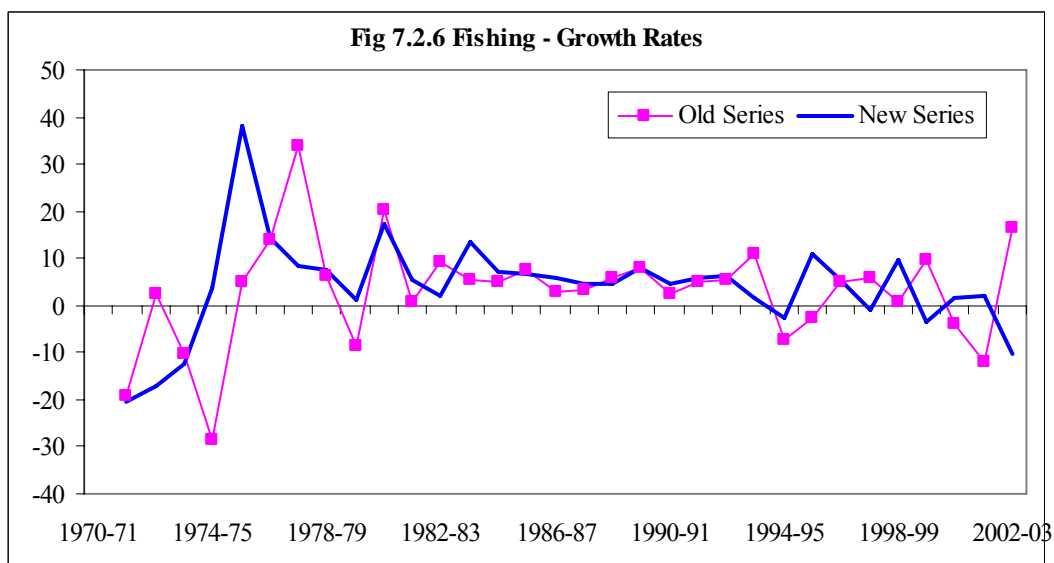
	Punjab	Sindh	NWFP	Balochistan
1970-75	63.5	17.1	14.4	5.0
1975-80	62.6	19.2	12.0	6.2
1980-85	60.2	20.2	12.7	6.9
1985-90	57.5	21.8	13.4	7.3
1990-95	54.7	24.4	13.8	7.1
1995-00	51.7	27.1	14.3	6.9
2000-05	48.5	30.3	14.2	7.0
Overall	55.3	24.2	13.5	7.0

7.2.4 Fishing

There are wide differences in gross value added of fishing as estimated by FBS and those by this study. FBS figures are overestimated for benchmark year of 1999-00 and underestimated for other years. FBS uses figures of both inland and marine fish higher than actual for 1999-00 as reported in Agricultural Statistics of Pakistan. The figures they used actually correspond to 1998-99 as per Agricultural Statistics of Pakistan; this is why the present study estimates of 1998-99 exactly match FBS estimate for 1999-00. However, even if FBS estimates are compared with this study estimates with one year lag, there are wide differences for years 2001-02 and 2002-03 (Table 7.2.17).

	Present study's estimates	FBS estimates	% Difference	% Difference with one year lag
1998-99	15164			
1999-00	14608	15163	-3.7	0.01
2000-01	14861	14715	1.0	-0.72
2001-02	15170	12901	17.6	15.19
2002-03	13611	13346	2.0	13.66
2003-04	13916	13,611	2.2	0.00
2004-05	14185	13,916	1.9	0.00

When compared with the old base series of fishing, the new growth rates do not exactly follow their trend (Fig 7.2.6); however, looking at decade wise averages, it appears the average growth rates have similar movements across the decades, i.e., low in 1970s, high in 1980s, low in 1990s, and further low in 2000s.



The seasonality as determined in this study shows that fishing value added is lowest in the first quarter (15%); it is possibly due to the fact that fishing activities slow down during this period because summer is the season of reproduction of fish. In winter (second and third quarters) the fishing value added is the highest (Table 7.2.18).

Table 7.2.18 Fishing: Seasonal Factors (1999-00 prices)

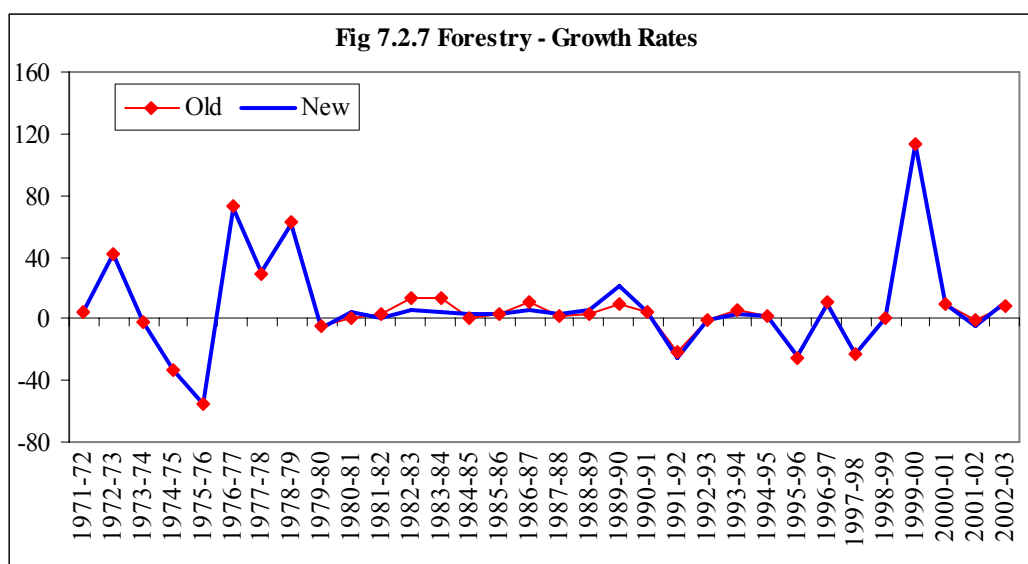
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun
1970-75	17.1	29.6	27.5	25.9
1975-80	15.7	29.0	29.2	26.0
1980-85	15.1	28.8	30.1	26.1
1985-90	14.5	28.6	30.7	26.1
1990-95	14.5	28.6	30.9	26.1
1995-00	13.9	28.4	31.6	26.2
2000-05	13.8	28.3	31.7	26.2
Overall	14.9	28.7	30.2	26.1

As regards the provincial origin of fishing value added, it is mostly coming from Sindh which have two third of the total value added in the country. The Punjab generates about one fourth of the total value added consisting entirely of land fishing. Balochistan has a share of 10.8 percent while NWFP has about 1 percent share in total value added of fishing (Table 7.2.19).

	Punjab	Sindh	NWFP	Balochistan
1970-75	7.5	80.0	0.5	12.0
1975-80	15.0	68.9	2.6	13.5
1980-85	20.2	66.9	0.7	12.3
1985-90	26.6	62.3	0.6	10.4
1990-95	29.8	59.1	1.3	9.9
1995-00	26.0	64.6	0.4	8.9
2000-05	25.8	64.4	0.8	9.0
Overall	21.6	66.6	1.0	10.8

7.2.5 Forestry

By construction our estimates of gross value added of forestry exactly match the FBS estimates. Moreover, the new growth rates also follow the path of old ones in general (Fig 7.2.7).



The quarterly estimates of forestry value added have been made according to the seasonal factors suggested by Quaidian Economic Consultants (2002) as already mentioned in the section 5.1.4.

Regarding provincialisation, the results show that the Punjab has the highest share in forestry (45.8 percent) followed by NWFP (42.4 percent), Sindh (10.7 percent) and Balochistan 1% (Table 7.2.20).

	Punjab	Sindh	NWFP	Balochistan
1970-75	44.7	14.5	39.8	1.0
1975-80	47.0	13.9	38.0	1.1
1980-85	41.4	13.2	44.4	1.0
1985-90	45.1	10.2	43.7	1.1
1990-95	49.4	11.1	38.5	1.0
1995-00	54.6	7.3	36.3	1.8
2000-05	38.4	4.9	56.1	0.6
Overall	45.8	10.7	42.4	1.1

7.3 Industry

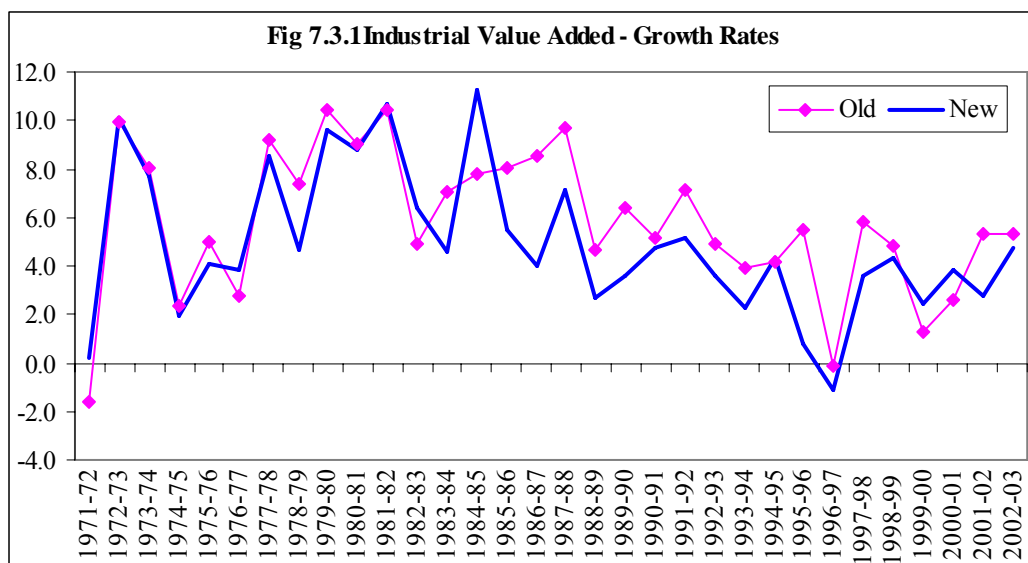
Gross value added of industry as estimated by this study is higher than FBS estimates for years 1999-00 onwards (Table 7.3.1). As against agriculture, FBS estimates of industrial value added are underestimated due solely to slaughtering. Since slaughtering, a small-scale industry, uses inputs from livestock which was highly overestimated by FBS, its value added was suppressed due to high input cost. If slaughtering is excluded from industry, then both the estimates are fairly close.

	Present study's estimates	FBS estimates	% Difference
1999-00	850,213	830,865	2.3
2000-01	882,635	865,196	2.0
2001-02	907,269	888,539	2.1
2002-03	950,478	926,183	2.6
2003-04	1,090,392	1,076,808	1.3
2004-05	1,206,103	1,199,664	0.5

While comparing the growth rate of industrial value at new base with those at old base of 1980-81, it is found that both the series move in a similar fashion, though some differences are visible (Table 7.3.2 and Fig 7.3.1). For example, for the period after mid 1980s, the new growth rates remained generally below the old growth rates. The main reason for lower growth exhibited by industry is lower growth in large-scale manufacturing.

	Old Base (1980-81)	New Base (1999-00)
1970-75	4.7	5.0
1975-80	7.0	6.1
1980-85	7.8	8.3
1985-90	7.5	4.6
1990-95	5.1	4.0
1995-00	3.5	2.0
2000-05*	4.4	7.3
Overall	5.8	5.4

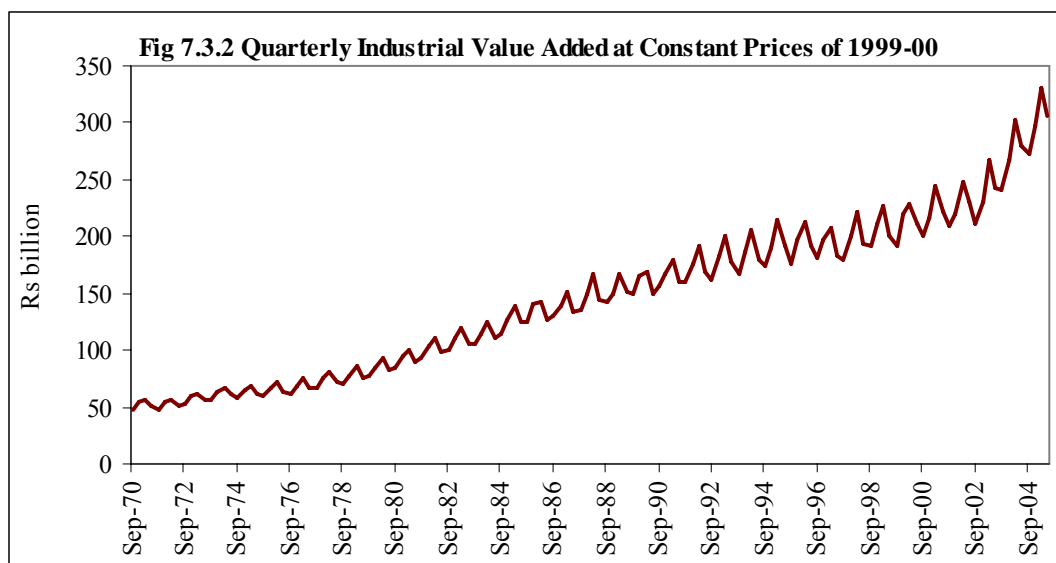
* Growth of old base data is for 2000-03



It is interesting to find that in comparison to agriculture, the industrial value added show lesser seasonal variations in a year: the first quarter of the year produces 22.9 percent of the gross value added of industry which is the lowest; the highest value added is produced in third quarter (27.4 percent) when textile industry is in full operation along with sugar industry (Table 7.3.3). The gap between lowest and highest seasonal factors of industry is thus 4 percentage points compared with 11 percentage points in case of agriculture.

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun
1970-75	23.0	25.7	27.0	24.3
1975-80	22.9	25.3	27.5	24.4
1980-85	23.0	25.3	27.4	24.3
1985-90	23.3	25.4	27.2	24.1
1990-95	22.9	25.1	27.6	24.4
1995-00	22.9	25.5	27.3	24.4
2000-05	22.5	24.4	27.7	25.4
Overall	22.9	25.3	27.4	24.5

The second and fourth quarters each produces about one fourth of the annual value added of the sector. A time series of quarterly value added in industry is exhibited in Fig 7.3.2 which shows that amplitude of seasonal factors has been changing slightly over the years.



Bengaliwala (1995) also found similar seasonal factors for industrial value added, however, with the gap between lowest and highest seasonal factor being slightly greater than this study.

	Punjab	Sindh	NWFP	Balochistan
1970-75	49.5	37.1	9.0	4.4
1975-80	50.0	35.8	8.7	5.5
1980-85	47.2	37.5	9.5	5.9
1985-90	47.4	37.2	9.7	5.7
1990-95	48.6	34.7	10.1	6.7
1995-00	49.3	34.2	10.8	5.7
2000-05	49.1	34.8	10.7	5.4
Overall	48.7	35.9	9.8	5.6

The provincial distribution of industrial value added shows that the Punjab contributes the most to industries (48.7 percent) followed by Sindh (35.9 percent). The contribution of other two provinces to national value added of industry is very low (Table 7.3.4). It is found that over the years there is no significant change in the distribution of industrial value added in provinces. Bengali and Sadaqat (2005) also came up with similar results (Table 7.3.5).

	Punjab	Sindh	NWFP	Balochistan
1972-75	50.2	37.7	9.4	2.8
1975-80	49.5	37.9	9.5	3.1
1980-85	46.0	40.9	9.9	3.2
1985-90	47.3	38.6	10.8	3.3
1990-95	50.3	36.3	9.6	3.8
1995-00	50.4	35.0	11.5	3.0
Overall	48.9	37.7	10.2	3.2

In terms of growth rates, it is found that average growth in all the provinces is almost the same (Table 7.3.6). It is interesting to note that all the provinces showed higher average growth in industrial value added compared with overall GDP growth (which has already been reported in Table 7.1.10).

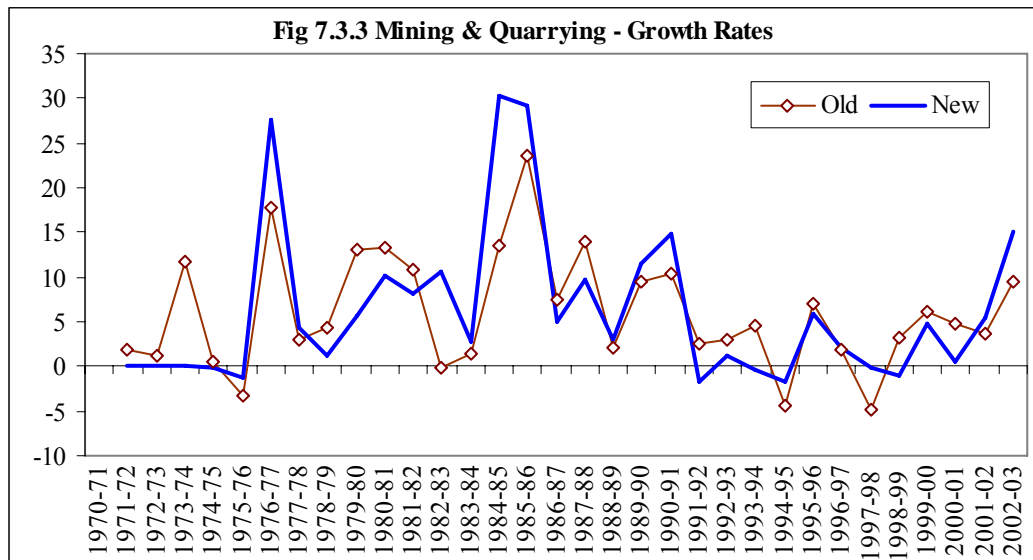
	Punjab	Sindh	NWFP	Balochistan	Pakistan
1970-75	5.02	4.83	3.85	8.94	5.01
1975-80	6.25	5.44	6.06	10.10	6.13
1980-85	6.95	9.81	10.07	8.36	8.34
1985-90	5.00	3.81	5.37	5.12	4.59
1990-95	4.42	2.68	5.20	6.89	4.02
1995-00	2.53	1.65	2.87	-1.22	2.01
2000-05	6.96	8.54	6.84	4.27	7.34
Overall	5.31	5.26	5.81	5.98	5.36

7.3.1 Mining & quarrying

The values of gross value added of mining and quarrying as estimated in this study are almost the same as estimated by FBS (Table 7.3.7). Slight differences in some of the years are either just statistical discrepancy or result of a little difference in the coverage as past data of some of the minerals is not available like chalk, bentonite, dolomite, red oxide, granite, etc. However, the share of such mineral items is very small.

	Present study's estimates	FBS estimates	% Difference
1999-00	48315	48377	-0.1
2000-01	48604	47561	2.2
2001-02	51249	51031	0.4
2002-03	58969	59266	-0.5
2003-04	61477	61509	-0.1
2004-05	64917	64609	0.5

Comparing new based series with the old one, the study finds that the old growth rates and new growth rates follow the same pattern over the years (Fig 7.3.3), however, there differences in absolute numbers.



The study finds that the mining activities are lowest in the first quarter (July-September), with 23.6 percent of the annual value added. In fourth quarter, the value added is the highest with an average share of 25.8 percent (Table 7.3.8).

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun
1970-75	24.4	24.0	25.5	26.0
1975-80	22.9	25.0	26.2	25.9
1980-85	22.4	25.2	26.2	26.2
1985-90	23.7	24.7	25.8	25.8
1990-95	23.7	25.3	25.9	25.1
1995-00	24.0	25.4	25.7	24.9
2000-05	24.4	25.2	24.2	26.3
Overall	23.6	25.0	25.6	25.8

In total gross value added of mining and quarrying, the share of Sindh increased considerably over time: During early 1970s, the share of Sindh was below 20 percent while the Punjab and Balochistan each contributed about 40 percent. However, currently the Sindh's share has increased to more than 50 percent and the shares of the Punjab and Balochistan declined (Table 7.3.9).

	Punjab	Sindh	N.W.F.P.	Balochistan
1970-75	40.9	18.2	0.6	40.2
1975-80	45.1	14.9	1.5	38.5
1980-85	35.6	24.7	1.6	38.2
1985-90	36.9	37.7	2.7	22.7
1990-95	30.9	45.8	3.2	20.1
1995-00	28.0	48.9	4.2	18.9
2000-05	25.0	52.1	5.3	17.6
Overall	34.6	34.6	2.7	28.0

NWFP has shown an impressive growth rate in the gross value added of mining and quarrying though its share is still very low. The growth in Sindh is also high (11 percent) which helped it to increase its share in total value added. The lowest growth has been in Balochistan (Table 7.3.10).

	Punjab	Sindh	N.W.F.P.	Balochistan	Pakistan
1970-75	-1.1	2.7	2.9	3.6	1.3
1975-80	14.5	-3.1	47.6	7.2	7.5
1980-85	7.5	42.3	18.0	4.8	12.4
1985-90	12.9	16.3	25.9	3.6	11.7
1990-95	-1.3	6.2	5.0	1.1	2.4
1995-00	2.1	1.9	9.1	2.8	2.3
2000-05	1.2	11.1	26.5	-1.7	6.2
Overall	5.3	11.3	19.8	3.1	6.4

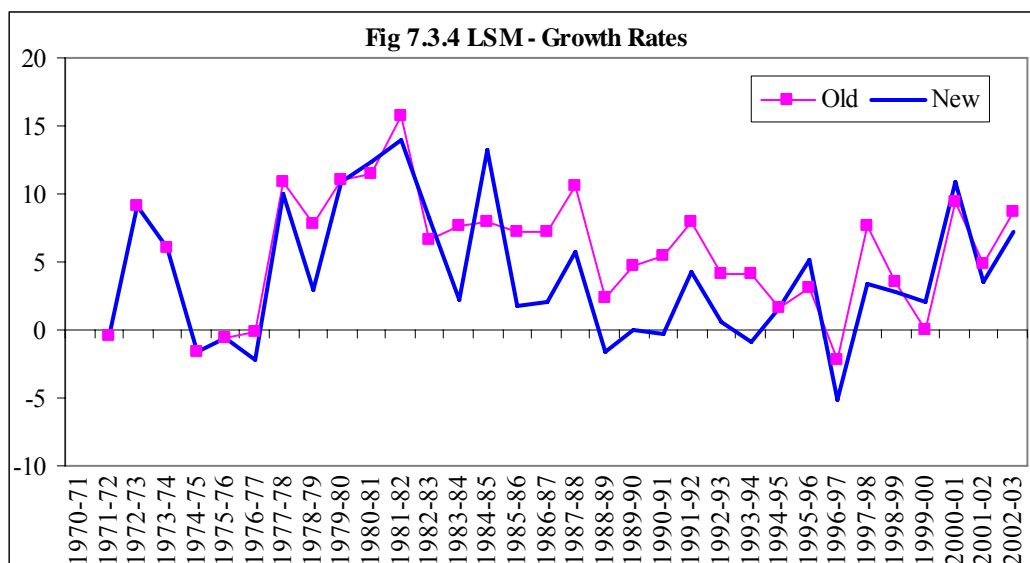
7.3.2 Manufacturing

i) Large-scale manufacturing

The estimates of gross value added of large-scale manufacturing as estimated by this study are the same for the period 1999-00 onward as those estimated by FBS because this study also uses the same information set as used by FBS (as already explained in

section 4.2.2). However, comparing the growth rates of new series of large-scale manufacturing value added with the old one it comes out that new growth rates are lower than old growth rates throughout the period (Table 7.3.11). However, the pattern of movement across decades is the same, i.e. low-high-low-high during the decades of 1970s-1980s-1990s-2000s (Fig 7.3.4).

	Old Base (1980-81)	New Base (1999-00)
1970-75	3.3	3.3
1975-80	5.8	4.2
1980-85	9.9	10.0
1985-90	6.4	1.6
1990-95	4.7	1.1
1995-00	2.4	1.6
2000-03	7.7	7.2
Overall	5.7	4.0



Our results show that manufacturing activities are the highest in the third quarter (about 27%) followed by the second quarter (Table 7.3.12). As we have applied the same seasonal factors on small-scale manufacturing, so this also shows seasonality of SSM.

Table 7.3.12 LSM: Seasonal Factors (1999-00 prices) %

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun
1970-75	23.0	26.4	27.0	23.7
1975-80	23.0	26.3	27.0	23.7
1980-85	22.9	26.3	27.0	23.8
1985-90	23.5	26.3	26.9	23.3
1990-95	23.0	25.7	27.1	24.2
1995-00	22.7	25.8	27.1	24.4
2000-05	22.4	24.2	27.9	25.6
Overall	22.9	25.8	27.1	24.1

As shown in Table 7.3.13, the province of Sindh has the highest share in large-scale manufacturing value added (47 percent), followed by the Punjab (43 percent), NWFP (9 percent) and Balochistan (a meager 1%). In terms of growth rates, Balochistan has shown the highest growth (16.6 percent) during the period of 1970-2005 (Table 7.3.14), however, as the volume of large-scale manufacturing is very low in this province, such a high growth has no significance. The average growth in other three provinces was about 5 percent.

Table 7.3.13 LSM: Provincial shares (1999-00 prices) %				
	Punjab	Sindh	NWFP	Balochistan
1970-75	43.8	47.7	8.2	0.3
1975-80	43.8	47.7	8.2	0.3
1980-85	40.7	48.7	9.6	1.0
1985-90	40.7	48.7	9.6	1.0
1990-95	43.2	45.3	9.5	2.1
1995-00	43.2	45.3	9.5	2.1
2000-05	43.2	45.3	9.5	2.1
Overall	42.7	46.9	9.1	1.3

Table 7.3.14 LSM: Provincial Growth Rates (1999-00 prices) %					
	Punjab	Sindh	NWFP	Balochistan	Pakistan
1970-75	3.3	3.3	3.3	3.3	3.3
1975-80	4.2	4.2	4.2	4.2	4.2
1980-85	8.4	10.5	13.9	67.6	10.0
1985-90	1.6	1.6	1.6	1.6	1.6
1990-95	2.3	-0.3	0.9	24.1	1.1
1995-00	1.6	1.6	1.6	1.6	1.6
2000-05	11.1	11.1	11.1	11.1	11.1
Overall	4.7	4.6	5.3	16.6	4.7

ii) Small-scale manufacturing

Since the present study adopts the same fixed growth rates as by FBS, there is no difference between the two estimates.

In case of small scale manufacturing, the Punjab has the highest share (68 percent), followed by Sindh (25 percent), NWFP (6 percent) and Balochistan (less than 1%) (Table 7.3.15). Over the years, the share of the Punjab increased while that of Sindh declined.

Table 7.3.15 SSM: Provincial shares (%)					
	Punjab	Sindh	NWFP	Balochistan	
1970-75	66.0	28.6	4.4	0.9	
1975-80	66.0	28.6	4.4	0.9	
1980-85	66.0	28.6	4.4	0.9	
1985-90	68.7	24.9	5.4	1.1	
1990-95	70.4	22.3	6.1	1.2	
1995-00	70.5	19.6	9.1	0.8	
2000-05	70.6	18.9	9.8	0.7	
Overall	68.3	24.5	6.2	0.9	

iii) Slaughtering

In case of gross value added of slaughtering, there are huge differences between the two estimates. As Table 7.3.16 shows the output value in the benchmark year is

almost the same in the two sets of estimates; the difference actually lies in inputs. One of the major inputs of slaughtering is “Net Sales” which is output of Livestock sector; as explained in detail in section 4.1.3 (Livestock section), FBS has overestimated Net sales. This overestimation has led to their estimate of slaughtering underestimated. It is interesting to note that if we combine the gross value added of livestock and slaughtering then the difference between FBS and our estimates almost vanishes.

	Present study's estimates				FBS estimates			
	Output	Input	GVA	Growth	Output	Input	GVA	Growth
1999-00	200319	96409	103910		203830	152003	51827	
2000-01	206635	98598	108037	3.97			53360	2.96
2001-02	212576	100598	111979	3.65			54985	3.05
2002-03	218705	102541	116164	3.74			56602	2.94
2002-04	224321	103546	120775	3.97			57966	2.41
2002-05	225295	103905	121390	0.51			59363	2.41

As it has already been mentioned in section 5.2.2, we have used seasonal factors as suggested in FBS study on slaughtering for all the years. Thus the seasonal factors of slaughtering are 0.18, 0.25, 0.35 and 0.22 for first, second, third and fourth quarters respectively.

Regarding provincial distribution of gross value added of slaughtering, it is found that the Punjab is the major share holder (45 percent) followed by Sindh (20 percent), Balochistan (18 percent) and NWFP (16%). However, the share of the Punjab has declined over time while that of Sindh and NWFP has increased (Table 7.3.17).

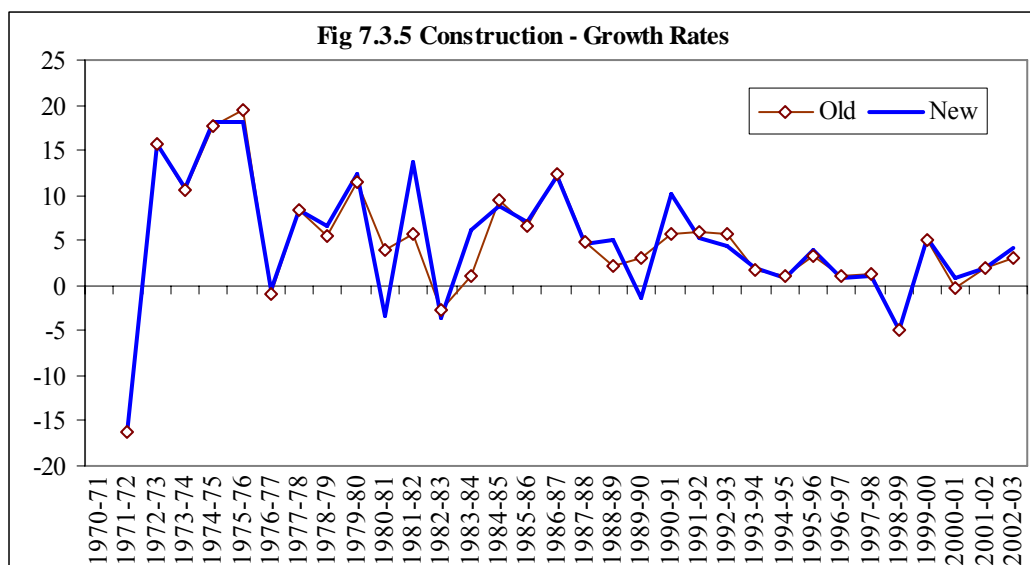
	Punjab	Sindh	NWFP	Balochistan
1970-75	52.6	15.0	17.3	15.0
1975-80	50.3	18.3	13.2	18.2
1980-85	46.2	18.8	14.1	20.9
1985-90	43.8	19.8	15.3	21.1
1990-95	41.6	21.4	16.7	20.3
1995-00	41.1	23.3	18.8	16.9
2000-05	39.3	25.1	19.5	16.1
Overall	45.0	20.3	16.4	18.4

7.3.3 Construction

The estimates of gross value added of construction by FBS and this study are almost the same for the period 1999-00 onward, which gives confidence to the series estimated by this study for years prior to 1999-00 (Table 7.3.18).

Table 7.3.18 Construction: Comparison of Estimates - Rs million (1999-00 prices)			
	Present study's estimates	FBS estimates	% difference
1999-00	87390	87386	0.0
2000-01	88031	87846	0.2
2001-02	89823	89241	0.7
2002-03	93473	92789	0.7
2003-04	82644	82818	-0.2
2004-05	98983	98190	0.8

There is also a similar pattern in the movements of growth rates of our new base series and the old series (Fig 7.3.5)



Within a given year, construction activities increase in summer season and decline in winter season. The highest value addition in this sector takes place during the first quarter (26.4 percent) followed by third and fourth quarters (above 25 percent). The second quarter which is winter season witness lower construction activities with share in annual value added of 2.3 percent (Table 7.3.19).

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun
1970-75	26.5	24.7	23.6	25.3
1975-80	26.6	21.4	25.9	26.1
1980-85	27.7	21.3	25.5	25.6
1985-90	26.6	22.2	25.3	25.9
1990-95	26.0	22.7	26.2	25.1
1995-00	26.0	26.2	25.7	22.2
2000-05	25.6	24.7	25.0	24.8
Overall	26.4	23.3	25.3	25.0

The provincial distribution of construction value added reveals that the share of the Punjab in construction value added is the highest (55 percent) followed by Sindh (24 percent), NWFP (12 percent) and Balochistan (8.5 percent). The shares of the Punjab and NWFP have declined over time and that of Sindh has increased significantly (Table 7.3.20).

	Punjab	Sindh	NWFP	Balochistan
1970-75	57.1	20.4	14.0	8.5
1975-80	55.8	22.1	13.6	8.6
1980-85	55.7	22.7	13.1	8.5
1985-90	55.2	24.5	12.4	7.9
1990-95	54.1	26.0	11.6	8.4
1995-00	53.9	26.5	11.1	8.5
2000-05	53.5	26.9	10.6	9.0
Overall	55.0	24.2	12.3	8.5

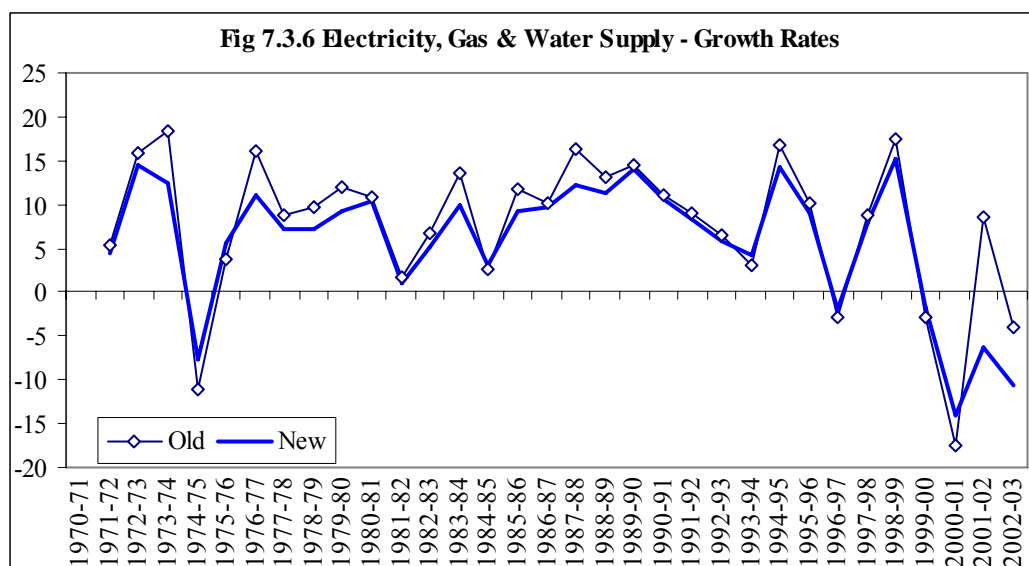
All the provinces have witnessed slow down in the growth rates of construction value added (Table 7.3.21) with the lowest growth rates in later part of 1990s. There was, however, some revival of growth in construction during 2000-05. The overall average growth rate was highest in Sindh (5.9 percent) followed by Balochistan (5 percent), the Punjab (4.7 percent) and NWFP (4 percent).

	Punjab	Sindh	NWFP	Balochistan	Pakistan
1970-75	6.3	10.3	6.6	6.0	7.1
1975-80	8.7	10.1	8.1	10.0	9.0
1980-85	4.5	4.9	3.4	3.0	4.3
1985-90	4.8	7.7	4.2	5.6	5.4
1990-95	4.3	5.3	3.1	5.5	4.5
1995-00	1.5	1.0	0.6	1.2	1.2
2000-05	2.8	3.3	2.6	4.1	3.0
Overall	4.7	5.9	4.0	5.0	4.9

7.3.4 Electricity, gas & water supply

Gross value added of electricity, gas and water supply for years 1999-00 (benchmark) as estimated by this study and FBS are almost the same; however, there are some differences in other years (Table 7.3.22). The difference may be due to the fact that the present study either uses old growth rates and apply them on the benchmark value or uses some proxies; however, the extent of differences is not very large so past series as estimated by this study can safely be used. The new series very closely follows the path of the old series (Fig 7.3.6).

	Present study's estimates	FBS estimates	% difference
1999-00	139627	139,626	0.00
2000-01	119966	120,465	-0.41
2001-02	112362	112,026	0.30
2002-03	100429	98,932	1.51
2003-04	156024	155,078	0.61
2004-05	161366	160,487	0.55



The seasonal patten of gross value added of this sector shows that it is the highest in the last quarter (Apr-Jun) with a share of more than 28 percent. In the third quarter, lowest 23.3 percent of the annual value added of this sector is generated.

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun
1970-75	23.1	24.4	23.2	29.3
1975-80	23.4	24.4	23.2	29.0
1980-85	23.8	24.5	23.3	28.4
1985-90	24.3	24.5	23.2	28.0
1990-95	24.6	24.5	23.4	27.6
1995-00	24.7	24.5	23.3	27.4
2000-05	24.5	24.6	23.3	27.5
Overall	24.1	24.5	23.3	28.2

In gross value added of electricity, gas and water supply, the Punjab has the highest share (59 percent) followed by Sindh (29 percent), NWFP (9 percent) and Balochistan (3 percent). Over time the shares of both the Punjab and Sindh have declined (Table 7.3.24) while those of NWFP and Balochistan have increased.

	Punjab	Sindh	NWFP	Balochistan
1970-75	61.8	29.0	7.6	1.5
1975-80	60.4	30.7	6.8	2.2
1980-85	60.1	30.0	7.1	2.7
1985-90	59.1	28.7	9.0	3.2
1990-95	57.6	29.0	9.9	3.5
1995-00	57.1	27.7	11.5	3.7
2000-05	58.6	25.8	10.4	5.2
Overall	59.2	28.7	8.9	3.1

The growth rates of gross value added of electricity, gas and water supply has declined over time in Sindh and NWFP (Table 7.3.25). The province of Balochistan, though have the lowest share in the sector has shown the highest growth rate followed by NWFP. The Punjab, on the other hand showed the lowest growth.

	Punjab	Sindh	NWFP	Balochistan	Pakistan
1970-75	4.8	8.2	8.2	7.0	5.9
1975-80	8.0	8.2	6.7	16.5	8.1
1980-85	5.6	5.3	9.2	11.5	5.9
1985-90	10.8	10.9	16.2	13.9	11.3
1990-95	8.2	8.7	11.4	9.4	8.7
1995-00	5.8	4.7	6.6	8.0	5.7
2000-05	5.9	4.6	4.5	11.1	5.5
Overall	7.1	7.2	9.0	11.2	7.3

7.4 Services

The gross value added of services sector at 1999-00 prices estimated by this study for the year 1999-00 onward is fairly close to that estimated by FBS (Table 7.4.1) which gives

	Present study's estimates	FBS estimates	% difference
1999-00	1,793,612	1,807,546	-0.8
2000-01	1,858,372	1,863,396	-0.3
2001-02	1,948,168	1,952,146	-0.2
2002-03	2,051,554	2,052,901	-0.1
2003-04	2,179,528	2,173,947	0.3
2004-05	2,369,756	2,347,552	0.9

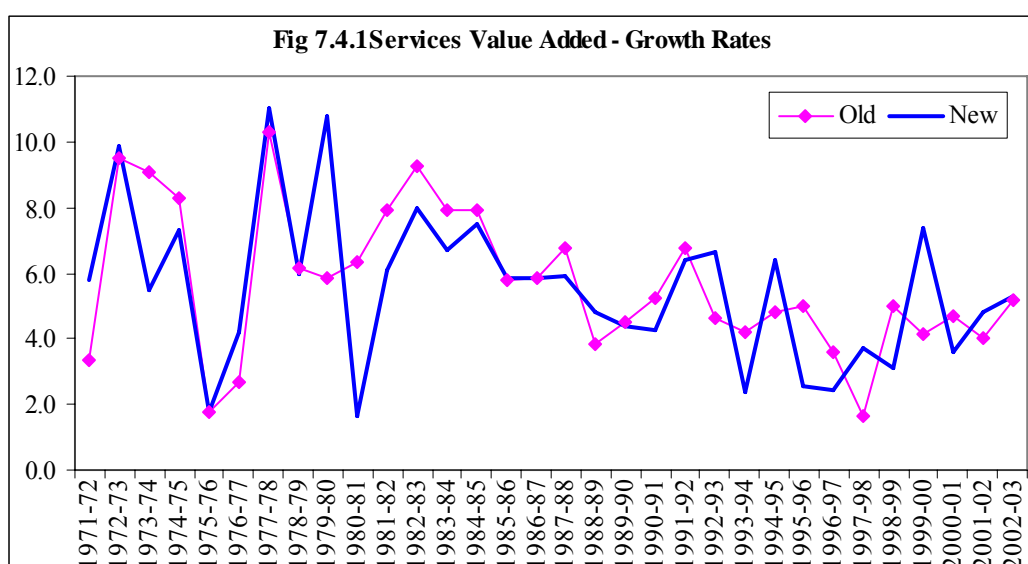
confidence to the series of services gross value added for years prior to 1999-00 that is estimated by the current study and not available officially.

When compared with old series, it is found that growth rates of new series as estimated by this study have similar pattern on average as those of the old series at 1980-81 base (Table 7.4.2). However, year-to-year movements of the two series

	Old Base (1980-81)	New Base (1999-00)
1970-75	7.5	7.1
1975-80	5.4	6.7
1980-85	7.9	6.0
1985-90	5.3	5.4
1990-95	5.1	5.2
1995-00	3.9	3.8
2000-05*	4.6	5.7
Overall	5.7	5.7

* Growth of old base data is for 2000-03

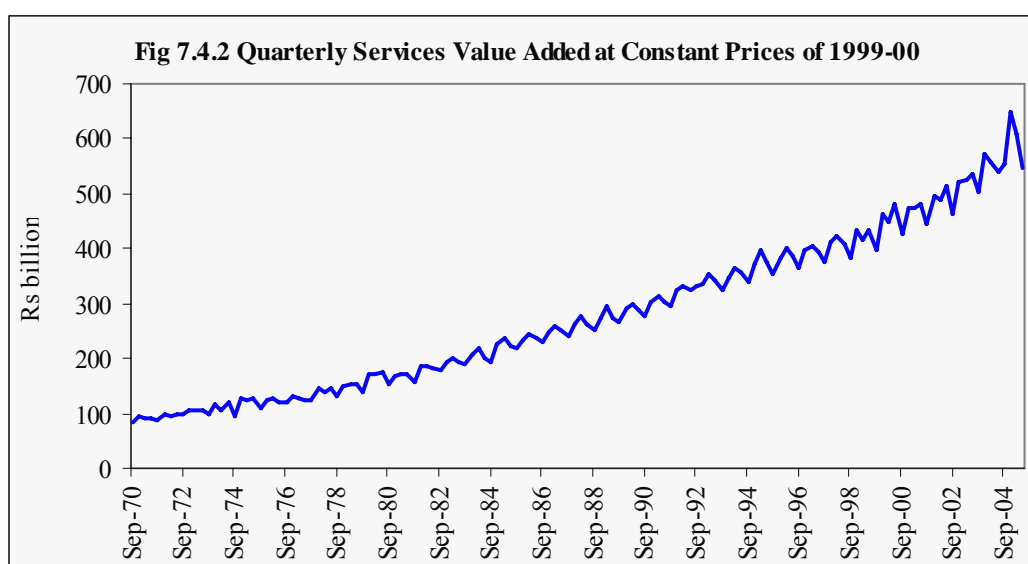
have dissimilarities in a number of years (Fig 7.4.1).



The movement of the gross value added in services within a year shows that services value added is spread almost evenly throughout the year except the first quarter

wherein it is very low at 23 percent. The other three quarters share almost equally in services (Table 7.4.3).

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun
1970-75	22.5	26.2	25.2	26.1
1975-80	22.5	26.0	25.7	25.7
1980-85	22.7	25.6	26.3	25.4
1985-90	23.2	25.2	26.4	25.2
1990-95	23.4	25.1	26.2	25.3
1995-00	22.9	25.6	25.7	25.8
2000-05	23.0	26.1	25.6	25.3
Overall	22.9	25.7	25.9	25.6



The provincial distribution of services value added shows that the Punjab contributes 49.2 percent of the gross value added in this sector followed by Sindh by 32.7 percent, NWFP by 12.6 percent and Balochistan by 5.4 percent (Table 7.4.4). The results of this study are slightly different to those of Bengali and Sadaqat (2005) who find the Punjab's share as 52 percent average during the period 1972-00 and Balochistan's share as 3.9 percent average during this period (Table 7.4.5); compared with average share of 49.6 percent and 5.5 percent for the Punjab and Balochistan respectively during the same period estimated by the present study. The results for Sindh and NWFP are similar in both the studies.

Table 7.4.4 Real Value Added in Services - Share of Provinces (%) (1999-00 prices)				
	Punjab	Sindh	NWFP	Balochistan
1970-75	50.2	33.3	12.1	4.4
1975-80	49.2	33.9	12.0	5.0
1980-85	48.1	33.8	12.5	5.5
1985-90	48.2	33.0	12.8	6.0
1990-95	48.8	32.0	12.9	6.3
1995-00	49.9	30.9	13.2	6.0
2000-05	50.2	31.8	12.9	5.1
Overall	49.2	32.7	12.6	5.5

Table 7.4.5 Real Services: Bengali and Sadaqat Provincial Shares (%) (1980-81 prices)				
	Punjab	Sindh	NWFP	Balochistan
1972-75	49.6	33.3	12.3	4.7
1975-80	50.6	32.7	12.3	4.4
1980-85	51.5	32.3	12.1	4.1
1985-90	52.2	32.4	11.8	3.6
1990-95	52.7	31.7	12.0	3.6
1995-00	54.4	29.9	12.3	3.4
Overall	52.0	32.0	12.1	3.9

In terms of growth rates, Balochistan and NWFP had shown higher average growth during the last 35 years compared with the Punjab and Sindh (Table 7.4.6); however, both Balochistan and NWFP are too far to catch up the other two provinces of the Punjab and Sindh.

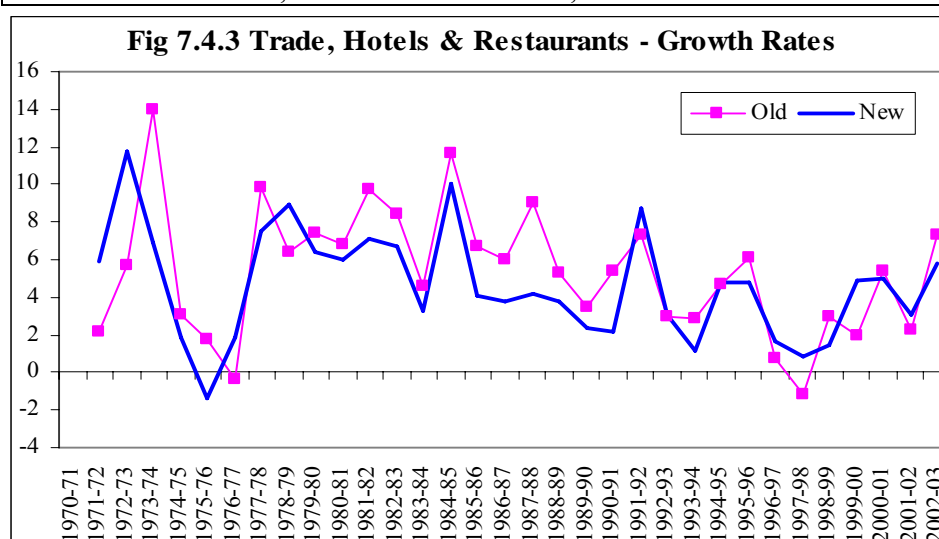
Table 7.4.6 Real Growth in Services Value Added by Provinces (%) (1999-00 prices)					
	Punjab	Sindh	NWFP	Balochistan	Pakistan
1970-75	7.3	7.1	4.8	11.7	7.1
1975-80	5.9	7.6	8.2	6.9	6.7
1980-85	5.8	5.7	5.9	9.9	6.0
1985-90	5.5	4.3	7.0	6.9	5.4
1990-95	5.6	4.9	4.4	5.6	5.2
1995-00	4.5	3.1	4.1	1.4	3.8
2000-05	5.3	6.9	6.1	2.1	5.7
Overall	5.7	5.6	5.8	6.2	5.7

7.4.1 Trade, hotels & restaurants

The difference between the gross value added of trade, hotels and restaurants as estimated by this study and that by FBS ranged between -2.3 to 0.8 percent for the years 1999-00 onward (Table 7.4.7). It is primarily due to differences in the two estimates of livestock and use of proxies for hotels and restaurants. However, it is

argued that the difference is too small to affect the trend of gross value added in overall services sector or GDP.

	Present study's estimates	FBS estimates	% difference
1999-00	607,773	621,842	-2.3
2000-01	638,315	649,564	-1.7
2001-02	657,797	667,615	-1.5
2002-03	696,268	707,145	-1.5
2003-04	760,941	766,693	-0.8
2004-05	858,886	851,744	0.8



The growth rates of the new series of value added of this sector follows the similar path as of the series at old base of 1980-81; however, the new series show lesser oscillation (with variance 8.5) as compared with old one (with variance 11.7) (Fig 7.4.3).

The results of quarterisation show that the value added of trade and hotel activities is highest in third and fourth quarters and lowest in the first quarter (Table 7.4.8).

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun
1970-75	21.9	25.5	26.7	25.9
1975-80	21.4	25.3	27.0	26.3
1980-85	21.6	25.6	26.8	26.1
1985-90	21.5	26.0	26.9	25.7
1990-95	21.4	26.0	27.1	25.5
1995-00	21.0	26.4	26.8	25.8
2000-05	21.0	25.2	27.3	26.4
Overall	21.4	25.7	27.0	26.0

The provincial distribution, on the other hand, shows that the province of the Punjab holds 50 percent of the total gross value added in trade, hotels and restaurants (Table 7.4.9) followed by Sindh (33 percent), NWFP (11 percent) and Balochistan (5.7 percent). The growth rate of this sector has remained stable in Sindh and the Punjab while the other two provinces, particularly Balochistan showed larger variations in growth (Table 7.4.10).

	Punjab	Sindh	NWFP	Balochistan
1970-75	52.5	31.7	11.5	4.3
1975-80	51.5	32.9	10.2	5.4
1980-85	48.6	34.6	10.9	5.8
1985-90	49.2	33.9	11.0	5.8
1990-95	50.1	32.2	10.9	6.8
1995-00	50.0	32.5	11.2	6.3
2000-05	50.6	32.0	12.2	5.3
Overall	50.4	32.8	11.1	5.7

	Punjab	Sindh	NWFP	Balochistan	Pakistan
1970-75	9.1	9.6	5.0	11.1	8.8
1975-80	2.9	4.2	0.7	9.7	3.4
1980-85	5.9	8.0	8.7	8.6	7.0
1985-90	5.3	4.7	5.4	4.8	5.1
1990-95	4.4	3.0	3.8	7.2	4.0
1995-00	2.4	3.0	3.3	1.9	2.6
2000-05	4.4	3.3	6.7	0.4	4.0
Overall	4.5	4.7	4.8	5.8	4.6

7.4.2 Transport, storage & communication

In case of transport, storage and communication also, the estimates of this study are fairly close to those by FBS (Table 7.4.11) reflecting the aptness in estimation technique adopted by this study.

	Present study's estimates	FBS estimates	% difference
1999-00	400,981	400,983	0.0
2000-01	423,227	422,195	0.2
2001-02	430,501	427,296	0.7
2002-03	449,236	445,552	0.8
2003-04	464,191	461,276	0.6
2004-05	482,574	477,701	1.0

Comparing the growth rates of new estimates with old growth rates, Fig 7.4.4 shows that new growth rates are generally higher than old growth rates and there is also difference in the pattern of movements. It may be due to expansion in the sector in new methodology, e.g. courier services and mobile phones was not included in old methodology but now they have been included and have 4 to 5 percent share in the gross value added of this sector.

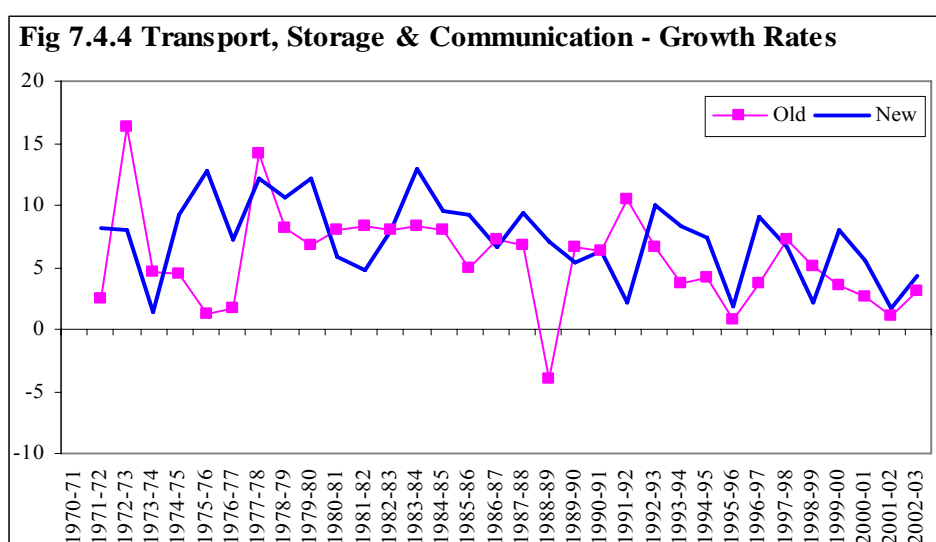


Table 7.4.12 reports the seasonal factors as computed through quarterisation of annual gross value added of this sector: the results show that gross value added is higher in the last two quarters as compared to the first two quarters. However, there are not strong seasonal variations in this sector. In fact, there is a gradual increase in the gross value added of this sector during the year.

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun
1970-75	24.4	24.7	25.2	25.7
1975-80	24.1	24.7	25.3	25.9
1980-85	24.3	24.7	25.2	25.8
1985-90	24.3	24.8	25.2	25.7
1990-95	24.4	24.8	25.2	25.6
1995-00	24.5	24.8	25.2	25.6
2000-05	25.5	26.6	25.5	22.3
Overall	24.5	25.0	25.3	25.2

Like most of the other economic sectors, the province of the Punjab has the highest share in trade, hotels and restaurant (45 percent) followed by Sindh (34 percent).

While the shares of all other provinces increased over time, the share of Sindh declined from 39 percent in 1970s to 30 percent in recent years (Table 7.4.13).

	Punjab	Sindh	NWFP	Balochistan
1970-75	44.7	37.9	12.5	4.8
1975-80	42.0	39.1	13.4	5.5
1980-85	42.2	34.3	16.6	7.0
1985-90	43.6	32.9	15.4	8.1
1990-95	46.1	31.3	14.8	7.8
1995-00	47.1	30.0	15.5	7.4
2000-05	48.7	29.7	14.7	6.9
Overall	44.9	33.6	14.7	6.8

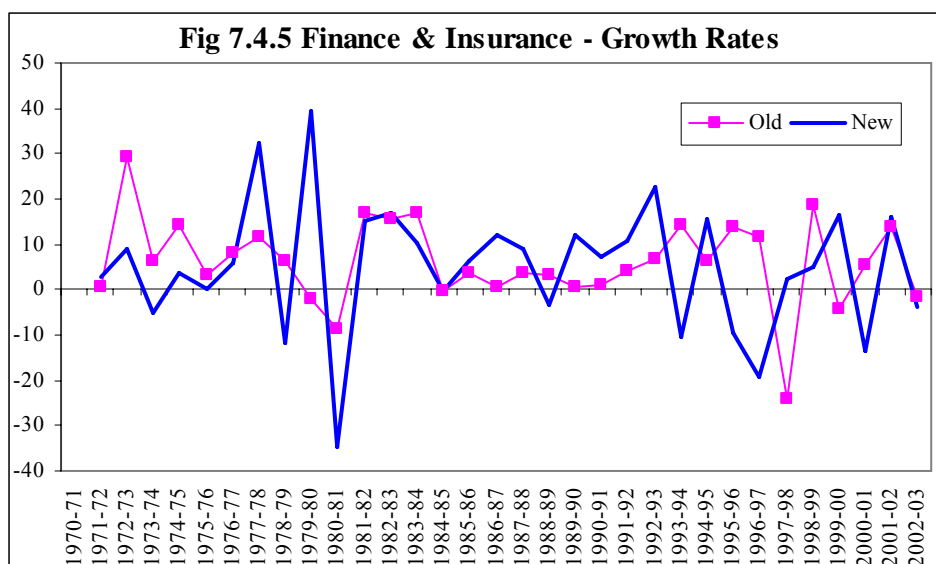
All the provinces have shown very high growth rates in gross value added of transport, storage and communication (Table 7.4.14). However, NWFP and Balochistan have witnessed sluggishness in NWFP and Balochistan during early years of 2000s, though on average their growth rates remained higher than 7 percent during the period of 1970-2005.

	Punjab	Sindh	NWFP	Balochistan	Pakistan
1970-75	6.6	7.3	3.2	11.5	6.7
1975-80	10.3	10.2	15.9	11.7	11.0
1980-85	7.7	6.7	10.4	15.7	8.2
1985-90	8.7	6.3	6.1	9.8	7.6
1990-95	8.4	5.9	5.5	4.5	6.8
1995-00	5.8	4.1	7.8	5.3	5.5
2000-05	4.0	5.2	1.7	1.6	3.8
Overall	7.4	6.5	7.4	8.5	7.1

7.4.3 Finance & Insurance

The gross value added of finance and insurance for benchmark year 1999-00 is the same in two estimates: one by this study and the other by FBS. However, there is a difference of more than 1 percent between the two estimates for some of the subsequent years (Table 7.4.15). This difference may be statistical discrepancy coming from changes in reporting format of financial information in Banking Statistics of Pakistan after 1999-00

	Present study's estimates	FBS estimates	% difference
1999-00	132453	132,454	0.0
2000-01	114455	112,455	1.7
2001-02	132761	131,761	0.8
2002-03	127604	130,081	-1.9
2003-04	140766	141,768	-0.7
2004-05	181899	183,900	-1.1



A comparison of growth rates of old based series and new series is given in Fig 7.4.5 which shows that two series of growth rates are different than each other. These differences can be explained by expansion in the coverage of financial institutions in the new estimates

The results of quarterisation show a strong seasonality in finance and insurance; financial activities are lowest in the first quarter and highest in the second quarter (more than 30% of the annual value added) (Table 7.4.16), which may be a reflection of seasonality of commodity producing sectors.

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun
1970-75	15.5	36.8	17.4	30.3
1975-80	18.0	36.5	22.2	23.3
1980-85	17.2	32.0	30.5	20.3
1985-90	24.2	24.3	30.9	20.6
1990-95	25.0	23.4	28.5	23.1
1995-00	20.3	29.0	23.7	27.0
2000-05	15.8	33.2	17.6	33.5
Overall	19.4	30.7	24.4	25.5

The province of Sindh dominates in finance and insurance services with a share of 63.6 percent; it is followed by the Punjab with a share of 29 percent, NWFP with a share of 6.5 percent and Balochistan with a share of less than 1 percent (Table 7.4.17).

	Punjab	Sindh	NWFP	Balochistan
1970-75	31.2	58.9	8.9	1.1
1975-80	31.2	58.9	8.9	1.1
1980-85	25.7	67.6	5.7	1.0
1985-90	26.4	65.9	6.8	0.9
1990-95	29.9	64.6	5.0	0.5
1995-00	29.9	64.6	5.0	0.5
2000-05	29.7	64.8	5.0	0.5
Overall	29.1	63.6	6.5	0.8

The average growth rates in the Punjab and Sindh have been 6 percent while those in NWFP and Balochistan have been 5 percent and 4 percent respectively (Table 7.4.18). All the provinces witnessed a negative growth in the second half of 1990s, so the country as a whole.

	Punjab	Sindh	NWFP	Balochistan	Pakistan
1970-75	2.6	2.6	2.6	2.6	2.6
1975-80	13.2	13.2	13.2	13.2	13.2
1980-85	-0.9	3.4	-3.2	0.3	1.4
1985-90	10.9	6.3	6.0	-4.2	7.3
1990-95	9.0	9.0	9.0	9.0	9.0
1995-00	-1.0	-1.0	-1.0	-1.0	-1.0
2000-05	6.7	8.0	8.1	8.1	7.6
Overall	5.9	6.0	5.0	4.0	5.8

7.4.4 Ownership of dwelling

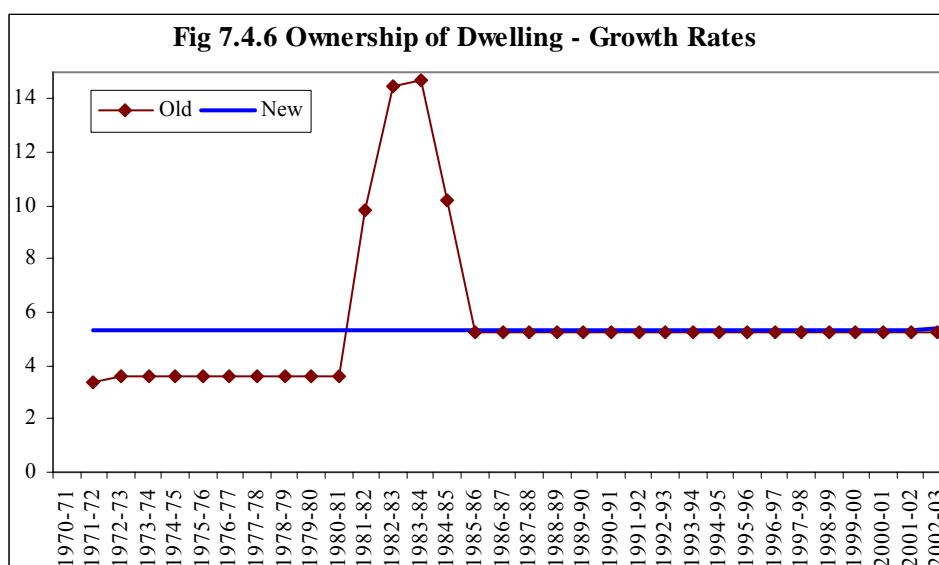
The estimates of gross value added of ownership of dwelling by this study are very different to those estimated by the FBS for years after benchmark year of 1999-00 (Table 7.4.19). The benchmark estimates are the same simply because this study has adopted FBS estimates; the issue is really for other years. The present study estimates growth rates of dwelling significantly higher than those adopted by the FBS. The FBS has used a fixed growth rate of 3.5 percent while this study estimates the growth rate which is higher than 5 percent on the basis of quality adjusted housing growth in the country (detail of methodology used by this study is given in sections 4.3.4 and 6.3.4).

	Present study's estimates	FBS estimates	% difference
1999-00	110425	110,425	0.0
2000-01	116341	114,593	1.5
2001-02	122577	118,604	3.3
2002-03	129150	122,466	5.5
2003-04	136078	126,764	7.3
2004-05	143381	131,214	9.3

The old series of gross value added of ownership of dwelling showed exceptionally high growth rates for years 1981-82 to 1984-85 that was due to methodological problems instead of actual developments. The growth rates estimated by this study are rather smoother over the years (Fig 7.4.6).

Like transport, storage and communication, the gross value added of ownership of dwelling also increased gradually over the four quarters in a year.

The highest contributor in gross value added of ownership of dwelling is the province of the Punjab with an average share of 58.4 percent; it is followed by Sindh with a share of 28.4 percent, NWFP with a share of 8.7 percent and Balochistan with a share of 4.5 percent (Table 7.4.20). Over the years, the shares of the Punjab and Balochistan have declined and those of NWFP and Sindh have increased.

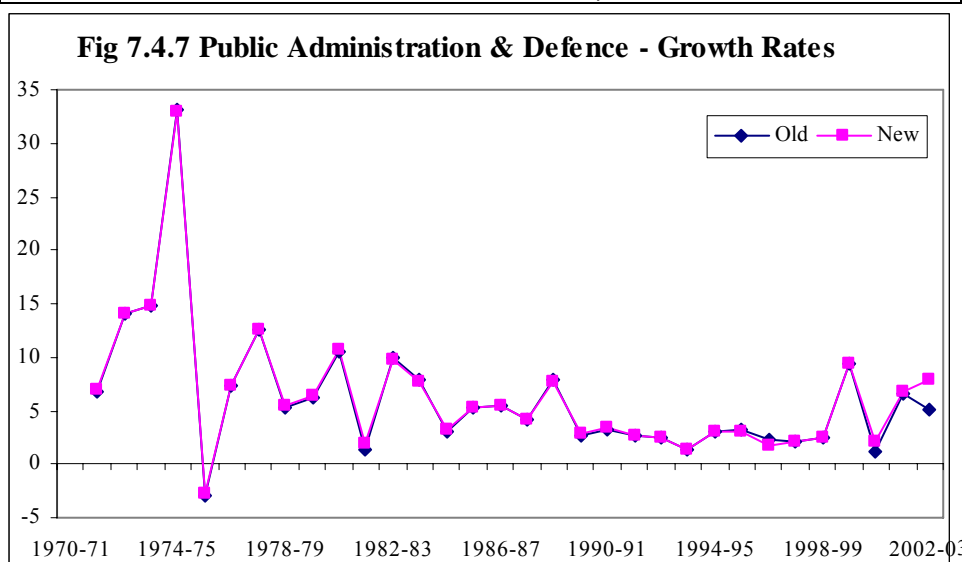


	Punjab	Sindh	NWFP	Balochistan
1970-75	59.6	27.9	7.2	5.3
1975-80	59.3	28.1	7.6	5.0
1980-85	58.9	28.2	8.1	4.8
1985-90	58.5	28.4	8.6	4.5
1990-95	58.0	28.5	9.2	4.3
1995-00	57.5	28.6	9.8	4.1
2000-05	57.0	28.7	10.4	3.8
Overall	58.4	28.4	8.7	4.5

7.4.5 Public administration & defence

In the case of public administration and defence also, the estimates of gross value added by this study are the almost same as those by FBS (Table 7.4.21). The growth rates of new series also follow the same path and show the same pattern as old growth rates (Fig 7.4.7).

	Present study's estimates	FBS estimates	% difference
1999-00	220429	220,291	0.1
2000-01	225207	225,152	0.0
2001-02	240386	240,585	-0.1
2002-03	259359	259,148	0.1
2003-04	267427	267,321	0.0
2004-05	268849	268,826	0.0



Regarding seasonal movements of gross value added of this sector, it has been mentioned in the section 4.3.5 the seasonal factors used for this sector are 0.2441, 0.2441, 0.2559, and 0.2559 for respective quarters.

According to the provincial distribution of gross value added of this sector, the share of the Punjab in the gross value added of public administration and defence is 54.2 percent which is followed by Sindh with a share of 25.1 percent, NWFP with a share of 14.5 percent and Balochistan with a share of 6.3 percent (Table 7.4.22).

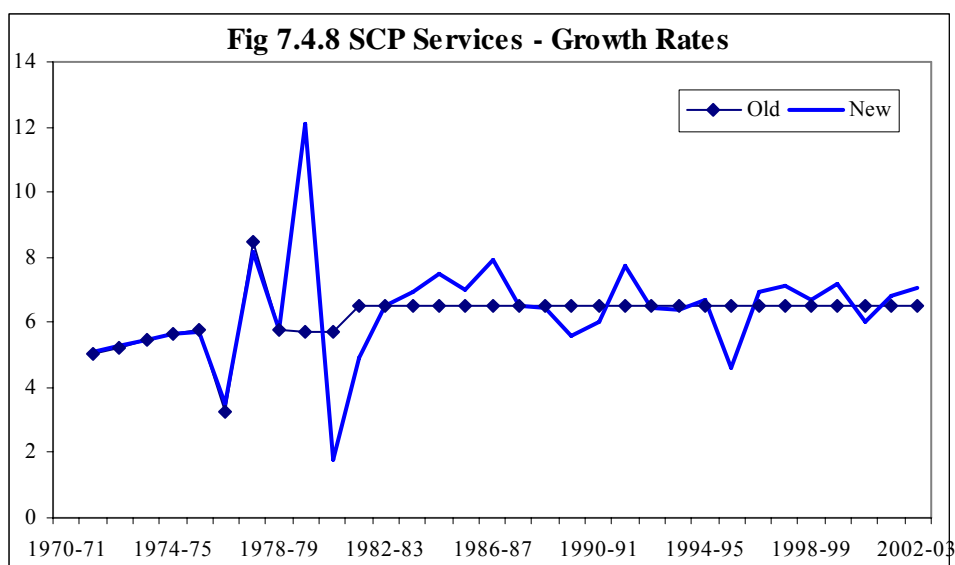
Table 7.4.22 Public Administration & Defence: Provincial Shares (1999-00 prices)				
	Punjab	Sindh	NWFP	Balochistan
1970-75	55.5	23.9	13.7	6.9
1975-80	54.7	23.9	15.0	6.4
1980-85	55.5	24.1	14.6	5.8
1985-90	53.5	25.0	14.6	6.9
1990-95	53.6	25.0	14.4	7.0
1995-00	56.6	23.6	14.0	5.8
2000-05	49.8	30.0	14.9	5.3
Overall	54.2	25.1	14.5	6.3

7.4.6 Social, community and private services

In the case of social, community and private services also, the gross value added of social, community and private services estimated by the present study are very close to FBS estimates (Table 7.4.23). However, the growth rates of new series are very different to the growth rates of the old series at 1980-81 base (Fig 7.4.8).

Table 7.4.23 SCP Services: Comparison of Estimates Rs million (1999-00 prices)			
	Present study's estimates	FBS estimates	% difference
1999-00	321551	321,551	0.0
2000-01	340826	339,437	0.4
2001-02	364147	366,285	-0.6
2002-03	389937	388,509	0.4
2003-04	410125	410,125	0.0
2004-05	434167	434,167	0.0

The new data show more fluctuations over the years as compared to the old data. It may be due to the fact in old methodology most of the time fixed growth rates were assumed, while the new series has been estimated on the basis of different assumptions as already discussed earlier.



Regarding within the year movements, like transport, storage and communication, and ownership of dwelling, the gross value added of this sector also increase gradually over the four quarters in a year due to very nature of technique of quarterisation.

In the gross value added of social, community and private services also the Punjab is the biggest contributor with a share of 53.7 percent; it is followed by Sindh with a share of 23.7 percent, NWFP with a share of 17.1 percent and Balochistan with a share of 5.6 percent (Table 7.4.24).

	Punjab	Sindh	NWFP	Balochistan
1970-75	51.9	27.4	16.4	4.3
1975-80	51.9	27.4	16.4	4.3
1980-85	53.8	24.8	15.9	5.4
1985-90	54.4	21.7	17.3	6.5
1990-95	53.4	19.6	19.9	7.1
1995-00	54.0	20.5	18.9	6.6
2000-05	56.6	24.3	14.6	4.5
Overall	53.7	23.7	17.1	5.6

This chapter and the one given next undertake factorization of the new series of gross domestic product and its sub-sectors under growth accounting framework and attempt to estimate the contributions of capital, labour and total factor productivity to output growth. This chapter presents a methodology to estimate capital stock valued at constant prices of 1999-00 and skill-adjusted labour. The next chapter 9 offers growth accounting framework and estimates total factor productivity.

Following the tradition set by Solow (1957), the framework for factorization of output starts with a production function with a Hick's neutral shift parameter and constant return to scale, i.e.,

$$Y_t = A_t F(K_t, L_t) \tag{8.1}$$

Y_t is output, K_t is physical capital stock, and L_t is used to denote a skill-adjusted measure of the labour input, such that $L = H \cdot N$; H is an index of labour quality and N is the number of persons in employed labour force. The Hicksian A_t parameter measures the shift in the production function at given levels of labour and capital; it has also been termed in literature as Solow Residual, parameter of technical change and a measure of total factor productivity (TFP).

Whatever, the technique of factorization is used, one needs the values of all the variables *less* one. Since A_t is estimated usually as residual, some estimates of the values of Y_t , K_t , and L_t are necessary. While Y_t at new base prices has already been estimated by this study; techniques to estimate K_t , and L_t are given below.

8.1 Physical Capital

The capital stock has been estimated through perpetual inventory method (PIM) as follows.

$$K_t = I_{t-1} + (1 - \delta)K_{t-1} \tag{8.2}$$

K_t is capital stock at the beginning of the year t , I_t is gross fixed capital formation and δ is depreciation.⁶⁹ PIM requires three types of information; a series of gross fixed capital formation at constant prices of 1999-00, initial capital stock (for the year 1970-71 in our case) and the rate of depreciation. The series of gross fixed capital formation at current prices is available since 1963-64 at sectoral level (FBS, 1998, 50 Years of Pakistan in Statistics).⁷⁰ In order to convert the series at constant prices of 1999-00, some deflator for each sector has been developed (i.e. separate deflator for gross fixed capital formation in agriculture, manufacturing, trade, etc.), as defined below.

$$P_{jt} = \alpha_j PB_t + (1 - \alpha_j) PM_t \quad (8.3)$$

P_{jt} is deflator for a sector j (1999-00 = 100)

PB_t is wholesale price index of building material group (1999-00 = 100)

PM_t is wholesale price index of machinery group (1999-00 = 100)

α_j is the weight of building material in the deflator of the sector j . For a value of the weight α_j , we have taken the relative share of structures in gross fixed capital formation in sector j ; these shares have been taken from a study “Capital Formation in Pakistan 1999-00” undertaken by Arshad Zaman Associate for FBS and are given in the following table.

Sectors	Structures	Equipment
Agriculture	0.244	0.756
Mining & Quarrying	0.406	0.594
Manufacturing	0.285	0.715
Construction	0.933	0.067
Electricity, Gas & Water Supply	0.654	0.346
Transport, Storage & Communication	0.598	0.402
Trade, Hotel & Restaurants	0.375	0.625
Finance & Insurance	0.134	0.866
Ownership of Dwellings*	0.933	0.067
Public Admin & Defence	0.939	0.061
Other Services	0.400	0.600

* Assumed same as for construction

⁶⁹ If K_t is defined as capital stock at the end of the year then equation (8.1) becomes $K_t = I_t + (1 - \delta)K_{t-1}$, however, we prefer to define K_t as beginning of the year as it is the capital stock which is used as input in the production process (the underlying assumption is, a unit of capital enters into production process with a lag of about one year).

⁷⁰ The gross fixed capital formation at constant prices of 1980-81 is also available since 1980-81, but we did not need to use it.

The next is the issue of initial capital stock. Starting with the equation (8.2), we can derive an expression for the initial capital (see Annexure C) which is:

$$K_{j0} = \frac{I_{j0}}{g_j + \delta_j} \quad (8.4)$$

g is steady state growth rate of gross fixed capital formation during years prior to year 1 and δ is the rate of depreciation. We have taken annual compound growth rate of gross fixed capital formation of each sector during the period 1963-64 to 1970-71 as a measure of g . The rate of depreciation of capital stock in each sector has been taken from a study by Innovative Development Consultants (Pvt) Limited on Depreciation Rates in Pakistan; these are given in the following table.

Sector	Rate
Agriculture	0.058
Mining & Quarrying	0.025
Manufacturing	0.071
Construction	0.025
Electricity, Gas & Water Supply	0.035
Transport, Storage & Communication	0.075
Trade, Hotel & Restaurants	0.038
Finance & Insurance	0.043
Ownership of Dwellings	0.052
Public Admin & Defence	0.035
Other Services	0.037
Source: Innovative Development Consultants (Pvt) Limited (2002), Study on Depreciation Rates in Pakistan	

With the initial capital stock (for the year 1970-71), series of gross fixed capital formation at constant prices of 1999-00 and rates of depreciation for each sector in our hand, we have estimated sector-wise capital stock valued at constant prices. The overall capital stock has been worked out as the sum of the sectoral capital stocks. The sector-wise values of estimated capital stock for selected years are given in Table 8.3 (detail time series have been reported as annexure).

The results show that about 47 percent of the total capital stock has been employed in services sector which contributes about 50 percent of the total gross value added. On the other hand, the industrial sector also has more than 40 percent of the total capital stock, while its contribution to gross domestic product is 25 percent which indicates

marginal efficiency of capital lower in industrial sector than in services. The share of agriculture sector in total capital stock is just 10 percent.

The overall capital output ratio is about 2 and it has declined over time indicating increase in marginal efficiency of capital with the passage of time. Although industry has higher capital out ratio, a declining trend is visible in it. On the other hand, agriculture has the lowest capital output ratio indicating high marginal efficiency of capital but this ratio increased over time. The other sectors that showed increase in capital output ratio over time (hence decline in marginal efficiency of capital) included mining and quarrying and finance and insurance.

Table 8.3 Estimates of Capital Stock (Rs million) (1999-00 prices)					
	1970-71	1980-81	1990-91	1999-00	2004-05
Agriculture	176465	279353	590425	815833	894261
Mining & Quarrying	17980	27558	95664	233490	372667
Manufacturing	337006	412199	637718	1055141	1408336
Construction	575719	523427	493683	519437	509772
Electricity, Gas & Water Supply	100668	198325	443388	940595	1018928
Total Industry	1031374	1161509	1670454	2748664	3309703
Transport, Storage & Communication	142756	155121	276356	501171	721357
Trade, Hotel & Restaurants	48194	51383	51231	72785	107897
Finance & Insurance	8100	11758	23453	64770	116019
Ownership of Dwellings	175960	198463	452491	728502	931367
Public Admin & Defence	269232	411242	708516	1044580	1227957
Other Services	355946	497758	501265	624827	757054
Total Services	1000188	1325724	2013311	3036635	3861652
Total GDP	2208026	2766586	4274190	6601132	8065615
Capital Output Ratio					
Agriculture	0.5	0.6	0.9	0.9	0.9
Mining & Quarrying	2.1	1.9	2.2	4.8	5.7
Manufacturing	2.1	1.5	1.4	1.8	1.6
Construction	26.7	13.0	6.8	5.9	5.2
Electricity, Gas & Water Supply	5.9	5.8	5.7	6.7	6.3
Total Industry	5.0	3.1	2.5	3.2	2.7
Transport, Storage & Communication	3.0	1.4	1.2	1.2	1.5
Trade, Hotel & Restaurants	0.3	0.2	0.1	0.1	0.1
Finance & Insurance	0.2	0.3	0.2	0.5	0.6
Ownership of Dwellings	7.2	4.8	6.5	6.6	6.5
Public Admin & Defence	7.2	4.1	4.2	4.7	4.6
Other Services	6.5	5.2	2.8	1.9	1.7
Total Services	2.7	2.0	1.7	1.7	1.6
Total GDP	2.3	1.8	1.7	1.9	1.8

8.2 Labour

As mentioned above, we have taken skill-adjusted labour force in the production function which is defined as a product of number of employed workers and a human capital index (Collins and Bosworth, 1996), i.e. $L = H \cdot N$.

The sector-wise numbers of employed workers (N) have been worked out by combining information regarding percent distribution of employees by industry groups and total employed labour force (source: Statistical Years Books and Economic Survey, various issues).

There is no dispute that all employed workers are not identical in terms of productivity, instead worker personal characteristics influence marginal productivity. Some previous growth accounting studies have incorporated detailed adjustments by labor force groupings, including education, age, and gender (for example Denison (1967 and Young (1995))). We have followed a simpler approach, adjusting only for the characteristic that has been found to be the most important: *education*. The benefits of education are assumed to be embodied in workers, as explained by Collins and Bosworth, 1996.

The human capital index (H) has been constructed by using the estimates of the return to education as weights for aggregating workers across different educational levels. That is,

$$H = \sum R_i E_i$$

R_i is return to education level i (relative to no education) and E_i is the ratio of employed workers with education level i . The return to education has been taken from Katsis, Mattson and Psacharopoulos (KMP) as reported by Psacharopoulos (2002), according to which every additional year of primary education adds 8.4 % to the income of workers, every additional year of secondary education adds 13.7 % and every additional year of higher education adds in the return to the extent of 31.2%. Table 8.4 gives the return to different levels of education worked out on the basis of

KMP results. We have taken a return of 1 for no education; every year of schooling then adds to it according to the above ratios.

Table 8.4 Rates of Return to Education in Pakistan		
Education level	Years of Schooling	Return (R_i)
Illiterate		1
No formal education*		1.1
Less than primary	3	1.3
Primary	5	1.5
Middle	8	2.2
Matric	10	2.8
Intermediate	12	3.7
BA	14	6.3
MA	16	10.9
M Phil/PhD	18	18.8
Others**		5.4
* average rate of return in Asian countries		
** average of all education level (excluding illiterate)		
Source: Author's calculation on the basis of results of Katsis, Mattson and Psacharopoulos (1999)		

The distribution of employed workers with respect to the above education levels has been obtained from Household Income and Expenditure Survey, various issues. As HIES is not available for all the years of our sample, we have filled the gaps on pro rata basis.

The sector wise distribution of skill-adjusted labour force for selected years has been given in the Table 8.5 which shows that most of the labour force is engaged in agriculture activities followed by trade, hotel and restaurant sector and manufacturing. The electricity, gas and water supply has traditionally been the most capital intensive sector, however, mining and quarrying has emerged extremely capital intensive sector in recent years. The least capital intensity has been found in trade, hotel and restaurant sector.

Table 8.5 Estimates of Skill-adjusted Labour Force					
(million numbers)					
	1970-71	1980-81	1990-91	1999-00	2004-05
Agriculture	14.7	18.2	23.0	32.8	36.0
Mining & Quarrying	0.1	0.1	0.1	0.0	0.1
Manufacturing	3.8	3.2	5.9	7.8	11.6
Construction	1.0	1.4	3.2	3.9	4.9
Electricity, Gas & Water Supply	0.1	0.2	0.4	0.5	0.6
Total Industry	4.9	4.9	9.6	12.2	17.1
Transport, Storage & Communication	1.2	1.4	2.5	3.4	4.8
Trade, Hotel & Restaurants	2.8	3.2	6.4	9.1	12.5
Finance & Insurance	0.2	0.3	0.4	0.6	0.9
Ownership of Dwellings	0.4	1.1	1.8	2.9	4.2
Public Admin & Defence	0.7	2.4	2.8	4.2	5.5
Other Services	0.6	2.9	2.1	2.5	3.4
Total Services	5.9	11.3	16.0	22.7	31.2
Total GDP	25.6	34.5	48.6	67.7	84.3
<i>Capital Labour Ratio (000 rupees per labour)</i>					
Agriculture	12	15	26	25	25
Mining & Quarrying	270	200	1313	4928	6314
Manufacturing	88	131	107	136	122
Construction	592	363	154	133	104
Electricity, Gas & Water Supply	1573	959	1100	1985	1804
Total Industry	209	235	173	225	194
Transport, Storage & Communication	114	109	109	147	150
Trade, Hotel & Restaurants	17	16	8	8	9
Finance & Insurance	42	45	54	117	130
Ownership of Dwellings	414	173	257	249	223
Public Admin & Defence	414	173	257	249	223
Other Services	575	173	243	249	223
Total Services	169	117	126	134	124
Total GDP	86	80	88	98	96

8.3 Factors Shares

An important ingredient of growth accounting framework is estimates of the shares of labour and capital in total income as explained in detail in the next chapter 9. Since only two factors of productions have been assumed in a typical production function, it suffices to make some estimate of share of one of the factors in total income. This study takes an estimate of the share of labour in total income from information provided in Statistical Year Book, various issues; the Year Book reports sources of monthly household income which include wages and salaries, self employment, rent and other sources. As a share of labour in total income, we have summed share of wages and salaries and 60 percent of the self employment income; in case of self employment we assume that 60% of the income goes to labour and 40% to the capital (usually a self employed person puts more labour-hours in production process - up to

12 hours a day – as compared to other workers). Such data are available for selected years; we have worked out the share of labour for those years and averaged them out to have a constant number for our sample. The share of labour comes out to be 58.3% and thus the share of capital is 41.7 percent. The share of capital as worked out by this study is higher than assumed by Collins & Bosworth (1996) for South Asia (35%) and Guha-Khasnobis and Bari (2000) for Pakistan and other South Asian countries (33%); however, it is equal to the share estimated by Senhadji (1999) for South Asia (42%).

Given the basic framework of growth accounting and the time series of capital stock and labour force along with their shares in total income as estimated in the previous chapter, this chapter estimates the total factor productivity for years from 1970-71 to 2004-05. As already mentioned, the term A_t in the production function ($Y_t = A_t F(K_t, L_t)$) is termed as a measure of total factor productivity. In order to measure its value, Solow adopted a non-parametric approach (i.e. an approach that does not impose a specific form on production function). The solution is based on the total differential of the production function:⁷¹

$$dY = dA \cdot F(K, L) + \frac{\partial Y}{\partial K} dK + \frac{\partial Y}{\partial L} dL$$

$$\frac{dY}{Y} = \frac{dA}{A} + \left(\frac{\partial Y}{\partial K} \cdot \frac{K}{Y} \right) \frac{dK}{K} + \left(\frac{\partial Y}{\partial L} \cdot \frac{L}{Y} \right) \frac{dL}{L}$$

$$y = a + \varepsilon_k \cdot k + \varepsilon_l \cdot l \quad (9.1)$$

y is growth rate of output, a the growth rate of TFP, k and l are growth rates of physical capital and labour, and ε_k and ε_l are output elasticities of capital and labour.

The output elasticities in (9.1) are not directly observable; however, if each input is paid the value of its marginal product,⁷² i.e., if

$$\frac{\partial Y}{\partial K} = r; \text{ and } \frac{\partial Y}{\partial L} = w \quad (9.2)$$

then output elasticities can be measured as factor shares in total income, i.e.,

$$\varepsilon_k = \frac{rK}{Y}; \text{ and } \varepsilon_l = \frac{wL}{Y} \quad (9.3)$$

r and w are real returns to a unit of capital and labour. Thus (9.1) can be written as:

$$y = a + s_k \cdot k + s_l \cdot l \quad (9.4)$$

and growth in total factor productivity can be computed as

$$a = y - s_k \cdot k - s_l \cdot l \quad (9.5)$$

⁷¹ For simplicity subscript t has been removed.

⁷² It only requires a degree of competition sufficient to ensure that the factors are paid their marginal products.

The information needed to get a value for growth in total factor productivity in a certain year t include output, physical capital, number of persons in employed labour force, index of labour quality and share of capital (s_k) or labour (s_l) in total income.⁷³ The earlier chapters of this dissertation have already estimated series of the required data for calculating total factor productivity: the value of output in the form of gross domestic product at 1999-00 prices has been estimated in chapter 4 by sectors, the value of capital stock at 1999-00 prices and skill-adjusted labour force along with factor shares have been estimated in chapter 8. Thus all the data with hand, TFP growth has been calculated for the period 1970-71 to 2004-05 and results have been analyzed in the following. Detailed results have been given as annexure.

9.1 Analysis of Results

It has been found that the contribution of total factor productivity to GDP growth during the period 1970-2005 had been 1 percentage point. It was higher in 1970s and early eighties and remained below 1 percent in subsequent years with negative growth during the periods of late 1980s and late 1990s. Resurgence in total factor productivity growth has been witnessed in recent years (Table 9.1).

Comparing the relative contribution of capital and labour, the results show that labour remained a biggest contributor to economic growth during this period (1970-2005); however, in recent years capital contribution has surpassed the labour contribution (see detail table in annexure).

Table 9.1 Factorization of GDP Growth (1999-00 prices)					
	GDP Growth	Share-weighted Growth of		TFP	
		Capital	Labour	Growth	% contribution
1970-75	4.56	0.49	1.48	2.59	56.7
1975-80	5.47	1.26	2.07	2.14	39.1
1980-85	5.75	1.59	1.30	2.86	49.7
1985-90	4.66	2.03	2.98	-0.36	-7.7
1990-95	4.24	2.23	1.82	0.19	4.5
1995-00	3.20	1.83	2.27	-0.90	-28.0
2000-05	5.33	1.71	2.65	0.98	18.4
Overall	4.75	1.62	2.10	1.03	21.6

⁷³ As $s_k + s_l = 1$, we need to know only one of them.

The results of this study are different to those obtained by some other studies in case of Pakistan like Kemal (1992), Kemal, et al. (2002) and Guha-Khasnobis & Bari (2000) who found TFP contribution of -0.56, 1.66 and 2.03 respectively (Table 9.2). The results of Senhadji and Collins & Bosworth are however, closer to our results. A cross country comparison of the contribution of total factor productivity in economic growth has been made by Collins & Bosworth (1996) who find 0.9 for Indonesia, 1.4 for Malaysia, 3.1 for Singapore 3.1 and 0.9 for USA during the period 1984-94. They also quoted results of some other studies including Denison and Chung (1976) who found that TFP growth contributed from 1.9 to 4.9 percentage points per year to growth for nine industrial countries in various years between 1948-71, and Christenson et al. (1980) who found that the contribution of TFP to growth for eight industrial countries over selected period within 1947-73 ranged from 1.4 to 4.1 percentage points per year. With such a variety of results available in the literature, it is hard to give TFP in Pakistan some position at the performance scale.

Table 9.2 Results of Other Studies			
	Period	TFP growth	% contribution
Arby (2007); this study	1970 - 2005	1.0	21.6
Sabir and Ahmad (2003)	1972-2001	1.8	35.3
Kemal et al. (2002)	1965 - 2001	1.66	31.26
Pasha et al. (2002)	1972-1998	2.2	40
Mahmood and Siddiqui (2000)			
Guha-Khasnobis, and Faisal Bari (2000)	1960 - 90	2.03	34.9
Senhadji (1999)*	1960 - 94	0.91	19.5
Collins & Bosworth (1996)	1960 - 94	0.4 to 1.0	17.4 to 43.5
Kemal (1992)	1950 - 91	-0.56	-11.0
Burney (1986)	1960-65		54.5
	1965-70		58.1
	1970-75		33.6
	1975-80		23.2
	1980-85		43.4
* For South Asia, with share of capital in income 40%.			

Table 9.3 reports results of our working for major sectors of the GDP. TFP contribution to growth of agriculture has been negative (-0.74 percent on average during 1970-2005); moreover contribution of labour remained lower than that of capital with the exception of the period of late 1990s and recent years. The contribution of TFP in industrial growth is 1.5 percent. It is interesting to note that contrary to the case of agriculture, the contribution of labour to growth of industrial

sector remained higher than that of capital with the exception of 1990s. In the case of services sector, the contribution of TFP growth is 0.94 percent. Moreover, the contribution of labour to services growth is higher than the contribution of capital during all the decades of the period 1970-2005.

Table 9.3 Factors of Growth of Major Sectors				
	GDP growth	Capital growth*	Labour growth*	TFP growth
Agriculture Sector				
1970-75	1.63	0.91	0.77	-0.04
1975-80	3.41	2.67	1.59	-0.86
1980-85	3.42	3.43	0.82	-0.83
1985-90	3.56	3.18	2.49	-2.11
1990-95	2.71	1.97	1.45	-0.71
1995-00	3.13	1.23	2.71	-0.81
2000-05	2.34	0.77	1.23	0.33
Overall	2.92	2.06	1.60	-0.74
Industrial Sector				
1970-75	5.01	0.04	1.48	3.49
1975-80	6.13	0.88	1.49	3.76
1980-85	8.34	0.91	3.59	3.85
1985-90	4.59	1.86	2.86	-0.13
1990-95	4.02	2.66	1.15	0.21
1995-00	2.01	2.04	1.96	-1.99
2000-05	7.34	1.58	4.07	1.70
Overall	5.36	1.46	2.40	1.50
Services Sector				
1970-75	7.12	0.88	3.76	2.48
1975-80	6.74	1.35	3.51	1.88
1980-85	5.98	1.77	1.18	3.03
1985-90	5.36	1.88	4.23	-0.75
1990-95	5.22	1.94	2.95	0.32
1995-00	3.83	1.81	1.93	0.10
2000-05	5.74	2.05	3.85	-0.16
Overall	5.67	1.69	3.04	0.94

* growth rates multiplied by factor shares as weights.

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ANNEXURES

A Harvest Calendars of Crops

Production in a Quarter as percent of Annual Production

1. Major Crops

	Rice Basmati	Rice Irri/other	Wheat	Barley	Jowar	Bajra	Maize
Punjab							
Jul-Sep	0	0.75	0	0	0.25	0.25	0
Oct-Dec	1	0.25	0	0	0.75	0.75	0.70
Jan-Mar	0	0	0	0	0	0	0
Apr-Jun	0	0	1	1	0	0	0.30
Sindh							
Jul-Sep	0	0.24	0	0	0.22	0.18	0.12
Oct-Dec	0	0.76	0	0	0.78	0.82	0.88
Jan-Mar	0	0	0.32	0.90	0	0	0
Apr-Jun	0	0	0.68	0.10	0	0	0
NWFP							
Jul-Sep	0	0	0	0	0	0	0
Oct-Dec	1	1	0	0	0	0	1
Jan-Mar	0	0	0	0	1	1	0
Apr-Jun	0	0	1	1	0	0	0
Balochistan							
Jul-Sep	0.40	0.40	0.20	0	0.35	0	0.10
Oct-Dec	0.60	0.60	0	0	0.65	1.0	0.90
Jan-Mar	0	0	0	0	0	0	0
Apr-Jun	0	0	0.80	1	0	0	0

	Gram	Cotton	Sugarcane	Rapeseed & Mustard	Sesamum	Tobacco
Punjab						
Jul-Sep	0	0.25	0	0	0	0
Oct-Dec	0	0.70	0.15	0	1	0
Jan-Mar	0.15	0.05	0.80	0.85	0	0
Apr-Jun	0.85	0	0.05	0.15	0	1
Sindh						
Jul-Sep	0	0.22	0	0	0	0
Oct-Dec	0	0.69	0.38	0	1	0
Jan-Mar	0.75	0.09	0.61	0.65	0	0.85
Apr-Jun	0.25	0	0.01	0.35	0	0.15
NWFP						
Jul-Sep	0	0	0	0	0	0.25
Oct-Dec	0	1	0.50	0	0	0
Jan-Mar	0	0	0.50	0	1	0
Apr-Jun	1	0	0	1	0	0.75
Balochistan						
Jul-Sep	0	0.70	0	0.25	0	0
Oct-Dec	0	0.30	0	0	1	0
Jan-Mar	1	0	1	0	0	0
Apr-Jun	0	0	0	0.75	0	1

2. Minor Crops

	Mash	Masoor	Mung	Mattar	Other pulses	Tomato	Potato	Other vegetables
Punjab								
Jul-Sep						0.10		0.70
Oct-Dec	1.00		1.00			0.10	0.35	0.10
Jan-Mar						0.10	0.55	0.10
Apr-Jun		1.00		1.00	1.00	0.70	0.10	0.10
Sindh								
Jul-Sep						0.05		0.70
Oct-Dec	1.00		1.00		0.40	0.20		0.10
Jan-Mar		0.70		0.73	0.50	0.65	0.82	0.10
Apr-Jun		0.30		0.27	0.10	0.10	0.18	0.10
NWFP								
Jul-Sep							1.00	0.70
Oct-Dec						1.00		0.10
Jan-Mar	1.00		1.00					0.10
Apr-Jun		1.00		1.00	1.00			0.10
Balochistan								
Jul-Sep		0.20		0.20		0.18	0.40	0.70
Oct-Dec	1.00		1.00		1.00		0.50	0.10
Jan-Mar						0.32	0.10	0.10
Apr-Jun		0.80		0.80		0.50		0.10

	Ground nuts	Soybean	Sunflower	Safflower	Canola	Linseed	Castro seed	Mango
Punjab								
Jul-Sep								0.80
Oct-Dec	1.00		0.05		0.13		0.35	
Jan-Mar			0.95		0.16		0.65	
Apr-Jun		1.00		1.00	0.71	1.00		0.20
Sindh								
Jul-Sep	0.35	0.15						0.35
Oct-Dec	0.65	0.85	0.25		0.13		0.35	
Jan-Mar			0.35		0.16	0.85	0.65	
Apr-Jun			0.40	1.00	0.71	0.15		0.65
NWFP								
Jul-Sep		0.15			0.13			0.70
Oct-Dec		0.85	0.25		0.16			0.30
Jan-Mar	1.00		0.35		0.71		0.35	
Apr-Jun			0.40	1.00		1.00	0.65	
Balochistan								
Jul-Sep			0.20	0.20				0.55
Oct-Dec		0.80			0.13		0.35	
Jan-Mar	1.00	0.20			0.16		0.65	
Apr-Jun			0.80	0.80	0.71			0.45

	Banana	Apple	Citrus fruits	Dates	Guava	Apricot	Peach	Pomegranate
Punjab								
Jul-Sep		1.00		1.00	0.35	1.00	1.00	1.00
Oct-Dec	0.50		0.25		0.40			
Jan-Mar	0.25		0.75		0.20			
Apr-Jun	0.25				0.05			
Sindh								
Jul-Sep	0.15	1.00	0.40	0.70	0.10			1.00
Oct-Dec	0.42		0.35		0.40			
Jan-Mar	0.35		0.20		0.45			
Apr-Jun	0.08		0.05	0.30	0.05			
NWFP								
Jul-Sep		0.50		0.70			0.30	1.00
Oct-Dec	1.00	0.50	1.00		0.50			
Jan-Mar								
Apr-Jun				0.30	0.50	1.00	0.70	
Balochistan								
Jul-Sep	0.40	0.60	0.20	1.00			0.30	0.20
Oct-Dec	0.50	0.30	0.80					0.80
Jan-Mar					1.00			
Apr-Jun	0.10	0.10				1.00	0.70	

	Plums	Grapes	Pears	Almonds	Chilies	Onion	Garlic	Turmeric
Punjab								
Jul-Sep	1.00	0.50	1.00	0.40	1.00		1.00	
Oct-Dec				0.60				
Jan-Mar								1.00
Apr-Jun		0.50				1.00		
Sindh								
Jul-Sep		0.35			0.30	0.05		0.25
Oct-Dec		0.65			0.45	0.45	0.45	0.75
Jan-Mar					0.15	0.35	0.50	
Apr-Jun					0.10	0.15	0.05	
NWFP								
Jul-Sep	0.30			1.00	0.50	0.50		0.60
Oct-Dec								
Jan-Mar								
Apr-Jun	0.70	1.00	1.00		0.50	0.50	1.00	0.40
Balochistan								
Jul-Sep	0.30		0.70	0.60	0.80	0.20		
Oct-Dec			0.30			0.55	0.45	
Jan-Mar					0.20	0.25	0.35	
Apr-Jun	0.70	1.00		0.40			0.20	

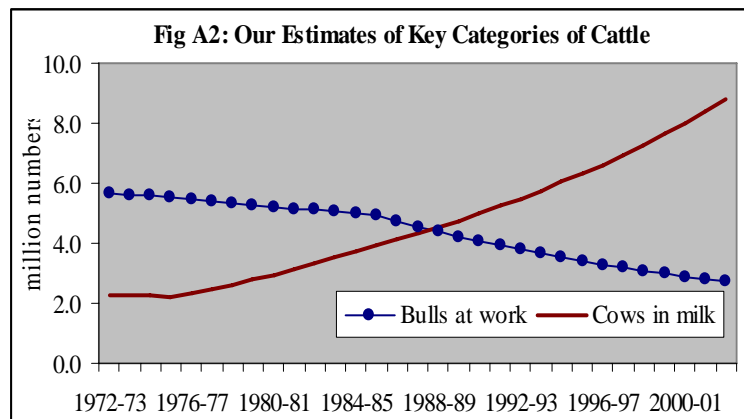
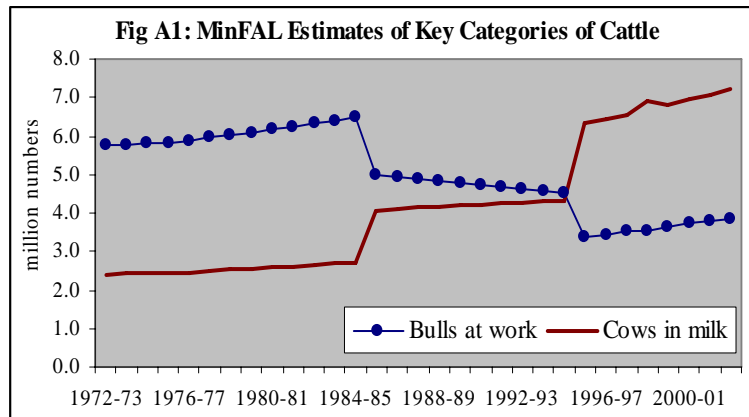
	Ginger	Other condiments	Guar seeds	Fodder crops	Sugar beet
Punjab					
Jul-Sep		0.15		0.35	0.35
Oct-Dec		0.35	1.00	0.15	0.15
Jan-Mar		0.35		0.35	0.35
Apr-Jun		0.15		0.15	0.15
Sindh					
Jul-Sep	0.45	0.15		0.42	0.20
Oct-Dec	0.55	0.35	1.00	0.20	0.30
Jan-Mar		0.35		0.22	0.45
Apr-Jun		0.15		0.16	0.05
NWFP					
Jul-Sep		0.15		0.50	0.35
Oct-Dec		0.35	1.00		0.15
Jan-Mar		0.35			0.35
Apr-Jun		0.15		0.50	0.15
Balochistan					
Jul-Sep		0.15		0.40	0.02
Oct-Dec		0.35	1.00	0.15	0.40
Jan-Mar		0.35		0.35	0.40
Apr-Jun		0.15		0.10	0.18

B Issues in Estimates of Livestock Population

We have estimated the time series of livestock population on the basis of four censuses of livestock, i.e., 1972, 1976, 1986, and 1996 and inter-census interpolation. The interpolation technique which we have adopted is different to that adopted by Ministry of Food, Agriculture and Livestock (MinFAL) and thus our series of livestock population is different to that reported in Agricultural Statistics of Pakistan. The MinFal’s approach is the following:

- The annual compound growth rates of overall population of different animals in two censuses have been used for projecting inter-census population (at province level).
- The overall population thus estimated for inter-census years has been categorized into sub-categories of animals like Bulls at work, Cows in milk, Bulls < 3 years, etc on the basis of their shares in census year.

Problem: Due to this method of interpolation, there are sudden jumps in the time series of different categories of animals, see for example Fig A1; as a consequence, the populations of key categories like ‘animals in milk’ and ‘animals at work’ are wrongly estimated. In order to make this point clear, look at the population of different categories of cattle as given in Table



A1. As given in the table, before 1985-86 bulls at work and cows in milk were being estimated on the basis of their shares as per 1976 census (bulls at work were 39% of

total and cows in milk were 16.4%). In 1985-86 census, the shares changed; bulls at work were 28.5% of total cattle and cows in milk were 23.3%. As a result the MinFal figures shows that in 1984-85 bulls at work are 6.5 million (39%) and the next year they suddenly became 5 million (28.5%) which may not be true. Similar is the case with cows in milk. Similar kinds of jumps can be seen in 1995-96 when new census data becomes available. There must be a gradual decline in the numbers of bulls at work and similarly a gradual increase in the numbers of cows in milk. There is another contrary to factual position in case of bulls at work: after a reduction of the number from 4.5 to 3.4 million in 1995-96, it starts rising in subsequent years. Theoretically, it should continue to decline as draught power is being replaced by mechanization.

Solution: We have projected the population of each animal by applying inter-census annual compound growth rates of each sub-category, and then aggregating them to get an estimate of overall population of the animal.¹ With this approach, there are gradual increase and decrease in the numbers of different categories and their shares (Fig A2). As an example, Tables A1 also gives our estimates of bulls at work which are declining gradually, and cows in milk which are increasing gradually.

Table A1: Two Different Estimates of Cattle Population
(million numbers)

	MinFAL Estimates				Our Estimates			
	Bulls at work	Cows in milk	Others	Total	Bulls at work	Cows in milk	Others	Total
1982-83	6.3	2.7	7	16.2	5.1	3.3	8	15.9
1983-84	6.4	2.7	7	16.4	5.0	3.5	8	16.3
1984-85	6.5	2.7	7	16.5	5.0	3.7	8	16.7
1985-86	5.0	4.1	8	17.5	4.9	3.9	8	17.1
1986-87	4.9	4.1	9	17.6	4.7	4.1	8	17.3
1987-88	4.9	4.1	9	17.6	4.6	4.3	9	17.5
1992-93	4.6	4.3	9	17.8	3.8	5.5	10	19.1
1993-94	4.6	4.3	9	17.8	3.6	5.8	10	19.5
1994-95	4.5	4.3	9	17.8	3.5	6.0	10	19.9
1995-96	3.4	6.3	11	20.4	3.4	6.3	11	20.4
1996-97	3.45	6.4	11	20.8	3.3	6.6	11	21.0
1997-98	3.52	6.6	11	21.2	3.2	7.0	11	21.5
1998-99	3.52	6.9	11	21.6	3.1	7.3	12	22.1
1999-00	3.65	6.8	12	22.0	3.0	7.6	12	22.8

¹ This exercise was undertaken at provincial level, and then national level population was obtained by aggregation.

C Derivation of an Expression for Initial Capital Stock

According to perpetual inventory method, the capital stock grows in the following fashion:

$$K_0 = I_1 + (1-\delta) K_{-1} \quad (1)$$

K_0 is the capital stock at the beginning of the year 0; I_1 is gross fixed capital formation in previous year, and K_{-1} is the capital stock at the beginning of the previous year which also grew according to (1), i.e.,

$$K_{-1} = I_2 + (1-\delta) K_{-2} \quad (1a)$$

Replacing K_{-1} from (1a) into (1), we get

$$K_0 = I_1 + (1-\delta) I_2 + (1-\delta)^2 K_{-2} \quad (2)$$

If we continue replacing past capital stocks perpetually, we can obtain

$$K_0 = I_1 + (1-\delta) I_2 + (1-\delta)^2 I_3 + (1-\delta)^3 I_4 + \dots \quad (3)$$

Let investment increase with a constant growth rate (in a steady state), i.e.

$$I_t = (1+g) I_{t-1} = (1+g)^2 I_{t-2} = (1+g)^3 I_{t-3} = (1+g)^4 I_{t-4} = \dots$$

Where g = growth rate of investment. Then (3) becomes

$$K_0 = I_1 (1 + \pi + \pi^2 + \pi^3 + \pi^4 + \dots) \quad (4)$$

Where $\pi = \frac{(1-\delta)}{(1+g)}$

$$K_0 = I_{-1} \left[\frac{1}{1-\pi} \right] = I_{-1} \left[\frac{1+g}{g+\delta} \right] = \frac{(1+g) \cdot I_{-1}}{g+\delta}$$

$$K_0 = \frac{I_0}{g+\delta} \quad (5)$$

D Time Series of National Accounts

Gross Domestic Product - Quarterly (1999-00 prices)

	(Rs million)				
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	207581	257864	235289	245257	945992
1971-72	217403	270121	239212	254551	981286
1972-73	234358	281519	257504	274837	1048217
1973-74	240464	300192	264743	296586	1101984
1974-75	236155	309888	282667	301593	1130304
1975-76	253088	310757	291384	304206	1159436
1976-77	263029	318635	300928	317235	1199828
1977-78	278213	349108	321408	340996	1289724
1978-79	291953	359444	343011	365256	1359664
1979-80	308862	399816	370040	394517	1473236
1980-81	329345	410898	384978	407199	1532420
1981-82	345361	445970	415086	424876	1631293
1982-83	377449	462378	439868	457047	1736742
1983-84	392969	472558	464037	460434	1789998
1984-85	417589	523092	502500	503539	1946721
1985-86	455869	548373	513837	537361	2055440
1986-87	479324	575007	541129	546613	2142073
1987-88	495646	604982	581883	572948	2255461
1988-89	518187	624990	605426	608421	2357024
1989-90	540921	663572	614718	624693	2443904
1990-91	563216	686667	642850	652321	2545054
1991-92	593580	732253	677926	691959	2695718
1992-93	623253	731820	706446	716887	2778407
1993-94	628956	755884	730954	732918	2848712
1994-95	655193	791240	779230	781065	3006727
1995-96	675703	825325	784004	795460	3080492
1996-97	690937	841042	783913	795689	3111582
1997-98	704171	861255	827535	835660	3228622
1998-99	728730	900778	829769	866636	3325913
1999-00	746178	957056	866280	944460	3513973
2000-01	788390	960531	904643	943314	3596878
2001-02	814676	989159	930889	981126	3715850
2002-03	834487	1033004	990289	1031182	3888962
2003-04	906484	1131478	1064147	1073913	4176022
2004-05	1004425	1266870	1148214	1130682	4550191

Gross Value Added of Agriculture - Quarterly
(1999-00 prices)

	(Rs million)				
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	76092	108475	86153	100984	371703
1971-72	80062	114309	85681	105191	385243
1972-73	80808	114805	87188	110148	392949
1973-74	82603	118273	91103	113530	405510
1974-75	80453	115815	88094	111736	396098
1975-76	80052	116680	91378	118420	406530
1976-77	80066	116660	96106	123540	416372
1977-78	85057	123842	97953	119821	426673
1978-79	86954	129075	101076	132107	449212
1979-80	88998	139728	103842	135580	468147
1980-81	89537	144343	110015	142818	486714
1981-82	93370	152846	116324	142470	505010
1982-83	97436	157494	117550	154427	526908
1983-84	96373	148280	119353	144282	508288
1984-85	105660	168261	123820	154229	551970
1985-86	110317	173825	125325	171565	581032
1986-87	116553	183896	130517	160478	591444
1987-88	117426	190255	133901	164750	606332
1988-89	119816	199530	140817	180703	640866
1989-90	124022	205068	143849	184107	657046
1990-91	127985	214485	147851	188158	678479
1991-92	135594	232897	152135	197385	718011
1992-93	129689	212699	150974	197097	690460
1993-94	136572	220259	158929	196364	712124
1994-95	140725	228357	166518	213426	749025
1995-96	146281	245727	169783	216834	778625
1996-97	147020	245727	171718	216611	781075
1997-98	149573	248212	181530	233781	813096
1998-99	154005	254279	186293	230778	825354
1999-00	158150	274219	187966	252813	873148
2000-01	161529	270979	186525	240337	859370
2001-02	159374	275114	192729	237696	864912
2002-03	160675	282049	198295	250411	891430
2003-04	162525	289983	202749	253881	909138
2004-05	177380	318133	205663	276713	977889

Gross Value Added of Major Crops - Quarterly
(1999-00 prices)

	(Rs million)				
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	12881	43928	21669	49873	128352
1971-72	14772	49050	20411	52808	137040
1972-73	14651	49074	20433	56921	141079
1973-74	14768	51066	23461	58781	148076
1974-75	13303	48553	20837	58321	141014
1975-76	12611	48251	23832	65158	149852
1976-77	12361	46750	26717	68951	154779
1977-78	15486	51322	26599	63483	156890
1978-79	14256	52451	25083	72562	164352
1979-80	16083	61410	25756	75423	178672
1980-81	14593	62687	28847	80537	186664
1981-82	15870	67329	31663	78295	193156
1982-83	16964	68654	29654	88087	203359
1983-84	13197	55568	28352	75882	173000
1984-85	20219	72172	29466	83516	205373
1985-86	21613	74615	27552	98130	221911
1986-87	23481	79542	28112	83526	214661
1987-88	23015	85236	29803	86294	224347
1988-89	22642	88711	32736	99724	243813
1989-90	22699	89810	31332	100266	244107
1990-91	24853	96881	32654	102314	256702
1991-92	31470	114253	36009	110722	292454
1992-93	23932	91257	32607	108544	256340
1993-94	23362	93371	35663	104303	256699
1994-95	23877	96791	38944	118311	277923
1995-96	28219	110073	38931	118767	295990
1996-97	26226	106177	36923	115982	285307
1997-98	27476	106230	44346	131858	309910
1998-99	26562	108182	44828	124755	304327
1999-00	32007	123863	41481	144654	342004
2000-01	31145	114875	36342	128552	310914
2001-02	26913	114768	38656	122587	302923
2002-03	27333	118661	41636	133701	321331
2003-04	28426	122564	42676	134941	328607
2004-05	36944	149061	43142	155295	384443

Gross Value Added of Minor Crops - Quarterly
(1999-00 prices)

	(Rs million)				
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	26547	12825	16692	13659	69724
1971-72	28504	13385	17271	14832	73992
1972-73	28554	12773	17534	14685	73546
1973-74	30111	14035	18218	16113	78477
1974-75	29918	14634	18556	15484	78593
1975-76	30598	16107	19303	15830	81838
1976-77	30034	15825	19554	16165	81577
1977-78	30326	15938	19192	16209	81664
1978-79	31178	16617	20456	16821	85072
1979-80	30629	16672	21147	16676	85124
1980-81	30739	17053	21484	16749	86025
1981-82	31879	18479	22817	17189	90365
1982-83	33039	18932	23445	17492	92909
1983-84	33784	19625	23624	17453	94485
1984-85	34057	19795	24076	17697	95624
1985-86	35245	19554	24414	18242	97455
1986-87	36515	20652	25175	18542	100885
1987-88	36423	18946	24710	18535	98615
1988-89	37587	22137	26259	19334	105317
1989-90	39467	23064	27312	19635	109478
1990-91	39569	22612	27449	19834	109463
1991-92	40189	22486	27680	20520	110874
1992-93	40080	22410	27396	20630	110516
1993-94	45767	24887	29496	22241	122392
1994-95	47531	26566	31129	23438	128664
1995-96	46461	27276	31368	24125	129229
1996-97	46882	27427	31874	24228	130411
1997-98	47157	27687	32608	24703	132156
1998-99	50300	28005	33448	26432	138185
1999-00	44539	25720	31933	23488	125680
2000-01	45362	25837	30521	23554	125274
2001-02	43460	24506	29316	22916	120199
2002-03	43037	24380	29240	23252	119910
2003-04	42067	25761	30276	23758	121863
2004-05	47170	24749	30822	25395	128137

Gross Value Added of Livestock - Quarterly
(1999-00 prices)

	(Rs million)				
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	34147	48212	44194	34147	160700
1971-72	34377	48546	44498	34377	161798
1972-73	34572	48863	44780	34572	162787
1973-74	34833	49268	45144	34833	164078
1974-75	35157	49755	45584	35157	165652
1975-76	35551	50331	46108	35551	167541
1976-77	35745	51261	46828	35745	169579
1977-78	36888	53182	48527	36888	175486
1978-79	38123	55236	50346	38123	181827
1979-80	39065	57072	51927	39065	187129
1980-81	40760	59652	54254	40760	195426
1981-82	42109	61972	56297	42109	202488
1982-83	43768	64635	58673	43768	210844
1983-84	45484	67414	61148	45484	219531
1984-85	47308	70359	63773	47308	228748
1985-86	49236	73469	66546	49236	238488
1986-87	52091	77145	69987	52091	251315
1987-88	53358	79261	71860	53358	257836
1988-89	54716	81504	73850	54716	264786
1989-90	56116	83830	75912	56116	271973
1990-91	57533	86221	78024	57533	279311
1991-92	58948	88659	80170	58948	286725
1992-93	60570	91340	82549	60570	295030
1993-94	62299	94173	85066	62299	303837
1994-95	64160	97184	87748	64160	313252
1995-96	67152	101288	91535	67152	327128
1996-97	69105	104507	94392	69105	337108
1997-98	70800	107557	97055	70800	346213
1998-99	72813	110966	100065	72813	356657
1999-00	74872	114493	103172	74872	367409
2000-01	77824	119506	107597	77824	382750
2001-02	81993	125284	112915	81993	402185
2002-03	82974	128200	115278	82974	409427
2003-04	84837	130985	117800	84837	418459
2004-05	87643	135622	121914	87643	432821

Gross Value Added of Fishing - Quarterly
(1999-00 prices)

	(Rs million)				
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	823	1350	1168	1158	4499
1971-72	632	1063	954	921	3570
1972-73	504	874	817	766	2960
1973-74	422	758	739	672	2590
1974-75	436	784	767	696	2683
1975-76	570	1071	1098	964	3703
1976-77	681	1237	1222	1101	4241
1977-78	740	1340	1318	1191	4590
1978-79	781	1435	1437	1282	4934
1979-80	764	1442	1487	1300	4994
1980-81	886	1688	1758	1526	5858
1981-82	937	1783	1854	1612	6185
1982-83	955	1817	1890	1642	6304
1983-84	1071	2057	2158	1864	7150
1984-85	1151	2205	2309	1997	7661
1985-86	1206	2342	2487	2130	8165
1986-87	1264	2477	2652	2259	8652
1987-88	1322	2594	2782	2367	9064
1988-89	1362	2706	2938	2479	9484
1989-90	1472	2923	3172	2677	10244
1990-91	1555	3066	3303	2802	10726
1991-92	1649	3244	3487	2962	11341
1992-93	1789	3462	3662	3146	12060
1993-94	1741	3490	3822	3206	12260
1994-95	1695	3401	3728	3125	11950
1995-96	1830	3751	4191	3467	13239
1996-97	1931	3948	4402	3648	13930
1997-98	1928	3919	4347	3614	13807
1998-99	2116	4303	4776	3969	15164
1999-00	2022	4139	4622	3826	14608
2000-01	2061	4213	4696	3891	14861
2001-02	2099	4298	4800	3973	15170
2002-03	1877	3854	4315	3565	13611
2003-04	1913	3938	4419	3646	13916
2004-05	1946	4013	4510	3717	14185

Gross Value Added of Forestry - Quarterly
(1999-00 prices)

	(Rs million)				
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	1693	2158	2429	2147	8428
1971-72	1777	2265	2549	2253	8843
1972-73	2527	3221	3625	3205	12577
1973-74	2469	3147	3542	3131	12290
1974-75	1638	2089	2350	2078	8156
1975-76	722	921	1036	916	3596
1976-77	1245	1587	1786	1579	6197
1977-78	1616	2060	2318	2049	8043
1978-79	2617	3336	3754	3319	13026
1979-80	2457	3132	3524	3116	12228
1980-81	2560	3263	3672	3247	12741
1981-82	2575	3282	3693	3265	12816
1982-83	2711	3455	3888	3438	13492
1983-84	2837	3617	4070	3598	14123
1984-85	2926	3730	4198	3711	14565
1985-86	3016	3845	4327	3825	15014
1986-87	3200	4080	4591	4059	15930
1987-88	3309	4218	4747	4197	16471
1988-89	3509	4473	5033	4450	17465
1989-90	4268	5440	6122	5413	21243
1990-91	4475	5705	6420	5676	22277
1991-92	3338	4255	4789	4234	16616
1992-93	3318	4229	4760	4208	16515
1993-94	3403	4338	4881	4316	16937
1994-95	3463	4414	4968	4392	17237
1995-96	2619	3339	3758	3322	13039
1996-97	2877	3667	4127	3649	14319
1997-98	2212	2820	3173	2805	11010
1998-99	2214	2823	3176	2808	11022
1999-00	4710	6005	6757	5974	23447
2000-01	5137	6549	7370	6515	25571
2001-02	4909	6258	7042	6226	24436
2002-03	5454	6953	7825	6918	27150
2003-04	5282	6734	7578	6699	26293
2004-05	3677	4688	5275	4664	18304

Gross Value Added of Industry - Quarterly
(1999-00 prices)

	(Rs million)				
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	47749	53725	56194	50516	208185
1971-72	48146	54133	55971	50417	208666
1972-73	52947	59193	61978	55676	229795
1973-74	57026	62784	66694	61052	247555
1974-75	57403	65148	68789	61054	252393
1975-76	60636	66608	71565	63884	262693
1976-77	62106	68495	75366	66718	272685
1977-78	67412	75966	81234	71408	296021
1978-79	70600	77839	85365	75893	309696
1979-80	78013	85258	93030	83110	339412
1980-81	84618	94491	100873	89240	369222
1981-82	93996	104025	111605	98990	408615
1982-83	100221	110602	118748	105164	434735
1983-84	104966	113606	124950	111104	454626
1984-85	115179	127167	139050	124557	505953
1985-86	124743	139937	142198	126994	533872
1986-87	130780	139681	150893	133720	555074
1987-88	134641	149871	166801	143475	594787
1988-89	143157	149018	167794	150925	610894
1989-90	149312	164907	168917	149693	632830
1990-91	155897	166532	180063	160510	663002
1991-92	160687	175161	191663	169685	697196
1992-93	161915	182512	200894	176911	722231
1993-94	167429	186753	204955	179514	738651
1994-95	174217	189969	215156	191220	770562
1995-96	175196	196744	212071	192527	776538
1996-97	180365	196946	207485	183373	768170
1997-98	180193	200885	221773	192653	795504
1998-99	191387	210752	226860	200811	829810
1999-00	191460	220315	228237	210201	850213
2000-01	200776	216639	244060	221161	882635
2001-02	209701	218984	248068	230517	907269
2002-03	210513	230198	267355	242411	950478
2003-04	240965	267983	302502	278943	1090392
2004-05	272102	297656	330758	305587	1206103

Gross Value Added of Mining & Quarrying - Quarterly
(1999-00 prices)

	(Rs million)				
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	2118	2083	2212	2259	8673
1971-72	2159	2123	2255	2303	8840
1972-73	2222	2128	2331	2269	8951
1973-74	2216	2148	2287	2501	9151
1974-75	2214	2267	2329	2327	9137
1975-76	2070	2217	2297	2427	9012
1976-77	2656	2898	3005	2945	11503
1977-78	2876	3107	3070	2954	12007
1978-79	2605	2996	3257	3302	12161
1979-80	2979	3155	3447	3259	12841
1980-81	3251	3676	3731	3496	14154
1981-82	3327	3763	4021	4188	15298
1982-83	3983	4215	4406	4300	16905
1983-84	3896	4381	4418	4672	17367
1984-85	4797	5711	6087	6039	22633
1985-86	7328	7046	7349	7521	29244
1986-87	7311	7824	7778	7791	30703
1987-88	7829	8334	9173	8342	33678
1988-89	8020	8248	8981	9433	34682
1989-90	8980	9830	9773	10053	38636
1990-91	10557	11384	11417	11019	44376
1991-92	10530	10943	11197	10925	43595
1992-93	10160	11228	11631	11091	44109
1993-94	11083	10955	11257	10673	43969
1994-95	9635	11046	11278	11253	43212
1995-96	10539	11619	11967	11602	45728
1996-97	11359	11909	11848	11547	46662
1997-98	11269	11805	11779	11781	46634
1998-99	11431	11640	11796	11295	46162
1999-00	11555	12293	12563	11905	48315
2000-01	12189	12424	10964	13026	48604
2001-02	11990	12666	12729	13864	51249
2002-03	14532	14840	14751	14847	58969
2003-04	14984	15477	14764	16253	61477
2004-05	15753	16379	15845	16940	64917

Gross Value Added of Large-scale Manufacturing - Quarterly
(1999-00 prices)

	(Rs million)				
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	28417	32558	33299	29257	123532
1971-72	28286	32409	33137	29117	122950
1972-73	30885	35386	36179	31783	134233
1973-74	32764	37520	38384	33707	142375
1974-75	32233	36917	37802	33213	140165
1975-76	32047	36744	37550	33010	139351
1976-77	31353	35931	36682	32245	136210
1977-78	34484	39506	40387	35443	149820
1978-79	35544	40601	41658	36514	154317
1979-80	39208	44932	46225	40717	171083
1980-81	44212	50979	51575	45464	192230
1981-82	50652	57902	58816	51685	219055
1982-83	54561	62407	64243	55909	237120
1983-84	56022	63050	65875	57397	242345
1984-85	61311	71432	74490	67213	274446
1985-86	65383	77658	72298	63982	279321
1986-87	67720	74158	76869	66503	285250
1987-88	67720	77694	85415	70898	301727
1988-89	70260	72799	82081	71926	297066
1989-90	71953	81689	76142	67453	297236
1990-91	71953	76065	78778	69721	296517
1991-92	71577	79377	83556	74492	309002
1992-93	70014	81128	85040	74599	310780
1993-94	70125	79455	83536	75072	308187
1994-95	70395	79006	85558	78296	313255
1995-96	73319	85883	88776	81340	329319
1996-97	74533	81546	83115	73104	312298
1997-98	72270	82235	90098	78392	322996
1998-99	74776	83522	92104	81502	331903
1999-00	75877	88595	89560	84569	338602
2000-01	85184	92317	104062	94124	375687
2001-02	89516	92133	106984	100226	388859
2002-03	92262	99537	118639	106517	416955
2003-04	106438	119598	138823	127774	492632
2004-05	127343	139577	157469	144936	569325

Gross Value Added of Small-scale Manufacturing - Quarterly
(1999-00 prices)

	(Rs million)				
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	4455	4781	4786	4510	18531
1971-72	4780	5130	5135	4839	19884
1972-73	5130	5505	5510	5191	21336
1973-74	5505	5906	5913	5568	22893
1974-75	5903	6335	6345	5981	24564
1975-76	6335	6802	6806	6415	26358
1976-77	6802	7299	7299	6881	28282
1977-78	7374	7912	7920	7452	30657
1978-79	7997	8571	8594	8070	33232
1979-80	8632	9268	9303	8822	36024
1980-81	9386	10111	10067	9486	39050
1981-82	10221	10932	10901	10275	42330
1982-83	11039	11836	11909	11102	45886
1983-84	11999	12793	12926	12022	49740
1984-85	12639	13693	13830	13757	53919
1985-86	14269	15622	14938	13618	58448
1986-87	15648	16153	16229	15328	63357
1987-88	16215	17608	18515	16341	68679
1988-89	17690	18329	18913	17394	72326
1989-90	18649	20301	19735	17483	76167
1990-91	19464	20576	21310	18860	80211
1991-92	19567	21699	22841	20364	84470
1992-93	20040	23221	24341	21353	88956
1993-94	21316	24152	25392	22819	93679
1994-95	22170	24881	26945	24658	98654
1995-96	23130	27094	28007	25661	103892
1996-97	26111	28569	29118	25611	109409
1997-98	25780	29335	32140	27964	115219
1998-99	27739	30983	34167	30234	123123
1999-00	29663	34634	35012	33061	132369
2000-01	32268	34970	39419	35654	142310
2001-02	35220	36250	42093	39434	152997
2002-03	36397	39267	46803	42021	164487
2003-04	38208	42932	49833	45867	176841
2004-05	42525	46610	52586	48400	190121

Gross Value Added of Slaughtering - Quarterly
(1999-00 prices)

	(Rs million)				
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	3379	4693	6571	4130	18773
1971-72	3797	5273	7382	4640	21092
1972-73	4307	5982	8375	5264	23930
1973-74	4857	6746	9444	5936	26983
1974-75	5393	7490	10486	6591	29960
1975-76	5985	8312	11637	7315	33248
1976-77	7135	9910	13874	8721	39641
1977-78	7551	10488	14683	9229	41950
1978-79	7957	11052	15472	9726	44207
1979-80	8363	11615	16262	10222	46462
1980-81	8816	12244	17142	10775	48976
1981-82	9229	12818	17945	11280	51272
1982-83	9716	13494	18892	11875	53976
1983-84	10439	14499	20299	12759	57996
1984-85	11236	15605	21847	13732	62420
1985-86	12038	16719	23406	14713	66875
1986-87	11653	16185	22659	14243	64741
1987-88	12732	17683	24756	15561	70731
1988-89	13927	19343	27081	17022	77373
1989-90	15049	20901	29261	18393	83603
1990-91	16275	22604	31646	19892	90417
1991-92	17690	24569	34397	21621	98276
1992-93	19466	27037	37851	23792	108147
1993-94	21111	29321	41049	25803	117284
1994-95	22659	31471	44059	27694	125884
1995-96	17137	23801	33321	20945	95204
1996-97	17809	24735	34629	21767	98941
1997-98	17982	24975	34965	21978	99899
1998-99	18609	25847	36185	22745	103386
1999-00	18704	25978	36369	22860	103910
2000-01	19447	27009	37813	23768	108037
2001-02	20156	27995	39192	24635	111979
2002-03	20910	29041	40658	25556	116164
2003-04	21740	30194	42271	26571	120775
2004-05	21850	30348	42487	26706	121390

Gross Value Added of Construction - Quarterly
(1999-00 prices)

	(Rs million)				
	Jul-Sep	Oct-Dec	Jan-Feb	Mar-Apr	Annual
1970-71	5454	5454	5345	5311	21563
1971-72	5014	4851	3909	4263	18037
1972-73	5697	5217	4823	5140	20877
1973-74	6323	4859	5313	6657	23151
1974-75	6738	6942	6908	6738	27327
1975-76	9038	7055	8082	8133	32308
1976-77	8363	6369	8727	8696	32154
1977-78	8891	8426	8974	8591	34882
1978-79	9774	7622	9737	10032	37165
1979-80	11442	8644	10530	11130	41747
1980-81	10778	9033	10311	10219	40341
1981-82	12305	10085	11815	11652	45857
1982-83	12218	9697	10792	11544	44251
1983-84	12969	9046	12103	12854	46972
1984-85	15266	10573	13181	12048	51068
1985-86	14806	11791	13684	14361	54642
1986-87	16451	13174	15780	15856	61261
1987-88	16571	14884	15981	16652	64087
1988-89	18088	15089	16307	17769	67253
1989-90	17339	14828	17489	16631	66287
1990-91	18429	16684	18589	19353	73055
1991-92	20457	17745	19801	18868	76871
1992-93	20108	17837	20986	21301	80233
1993-94	20802	19852	21832	19272	81758
1994-95	22947	17293	22313	19886	82440
1995-96	22215	19734	22761	20988	85698
1996-97	22316	22099	22063	19924	86402
1997-98	22375	22254	23989	18719	87336
1998-99	23517	23913	19438	16221	83089
1999-00	21073	24545	22171	19600	87390
2000-01	22213	20384	23860	21576	88031
2001-02	25211	22278	20898	21437	89823
2002-03	21833	22749	23133	25759	93473
2003-04	21334	21349	20476	19485	82644
2004-05	25060	24986	24798	24140	98983

Gross Value Added of Electricity, Gas & Water Supply - Quarterly
(1999-00 prices)

	(Rs million)				
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	3926	4156	3981	5049	17113
1971-72	4109	4346	4153	5255	17863
1972-73	4706	4975	4759	6028	20469
1973-74	5361	5605	5353	6682	23001
1974-75	4920	5197	4919	6203	21239
1975-76	5162	5477	5193	6584	22417
1976-77	5797	6088	5778	7231	24894
1977-78	6236	6528	6201	7739	26704
1978-79	6722	6996	6647	8250	28615
1979-80	7389	7644	7263	8960	31256
1980-81	8176	8448	8048	9800	34472
1981-82	8262	8525	8106	9909	34802
1982-83	8704	8952	8507	10434	36597
1983-84	9640	9837	9329	11399	40206
1984-85	9931	10153	9616	11767	41467
1985-86	10919	11101	10522	12800	45342
1986-87	11997	12188	11578	13999	49762
1987-88	13574	13667	12962	15681	55884
1988-89	15172	15209	14431	17381	62193
1989-90	17343	17360	16517	19680	70900
1990-91	19219	19218	18323	21665	78425
1991-92	20867	20828	19872	23415	84981
1992-93	22126	22061	21045	24774	90005
1993-94	22992	23019	21887	25875	93774
1994-95	26412	26271	25002	29433	107117
1995-96	28855	28613	27238	31991	116697
1996-97	28236	28089	26712	31421	114457
1997-98	30517	30282	28803	33818	123420
1998-99	35316	34847	33171	38813	142148
1999-00	34588	34270	32563	38206	139627
2000-01	29476	29535	27942	33013	119966
2001-02	27607	27663	26171	30920	112362
2002-03	24580	24765	23374	27710	100429
2003-04	38262	38433	36335	42994	156024
2004-05	39571	39756	37573	44465	161366

Gross Value Added of Services - Quarterly

(1999-00 prices)

(Rs million)

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	83741	95664	92943	93756	366104
1971-72	89195	101679	97560	98943	387377
1972-73	100603	107520	108338	109013	425473
1973-74	100835	119135	106946	122004	448920
1974-75	98300	128926	125784	128803	481813
1975-76	112400	127469	128440	121903	490212
1976-77	120856	133481	129456	126977	510770
1977-78	125744	149300	142220	149766	567030
1978-79	134399	152530	156570	157255	600755
1979-80	141851	174830	173169	175827	665677
1980-81	155189	172064	174089	175141	676484
1981-82	157996	189099	187157	183417	717668
1982-83	179792	194281	203570	197456	775099
1983-84	191630	210672	219733	205048	827084
1984-85	196750	227665	239630	224753	888797
1985-86	220810	234611	246313	238802	940536
1986-87	231991	251430	259719	252416	995556
1987-88	243579	264857	281181	264724	1054341
1988-89	255214	276442	296815	276794	1105264
1989-90	267586	293596	301951	290893	1154027
1990-91	279334	305651	314936	303652	1203572
1991-92	297298	324195	334128	324889	1280511
1992-93	331649	336609	354578	342879	1365715
1993-94	324955	348872	367070	357039	1397936
1994-95	340250	372914	397556	376419	1487140
1995-96	354226	382854	402151	386098	1525329
1996-97	363552	398369	404710	395705	1562337
1997-98	374406	412158	424232	409226	1620021
1998-99	383338	435747	416615	435048	1670748
1999-00	396568	462521	450076	481446	1790612
2000-01	426086	472912	474058	481816	1854872
2001-02	445601	495062	490092	512914	1943668
2002-03	463298	520757	524639	538360	2047054
2003-04	502995	573513	558896	541089	2176492
2004-05	554942	651082	611794	548382	2366199

Gross Value Added of Trade, and Hotels & Restaurants - Quarterly
(1999-00 prices)

(Rs million)

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	36633	42725	43826	41742	164927
1971-72	38951	45358	45836	44434	174578
1972-73	42887	49773	51774	50647	195082
1973-74	44080	51816	57082	55500	208478
1974-75	45964	54148	56885	55404	212401
1975-76	46616	52835	55985	53966	209403
1976-77	45319	54279	58179	55616	213393
1977-78	48690	58128	61991	60680	229489
1978-79	52192	63474	68466	65888	250021
1979-80	57485	66494	71107	70956	266042
1980-81	61592	71942	75072	73469	282074
1981-82	64417	77638	80534	79498	302087
1982-83	69225	83638	86069	83549	322481
1983-84	71248	84316	91082	86539	333184
1984-85	80109	92949	97445	96162	366665
1985-86	84355	98447	100377	98583	381762
1986-87	86780	102836	104848	101765	396229
1987-88	87994	106981	112350	105361	412685
1988-89	89000	109950	118636	110822	428408
1989-90	92992	115920	118336	111281	438529
1990-91	94094	118921	121198	113738	447951
1991-92	105306	127555	131554	122501	486916
1992-93	106381	131431	136087	127830	501729
1993-94	110649	130185	137777	128769	507381
1994-95	112393	136246	143835	139279	531752
1995-96	116306	146073	149419	145581	557379
1996-97	121225	152299	150283	142701	566508
1997-98	119655	149902	154003	147718	571278
1998-99	121270	151359	156457	150277	579364
1999-00	126473	159363	161537	157401	604773
2000-01	135162	161868	172371	165415	634815
2001-02	140473	163495	176898	172431	653297
2002-03	144195	174839	192335	180398	691768
2003-04	156703	190626	206790	203786	757906
2004-05	177714	215219	233994	228402	855329

Gross Value Added of Transport, Storage and Communication - Quarterly
(1999-00 prices)

(Rs million)

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	11561	11778	12010	12257	47607
1971-72	12498	12734	12983	13248	51463
1972-73	13583	13911	14064	14040	55598
1973-74	13922	13877	14062	14477	56339
1974-75	14837	15105	15513	16061	61517
1975-76	16672	17224	17626	17877	69398
1976-77	18042	18269	18708	19360	74378
1977-78	20017	20587	21150	21704	83458
1978-79	22210	22720	23350	24100	92381
1979-80	24961	25769	26310	26581	103621
1980-81	26867	27260	27615	27929	109671
1981-82	28162	28413	28865	29518	114958
1982-83	30026	30457	31247	32398	124127
1983-84	33610	34676	35596	36373	140255
1984-85	37127	37942	38804	39716	153590
1985-86	40694	41650	42445	43081	167869
1986-87	43596	44179	45055	46224	179055
1987-88	47455	48567	49530	50345	195897
1988-89	51215	52144	52933	53581	209873
1989-90	54172	54821	55607	56529	221129
1990-91	57639	58688	59280	59415	235022
1991-92	59151	59081	59985	61863	240079
1992-93	63790	65321	66754	68090	263955
1993-94	69449	70846	72187	73471	285953
1994-95	75077	76698	77526	77561	306863
1995-96	77114	76999	78055	80282	312450
1996-97	82640	84521	86105	87395	340661
1997-98	88986	90691	91643	91843	363163
1998-99	91576	91626	92808	95122	371132
1999-00	97607	99628	101256	102491	400981
2000-01	104036	105733	106656	106803	423227
2001-02	106703	106922	107735	109141	430501
2002-03	110535	111690	112886	114125	449236
2003-04	124708	135465	121426	82592	464191
2004-05	129440	140859	126353	85922	482574

Gross Value Added of Finance and Insurance - Quarterly
(1999-00 prices)

(Rs million)

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	7076	12452	7707	10099	37334
1971-72	7648	13240	7657	9897	38443
1972-73	11595	11030	8871	10393	41889
1973-74	7502	17822	-743	15156	39737
1974-75	-3270	18591	11152	14756	41229
1975-76	7443	15374	11694	6689	41199
1976-77	13542	16791	7197	6071	43602
1977-78	9135	22171	9257	17184	57748
1978-79	9400	15452	12274	13912	51038
1979-80	4683	26915	18524	20999	71122
1980-81	8149	14109	11123	12969	46351
1981-82	4882	22123	15132	11184	53322
1982-83	15492	14608	18760	13380	62239
1983-84	17204	21526	20808	9169	68708
1984-85	6311	22882	27304	12090	68586
1985-86	18138	16225	22872	15649	72885
1986-87	18994	20941	23899	17771	81605
1987-88	20956	21388	28881	17778	89004
1988-89	21905	20437	28695	15079	86116
1989-90	23136	24823	27261	21452	96672
1990-91	25734	25398	28872	23734	103737
1991-92	25763	29356	31310	28247	114676
1992-93	49202	26576	35339	29465	140582
1993-94	27825	29767	35804	32268	125664
1994-95	29690	35612	48604	31106	145012
1995-96	32376	30526	42033	26095	131030
1996-97	25555	26094	29165	24924	105739
1997-98	24838	29160	32359	21916	108272
1998-99	22418	43238	13839	34374	113869
1999-00	13199	42498	22009	54747	132453
2000-01	20065	37003	22379	35009	114455
2001-02	20880	45310	21384	45187	132761
2002-03	18385	41915	22236	45068	127604
2003-04	22366	46596	24909	46895	140766
2004-05	27906	60681	31061	62251	181899

Gross Value Added of Ownership of Dwelling - Quarterly
(1999-00 prices)

(Rs Million)

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	6014	6090	6169	6251	24523
1971-72	6332	6412	6495	6582	25822
1972-73	6668	6752	6840	6931	27191
1973-74	7021	7110	7202	7299	28632
1974-75	7394	7487	7584	7686	30151
1975-76	7786	7884	7987	8094	31750
1976-77	8199	8302	8411	8523	33435
1977-78	8634	8743	8857	8976	35210
1978-79	9093	9207	9327	9453	37080
1979-80	9576	9697	9823	9955	39050
1980-81	10085	10212	10345	10484	41126
1981-82	10621	10755	10895	11042	43312
1982-83	11185	11327	11475	11629	45616
1983-84	11781	11930	12085	12248	48044
1984-85	12408	12565	12729	12900	50601
1985-86	13068	13234	13407	13587	53296
1986-87	13764	13939	14121	14311	56135
1987-88	14498	14681	14873	15074	59126
1988-89	15271	15464	15666	15878	62279
1989-90	16085	16289	16502	16725	65601
1990-91	16943	17158	17383	17617	69101
1991-92	17847	18074	18311	18558	72789
1992-93	18800	19039	19288	19549	76676
1993-94	19804	20056	20319	20593	80772
1994-95	20863	21128	21405	21694	85089
1995-96	21978	22257	22549	22854	89639
1996-97	23153	23448	23755	24077	94433
1997-98	24392	24702	25027	25365	99486
1998-99	25698	26025	26366	26723	104812
1999-00	27074	27418	27779	28155	110425
2000-01	28524	28887	29267	29663	116341
2001-02	30053	30435	30836	31253	122577
2002-03	31664	32067	32489	32930	129150
2003-04	33362	33787	34232	34696	136078
2004-05	38325	41870	37618	25568	143381

Gross Value Added of Public Administration & Defence - Quarterly
(1999-00 prices)

	(Rs million)				
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	9102	9102	9544	9544	37293
1971-72	9731	9731	10204	10204	39870
1972-73	11106	11106	11644	11644	45499
1973-74	12749	12749	13367	13367	52230
1974-75	16944	16944	17767	17767	69423
1975-76	16481	16481	17280	17280	67523
1976-77	17704	17704	18561	18561	72531
1977-78	19946	19946	20911	20911	81712
1978-79	21055	21055	22072	22072	86255
1979-80	22387	22387	23467	23467	91708
1980-81	24764	24764	25957	25957	101442
1981-82	25262	25262	26473	26473	103471
1982-83	27735	27735	29067	29067	113604
1983-84	29898	29898	31336	31336	122467
1984-85	30851	30851	32334	32334	126371
1985-86	32505	32505	34066	34066	133141
1986-87	34304	34304	35951	35951	140510
1987-88	35744	35744	37459	37459	146405
1988-89	38480	38480	40331	40331	157621
1989-90	39573	39573	41474	41474	162093
1990-91	40908	40908	42872	42872	167561
1991-92	41980	41980	43995	43995	171949
1992-93	43012	43012	45076	45076	176178
1993-94	43557	43557	45650	45650	178414
1994-95	44900	44900	47059	47059	183918
1995-96	46271	46271	48498	48498	189539
1996-97	47031	47031	49307	49307	192677
1997-98	48027	48027	50350	50350	196754
1998-99	49216	49216	51596	51596	201623
1999-00	53805	53805	56409	56409	220429
2000-01	54985	54985	57619	57619	225207
2001-02	58694	58694	61499	61499	240386
2002-03	63335	63335	66345	66345	259359
2003-04	65298	65298	68416	68416	267427
2004-05	65647	65647	68778	68778	268849

Gross Value Added of Social, Community & Personal Services**Quarterly**

(1999-00 prices)

(Rs million)

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	13354	13517	13686	13863	54420
1971-72	14035	14204	14385	14578	57201
1972-73	14765	14948	15145	15356	60214
1973-74	15561	15761	15976	16206	63503
1974-75	16431	16650	16882	17128	67092
1975-76	17402	17671	17869	17997	70939
1976-77	18051	18135	18400	18845	73431
1977-78	19322	19725	20055	20311	79413
1978-79	20449	20620	21080	21830	83980
1979-80	22759	23568	23938	23869	94134
1980-81	23734	23777	23977	24332	95820
1981-82	24651	24907	25257	25702	100517
1982-83	26129	26518	26952	27432	107031
1983-84	27889	28327	28826	29384	114425
1984-85	29943	30477	31013	31551	122984
1985-86	32051	32551	33146	33836	131584
1986-87	34553	35230	35844	36394	142021
1987-88	36932	37496	38088	38708	151223
1988-89	39343	39967	40554	41104	160967
1989-90	41629	42170	42771	43433	170004
1990-91	44016	44578	45331	46276	180201
1991-92	47252	48149	48974	49726	194101
1992-93	50464	51231	52032	52868	206595
1993-94	53671	54461	55333	56288	219752
1994-95	57327	58330	59128	59721	234506
1995-96	60181	60727	61596	62788	245293
1996-97	63947	64976	66094	67301	262320
1997-98	68507	69676	70851	72034	281068
1998-99	73160	74284	75549	76955	299947
1999-00	78411	79809	81087	82244	321551
2000-01	83315	84436	85768	87308	340826
2001-02	88799	90205	91740	93403	364147
2002-03	95184	96911	98348	99495	389937
2003-04	100558	101740	103123	104704	410125
2004-05	115910	126806	113990	77461	434167

Gross Domestic Product - Quarterly

(current prices)

(Rs million)

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	14036	17176	15866	17037	64114
1971-72	15448	19272	17349	18917	70986
1972-73	17975	21906	20951	24152	84984
1973-74	23643	31112	27984	33831	116570
1974-75	30274	40663	38168	42826	151931
1975-76	37082	46094	43710	47100	173986
1976-77	42740	52293	50547	53695	199275
1977-78	48350	58813	54971	58173	220306
1978-79	52508	63691	61919	67601	245719
1979-80	61017	77013	72616	80356	291002
1980-81	70872	89469	85428	94306	340075
1981-82	84341	107731	101414	105236	398721
1982-83	96629	117700	113244	120012	447586
1983-84	109804	131825	134455	132299	508383
1984-85	124732	153085	147338	148963	574118
1985-86	141775	168227	159797	166326	636124
1986-87	154111	184758	178087	182558	699515
1987-88	176156	210887	206889	206336	800268
1988-89	201395	238033	235042	241026	915496
1989-90	222619	268656	253624	263104	1008002
1990-91	258310	314227	304442	315550	1192528
1991-92	301164	367014	347155	360413	1375746
1992-93	336672	392586	388186	398043	1515488
1993-94	367837	447234	455273	483045	1753388
1994-95	436317	540065	550017	557242	2083640
1995-96	498591	621569	609168	631989	2361317
1996-97	566517	706195	691109	709948	2673769
1997-98	630145	786402	757635	776764	2950946
1998-99	690938	867930	808401	1023326	3390595
1999-00	733524	946578	868494	968377	3516973
2000-01	832719	1034602	981901	1025742	3874963
2001-02	895567	1076264	1020694	1087545	4080070
2002-03	941682	1170450	1147704	1199550	4459386
2003-04	1071669	1387905	1333014	1372437	5165025
2004-05	959471	1221655	1151602	1241568	4574296

Gross Value Added of Agriculture - Quarterly
(at current prices)

(Rs million)

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	5735	7576	6102	7455	26868
1971-72	6214	8664	6663	8362	29902
1972-73	6596	9316	7481	10744	34137
1973-74	9048	13340	10778	14472	47637
1974-75	11285	16169	13090	17153	57696
1975-76	12842	18394	14880	19668	65785
1976-77	14812	20766	17744	22442	75763
1977-78	16906	23322	19330	22929	82487
1978-79	17685	25149	20670	27098	90602
1979-80	20414	28845	21955	29461	100675
1980-81	21597	33245	26533	36276	117652
1981-82	26985	40284	32444	39584	139297
1982-83	29727	44179	34623	44625	153155
1983-84	32528	45633	38073	46408	162642
1984-85	38486	54560	42014	50238	185298
1985-86	40036	57262	43862	56563	197721
1986-87	43436	62781	48444	58040	212701
1987-88	50302	71037	54551	64856	240747
1988-89	57458	82110	62954	78559	281081
1989-90	61175	88664	67107	83891	300837
1990-91	68845	102415	77567	97376	346203
1991-92	79189	121409	85803	110479	396880
1992-93	82745	122281	93936	118022	416985
1993-94	92957	138280	112145	145579	488961
1994-95	106985	169060	133341	168919	578305
1995-96	123309	195324	142316	183504	644453
1996-97	132751	213096	159129	203714	708691
1997-98	141554	240978	175114	227273	784919
1998-99	151227	251816	189327	326678	919048
1999-00	156181	269020	189289	258657	873148
2000-01	163499	282618	195061	248162	889340
2001-02	162068	285529	201510	245725	894832
2002-03	167049	302117	213678	276246	959090
2003-04	175356	342315	238392	313743	1069806
2004-05	200742	370075	241970	334867	1147654

Gross Value Added of Major Crops - Quarterly
(at current prices)

(Rs million)

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	852	2979	1506	3452	8790
1971-72	1048	3515	1610	4046	10219
1972-73	1124	3979	1882	5594	12580
1973-74	1538	5580	2612	6634	16364
1974-75	1545	6288	2884	8580	19298
1975-76	1860	6949	3501	9637	21948
1976-77	1825	7251	4290	11030	24396
1977-78	2528	8806	4892	11187	27413
1978-79	2530	9629	4738	13519	30416
1979-80	3063	11983	5139	14992	35177
1980-81	2729	13206	6255	18172	40362
1981-82	3746	16283	7767	19352	47148
1982-83	4177	17272	7467	22248	51164
1983-84	3303	14797	7680	20587	46367
1984-85	5749	19536	8107	23004	56396
1985-86	5923	20802	7760	27416	61901
1986-87	6334	22527	7994	24558	61412
1987-88	7025	25431	9030	27294	68781
1988-89	7142	28757	10541	35449	81888
1989-90	8118	31546	11307	37259	88230
1990-91	9293	37989	12879	43671	103831
1991-92	13902	51162	16401	53023	134489
1992-93	11702	44427	16384	54854	127368
1993-94	10963	47790	21267	70668	150689
1994-95	15037	65223	27857	85816	193933
1995-96	20429	80179	28583	91847	221038
1996-97	19890	86066	31658	107850	245464
1997-98	25553	104656	43639	126668	300516
1998-99	27107	108238	46912	127331	309588
1999-00	32085	118848	41603	149468	342004
2000-01	31113	123454	38928	134932	328426
2001-02	27025	120335	40212	125482	313054
2002-03	29170	132562	47175	150302	359209
2003-04	30988	156657	56112	172881	416638
2004-05	45715	180917	55355	197478	479464

Gross Value Added of Minor Crops - Quarterly
(at current prices)

(Rs million)

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-June	Annual
1970-71	2046	937	1043	906	4931
1971-72	2000	953	1134	1010	5097
1972-73	2047	940	1395	1288	5670
1973-74	3267	1857	2027	2141	9293
1974-75	4021	1939	2353	2067	10380
1975-76	4407	2389	2703	2471	11969
1976-77	4885	2473	3083	2694	13136
1977-78	5477	2702	3115	2600	13894
1978-79	5750	3047	3962	3419	16178
1979-80	6539	2979	3829	3113	16461
1980-81	6402	3731	4665	4386	19185
1981-82	8945	5239	6071	4659	24914
1982-83	9307	5078	6157	4919	25461
1983-84	10909	6778	7383	6034	31105
1984-85	12456	6880	7938	5949	33224
1985-86	12276	6512	7887	5957	32632
1986-87	12952	7413	8411	6542	35319
1987-88	15401	7499	9081	7724	39705
1988-89	18287	10719	11805	8571	49381
1989-90	16897	9718	10765	8827	46208
1990-91	20925	12543	14204	10694	58366
1991-92	22575	12474	14319	10691	60060
1992-93	24270	13625	16804	12001	66700
1993-94	29426	17757	21138	15416	83737
1994-95	32513	19699	25347	17564	95124
1995-96	38169	21593	23210	18763	101736
1996-97	41689	21896	28698	20393	112675
1997-98	42763	26012	28990	23364	121129
1998-99	49555	28461	35266	26363	139645
1999-00	42784	24939	33015	24942	125680
2000-01	47312	27939	35477	25357	136085
2001-02	46311	26963	33491	27126	133891
2002-03	46317	27591	33980	26455	134343
2003-04	48050	33817	41788	31243	154898
2004-05	57612	30195	39918	32430	160155

Gross Value Added of Livestock - Quarterly
(at current prices)

(Rs million)

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	2774	3564	3445	2988	12771
1971-72	3079	4084	3765	3155	14084
1972-73	3282	4201	3974	3666	15124
1973-74	4095	5648	5732	5341	20816
1974-75	5543	7691	7547	6265	27046
1975-76	6461	8866	8484	7394	31205
1976-77	7918	10769	10087	8451	37225
1977-78	8654	11377	10825	8721	39577
1978-79	8952	11823	11148	9461	41384
1979-80	10326	13155	12153	10576	46210
1980-81	11822	15351	14526	12679	54378
1981-82	13454	17558	17240	14392	62644
1982-83	15307	20472	19453	16132	71364
1983-84	17209	22491	21219	18246	79166
1984-85	19115	26446	24008	19572	89140
1985-86	20553	28061	26033	21315	95962
1986-87	22799	30673	29568	24835	107874
1987-88	26344	35731	33709	27532	123316
1988-89	30291	39924	37448	31857	139520
1989-90	33851	43970	41046	34342	153209
1990-91	35984	47947	45885	38997	168812
1991-92	40235	54047	50850	42997	188129
1992-93	44126	60055	55988	47325	207494
1993-94	49618	68397	64303	54734	237052
1994-95	56166	78888	73622	60518	269194
1995-96	61729	88343	84473	67644	302188
1996-97	67372	98750	91516	69075	326712
1997-98	69656	104230	95308	71180	340375
1998-99	70617	108266	99432	166487	444803
1999-00	74654	115256	103224	74275	367409
2000-01	77685	120264	108224	77123	383295
2001-02	81332	126823	114924	82024	405103
2002-03	83699	130295	119268	87973	421235
2003-04	88638	140157	127443	98179	454416
2004-05	91008	149372	135690	94747	470817

Gross Value Added of Fishing - Quarterly
(at current prices)

(Rs million)

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	22	37	34	35	128
1971-72	20	36	40	40	136
1972-73	14	35	49	44	142
1973-74	25	46	63	40	174
1974-75	28	64	66	46	203
1975-76	45	102	90	75	312
1976-77	58	116	110	107	390
1977-78	64	138	159	121	481
1978-79	75	157	177	103	513
1979-80	77	184	207	195	662
1980-81	138	283	334	234	990
1981-82	160	334	362	289	1144
1982-83	176	363	418	328	1285
1983-84	268	451	489	395	1603
1984-85	238	516	573	488	1816
1985-86	293	605	732	627	2257
1986-87	297	784	893	726	2700
1987-88	407	902	1011	800	3120
1988-89	468	1040	1199	924	3631
1989-90	561	1164	1379	1100	4205
1990-91	672	1273	1438	1224	4607
1991-92	782	1509	1658	1418	5367
1992-93	785	1723	1945	1402	5855
1993-94	803	1576	2241	1892	6512
1994-95	959	2278	3048	1912	8197
1995-96	1119	2765	3222	2742	9849
1996-97	1505	3383	3735	3146	11769
1997-98	1608	3516	4243	3415	12781
1998-99	1879	4160	4661	3769	14470
1999-00	2005	4038	4638	3928	14608
2000-01	2162	4235	4783	3910	15091
2001-02	2244	4834	5438	4515	17030
2002-03	2151	4227	4702	3774	14854
2003-04	2167	4343	4482	3494	14486
2004-05	1938	3840	4524	4132	14434

Gross Value Added of Forestry - Quarterly
(at current prices)

	(Rs million)				
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	41	59	74	73	248
1971-72	68	75	113	110	366
1972-73	128	160	182	152	622
1973-74	122	209	344	315	990
1974-75	148	187	239	195	769
1975-76	70	88	102	91	351
1976-77	125	157	174	160	616
1977-78	184	300	339	301	1123
1978-79	377	493	645	595	2111
1979-80	409	545	627	585	2165
1980-81	506	674	753	804	2737
1981-82	679	871	1005	891	3446
1982-83	760	994	1128	998	3881
1983-84	839	1115	1302	1146	4402
1984-85	927	1182	1387	1225	4721
1985-86	990	1281	1450	1248	4969
1986-87	1054	1384	1578	1379	5395
1987-88	1125	1474	1721	1507	5826
1988-89	1270	1671	1961	1759	6661
1989-90	1748	2266	2609	2363	8986
1990-91	1972	2663	3161	2790	10586
1991-92	1694	2217	2574	2349	8835
1992-93	1863	2451	2815	2440	9569
1993-94	2148	2760	3195	2869	10971
1994-95	2309	2971	3466	3109	11856
1995-96	1862	2444	2828	2508	9643
1996-97	2295	3002	3522	3251	12069
1997-98	1974	2564	2933	2647	10118
1998-99	2069	2690	3057	2727	10543
1999-00	4653	5940	6809	6044	23447
2000-01	5227	6727	7649	6840	26443
2001-02	5157	6574	7446	6578	25754
2002-03	5711	7441	8553	7742	29448
2003-04	5513	7342	8567	7946	29368
2004-05	4470	5751	6484	6080	22784

Gross Value Added of Industry
(at current prices)

(Rs million)

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	3221	3689	3947	3632	14488
1971-72	3573	4018	4160	3769	15520
1972-73	4234	4829	5295	4908	19266
1973-74	5225	6278	7003	7047	25553
1974-75	7910	9231	9641	9137	35919
1975-76	9417	10430	11483	10520	41850
1976-77	10596	11848	13255	11904	47603
1977-78	11978	12301	13248	11564	49092
1978-79	12853	13358	14946	13501	54657
1979-80	14901	16302	18442	17334	66979
1980-81	17843	20345	21816	19562	79566
1981-82	21229	23381	25099	22550	92258
1982-83	23471	26337	28625	26182	104615
1983-84	27563	30062	37295	30031	124951
1984-85	31895	35078	38060	34876	139908
1985-86	36615	41124	42028	37832	157599
1986-87	40055	43756	48109	43722	175642
1987-88	45655	51497	57525	50278	204954
1988-89	53096	55996	64051	58816	231959
1989-90	59641	66995	69328	63034	258998
1990-91	69641	77026	85678	78462	310807
1991-92	80931	88813	98536	87583	355863
1992-93	84141	96071	107893	95749	383853
1993-94	93490	106807	124101	116409	440808
1994-95	113277	126506	147980	131629	519392
1995-96	126284	149359	166497	153826	595967
1996-97	148081	169450	187452	164184	669167
1997-98	161738	181510	203512	179187	725947
1998-99	181305	201431	219128	274476	876338
1999-00	187986	220030	228593	213604	850213
2000-01	211110	233731	263766	242500	951107
2001-02	233591	238987	269386	256846	998810
2002-03	240023	263701	315414	287778	1106916
2003-04	297208	340167	399285	374468	1411129
2004-05	371808	404596	463649	427213	1667266

Gross Value Added of Mining & Quarrying - Quarterly
(at current prices)

	(Rs million)				
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	65	63	68	71	267
1971-72	68	67	71	73	280
1972-73	96	98	114	111	418
1973-74	106	109	130	148	493
1974-75	133	140	199	229	700
1975-76	203	219	228	273	923
1976-77	299	327	339	333	1299
1977-78	326	328	324	313	1291
1978-79	266	311	350	355	1281
1979-80	372	392	500	486	1750
1980-81	511	595	613	558	2278
1981-82	532	607	714	747	2600
1982-83	687	727	882	902	3198
1983-84	862	967	975	1083	3887
1984-85	1206	1436	1468	1718	5829
1985-86	2471	2376	2478	2526	9850
1986-87	2766	3012	2999	3004	11780
1987-88	3602	3835	4218	3830	15485
1988-89	3566	3696	4024	4227	15513
1989-90	3957	4351	4326	4532	17167
1990-91	4591	5126	5193	5514	20425
1991-92	5196	5400	5526	5391	21512
1992-93	4955	5476	5694	5464	21589
1993-94	5699	5920	6084	5768	23471
1994-95	5409	6238	6445	6719	24810
1995-96	6980	7782	8027	7847	30636
1996-97	7377	8287	10145	9895	35704
1997-98	9499	9954	9935	10037	39426
1998-99	9654	9836	9967	9572	39029
1999-00	10653	12516	12870	12277	48315
2000-01	13978	14980	13782	17709	60448
2001-02	15574	16301	16407	17997	66279
2002-03	20424	21014	21215	21163	83816
2003-04	27735	28895	27661	30581	114871
2004-05	22073	23009	23442	25871	94396

Gross Value Added of Large-scale Manufacturing - Quarterly
(at current prices)

	(Rs million)				
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	2110	2455	2598	2349	9513
1971-72	2341	2647	2757	2437	10182
1972-73	2732	3189	3491	3135	12548
1973-74	3265	4177	4479	4370	16290
1974-75	4996	5846	5824	5554	22220
1975-76	5472	6310	6730	6040	24552
1976-77	5927	6908	7232	6426	26492
1977-78	6739	6755	6930	6025	26448
1978-79	7117	7470	7774	6913	29275
1979-80	7824	9114	9658	8896	35492
1980-81	9792	11535	11752	10483	43562
1981-82	11829	13494	13694	12217	51235
1982-83	13126	15404	15968	14436	58934
1983-84	15307	17511	21834	16288	70940
1984-85	17682	20426	21095	19129	78332
1985-86	19277	23094	21841	19343	83554
1986-87	20929	23467	24816	22052	91264
1987-88	23030	26655	29277	24732	103694
1988-89	26255	27467	31472	28418	113613
1989-90	29318	33705	31804	29018	123845
1990-91	33279	36666	39474	35986	145405
1991-92	38074	42333	45170	40420	165997
1992-93	38032	44738	48045	42135	172950
1993-94	40038	45814	52224	51803	189879
1994-95	48209	54972	61409	56353	220942
1995-96	54284	67852	72990	68177	263302
1996-97	64158	73256	77545	67777	282736
1997-98	66398	75860	83680	73702	299641
1998-99	70249	79188	88744	79233	317414
1999-00	75355	89101	89230	84916	338602
2000-01	91282	100976	114603	104018	410879
2001-02	98531	100442	115160	109956	424089
2002-03	104516	113043	138120	125695	481374
2003-04	126561	149124	179671	166544	621899
2004-05	175400	189656	218342	201702	785100

Gross Value Added of Small-scale Manufacturing - Quarterly
(at current prices)

	(Rs million)				
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	331	361	373	362	1427
1971-72	396	419	427	405	1647
1972-73	454	496	532	512	1994
1973-74	549	658	690	722	2619
1974-75	915	1003	977	1000	3894
1975-76	1082	1168	1220	1174	4644
1976-77	1286	1404	1439	1371	5501
1977-78	1439	1351	1357	1265	5412
1978-79	1600	1576	1603	1526	6304
1979-80	1722	1880	1944	1927	7473
1980-81	2079	2288	2294	2188	8849
1981-82	2387	2548	2538	2429	9901
1982-83	2656	2922	2960	2867	11405
1983-84	3287	3561	4292	3420	14560
1984-85	3644	3915	3916	3914	15389
1985-86	4207	4646	4513	4117	17484
1986-87	4836	5112	5240	5083	20271
1987-88	5515	6041	6346	5701	23603
1988-89	6613	6918	7255	6875	27661
1989-90	7598	8375	8242	7520	31735
1990-91	9002	9919	10678	9735	39334
1991-92	10408	11572	12348	11049	45378
1992-93	10886	12806	13752	12060	49504
1993-94	12170	13926	15875	15747	57717
1994-95	15182	17312	19340	17747	69582
1995-96	17125	21406	23026	21508	83065
1996-97	22477	25664	27167	23745	99052
1997-98	23685	27061	29850	26291	106887
1998-99	26060	29375	32920	29392	117747
1999-00	29458	34832	34883	33196	132369
2000-01	31872	35257	40015	36319	143463
2001-02	37577	38306	43918	41934	161734
2002-03	37792	40875	49943	45450	174061
2003-04	40829	48107	57962	53727	200625
2004-05	49636	53671	61789	57080	222176

Gross Value Added of Slaughtering - Quarterly
(at current prices)

	(Rs million)				
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	167	238	341	219	965
1971-72	207	308	408	253	1176
1972-73	239	326	460	317	1342
1973-74	325	456	749	549	2080
1974-75	497	767	1147	693	3103
1975-76	648	984	1385	902	3919
1976-77	936	1365	1939	1254	5494
1977-78	1061	1469	2126	1308	5964
1978-79	1093	1582	2303	1455	6433
1979-80	1330	1851	2606	1753	7540
1980-81	1615	2313	3251	2097	9276
1981-82	1850	2667	3749	2366	10632
1982-83	2109	3013	4263	2694	12080
1983-84	2446	3412	4796	3086	13739
1984-85	2758	3937	5595	3542	15832
1985-86	3072	4321	6156	3994	17542
1986-87	3238	4561	6664	4360	18824
1987-88	4040	5698	8272	5321	23330
1988-89	5234	7505	10773	6844	30356
1989-90	6257	8759	12326	7828	35170
1990-91	7182	10129	14525	9523	41360
1991-92	8702	12124	17336	11433	49594
1992-93	10435	14471	20385	13590	58881
1993-94	12929	17942	25531	17737	74140
1994-95	15997	22772	32443	21646	92858
1995-96	13782	19350	27938	18461	79531
1996-97	16014	22643	32203	20407	91267
1997-98	17018	23688	33787	21476	95969
1998-99	20915	28059	38341	104909	192224
1999-00	18642	25962	36358	22948	103910
2000-01	19582	27181	38118	24027	108908
2001-02	20535	28557	41093	25952	116137
2002-03	24382	34326	50892	34062	143661
2003-04	27493	39285	58493	41331	166603
2004-05	35529	50244	71692	46616	204081

Gross Value Added of Construction - Quarterly
(at current prices)

	(Rs million)				
	Jul-Sep	Oct-Dec	Jan-Feb	Mar-Apr	Annual
1970-71	414	421	419	423	1677
1971-72	406	399	327	362	1494
1972-73	519	483	454	492	1947
1973-74	704	550	611	779	2644
1974-75	1023	1071	1084	1075	4253
1975-76	1551	1231	1433	1466	5681
1976-77	1612	1247	1738	1760	6358
1977-78	1829	1762	1907	1856	7354
1978-79	2123	1683	2185	2289	8279
1979-80	2746	2109	2611	2805	10271
1980-81	2422	2063	2394	2412	9290
1981-82	3136	2473	2873	2880	11362
1982-83	3237	2540	2815	3101	11692
1983-84	3655	2526	3420	3637	13237
1984-85	4398	3080	4003	3820	15301
1985-86	4690	3722	4228	4441	17081
1986-87	5200	4308	5245	5363	20117
1987-88	5506	5240	5597	6029	22373
1988-89	6795	5631	6004	6904	25334
1989-90	7043	6216	7325	7427	28012
1990-91	9012	7935	8720	9116	34783
1991-92	10363	9119	10288	9867	39637
1992-93	11082	9735	11505	12131	44453
1993-94	12008	11811	13493	12124	49436
1994-95	15073	11352	14618	13431	54474
1995-96	16419	14434	16770	16020	63643
1996-97	19122	18615	18688	16528	72954
1997-98	19998	19819	22344	17814	79975
1998-99	22269	23053	18762	15112	79196
1999-00	21001	24343	22257	19790	87390
2000-01	23802	22103	25637	23327	94870
2001-02	26858	23623	22311	23027	95818
2002-03	23442	24319	25114	28748	101624
2003-04	28116	27873	29953	29312	115254
2004-05	38236	37891	39345	39100	154572

Gross Value Added of Electricity, Gas & Water Supply - Quarterly
(at current prices)

	(Rs million)				
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	134	152	147	206	639
1971-72	156	178	170	239	742
1972-73	194	236	245	341	1016
1973-74	276	328	344	479	1427
1974-75	346	405	410	588	1749
1975-76	460	518	487	666	2131
1976-77	536	597	568	759	2460
1977-78	585	636	603	798	2622
1978-79	655	736	730	963	3084
1979-80	907	957	1122	1467	4453
1980-81	1424	1550	1512	1825	6311
1981-82	1496	1592	1531	1910	6528
1982-83	1656	1731	1736	2182	7305
1983-84	2006	2085	1979	2518	8588
1984-85	2206	2283	1984	2752	9225
1985-86	2899	2966	2812	3411	12089
1986-87	3087	3296	3145	3860	13387
1987-88	3962	4028	3815	4665	16470
1988-89	4632	4779	4523	5548	19482
1989-90	5468	5589	5305	6709	23070
1990-91	6574	7252	7087	8588	29500
1991-92	8188	8265	7869	9422	33744
1992-93	8750	8845	8511	10370	36476
1993-94	10647	11393	10894	13229	46163
1994-95	13408	13859	13726	15732	56725
1995-96	17693	18536	17746	21814	75789
1996-97	18933	20984	21703	25833	87454
1997-98	25138	25128	23915	29867	104049
1998-99	32158	31921	30393	36257	130729
1999-00	32877	33276	32996	40478	139627
2000-01	30593	33234	31612	37101	132540
2001-02	34516	31757	30498	37981	134753
2002-03	29466	30124	30130	32660	122380
2003-04	46474	46883	45545	52974	191876
2004-05	50934	50125	49039	56843	206941

Gross Value Added of Services
(at current prices)

(Rs million)

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Pakistan
1970-71	5080	5910	5817	5950	22758
1971-72	5661	6590	6527	6787	25564
1972-73	7145	7761	8175	8500	31581
1973-74	9370	11494	10203	12313	43380
1974-75	11080	15263	15437	16536	58316
1975-76	14823	17270	17346	16912	66351
1976-77	17333	19679	19549	19349	75909
1977-78	19466	23189	22393	23679	88727
1978-79	21970	25184	26303	27003	100460
1979-80	25703	31866	32219	33561	123348
1980-81	31431	35878	37079	38468	142857
1981-82	36127	44067	43871	43102	167166
1982-83	43432	47184	49996	49205	189817
1983-84	49712	56131	59087	55860	220791
1984-85	54351	63447	67264	63849	248912
1985-86	65124	69841	73907	71931	280803
1986-87	70620	78221	81534	80796	311171
1987-88	80199	88353	94813	91202	354566
1988-89	90841	99927	108037	103650	402455
1989-90	101803	112996	117189	116179	448166
1990-91	119824	134785	141197	139712	535518
1991-92	141044	156792	162816	162351	623003
1992-93	169786	174234	186358	184271	714650
1993-94	181389	202147	219027	221057	823620
1994-95	216055	244499	268695	256694	985943
1995-96	248998	276886	300355	294659	1120897
1996-97	285684	323649	344528	342050	1295912
1997-98	326853	363914	379010	370304	1440081
1998-99	358406	414683	399946	422172	1595208
1999-00	389358	457528	450611	496115	1793612
2000-01	458111	518252	523074	535080	2034516
2001-02	499907	551748	549798	584974	2186427
2002-03	534611	604632	618612	635526	2393381
2003-04	599105	705423	695337	684225	2684090
2004-05	726673	875790	842112	768175	3212750

Gross Value Added of Wholesale & Retail Trade, and Hotels & Restaurants
Quarterly (at current prices)

(Rs million)

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Pakistan
1970-71	1967	2364	2483	2360	9173
1971-72	2186	2642	2852	2848	10529
1972-73	2795	3347	3795	3900	13836
1973-74	3734	4714	5071	5205	18724
1974-75	4796	5972	6549	6651	23968
1975-76	5683	6701	7014	7033	26430
1976-77	6102	7502	8223	7920	29748
1977-78	6988	8228	8996	8617	32829
1978-79	7579	9377	10440	10206	37602
1979-80	9329	10827	12018	12245	44419
1980-81	11072	13625	14605	14859	54161
1981-82	13670	16790	17530	17128	65117
1982-83	15403	18672	19394	18945	72415
1983-84	16794	20561	22700	21864	81919
1984-85	20542	23750	24746	24743	93781
1985-86	22711	26951	27499	26760	103922
1986-87	23730	29320	30333	29910	113292
1987-88	27513	34025	36158	34178	131875
1988-89	30317	38203	41227	40160	149908
1989-90	34802	43627	44585	43230	166244
1990-91	38392	50574	52173	49985	191124
1991-92	46971	58671	60180	57429	223251
1992-93	50355	64002	67040	63918	245315
1993-94	57487	70736	78969	77910	285103
1994-95	69252	87650	96570	93997	347469
1995-96	80829	105473	110804	110108	407215
1996-97	95002	122995	127821	122847	468667
1997-98	104327	131725	137379	133269	506700
1998-99	113728	145348	152719	146862	558657
1999-00	125547	157723	162521	161982	607773
2000-01	141798	175378	186891	179882	683949
2001-02	156881	175903	189500	189568	711851
2002-03	158525	194884	219742	203548	776699
2003-04	176028	223429	248989	249239	897686
2004-05	218478	276085	309268	303900	1107731

Gross Value Added of Transport, Storage and Communication – Quarterly
(at current prices)

	(Rs million)				
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1971-72	680	707	737	768	2893
1972-73	770	800	834	869	3274
1973-74	918	959	991	1011	3880
1974-75	1223	1244	1288	1355	5110
1975-76	1651	1715	1801	1904	7071
1976-77	2071	2184	2285	2367	8907
1976-77	2448	2530	2649	2800	10428
1977-78	2903	3048	3201	3355	12507
1978-79	3490	3644	3828	4036	14998
1979-80	4331	4564	4763	4915	18573
1980-81	5309	5498	5693	5881	22380
1981-82	5891	6066	6299	6580	24835
1982-83	6850	7092	7437	7877	29256
1983-84	8710	9171	9624	10045	37550
1984-85	10251	10692	11178	11686	43806
1985-86	12621	13184	13734	14239	53778
1986-87	14352	14844	15475	16216	60887
1987-88	16173	16893	17611	18284	68961
1988-89	18052	18759	19466	20126	76403
1989-90	19901	20555	21313	22130	83899
1990-91	26156	27181	28065	28731	110133
1991-92	30223	30660	31390	32458	124730
1992-93	33646	34607	36115	37352	141719
1993-94	39396	42823	44075	45493	171787
1994-95	47259	48530	49442	50048	195279
1995-96	50666	51978	56171	59470	218286
1996-97	62575	66635	72013	73670	274893
1997-98	75078	77018	78139	78539	308774
1998-99	82527	83707	85124	90483	341841
1999-00	94200	97008	100514	109259	400981
2000-01	122418	126982	130933	133919	514251
2001-02	131275	134259	138281	143084	546899
2002-03	146528	151112	156121	161212	614973
2003-04	174274	196681	177825	131112	679892
2004-05	200929	226863	212811	161173	801776

Gross Value Added of Finance and Insurance - Quarterly
(at current prices)

(Rs million)

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	465	827	515	684	2491
1971-72	527	921	536	703	2685
1972-73	869	835	676	803	3182
1973-74	742	1785	-81	1622	4068
1974-75	-419	2255	1400	1967	5204
1975-76	1031	2170	1647	957	5806
1976-77	2000	2578	1157	978	6712
1977-78	1478	3623	1532	2870	9503
1978-79	1644	2731	2189	2534	9099
1979-80	914	5200	3638	4245	13998
1980-81	1762	3122	2508	2994	10386
1981-82	1196	5507	3779	2809	13292
1982-83	3972	3796	4892	3558	16219
1983-84	4696	6077	5841	2593	19207
1984-85	1821	6716	8099	3623	20259
1985-86	5550	5000	7066	4852	22468
1986-87	5981	6711	7609	5760	26061
1987-88	6994	7225	9778	6215	30212
1988-89	8070	7650	10775	5774	32269
1989-90	9004	9799	10826	8782	38412
1990-91	11098	11267	13025	11047	46438
1991-92	12345	14343	15571	14508	56766
1992-93	26125	14365	19324	16614	76427
1993-94	16159	17770	21789	20299	76018
1994-95	19276	24094	33855	21919	99145
1995-96	23733	22897	32186	20435	99251
1996-97	20563	21741	25217	22026	89547
1997-98	22191	26462	29687	20515	98856
1998-99	21343	41698	13403	33486	109930
1999-00	12835	42239	21897	55481	132453
2000-01	20588	38584	23305	36601	119078
2001-02	22251	48757	23104	49392	143505
2002-03	20389	46629	24799	50410	142228
2003-04	25085	53945	28987	56045	164062
2004-05	34857	76938	39532	80339	231666

Gross Value Added of Ownership of Dwelling - Quarterly
(current prices)

(Rs Million)

	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	492	510	530	551	2083
1971-72	542	563	584	607	2296
1972-73	626	650	675	701	2652
1973-74	857	889	924	960	3629
1974-75	1143	1187	1233	1281	4844
1975-76	1344	1396	1450	1506	5695
1976-77	1546	1605	1668	1732	6551
1977-78	1741	1807	1877	1950	7375
1978-79	1986	2062	2142	2225	8414
1979-80	2309	2397	2490	2587	9782
1980-81	2768	2874	2986	3101	11729
1981-82	3085	3203	3328	3457	13073
1982-83	3406	3537	3674	3816	14433
1983-84	3750	3894	4045	4202	15890
1984-85	4109	4266	4431	4603	17409
1985-86	4491	4663	4844	5032	19031
1986-87	4886	5073	5270	5475	20705
1987-88	5309	5511	5725	5946	22491
1988-89	5780	6002	6236	6478	24496
1989-90	6526	6776	7040	7313	27655
1990-91	7592	7879	8182	8497	32150
1991-92	8738	9075	9435	9809	37057
1992-93	10169	10563	10973	11390	43095
1993-94	11797	12225	12675	13154	49851
1994-95	13703	14225	14753	15293	57974
1995-96	15828	16374	16971	17604	66776
1996-97	18277	18987	19734	20485	77482
1997-98	21247	21992	22704	23542	89485
1998-99	24235	24807	25446	26074	100562
1999-00	26670	27297	27943	28515	110425
2000-01	30643	31281	31854	32478	126256
2001-02	31911	32421	32937	33422	130690
2002-03	34832	35327	35835	36521	142515
2003-04	37388	38437	39760	41426	157011
2004-05	47815	52572	47628	32766	180782

Gross Value Added of Public Administration & Defence - Quarterly
(at current prices)

	(Rs million)				
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	599	604	638	647	2488
1971-72	670	677	714	724	2785
1972-73	832	840	886	899	3457
1973-74	1267	1280	1367	1434	5347
1974-75	1984	2085	2284	2409	8762
1975-76	2283	2326	2434	2473	9516
1976-77	2592	2699	2939	2937	11166
1977-78	3229	3260	3464	3494	13446
1978-79	3689	3724	3940	4024	15377
1979-80	4373	4325	4608	4744	18050
1980-81	5371	5489	5867	6004	22731
1981-82	6217	6294	6620	6661	25792
1982-83	7106	7201	7575	7722	29604
1983-84	8155	8436	8791	8854	34236
1984-85	8946	9066	9601	9715	37328
1985-86	9945	10014	10524	10560	41043
1986-87	10797	10989	11441	11646	44872
1987-88	11907	12054	12665	13071	49696
1988-89	14152	14378	15125	15408	59063
1989-90	15385	15606	16454	16961	64406
1990-91	17623	18128	19322	19935	75008
1991-92	20121	20514	21882	22600	85117
1992-93	22773	23137	24558	25310	95778
1993-94	25333	26037	27809	28749	107927
1994-95	29234	30444	32825	33242	125745
1995-96	33876	34664	37099	37930	143569
1996-97	37828	39170	42615	43560	163172
1997-98	42865	43544	46153	47080	179642
1998-99	46882	47471	50017	50277	194648
1999-00	52945	53662	56507	57314	220429
2000-01	56711	57581	60303	60501	235096
2001-02	62706	63225	66605	67292	259827
2002-03	69580	69755	73286	73466	286087
2003-04	73880	75959	80241	82149	312228
2004-05	82545	83605	88076	89151	343377

Gross Value Added of Social, Community & Personal Services
(at current prices)

	(Rs million)				
	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Annual
1970-71	878	898	915	940	3631
1971-72	967	988	1006	1035	3995
1972-73	1106	1130	1152	1186	4574
1973-74	1547	1582	1634	1738	6501
1974-75	1925	2049	2171	2323	8468
1975-76	2411	2494	2517	2576	9997
1976-77	2643	2765	2914	2982	11304
1977-78	3128	3224	3323	3394	13068
1978-79	3582	3647	3763	3979	14971
1979-80	4446	4553	4702	4826	18527
1980-81	5149	5271	5421	5629	21471
1981-82	6067	6206	6316	6467	25056
1982-83	6694	6885	7023	7288	27891
1983-84	7607	7992	8086	8302	31988
1984-85	8683	8957	9209	9480	36328
1985-86	9806	10029	10239	10489	40563
1986-87	10874	11285	11406	11789	45354
1987-88	12303	12645	12877	13507	51332
1988-89	14470	14935	15209	15704	60317
1989-90	16185	16632	16970	17763	67550
1990-91	18963	19755	20430	21518	80666
1991-92	22648	23530	24359	25546	96082
1992-93	26719	27560	28349	29687	112315
1993-94	31217	32557	33709	35451	132934
1994-95	37331	39557	41250	42194	160332
1995-96	44065	45499	47124	49112	185801
1996-97	51439	54121	57128	59462	222151
1997-98	61144	63173	64948	67358	256623
1998-99	69691	71652	73238	74989	289571
1999-00	77159	79599	81229	83564	321551
2000-01	85953	88446	89787	91699	355885
2001-02	94883	97184	99371	102216	393655
2002-03	104757	106925	108829	110369	430879
2003-04	112449	116972	119535	124255	473211
2004-05	142049	159727	144796	100845	547418

Gross Domestic Product - Province wise
(1999-00 prices)

(Rs million)

	Punjab	Sindh	NWFP	Balochistan	Pakistan
1970-71	519724	282250	108778	35239	945992
1971-72	541121	291563	109327	39276	981286
1972-73	575344	316054	116466	40353	1048217
1973-74	600179	334191	120292	47321	1101984
1974-75	619591	339321	120272	51119	1130304
1975-76	634021	351614	120018	53782	1159436
1976-77	649024	364755	127064	58985	1199828
1977-78	689184	400909	136614	63016	1289724
1978-79	724841	414976	151505	68341	1359664
1979-80	775479	463029	161374	73354	1473236
1980-81	799225	477983	175616	79596	1532420
1981-82	839140	518106	185384	88662	1631293
1982-83	893960	548648	194392	99742	1736742
1983-84	907146	571785	204765	106302	1789998
1984-85	995570	619460	217410	114281	1946721
1985-86	1062810	642638	228808	121184	2055440
1986-87	1095885	676999	243126	126064	2142073
1987-88	1159288	706595	259386	130192	2255461
1988-89	1213646	722802	278555	142020	2357024
1989-90	1251302	747907	295511	149183	2443904
1990-91	1326997	765828	290395	161834	2545054
1991-92	1403611	804746	315890	171472	2695718
1992-93	1433140	837563	322605	185099	2778407
1993-94	1446837	865348	341478	195049	2848712
1994-95	1548464	901999	352332	203931	3006727
1995-96	1600756	927461	353325	198950	3080492
1996-97	1601194	929015	379756	201617	3111582
1997-98	1654291	970915	395829	207585	3228622
1998-99	1709716	1000664	404006	211526	3325913
1999-00	1847138	1053164	416448	200224	3516973
2000-01	1874928	1091807	432133	201511	3600378
2001-02	1926470	1141676	445809	206394	3720350
2002-03	2018737	1192634	471572	210519	3893462
2003-04	2157196	1301298	498616	221948	4179058
2004-05	2347873	1434095	541107	230673	4553747

Gross Value Added of Agriculture - Province wise
(1999-00 prices)

	(Rs million)				
	Punjab	Sindh	NWFP	Balochistan	Pakistan
1970-71	233,339	83,355	43,503	11,507	371,703
1971-72	243,417	85,289	43,149	13,388	385,243
1972-73	248,206	87,986	44,467	12,290	392,949
1973-74	252,671	91,364	45,231	16,244	405,510
1974-75	251,565	86,251	42,531	15,750	396,098
1975-76	256,647	92,361	40,977	16,546	406,530
1976-77	258,987	96,623	42,768	17,995	416,372
1977-78	261,908	101,067	44,628	19,070	426,673
1978-79	276,982	102,667	49,378	20,185	449,212
1979-80	284,320	112,803	49,572	21,452	468,147
1980-81	295,340	114,596	54,225	22,552	486,714
1981-82	300,202	122,777	55,835	26,196	505,010
1982-83	315,324	123,847	57,439	30,297	526,908
1983-84	298,306	119,916	58,177	31,889	508,288
1984-85	333,020	125,010	60,143	33,798	551,970
1985-86	358,527	125,822	62,396	34,287	581,032
1986-87	355,122	132,721	66,989	36,611	591,444
1987-88	366,329	135,311	69,177	35,515	606,332
1988-89	389,363	141,616	71,471	38,416	640,866
1989-90	393,920	142,571	79,984	40,572	657,046
1990-91	416,092	148,720	71,900	41,767	678,479
1991-92	438,939	153,030	80,634	45,408	718,011
1992-93	417,334	147,963	75,589	49,574	690,460
1993-94	409,384	164,432	83,188	55,121	712,124
1994-95	444,569	162,892	82,657	58,908	749,025
1995-96	458,470	177,135	80,098	62,922	778,625
1996-97	446,408	186,740	86,382	61,546	781,075
1997-98	466,024	195,935	87,187	63,950	813,096
1998-99	467,506	207,221	87,332	63,295	825,354
1999-00	514,532	213,790	92,408	52,418	873,148
2000-01	502,903	207,495	96,947	52,025	859,370
2001-02	502,249	210,908	100,008	51,747	864,912
2002-03	514,535	217,834	105,069	53,991	891,430
2003-04	526,675	221,764	102,857	57,842	909,138
2004-05	580,687	234,733	101,894	60,574	977,889

Gross Value Added of Major Crops - Province wise
(1999-00 prices)

	(Rs million)				
	Punjab	Sindh	NWFP	Balochistan	Pakistan
1970-71	85,385	31,500	10,316	1,151	128,352
1971-72	92,131	32,843	10,783	1,283	137,040
1972-73	93,972	34,130	11,809	1,168	141,079
1973-74	96,382	36,632	12,939	2,123	148,076
1974-75	94,436	31,611	13,504	1,463	141,014
1975-76	99,967	34,977	13,494	1,414	149,852
1976-77	103,176	36,360	13,870	1,373	154,779
1977-78	102,288	38,671	13,983	1,949	156,890
1978-79	111,539	36,584	13,826	2,403	164,352
1979-80	116,405	44,963	14,516	2,788	178,672
1980-81	123,914	44,068	15,623	3,058	186,664
1981-82	120,676	50,411	16,694	5,375	193,156
1982-83	129,564	49,375	17,191	7,229	203,359
1983-84	105,701	43,421	16,551	7,327	173,000
1984-85	134,845	45,959	16,846	7,723	205,373
1985-86	154,785	43,348	16,965	6,812	221,911
1986-87	143,270	45,728	17,517	8,146	214,661
1987-88	153,661	47,415	17,574	5,698	224,347
1988-89	166,495	49,596	19,951	7,772	243,813
1989-90	169,700	45,605	20,647	8,155	244,107
1990-91	179,829	47,201	21,033	8,640	256,702
1991-92	209,780	52,467	21,315	8,891	292,454
1992-93	179,994	44,495	21,158	10,694	256,340
1993-94	169,690	56,416	20,688	9,904	256,699
1994-95	195,705	50,838	21,572	9,809	277,923
1995-96	204,605	57,326	21,678	12,382	295,990
1996-97	190,559	63,757	20,612	10,379	285,307
1997-98	207,507	67,122	23,009	12,272	309,910
1998-99	205,142	66,627	21,452	11,106	304,327
1999-00	243,518	69,125	20,104	9,257	342,004
2000-01	231,115	54,458	16,542	8,799	310,914
2001-02	225,193	51,128	17,838	8,764	302,923
2002-03	238,250	53,761	18,743	10,578	321,331
2003-04	243,373	56,127	18,298	10,809	328,607
2004-05	293,988	60,969	18,885	10,600	384,443

Gross Value Added of Minor Crops - Province wise
(1999-00 prices)

	(Rs million)				
	Punjab	Sindh	NWFP	Balochistan	Pakistan
1970-71	42,734	20,705	3,468	2,817	69,724
1971-72	44,750	21,246	3,963	4,032	73,992
1972-73	44,994	21,719	4,238	2,595	73,546
1973-74	45,737	22,260	5,407	5,073	78,477
1974-75	47,243	21,457	5,249	4,644	78,593
1975-76	47,757	23,079	6,171	4,831	81,838
1976-77	45,331	24,013	6,801	5,433	81,577
1977-78	45,034	24,438	6,864	5,329	81,664
1978-79	46,107	26,189	7,361	5,415	85,072
1979-80	46,075	26,077	7,236	5,736	85,124
1980-81	46,098	26,118	8,189	5,620	86,025
1981-82	50,271	25,948	7,958	6,187	90,365
1982-83	51,903	25,841	7,663	7,502	92,909
1983-84	53,899	25,063	7,494	8,030	94,485
1984-85	54,601	25,119	7,481	8,424	95,624
1985-86	54,968	25,723	7,869	8,895	97,455
1986-87	56,363	26,034	9,745	8,743	100,885
1987-88	54,142	24,533	10,227	9,713	98,615
1988-89	60,103	25,417	9,654	10,143	105,317
1989-90	61,450	27,045	9,568	11,416	109,478
1990-91	61,707	26,246	9,848	11,663	109,463
1991-92	62,130	24,073	9,898	14,773	110,874
1992-93	62,498	21,706	9,767	16,545	110,516
1993-94	65,456	24,133	10,382	22,421	122,392
1994-95	68,976	23,551	10,402	25,735	128,664
1995-96	67,370	25,527	10,044	26,288	129,229
1996-97	69,934	24,197	9,947	26,334	130,411
1997-98	70,770	25,243	9,824	26,317	132,156
1998-99	70,139	31,292	10,475	26,280	138,185
1999-00	69,846	29,447	10,867	15,520	125,680
2000-01	67,202	30,958	11,443	15,671	125,274
2001-02	66,595	27,861	11,442	14,300	120,199
2002-03	66,011	28,512	11,715	13,673	119,910
2003-04	67,103	27,538	11,478	15,743	121,863
2004-05	71,324	28,888	11,086	16,838	128,137

Gross Value Added of Livestock - Province wise
(1999-00 prices)

	(Rs million)				
	Punjab	Sind	NWFP	Balochistan	Pakistan
1970-71	101,514	25,864	26,242	7,081	160,700
1971-72	102,620	26,836	24,752	7,590	161,798
1972-73	103,564	27,836	23,313	8,074	162,787
1973-74	104,557	28,928	21,997	8,596	164,078
1974-75	105,589	30,121	20,784	9,158	165,652
1975-76	106,673	31,433	19,671	9,764	167,541
1976-77	106,919	32,115	20,108	10,437	169,579
1977-78	109,831	33,600	21,027	11,028	175,486
1978-79	112,937	35,195	22,032	11,664	181,827
1979-80	115,562	36,638	22,673	12,256	187,129
1980-81	119,543	38,656	24,177	13,050	195,426
1981-82	122,943	40,496	25,255	13,794	202,488
1982-83	126,926	42,604	26,674	14,639	210,844
1983-84	131,042	44,818	28,139	15,532	219,531
1984-85	135,379	47,173	29,709	16,486	228,748
1985-86	139,930	49,674	31,381	17,503	238,488
1986-87	145,830	53,555	33,278	18,653	251,315
1987-88	148,181	56,226	34,435	18,994	257,836
1988-89	150,689	59,069	35,667	19,361	264,786
1989-90	153,260	62,059	36,911	19,743	271,973
1990-91	155,856	65,188	38,134	20,132	279,311
1991-92	158,447	68,449	39,305	20,524	286,725
1992-93	161,375	71,991	40,690	20,974	295,030
1993-94	164,462	75,757	42,160	21,457	303,837
1994-95	167,741	79,778	43,749	21,983	313,252
1995-96	172,692	84,770	46,826	22,839	327,128
1996-97	176,031	89,227	48,428	23,422	337,108
1997-98	178,986	93,694	49,585	23,948	346,213
1998-99	182,375	98,595	51,092	24,595	356,657
1999-00	185,797	103,751	52,562	25,299	367,409
2000-01	191,193	110,969	54,411	26,177	382,750
2001-02	197,292	120,801	56,929	27,163	402,185
2002-03	197,842	125,422	57,831	28,333	409,427
2003-04	200,848	128,101	59,686	29,824	418,459
2004-05	204,517	135,049	61,524	31,731	432,821

Gross Value Added of Fishing - Province wise
(1999-00 prices)

	(Rs million)				
	Punjab	Sind	NWFP	Balochistan	Pakistan
1970-71	135	4,031	1	333	4,499
1971-72	168	3,047	4	351	3,570
1972-73	210	2,368	12	371	2,960
1973-74	263	1,901	35	391	2,590
1974-75	339	1,928	12	404	2,683
1975-76	490	2,395	333	485	3,703
1976-77	560	2,969	35	676	4,241
1977-78	642	3,229	47	672	4,590
1978-79	765	3,503	53	613	4,934
1979-80	963	3,411	53	567	4,994
1980-81	1,086	4,017	53	702	5,858
1981-82	1,238	4,198	35	715	6,185
1982-83	1,302	4,175	35	791	6,304
1983-84	1,471	4,781	47	850	7,150
1984-85	1,617	4,974	47	1,023	7,661
1985-86	1,897	5,329	41	898	8,165
1986-87	2,172	5,573	47	860	8,652
1987-88	2,452	5,599	29	984	9,064
1988-89	2,709	5,756	64	956	9,484
1989-90	3,001	6,102	88	1,054	10,244
1990-91	3,182	6,293	198	1,053	10,726
1991-92	3,398	6,641	198	1,104	11,341
1992-93	3,427	7,250	204	1,178	12,060
1993-94	3,888	7,097	64	1,210	12,260
1994-95	3,468	7,184	93	1,204	11,950
1995-96	3,929	7,992	88	1,230	13,239
1996-97	3,742	8,853	53	1,282	13,930
1997-98	3,269	9,199	53	1,286	13,807
1998-99	3,836	10,060	58	1,210	15,164
1999-00	3,608	9,667	58	1,275	14,608
2000-01	3,620	9,847	64	1,330	14,861
2001-02	3,795	9,957	76	1,342	15,170
2002-03	3,585	8,663	117	1,247	13,611
2003-04	3,678	8,834	146	1,258	13,916
2004-05	3,795	8,960	152	1,278	14,185

Gross Value Added of Forestry - Province wise

(1999-00 prices)

(Rs million)

	Punjab	Sind	NWFP	Balochistan	Pakistan
1970-71	3,572	1,255	3,475	125	8,428
1971-72	3,748	1,317	3,647	132	8,843
1972-73	5,466	1,933	5,095	83	12,577
1973-74	5,732	1,643	4,854	61	12,290
1974-75	3,958	1,135	2,983	80	8,156
1975-76	1,759	478	1,308	51	3,596
1976-77	3,000	1,166	1,954	76	6,197
1977-78	4,113	1,130	2,707	92	8,043
1978-79	5,635	1,195	6,107	90	13,026
1979-80	5,314	1,715	5,094	105	12,228
1980-81	4,699	1,737	6,184	122	12,741
1981-82	5,074	1,724	5,892	125	12,816
1982-83	5,629	1,850	5,876	136	13,492
1983-84	6,194	1,833	5,946	149	14,123
1984-85	6,578	1,785	6,061	141	14,565
1985-86	6,947	1,748	6,140	179	15,014
1986-87	7,487	1,831	6,402	210	15,930
1987-88	7,893	1,539	6,913	126	16,471
1988-89	9,368	1,779	6,134	184	17,465
1989-90	6,508	1,760	12,771	205	21,243
1990-91	15,519	3,793	2,686	279	22,277
1991-92	5,184	1,399	9,917	116	16,616
1992-93	10,041	2,521	3,769	184	16,515
1993-94	5,887	1,029	9,893	128	16,937
1994-95	8,679	1,541	6,840	176	17,237
1995-96	9,874	1,520	1,462	183	13,039
1996-97	6,141	706	7,343	130	14,319
1997-98	5,491	676	4,716	126	11,010
1998-99	6,014	648	4,256	105	11,022
1999-00	11,763	1,800	8,817	1,066	23,447
2000-01	9,773	1,263	14,487	48	25,571
2001-02	9,373	1,161	13,724	178	24,436
2002-03	8,848	1,477	16,664	161	27,150
2003-04	11,673	1,164	13,248	207	26,293
2004-05	7,064	866	10,247	127	18,304

Gross Value Added of Industry - Province wise
(1999-00 prices)

	(Rs million)				
	Punjab	Sindh	NWFP	Balochistan	Pakistan
1970-71	103,180	77,195	19,162	8,647	208,185
1971-72	103,324	77,730	18,709	8,904	208,666
1972-73	114,112	85,329	20,739	9,615	229,795
1973-74	122,349	92,402	21,962	10,842	247,555
1974-75	125,125	92,934	22,188	12,147	252,393
1975-76	131,086	95,437	22,920	13,250	262,693
1976-77	137,583	96,555	23,772	14,775	272,685
1977-78	147,949	106,148	25,780	16,144	296,021
1978-79	154,751	110,288	27,227	17,431	309,696
1979-80	169,269	120,759	29,744	19,640	339,412
1980-81	175,993	136,066	34,825	22,339	369,222
1981-82	193,341	152,336	38,634	24,304	408,615
1982-83	204,481	164,108	40,975	25,171	434,735
1983-84	213,832	170,776	43,222	26,796	454,626
1984-85	236,460	192,329	47,888	29,277	505,953
1985-86	251,017	202,089	50,366	30,399	533,872
1986-87	261,689	210,341	52,553	30,492	555,074
1987-88	283,478	220,140	58,115	33,055	594,787
1988-89	291,451	224,352	60,335	34,756	610,894
1989-90	301,480	231,747	62,098	37,505	632,830
1990-91	322,828	232,417	64,725	43,032	663,002
1991-92	339,250	243,075	68,400	46,470	697,196
1992-93	350,635	250,463	72,839	48,295	722,231
1993-94	357,625	255,473	75,665	49,888	738,651
1994-95	374,008	264,431	79,998	52,126	770,562
1995-96	380,966	271,592	80,249	43,730	776,538
1996-97	377,482	262,128	84,386	44,174	768,170
1997-98	391,764	272,515	86,330	44,894	795,504
1998-99	410,114	282,479	90,363	46,854	829,810
1999-00	423,348	286,511	92,090	48,264	850,213
2000-01	436,010	302,013	94,305	50,308	882,635
2001-02	447,912	310,789	96,612	51,956	907,269
2002-03	464,238	331,129	102,713	52,398	950,478
2003-04	535,323	382,683	116,752	55,635	1,090,392
2004-05	589,403	429,565	127,701	59,435	1,206,103

Gross Value Added of Mining & Quarrying - Province wise
(1999-00 prices)

	(Rs million)				
	Punjab	Sindh	N.W.F.P.	Balochistan	Pakistan
1970-71	3546	1581	56	3490	8673
1971-72	3614	1612	57	3557	8840
1972-73	4035	1530	58	3328	8951
1973-74	3749	1692	55	3654	9151
1974-75	3345	1746	62	3984	9137
1975-76	3403	1629	185	3795	9012
1976-77	5926	1554	102	3921	11503
1977-78	5732	1888	185	4202	12007
1978-79	5358	1980	208	4613	12161
1979-80	5716	1379	191	5555	12841
1980-81	5476	2427	249	6002	14154
1981-82	5894	2898	222	6284	15298
1982-83	5853	4429	200	6423	16905
1983-84	5523	4879	317	6648	17367
1984-85	7752	7467	387	7028	22633
1985-86	11139	10341	650	7115	29244
1986-87	11685	11295	752	6971	30703
1987-88	12511	12653	999	7515	33678
1988-89	12468	13426	1009	7780	34682
1989-90	13587	15544	1129	8376	38636
1990-91	14728	19811	1475	8363	44376
1991-92	14386	18985	1331	8893	43595
1992-93	13318	20441	1422	8929	44109
1993-94	12775	20792	1436	8965	43969
1994-95	12614	20395	1379	8824	43212
1995-96	13357	22449	1703	8218	45728
1996-97	12845	23435	1898	8485	46662
1997-98	12745	23471	2023	8395	46634
1998-99	12540	22380	2097	9144	46162
1999-00	13867	22307	2108	10033	48315
2000-01	13110	22762	2111	10621	48604
2001-02	13593	25433	1571	10653	51249
2002-03	14523	30613	4312	9521	58969
2003-04	14988	33427	3792	9270	61477
2004-05	14639	37493	3627	9159	64917

Gross Value Added of Large-scale Manufacturing - Province wise
(1999-00 prices)

	(Rs million)				
	Punjab	Sind	NWFP	Balochistan	Pakistan
1970-71	54155	58960	10078	339	123532
1971-72	53900	58683	10031	337	122950
1972-73	58846	64068	10951	368	134233
1973-74	62415	67954	11616	390	142375
1974-75	61447	66899	11435	384	140165
1975-76	61090	66511	11369	382	139351
1976-77	59713	65012	11113	373	136210
1977-78	65679	71507	12223	411	149820
1978-79	67650	73654	12590	423	154317
1979-80	75000	81656	13958	469	171083
1980-81	78280	93642	18430	1878	192230
1981-82	89204	106710	21002	2140	219055
1982-83	96560	115510	22733	2317	237120
1983-84	98688	118055	23234	2368	242345
1984-85	111760	133692	26312	2682	274446
1985-86	113745	136067	26779	2729	279321
1986-87	116160	138955	27348	2787	285250
1987-88	122869	146982	28928	2948	301727
1988-89	120971	144711	28481	2903	297066
1989-90	121041	144794	28497	2904	297236
1990-91	127975	134177	28130	6235	296517
1991-92	133363	139826	29315	6498	309002
1992-93	134131	140631	29484	6535	310780
1993-94	133011	139458	29238	6481	308187
1994-95	135199	141751	29718	6587	313255
1995-96	142132	149020	31242	6925	329319
1996-97	134786	141318	29628	6567	312298
1997-98	139403	146159	30643	6792	322996
1998-99	143247	150189	31488	6979	331903
1999-00	146138	153221	32123	7120	338602
2000-01	162144	170002	35641	7900	375687
2001-02	167829	175962	36891	8177	388859
2002-03	179955	188676	39556	8768	416955
2003-04	212616	222921	46736	10359	492632
2004-05	245717	257625	54012	11972	569325

Gross Value Added of Small-scale Manufacturing - Province wise
(1999-00 prices)

	(Rs million)				
	Punjab	Sind	NWFP	Balochistan	Pakistan
1970-71	12233	5308	823	167	18531
1971-72	13126	5696	883	179	19884
1972-73	14084	6111	947	192	21336
1973-74	15113	6558	1017	206	22893
1974-75	16216	7036	1091	221	24564
1975-76	17400	7550	1170	238	26358
1976-77	18670	8101	1256	255	28282
1977-78	20238	8782	1361	276	30657
1978-79	21938	9519	1476	300	33232
1979-80	23781	10319	1600	325	36024
1980-81	25778	11186	1734	352	39050
1981-82	27944	12125	1880	382	42330
1982-83	30291	13144	2038	414	45886
1983-84	32835	14248	2209	448	49740
1984-85	35594	15445	2394	486	53919
1985-86	38584	16742	2595	527	58448
1986-87	41825	18148	2813	571	63357
1987-88	48359	15336	4184	800	68679
1988-89	50927	16150	4406	843	72326
1989-90	53631	17008	4640	888	76167
1990-91	56479	17911	4886	935	80211
1991-92	59478	18862	5145	984	84470
1992-93	62637	19864	5419	1037	88956
1993-94	65963	20919	5706	1092	93679
1994-95	69465	22029	6009	1150	98654
1995-96	73154	23199	6329	1211	103892
1996-97	77219	20671	10730	790	109409
1997-98	81319	21768	11299	831	115219
1998-99	86898	23261	12075	889	123123
1999-00	93424	25008	12981	955	132369
2000-01	100440	26887	13956	1027	142310
2001-02	107983	28906	15004	1104	152997
2002-03	116093	31077	16131	1187	164487
2003-04	124811	33410	17343	1276	176841
2004-05	134185	35919	18645	1372	190121

Gross Value Added of Slaughtering - Province wise
(1999-00 prices)

	(Rs million)				
	Punjab	Sind	NWFP	Balochistan	Pakistan
1970-71	9857.7	2504.0	3890.4	2520.8	18773
1971-72	11113.4	2971.0	3988.1	3019.4	21092
1972-73	12620.0	3572.6	4117.0	3619.9	23930
1973-74	14210.7	4283.3	4216.1	4273.3	26983
1974-75	15706.9	5065.5	4243.6	4944.5	29960
1975-76	17303.1	5997.7	4260.7	5686.4	33248
1976-77	20280.0	7211.4	5167.2	6982.6	39641
1977-78	21091.4	7692.3	5543.5	7623.2	41950
1978-79	21848.6	8165.5	5923.9	8269.0	44207
1979-80	22566.8	8637.5	6304.2	8953.2	46462
1980-81	23382.8	9156.4	6738.3	9698.2	48976
1981-82	24055.2	9637.7	7083.2	10495.9	51272
1982-83	24903.0	10177.8	7637.6	11257.8	53976
1983-84	26311.2	10971.1	8298.1	12415.9	57996
1984-85	27844.3	11835.0	9031.7	13708.8	62420
1985-86	29968.9	12761.1	9936.7	14208.4	66875
1986-87	28642.1	12598.2	9721.2	13779.4	64741
1987-88	30985.8	13985.7	10876.1	14883.3	70731
1988-89	33547.2	15547.9	12140.5	16137.6	77373
1989-90	35852.0	17146.1	13052.6	17552.7	83603
1990-91	38368.7	18890.0	14140.2	19018.2	90417
1991-92	41295.2	20842.6	15658.3	20480.4	98276
1992-93	45015.1	23093.4	18380.3	21658.1	108147
1993-94	48315.6	25391.6	20338.1	23238.9	117284
1994-95	51344.8	27673.8	22032.5	24833.0	125884
1995-96	39772.0	21412.0	17910.0	16109.9	95204
1996-97	40851.0	22536.5	19022.3	16531.4	98941
1997-98	41119.8	23403.5	18262.5	17113.0	99899
1998-99	42130.9	24542.7	19288.0	17424.5	103386
1999-00	41956.9	25030.7	19599.8	17323.1	103910
2000-01	43215.4	26387.0	20653.1	17781.8	108037
2001-02	44372.7	27725.3	21666.0	18214.6	111979
2002-03	45592.2	29145.7	22734.7	18691.8	116164
2003-04	46994.9	30729.7	23759.8	19290.7	120775
2004-05	46793.1	31296.2	24034.7	19266.2	121390

Gross Value Added of Construction - Province wise
(1999-00 prices)

	(Rs million)				
	Punjab	Sind	NWFP	Balochistan	Pakistan
1970-71	12505	4091	3096	1872	21563
1971-72	10393	3590	2511	1543	18037
1972-73	11858	4327	2896	1796	20877
1973-74	13140	4852	3176	1984	23151
1974-75	15383	5854	3815	2275	27327
1975-76	18234	6927	4402	2745	32308
1976-77	17962	7075	4369	2749	32154
1977-78	19375	7711	4787	3009	34882
1978-79	20677	8308	5025	3156	37165
1979-80	23123	9401	5601	3621	41747
1980-81	22263	9069	5432	3578	40341
1981-82	25408	10241	6142	4065	45857
1982-83	24807	9955	5754	3734	44251
1983-84	26322	10808	6059	3782	46972
1984-85	28577	11812	6545	4135	51068
1985-86	30382	12879	6925	4456	54642
1986-87	33996	14798	7606	4860	61261
1987-88	35522	15537	7943	5086	64087
1988-89	37273	16712	8300	4968	67253
1989-90	35841	17017	8012	5417	66287
1990-91	39980	18768	8590	5718	73055
1991-92	41760	19613	8970	6528	76871
1992-93	43386	20658	9247	6943	80233
1993-94	43884	21551	9511	6812	81758
1994-95	44106	21983	9307	7043	82440
1995-96	45961	23086	9516	7135	85698
1996-97	46229	22922	9649	7601	86402
1997-98	47335	23129	9586	7286	87336
1998-99	44777	21741	9331	7240	83089
1999-00	47333	23039	9571	7447	87390
2000-01	47401	23311	9274	8045	88031
2001-02	47703	24514	9679	7927	89823
2002-03	49261	26183	9754	8276	93473
2003-04	44490	21787	8872	7494	82644
2004-05	53251	26155	10656	8922	98983

Gross Value Added of Electricity, Gas & Water Supply - Province wise
(1999-00 prices)

	(Rs million)				
	Punjab	Sind	NWFP	Balochistan	Pakistan
1970-71	10884	4750	1219	259	17113
1971-72	11177	5179	1240	268	17863
1972-73	12669	5719	1769	311	20469
1973-74	13722	7063	1883	334	23001
1974-75	13027	6333	1541	338	21239
1975-76	13656	6824	1533	403	22417
1976-77	15032	7603	1765	495	24894
1977-78	15833	8569	1680	623	26704
1978-79	17279	8661	2004	671	28615
1979-80	19082	9366	2090	718	31256
1980-81	20813	10586	2243	830	34472
1981-82	20835	10725	2305	937	34802
1982-83	22066	10893	2612	1026	36597
1983-84	24153	11815	3104	1133	40206
1984-85	24934	12078	3218	1238	41467
1985-86	27200	13299	3480	1364	45342
1986-87	29381	14546	4313	1522	49762
1987-88	33230	15646	5186	1822	55884
1988-89	36264	17805	5999	2125	62193
1989-90	41528	20238	6767	2367	70900
1990-91	45298	22861	7504	2763	78425
1991-92	48968	24946	7980	3087	84981
1992-93	52148	25776	8887	3194	90005
1993-94	53676	27362	9436	3299	93774
1994-95	61278	30599	11551	3689	107117
1995-96	66591	32426	13549	4131	116697
1996-97	65553	31246	13459	4200	114457
1997-98	69843	34584	14517	4477	123420
1998-99	80521	40364	16084	5178	142148
1999-00	80628	37906	15707	5386	139627
2000-01	69699	32665	12669	4933	119966
2001-02	66432	28249	11800	5881	112362
2002-03	58814	25435	10225	5955	100429
2003-04	91422	40408	16249	7944	156024
2004-05	94819	41076	16727	8743	161366

Gross Value Added of Services - Province wise
(1999-00 prices)

(Rs million)

	Punjab	Sindh	NWFP	Balochistan	Pakistan
1970-71	183,205	121,700	46,114	15,085	366,104
1971-72	194,381	128,544	47,469	16,984	387,377
1972-73	213,025	142,739	51,260	18,448	425,473
1973-74	225,159	150,426	53,099	20,235	448,920
1974-75	242,901	160,136	55,553	23,222	481,813
1975-76	246,289	163,815	56,121	23,987	490,212
1976-77	252,454	171,576	60,525	26,216	510,770
1977-78	279,328	193,694	66,207	27,802	567,030
1978-79	293,108	202,022	74,900	30,725	600,755
1979-80	321,891	229,467	82,057	32,262	665,677
1980-81	327,892	227,322	86,565	34,705	676,484
1981-82	345,597	242,993	90,915	38,162	717,668
1982-83	374,155	260,693	95,977	44,274	775,099
1983-84	395,008	281,093	103,366	47,617	827,084
1984-85	426,090	302,122	109,379	51,206	888,797
1985-86	453,266	314,727	116,045	56,498	940,536
1986-87	479,074	333,937	123,584	58,961	995,556
1987-88	509,481	351,144	132,094	61,623	1,054,341
1988-89	532,832	356,833	146,750	68,848	1,105,264
1989-90	555,902	373,589	153,430	71,106	1,154,027
1990-91	588,077	384,691	153,771	77,034	1,203,572
1991-92	625,421	408,641	166,856	79,594	1,280,511
1992-93	665,171	439,137	174,177	87,230	1,365,715
1993-94	679,829	445,442	182,625	90,040	1,397,936
1994-95	729,888	474,677	189,677	92,898	1,487,140
1995-96	761,320	478,733	192,978	92,299	1,525,329
1996-97	777,304	480,147	208,988	95,898	1,562,337
1997-98	796,503	502,465	222,312	98,742	1,620,021
1998-99	832,097	510,965	226,311	101,376	1,670,748
1999-00	909,258	552,863	231,949	99,542	1,793,612
2000-01	936,015	582,299	240,880	99,179	1,858,372
2001-02	976,309	619,979	249,190	102,691	1,948,168
2002-03	1,039,964	643,671	263,790	104,129	2,051,554
2003-04	1,095,198	696,851	279,008	108,471	2,179,528
2004-05	1,177,783	769,797	311,512	110,664	2,369,756

Gross Value Added of Trade, and Hotels & Restaurants - Province wise
(1999-00 prices)

(Rs million)

	Punjab	Sindh	NWFP	Balochistan	Pakistan
1970-71	86307	51678	20519	6422	164927
1971-72	92178	54229	20704	7467	174578
1972-73	102638	61961	22575	7908	195082
1973-74	108695	67089	23195	9498	208478
1974-75	111703	68518	21997	10183	212401
1975-76	109796	68364	20571	10672	209403
1976-77	110613	69668	21419	11693	213393
1977-78	117870	75958	23195	12465	229489
1978-79	128071	81468	26852	13630	250021
1979-80	135257	88627	27562	14596	266042
1980-81	138088	96293	31584	16109	282074
1981-82	147043	104560	33154	17329	302087
1982-83	157073	111585	34986	18837	322481
1983-84	160498	116123	36518	20046	333184
1984-85	177695	128014	39367	21589	366665
1985-86	187371	131500	40758	22133	381762
1986-87	193872	136381	42891	23085	396229
1987-88	203306	140021	45545	23813	412685
1988-89	212864	143740	46741	25063	428408
1989-90	215505	146217	50717	26090	438529
1990-91	228064	144622	46689	28576	447951
1991-92	244758	156588	53859	31711	486916
1992-93	251938	162111	53971	33709	501729
1993-94	249554	164295	57509	36022	507381
1994-95	264329	170413	58661	38349	531752
1995-96	279286	182812	58798	36483	557379
1996-97	280495	184591	64575	36847	566508
1997-98	283281	188019	63138	36841	571278
1998-99	285577	193037	64033	36717	579364
1999-00	311609	188296	72461	35407	607773
2000-01	324534	200719	77869	35194	638315
2001-02	333105	207477	80809	36406	657797
2002-03	351155	220772	86821	37519	696268
2003-04	384547	245714	92623	38058	760941
2004-05	435084	282085	100330	41387	858886

Gross Value Added of Transport, Storage and Communication - Province wise
(1999-00 prices)

(Rs million)

	Punjab	Sindh	NWFP	Balochistan	Pakistan
1970-71	21179	17795	6483	2149	47607
1971-72	22935	19500	6586	2442	51463
1972-73	25086	21160	6760	2592	55598
1973-74	25269	21481	6815	2773	56339
1974-75	27312	23547	7357	3302	61517
1975-76	30524	26772	8362	3740	69398
1976-77	31141	29601	9629	4006	74378
1977-78	34161	33696	11065	4537	83458
1978-79	37596	36968	12635	5182	92381
1979-80	44311	38200	15388	5723	103621
1980-81	48014	37608	17345	6703	109671
1981-82	47976	39434	19443	8104	114958
1982-83	51833	42517	20951	8827	124127
1983-84	58724	48151	23449	9930	140255
1984-85	63960	52573	25244	11813	153590
1985-86	71545	56575	26645	13105	167869
1986-87	77618	59276	28005	14155	179055
1987-88	86461	64049	30029	15358	195897
1988-89	91903	68239	31599	18132	209873
1989-90	97128	71345	33908	18748	221129
1990-91	106413	73681	35418	19510	235022
1991-92	109095	76587	36137	18261	240079
1992-93	122109	81812	39181	20853	263955
1993-94	132597	89358	42087	21911	285953
1994-95	144745	94760	44183	23175	306863
1995-96	147423	95222	46381	23424	312450
1996-97	158222	105924	51820	24694	340661
1997-98	167083	112166	57554	26360	363163
1998-99	178723	107165	57377	27867	371132
1999-00	192037	115061	63917	29965	400981
2000-01	204157	123612	65511	29947	423227
2001-02	207362	127520	65109	30510	430501
2002-03	224805	131370	63287	29775	449236
2003-04	227168	137815	67477	31730	464191
2004-05	232820	147973	69415	32366	482574

Gross Value Added of Finance and Insurance - Province wise
(1999-00 prices)

(Rs million)

	Punjab	Sindh	NWFP	Balochistan	Pakistan
1970-71	11637	21975	3320	402	37334
1971-72	11982	22628	3419	414	38443
1972-73	13056	24656	3725	451	41889
1973-74	12386	23390	3534	428	39737
1974-75	12850	24268	3667	444	41229
1975-76	12841	24250	3664	444	41199
1976-77	13590	25664	3878	470	43602
1977-78	17999	33991	5136	622	57748
1978-79	15908	30041	4539	550	51038
1979-80	22168	41863	6325	766	71122
1980-81	11906	31339	2648	457	46351
1981-82	13697	36053	3047	526	53322
1982-83	15987	42082	3556	614	62239
1983-84	17649	46455	3926	678	68708
1984-85	17618	46373	3919	677	68586
1985-86	18617	48284	5293	691	72885
1986-87	20844	54061	5926	774	81605
1987-88	22734	58962	6464	844	89004
1988-89	21996	57049	6254	816	86116
1989-90	28866	62490	4834	482	96672
1990-91	30976	67057	5187	517	103737
1991-92	34242	74128	5735	572	114676
1992-93	41978	90874	7030	701	140582
1993-94	37523	81231	6284	626	125664
1994-95	43300	93737	7251	723	145012
1995-96	39125	84700	6552	653	131030
1996-97	31573	68351	5288	527	105739
1997-98	32330	69988	5414	540	108272
1998-99	34001	73607	5694	567	113869
1999-00	39550	85619	6623	660	132453
2000-01	34579	73692	5623	560	114455
2001-02	40344	85172	6589	657	132761
2002-03	38102	82485	6381	636	127604
2003-04	41112	91842	7104	708	140766
2004-05	52154	119573	9250	922	181899

Gross Value Added of Ownership of Dwelling - Provincial
(1999-00 prices)

(Rs Million)

	Punjab	Sind	NWFP	Balochistan	Pakistan
1970-71	14660	6831	1710	1322	24523
1971-72	15418	7202	1823	1378	25822
1972-73	16216	7593	1945	1437	27191
1973-74	17056	8006	2074	1497	28632
1974-75	17938	8440	2212	1560	30151
1975-76	18866	8898	2359	1626	31750
1976-77	19843	9382	2516	1695	33435
1977-78	20870	9891	2683	1767	35210
1978-79	21950	10428	2861	1841	37080
1979-80	23086	10994	3052	1919	39050
1980-81	24280	11591	3255	2000	41126
1981-82	25537	12220	3471	2084	43312
1982-83	26858	12884	3702	2172	45616
1983-84	28248	13583	3948	2264	48044
1984-85	29710	14321	4210	2360	50601
1985-86	31248	15098	4490	2460	53296
1986-87	32865	15918	4789	2563	56135
1987-88	34565	16782	5107	2672	59126
1988-89	36354	17693	5447	2784	62279
1989-90	38236	18654	5809	2902	65601
1990-91	40214	19667	6195	3025	69101
1991-92	42295	20734	6607	3152	72789
1992-93	44484	21860	7047	3285	76676
1993-94	46786	23047	7515	3424	80772
1994-95	49207	24298	8015	3569	85089
1995-96	51754	25617	8548	3720	89639
1996-97	54432	27008	9116	3877	94433
1997-98	57249	28474	9722	4040	99486
1998-99	60212	30020	10369	4211	104812
1999-00	63328	31650	11058	4389	110425
2000-01	66605	33369	11794	4574	116341
2001-02	70052	35180	12578	4767	122577
2002-03	73677	37090	13414	4969	129150
2003-04	77490	39104	14306	5178	136078
2004-05	81500	41227	15257	5397	143381

Gross Value Added of Public Administration & Defence - Province wise
(1999-00 prices)

(Rs million)

	Punjab	Sind	NWFP	Balochistan	Pakistan
1970-71	21200	8517	5147	2427	37293
1971-72	22203	9321	5546	2800	39870
1972-73	24803	10880	6370	3447	45499
1973-74	28822	13070	7055	3283	52230
1974-75	38305	16991	9306	4821	69423
1975-76	37474	16104	9518	4426	67523
1976-77	39186	17153	11027	5165	72531
1977-78	47246	18411	11090	4965	81712
1978-79	46033	20120	14225	5877	86255
1979-80	48253	24006	14276	5173	91708
1980-81	55912	24252	16001	5277	101442
1981-82	59217	23200	15298	5756	103471
1982-83	63417	26850	16122	7216	113604
1983-84	66827	30293	17713	7634	122467
1984-85	69329	32372	17496	7174	126371
1985-86	71968	32811	18376	9986	133141
1986-87	75605	35425	19865	9615	140510
1987-88	79072	36324	21409	9601	146405
1988-89	83728	38616	24661	10615	157621
1989-90	85354	41621	24314	10804	162093
1990-91	86150	44406	24403	12603	167561
1991-92	91345	42626	25872	12106	171949
1992-93	94303	42057	25816	14002	176178
1993-94	95981	44514	25477	12442	178414
1994-95	103036	45585	24877	10419	183918
1995-96	112700	42388	23862	10589	189539
1996-97	112455	42948	25961	11313	192677
1997-98	106419	48824	30523	10988	196754
1998-99	113357	48448	29119	10700	201623
1999-00	120823	54228	30796	14582	220429
2000-01	113324	68223	30167	13493	225207
2001-02	119437	76288	30774	13887	240386
2002-03	131625	77356	36779	13600	259359
2003-04	132861	82881	37432	14253	267427
2004-05	130603	73611	53674	10961	268849

Gross Value Added of Social, Community & Personal Services

Province wise

(1999-00 prices)

(Rs million)

	Punjab	Sind	NWFP	Balochistan	Pakistan
1970-71	28222	14902	8935	2362	54420
1971-72	29663	15664	9391	2482	57201
1972-73	31226	16489	9886	2613	60214
1973-74	32932	17390	10426	2756	63503
1974-75	34793	18372	11015	2911	67092
1975-76	36788	19426	11647	3078	70939
1976-77	38080	20108	12056	3187	73431
1977-78	41182	21746	13038	3446	79413
1978-79	43551	22997	13788	3644	83980
1979-80	48816	25778	15455	4085	94134
1980-81	49691	26239	15732	4158	95820
1981-82	52127	27526	16503	4362	100517
1982-83	58986	24776	16661	6608	107031
1983-84	63062	26487	17812	7064	114425
1984-85	67779	28469	19144	7593	122984
1985-86	72518	30459	20483	8123	131584
1986-87	78270	32875	22108	8768	142021
1987-88	83342	35006	23540	9336	151223
1988-89	85986	31495	32048	11438	160967
1989-90	90813	33263	33848	12080	170004
1990-91	96260	35258	35878	12805	180201
1991-92	103685	37978	38645	13793	194101
1992-93	110360	40422	41133	14680	206595
1993-94	117388	42997	43752	15615	219752
1994-95	125269	45883	46690	16664	234506
1995-96	131031	47994	48838	17430	245293
1996-97	140126	51325	52228	18640	262320
1997-98	150141	54994	55960	19972	281068
1998-99	160227	58688	59719	21314	299947
1999-00	181911	78008	47093	14539	321551
2000-01	192816	82684	49916	15410	340826
2001-02	206009	88342	53332	16464	364147
2002-03	220600	94598	57109	17631	389937
2003-04	232020	99496	60065	18543	410125
2004-05	245622	105329	63586	19630	434167

E Time Series of Capital Stock**Capital Stock - at Constant Prices of 1999-00 (Beginning of year)**

(Rs million)

	Agriculture	Mining & Quarrying	Manufacturing	LSM	SSM
1970-71	176,465	17,980	337,006	301,691	38,324
1971-72	179,096	18,255	338,854	302,161	39,543
1972-73	183,264	18,576	337,238	298,905	40,813
1973-74	188,800	19,443	331,683	291,222	42,289
1974-75	192,286	19,709	325,272	282,881	43,911
1975-76	193,056	20,536	324,306	280,333	45,650
1976-77	209,896	20,797	334,561	290,013	46,873
1977-78	227,200	23,599	350,955	305,934	48,127
1978-79	245,618	26,501	372,659	327,445	49,237
1979-80	261,566	27,058	393,962	348,303	50,405
1980-81	279,353	27,558	412,199	365,724	51,612
1981-82	299,259	29,497	423,361	375,386	53,127
1982-83	321,335	31,641	436,699	386,829	55,093
1983-84	351,776	32,806	455,469	403,567	57,397
1984-85	388,352	37,806	480,642	426,693	59,841
1985-86	427,233	43,372	501,218	444,479	62,637
1986-87	460,794	54,739	526,919	467,245	65,764
1987-88	498,571	69,944	550,619	487,557	69,095
1988-89	532,865	78,638	573,549	506,793	72,638
1989-90	560,462	90,591	601,820	531,261	76,565
1990-91	590,425	95,664	637,718	563,402	80,573
1991-92	620,912	102,569	679,072	601,140	84,917
1992-93	644,667	112,616	750,553	667,914	91,218
1993-94	673,377	120,727	823,404	734,823	98,516
1994-95	705,788	132,252	890,838	794,884	106,620
1995-96	739,586	150,321	906,942	802,402	113,838
1996-97	772,259	167,629	934,600	820,348	122,357
1997-98	778,586	197,534	968,333	844,065	131,304
1998-99	789,124	216,515	996,425	859,765	141,945
1999-00	815,833	233,490	1,055,141	904,359	155,043
2000-01	843,760	245,875	1,120,852	957,064	167,879
2001-02	859,591	272,340	1,184,121	1,006,237	181,923
2002-03	874,488	310,702	1,253,781	1,060,550	197,372
2003-04	890,327	369,674	1,314,441	1,101,978	216,797
2004-05	894,261	372,667	1,408,336	1,135,030	235,351

Continued...

	Construction	Electricity, Gas & Water Supply	Total Industry	Transport, Storage & Communication	Trade, Hotel & Restaurants
1970-71	575,719	100,668	1,031,374	142,756	48,194
1971-72	576,259	109,434	1,042,802	144,264	49,606
1972-73	575,735	113,704	1,045,253	144,952	51,042
1973-74	571,960	117,496	1,040,582	150,505	52,469
1974-75	567,295	122,542	1,034,818	153,339	53,215
1975-76	564,163	142,579	1,051,584	156,797	53,343
1976-77	561,352	161,751	1,078,460	156,615	53,050
1977-78	551,995	173,157	1,099,707	156,840	52,687
1978-79	543,716	184,438	1,127,313	156,232	52,301
1979-80	533,184	194,620	1,148,825	154,742	51,886
1980-81	523,427	198,325	1,161,509	155,121	51,383
1981-82	517,207	205,914	1,175,980	164,913	50,935
1982-83	512,734	215,770	1,196,844	177,017	50,466
1983-84	512,721	234,968	1,235,964	185,396	50,072
1984-85	508,592	251,741	1,278,781	196,315	49,810
1985-86	505,240	273,882	1,323,712	214,487	49,800
1986-87	501,419	294,583	1,377,660	230,598	49,836
1987-88	499,536	325,849	1,445,947	250,688	50,038
1988-89	497,875	355,055	1,505,117	262,125	50,514
1989-90	495,524	401,835	1,589,770	270,420	50,808
1990-91	493,683	443,388	1,670,454	276,356	51,231
1991-92	490,763	483,419	1,755,823	292,795	52,419
1992-93	492,545	532,732	1,888,446	314,068	53,718
1993-94	497,219	584,509	2,025,859	347,569	54,937
1994-95	502,971	639,156	2,165,217	364,152	56,453
1995-96	506,682	723,342	2,287,288	374,749	59,215
1996-97	512,049	808,068	2,422,347	398,922	62,960
1997-98	515,596	860,084	2,541,547	441,959	65,488
1998-99	519,372	918,570	2,650,882	475,459	69,206
1999-00	519,437	940,595	2,748,664	501,171	72,785
2000-01	521,569	975,028	2,863,325	543,664	77,166
2001-02	520,814	1,006,483	2,983,758	603,912	82,642
2002-03	521,142	1,024,060	3,109,685	639,201	89,468
2003-04	514,720	1,038,336	3,237,172	665,412	97,804
2004-05	509,772	1,018,928	3,309,703	721,357	107,897

Continued...

	Finance & Insurance	Ownership of Dwellings	Public Admin & Defence	Other Services	Total Services	Grand Total
1970-71	8,100	175,960	269,232	355,946	1,000,188	2,208,026
1971-72	8,562	177,545	273,283	362,017	1,015,277	2,237,175
1972-73	8,798	178,954	275,669	367,832	1,027,249	2,255,765
1973-74	9,068	177,519	284,766	373,950	1,048,277	2,277,660
1974-75	9,365	175,403	303,230	392,647	1,087,198	2,314,302
1975-76	9,577	179,682	325,685	402,036	1,127,120	2,371,760
1976-77	9,788	182,270	346,679	413,109	1,161,510	2,449,866
1977-78	10,220	186,104	369,204	430,683	1,205,738	2,532,644
1978-79	10,759	190,903	386,085	445,070	1,241,350	2,614,281
1979-80	11,168	194,589	401,739	461,094	1,275,218	2,685,608
1980-81	11,758	198,463	411,242	497,758	1,325,724	2,766,586
1981-82	12,219	224,096	428,586	493,451	1,374,200	2,849,439
1982-83	13,192	250,941	457,105	490,749	1,439,471	2,957,651
1983-84	14,440	278,513	486,296	488,316	1,503,033	3,090,773
1984-85	16,014	305,579	515,327	486,826	1,569,872	3,237,005
1985-86	17,449	332,448	545,743	485,709	1,645,636	3,396,582
1986-87	19,141	358,622	578,338	487,145	1,723,680	3,562,134
1987-88	20,847	385,616	615,602	492,198	1,814,989	3,759,507
1988-89	22,200	410,229	651,130	498,127	1,894,325	3,932,307
1989-90	22,815	432,088	680,913	499,879	1,956,923	4,107,155
1990-91	23,453	452,491	708,516	501,265	2,013,311	4,274,190
1991-92	24,119	479,822	750,474	505,756	2,105,385	4,482,120
1992-93	24,557	510,246	798,144	512,875	2,213,608	4,746,721
1993-94	26,309	546,128	851,773	521,067	2,347,782	5,047,018
1994-95	28,274	578,533	896,860	532,667	2,456,938	5,327,943
1995-96	33,288	604,382	936,501	542,754	2,550,889	5,577,763
1996-97	38,859	632,185	974,623	555,820	2,663,368	5,857,975
1997-98	49,234	660,305	993,437	574,791	2,785,215	6,105,348
1998-99	55,686	692,853	1,018,429	600,228	2,911,861	6,351,867
1999-00	64,770	728,502	1,044,580	624,827	3,036,635	6,601,132
2000-01	72,009	768,229	1,073,770	651,431	3,186,269	6,893,354
2001-02	73,905	812,824	1,101,433	678,919	3,353,634	7,196,983
2002-03	80,316	852,747	1,129,994	706,467	3,498,192	7,482,365
2003-04	98,167	891,142	1,171,191	729,972	3,653,688	7,781,187
2004-05	116,019	931,367	1,227,957	757,054	3,861,652	8,065,615

F	Factorization of Real GDP Growth (1999-00 prices)
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F.1: Factorization of Growth Rates of GDP

	Output Growth	Contribution of Capital	Contribution of Labour	TFP
1971-72	3.73	0.55	0.58	2.60
1972-73	6.82	0.35	2.18	4.30
1973-74	5.13	0.40	1.58	3.14
1974-75	2.57	0.67	1.60	0.30
1975-76	2.58	1.04	2.25	-0.71
1976-77	3.48	1.37	2.25	-0.14
1977-78	7.49	1.41	2.24	3.84
1978-79	5.42	1.34	2.29	1.79
1979-80	8.35	1.14	1.32	5.90
1980-81	4.02	1.26	1.33	1.42
1981-82	6.45	1.25	1.35	3.85
1982-83	6.46	1.58	1.35	3.54
1983-84	3.07	1.88	1.25	-0.06
1984-85	8.76	1.97	1.24	5.54
1985-86	5.58	2.06	0.14	3.39
1986-87	4.21	2.03	4.22	-2.03
1987-88	5.29	2.31	1.15	1.84
1988-89	4.50	1.92	4.97	-2.38
1989-90	3.69	1.85	4.43	-2.60
1990-91	4.14	1.70	0.51	1.94
1991-92	5.92	2.03	2.40	1.49
1992-93	3.07	2.46	1.96	-1.35
1993-94	2.53	2.64	2.76	-2.87
1994-95	5.55	2.32	1.48	1.75
1995-96	2.45	1.96	2.67	-2.17
1996-97	1.01	2.10	4.85	-5.94
1997-98	3.76	1.76	3.71	-1.71
1998-99	3.01	1.68	2.05	-0.72
1999-00	5.74	1.64	-1.95	6.05
2000-01	2.37	1.85	-0.03	0.55
2001-02	3.33	1.84	0.93	0.56
2002-03	4.65	1.65	3.71	-0.71
2003-04	7.34	1.67	4.99	0.68
2004-05	8.97	1.52	3.63	3.81

Continued ...

F.2: Factorization of Growth Rates of Gross Value Added of Agriculture

	Output Growth	Contribution of Capital	Contribution of Labour	TFP
1971-72	3.64	0.62	0.31	2.71
1972-73	2.00	0.97	3.53	-2.50
1973-74	3.20	1.26	-0.36	2.30
1974-75	-2.32	0.77	-0.41	-2.68
1975-76	2.63	0.17	1.65	0.81
1976-77	2.42	3.64	1.65	-2.86
1977-78	2.47	3.44	1.64	-2.60
1978-79	5.28	3.38	1.68	0.22
1979-80	4.22	2.71	1.35	0.15
1980-81	3.97	2.84	1.37	-0.24
1981-82	3.76	2.97	1.36	-0.57
1982-83	4.34	3.08	1.35	-0.09
1983-84	-3.53	3.95	0.02	-7.51
1984-85	8.59	4.34	-0.01	4.26
1985-86	5.27	4.18	4.12	-3.03
1986-87	1.79	3.28	-1.31	-0.18
1987-88	2.52	3.42	3.45	-4.35
1988-89	5.70	2.87	3.36	-0.54
1989-90	2.52	2.16	2.79	-2.43
1990-91	3.26	2.23	-1.07	2.10
1991-92	5.83	2.15	3.71	-0.04
1992-93	-3.84	1.60	1.10	-6.53
1993-94	3.14	1.86	5.92	-4.64
1994-95	5.18	2.01	-2.40	5.58
1995-96	3.95	2.00	0.95	1.01
1996-97	0.31	1.84	3.02	-4.55
1997-98	4.10	0.34	8.06	-4.30
1998-99	1.51	0.56	2.80	-1.86
1999-00	5.79	1.41	-1.26	5.64
2000-01	-1.58	1.43	-3.83	0.83
2001-02	0.64	0.78	-3.21	3.07
2002-03	3.07	0.72	3.71	-1.37
2003-04	1.99	0.76	5.86	-4.63
2004-05	7.56	0.18	3.63	3.75

Continued ...

F.3: Factorization of Growth Rates of Gross Value Added of Industrial Sector

	Output Growth	Contribution of Capital	Contribution of Labour	TFP
1971-72	0.23	0.46	-7.35	7.12
1972-73	10.13	0.10	-7.27	17.30
1973-74	7.73	-0.19	10.89	-2.97
1974-75	1.95	-0.23	9.66	-7.47
1975-76	4.08	0.68	3.76	-0.36
1976-77	3.80	1.07	3.73	-0.99
1977-78	8.56	0.82	3.69	4.05
1978-79	4.62	1.05	3.70	-0.13
1979-80	9.60	0.80	-7.44	16.24
1980-81	8.78	0.46	-8.93	17.26
1981-82	10.67	0.52	11.99	-1.84
1982-83	6.39	0.74	10.37	-4.72
1983-84	4.58	1.36	2.26	0.96
1984-85	11.29	1.44	2.24	7.61
1985-86	5.52	1.47	-2.68	6.73
1986-87	3.97	1.70	10.12	-7.85
1987-88	7.15	2.07	-4.01	9.10
1988-89	2.71	1.71	5.72	-4.72
1989-90	3.59	2.35	5.16	-3.92
1990-91	4.77	2.12	1.19	1.46
1991-92	5.16	2.13	1.85	1.18
1992-93	3.59	3.15	1.59	-1.15
1993-94	2.27	3.03	1.92	-2.68
1994-95	4.32	2.87	-0.79	2.24
1995-96	0.78	2.35	3.32	-4.90
1996-97	-1.08	2.46	5.52	-9.07
1997-98	3.56	2.05	-2.25	3.76
1998-99	4.31	1.79	3.68	-1.16
1999-00	2.46	1.54	-0.47	1.39
2000-01	3.81	1.74	4.40	-2.33
2001-02	2.79	1.75	5.12	-4.08
2002-03	4.76	1.76	3.71	-0.71
2003-04	14.72	1.71	3.47	9.54
2004-05	10.61	0.93	3.63	6.05

Continued ...

F.4: Factorization of Growth Rates of Gross Value Added of Mining & Quarrying

	Output Growth	Contribution of Capital	Contribution of Labour	TFP
1971-72	1.92	0.64	43.60	-42.31
1972-73	1.26	0.73	72.05	-71.53
1973-74	2.24	1.95	-23.73	24.02
1974-75	-0.15	0.57	-42.25	41.53
1975-76	-1.37	1.75	1.24	-4.36
1976-77	27.64	0.53	1.22	25.89
1977-78	4.38	5.62	1.20	-2.44
1978-79	1.28	5.13	1.23	-5.08
1979-80	5.59	0.88	56.67	-51.95
1980-81	10.23	0.77	30.04	-20.59
1981-82	8.09	2.93	-21.01	26.17
1982-83	10.50	3.03	-34.44	41.91
1983-84	2.73	1.54	22.09	-20.89
1984-85	30.32	6.36	16.68	7.29
1985-86	29.21	6.14	31.07	-8.00
1986-87	4.99	10.93	-3.00	-2.94
1987-88	9.69	11.58	-19.53	17.63
1988-89	2.98	5.18	4.97	-7.17
1989-90	11.40	6.34	4.43	0.63
1990-91	14.86	2.34	0.51	12.01
1991-92	-1.76	3.01	42.86	-47.63
1992-93	1.18	4.09	28.47	-31.38
1993-94	-0.32	3.00	2.76	-6.08
1994-95	-1.72	3.98	-38.37	32.67
1995-96	5.82	5.70	-2.41	2.54
1996-97	2.04	4.80	-0.89	-1.87
1997-98	-0.06	7.44	59.51	-67.01
1998-99	-1.01	4.01	-17.00	11.98
1999-00	4.66	3.27	-27.95	29.35
2000-01	0.60	2.21	-0.03	-1.59
2001-02	5.44	4.49	0.93	0.02
2002-03	15.06	5.87	3.71	5.48
2003-04	4.25	7.92	4.99	-8.66
2004-05	5.60	0.34	3.63	1.63

Continued ...

F.5: Factorization of Growth Rates of Gross Value Added of Manufacturing

	Output Growth	Contribution of Capital	Contribution of Labour	TFP
1971-72	1.92	0.23	-9.32	11.01
1972-73	9.50	-0.20	-18.19	27.89
1973-74	7.11	-0.69	20.99	-13.19
1974-75	1.27	-0.81	16.26	-14.18
1975-76	2.19	-0.12	3.24	-0.92
1976-77	2.60	1.32	3.22	-1.94
1977-78	8.96	2.04	3.20	3.72
1978-79	4.19	2.58	3.23	-1.62
1979-80	9.41	2.38	-9.69	16.71
1980-81	10.52	1.93	-12.16	20.76
1981-82	11.56	1.13	15.29	-4.85
1982-83	7.78	1.31	12.64	-6.17
1983-84	3.89	1.79	1.76	0.34
1984-85	11.63	2.31	1.75	7.57
1985-86	3.55	1.79	-2.13	3.89
1986-87	2.15	2.14	8.31	-8.29
1987-88	6.72	1.88	-7.22	12.07
1988-89	1.28	1.74	5.32	-5.78
1989-90	2.29	2.06	4.77	-4.54
1990-91	2.22	2.49	0.83	-1.10
1991-92	5.27	2.70	2.65	-0.08
1992-93	3.28	4.39	-2.36	1.25
1993-94	2.22	4.05	3.46	-5.29
1994-95	3.59	3.42	-4.48	4.66
1995-96	-1.74	0.75	4.78	-7.28
1996-97	-1.47	1.27	6.97	-9.71
1997-98	3.35	1.51	-2.66	4.51
1998-99	3.77	1.21	6.66	-4.10
1999-00	2.95	2.46	2.05	-1.56
2000-01	8.90	2.60	5.96	0.34
2001-02	4.44	2.35	6.45	-4.37
2002-03	6.69	2.45	3.71	0.53
2003-04	13.28	2.02	4.35	6.91
2004-05	11.46	2.98	3.63	4.86

Continued ...

F.6: Factorization of Growth Rates of Gross Value Added of Construction

	Output Growth	Contribution of Capital	Contribution of Labour	TFP
1971-72	-16.35	0.04	-5.46	-10.93
1972-73	15.75	-0.04	21.86	-6.08
1973-74	10.89	-0.27	-0.54	11.70
1974-75	18.04	-0.34	-0.60	18.97
1975-76	18.23	-0.23	4.84	13.62
1976-77	-0.48	-0.21	4.74	-5.00
1977-78	8.48	-0.70	4.63	4.54
1978-79	6.54	-0.63	4.59	2.58
1979-80	12.33	-0.81	-3.11	16.24
1980-81	-3.37	-0.76	-3.44	0.84
1981-82	13.67	-0.50	5.69	8.47
1982-83	-3.50	-0.36	5.39	-8.53
1983-84	6.15	0.00	6.21	-0.06
1984-85	8.72	-0.34	5.82	3.23
1985-86	7.00	-0.27	-3.62	10.89
1986-87	12.11	-0.32	13.40	-0.97
1987-88	4.61	-0.16	4.80	-0.03
1988-89	4.94	-0.14	5.76	-0.69
1989-90	-1.44	-0.20	5.21	-6.45
1990-91	10.21	-0.15	1.23	9.14
1991-92	5.22	-0.25	-0.26	5.73
1992-93	4.37	0.15	7.67	-3.45
1993-94	1.90	0.40	-1.03	2.53
1994-95	0.83	0.48	8.01	-7.66
1995-96	3.95	0.31	0.72	2.92
1996-97	0.82	0.44	2.77	-2.39
1997-98	1.08	0.29	-0.79	1.59
1998-99	-4.86	0.31	-0.26	-4.91
1999-00	5.18	0.01	-4.19	9.36
2000-01	0.73	0.17	1.34	-0.77
2001-02	2.04	-0.06	2.29	-0.19
2002-03	4.06	0.03	3.71	0.33
2003-04	-11.59	-0.51	2.69	-13.76
2004-05	19.77	-0.40	3.63	16.55

Continued ...

F.7: Factorization of Growth Rates of Gross Value Added of Electricity, Gas & Water Supply

	Output Growth	Contribution of Capital	Contribution of Labour	TFP
1971-72	4.39	3.63	28.84	-28.08
1972-73	14.58	1.63	-4.36	17.32
1973-74	12.37	1.39	16.10	-5.12
1974-75	-7.66	1.79	13.29	-22.74
1975-76	5.55	6.82	9.97	-11.24
1976-77	11.05	5.61	9.10	-3.65
1977-78	7.27	2.94	8.40	-4.07
1978-79	7.16	2.72	7.88	-3.44
1979-80	9.23	2.30	-4.32	11.25
1980-81	10.29	0.79	-4.89	14.39
1981-82	0.96	1.60	27.70	-28.33
1982-83	5.16	2.00	19.62	-16.45
1983-84	9.86	3.71	-10.34	16.49
1984-85	3.14	2.98	-13.15	13.31
1985-86	9.34	3.67	-14.26	19.93
1986-87	9.75	3.15	29.46	-22.86
1987-88	12.30	4.43	-10.25	18.13
1988-89	11.29	3.74	13.55	-6.00
1989-90	14.00	5.49	11.92	-3.41
1990-91	10.61	4.31	6.78	-0.48
1991-92	8.36	3.77	-0.53	5.12
1992-93	5.91	4.25	5.77	-4.12
1993-94	4.19	4.05	4.94	-4.81
1994-95	14.23	3.90	-1.96	12.29
1995-96	8.94	5.49	8.61	-5.16
1996-97	-1.92	4.89	10.46	-17.27
1997-98	7.83	2.68	-14.01	19.15
1998-99	15.17	2.84	2.05	10.28
1999-00	-1.77	1.00	-1.95	-0.83
2000-01	-14.08	1.53	4.55	-20.16
2001-02	-6.34	1.35	5.25	-12.93
2002-03	-10.62	0.73	3.71	-15.06
2003-04	55.36	0.58	-5.95	60.72
2004-05	3.42	-0.78	3.63	0.58

Continued ...

F.8: Factorization of Growth Rates of Gross Value Added of Services Sector

	Output Growth	Contribution of Capital	Contribution of Labour	TFP
1971-72	5.81	0.63	7.86	-2.68
1972-73	9.83	0.49	5.27	4.07
1973-74	5.51	0.85	0.95	3.71
1974-75	7.33	1.55	0.96	4.82
1975-76	1.74	1.53	2.42	-2.21
1976-77	4.19	1.27	2.42	0.50
1977-78	11.01	1.59	2.41	7.01
1978-79	5.95	1.23	2.46	2.26
1979-80	10.81	1.14	7.82	1.85
1980-81	1.62	1.65	7.20	-7.23
1981-82	6.09	1.53	-3.29	7.86
1982-83	8.00	1.98	-3.69	9.71
1983-84	6.71	1.84	2.86	2.00
1984-85	7.46	1.85	2.82	2.79
1985-86	5.82	2.01	-4.81	8.62
1986-87	5.85	1.98	11.11	-7.24
1987-88	5.90	2.21	0.97	2.73
1988-89	4.83	1.82	7.26	-4.25
1989-90	4.41	1.38	6.62	-3.58
1990-91	4.29	1.20	2.49	0.60
1991-92	6.39	1.91	0.85	3.64
1992-93	6.65	2.14	3.48	1.03
1993-94	2.36	2.53	-1.30	1.13
1994-95	6.38	1.94	9.23	-4.79
1995-96	2.57	1.59	4.63	-3.66
1996-97	2.43	1.84	6.83	-6.24
1997-98	3.69	1.91	1.56	0.23
1998-99	3.13	1.90	0.28	0.95
1999-00	7.35	1.79	-3.65	9.21
2000-01	3.61	2.06	3.09	-1.54
2001-02	4.83	2.19	3.94	-1.30
2002-03	5.31	1.80	3.71	-0.20
2003-04	6.24	1.85	4.86	-0.47
2004-05	8.73	2.37	3.63	2.73

Continued ...

F.9: Factorization of Growth Rates of Gross Value Added of Trade, Hotels & Restaurants

	Output Growth	Contribution of Capital	Contribution of Labour	TFP
1971-72	5.85	1.22	-0.02	4.65
1972-73	11.74	1.21	-2.10	12.64
1973-74	6.87	1.17	6.95	-1.25
1974-75	1.88	0.59	6.53	-5.24
1975-76	-1.41	0.10	2.45	-3.97
1976-77	1.91	-0.23	2.45	-0.32
1977-78	7.54	-0.29	2.45	5.38
1978-79	8.95	-0.31	2.49	6.76
1979-80	6.41	-0.33	-4.98	11.71
1980-81	6.03	-0.40	-5.70	12.13
1981-82	7.09	-0.36	9.33	-1.87
1982-83	6.75	-0.38	8.38	-1.25
1983-84	3.32	-0.33	0.25	3.40
1984-85	10.05	-0.22	0.23	10.04
1985-86	4.12	-0.01	-0.57	4.70
1986-87	3.79	0.03	7.78	-4.02
1987-88	4.15	0.17	0.50	3.48
1988-89	3.81	0.40	7.31	-3.89
1989-90	2.36	0.24	6.66	-4.54
1990-91	2.15	0.35	2.53	-0.73
1991-92	8.70	0.97	1.76	5.97
1992-93	3.04	1.03	2.97	-0.96
1993-94	1.13	0.95	0.29	-0.11
1994-95	4.80	1.15	9.52	-5.87
1995-96	4.82	2.04	2.92	-0.14
1996-97	1.64	2.64	5.11	-6.11
1997-98	0.84	1.67	0.53	-1.36
1998-99	1.42	2.37	1.25	-2.20
1999-00	4.90	2.16	-2.71	5.45
2000-01	5.03	2.51	2.89	-0.37
2001-02	3.05	2.96	3.75	-3.66
2002-03	5.85	3.44	3.71	-1.31
2003-04	9.29	3.89	4.78	0.62
2004-05	12.87	4.30	3.63	4.94

Continued ...

F.10: Factorization of Growth Rates of Gross Value Added of Transport, Storage and Communication

	Output Growth	Contribution of Capital	Contribution of Labour	TFP
1971-72	8.10	0.44	0.10	7.56
1972-73	8.04	0.20	-9.32	17.16
1973-74	1.33	1.60	8.84	-9.10
1974-75	9.19	0.79	8.07	0.33
1975-76	12.81	0.94	1.81	10.06
1976-77	7.18	-0.05	1.81	5.42
1977-78	12.21	0.06	1.80	10.34
1978-79	10.69	-0.16	1.84	9.01
1979-80	12.17	-0.40	-2.40	14.97
1980-81	5.84	0.10	-2.63	8.37
1981-82	4.82	2.63	4.59	-2.41
1982-83	7.98	3.06	4.42	0.50
1983-84	12.99	1.97	5.20	5.81
1984-85	9.51	2.46	4.95	2.10
1985-86	9.30	3.86	-8.63	14.06
1986-87	6.66	3.13	15.95	-12.42
1987-88	9.41	3.63	-2.93	8.70
1988-89	7.13	1.90	6.48	-1.25
1989-90	5.36	1.32	5.89	-1.85
1990-91	6.28	0.92	1.85	3.52
1991-92	2.15	2.48	5.53	-5.85
1992-93	9.94	3.03	2.07	4.85
1993-94	8.33	4.45	-3.54	7.43
1994-95	7.31	1.99	2.93	2.40
1995-96	1.82	1.21	6.51	-5.91
1996-97	9.03	2.69	8.60	-2.26
1997-98	6.61	4.50	1.21	0.90
1998-99	2.19	3.16	-0.42	-0.54
1999-00	8.04	2.26	-4.36	10.15
2000-01	5.55	3.54	5.01	-3.00
2001-02	1.72	4.62	5.65	-8.55
2002-03	4.35	2.44	3.71	-1.80
2003-04	3.33	1.71	2.85	-1.23
2004-05	3.96	3.51	3.63	-3.17

Continued ...

F.11: Factorization of Growth Rates of Gross Value Added of Finance & Insurance

	Output Growth	Contribution of Capital	Contribution of Labour	TFP
1971-72	2.97	2.38	0.58	0.02
1972-73	8.96	1.15	2.18	5.64
1973-74	-5.14	1.28	1.58	-8.00
1974-75	3.75	1.36	1.60	0.79
1975-76	-0.07	0.95	2.25	-3.27
1976-77	5.83	0.92	2.25	2.67
1977-78	32.44	1.84	2.24	28.36
1978-79	-11.62	2.20	2.29	-16.11
1979-80	39.35	1.58	1.32	36.45
1980-81	-34.83	2.20	1.33	-38.37
1981-82	15.04	1.64	3.71	9.70
1982-83	16.72	3.32	3.61	9.79
1983-84	10.39	3.95	3.43	3.02
1984-85	-0.18	4.54	3.35	-8.07
1985-86	6.27	3.74	4.12	-1.59
1986-87	11.97	4.04	-7.09	15.01
1987-88	9.07	3.72	-3.49	8.83
1988-89	-3.24	2.71	10.32	-16.27
1989-90	12.26	1.16	9.32	1.79
1990-91	7.31	1.17	4.76	1.39
1991-92	10.55	1.18	-6.47	15.83
1992-93	22.59	0.76	6.72	15.12
1993-94	-10.61	2.98	-0.22	-13.37
1994-95	15.40	3.11	0.71	11.57
1995-96	-9.64	7.40	10.98	-28.02
1996-97	-19.30	6.98	12.43	-38.71
1997-98	2.40	11.14	-3.25	-5.49
1998-99	5.17	5.47	0.32	-0.61
1999-00	16.32	6.80	-3.61	13.13
2000-01	-13.59	4.66	2.46	-20.71
2001-02	15.99	1.10	3.36	11.54
2002-03	-3.88	3.62	3.71	-11.21
2003-04	10.31	9.27	17.08	-16.04
2004-05	29.22	7.58	3.63	18.01

Continued ...

F.12: Factorization of Growth Rates of Gross Value Added of Ownership of Dwelling

	Output Growth	Contribution of Capital	Contribution of Labour	TFP
1971-72	5.30	0.38	22.17	-17.25
1972-73	5.30	0.33	19.39	-14.43
1973-74	5.30	-0.33	1.26	4.37
1974-75	5.30	-0.50	-16.26	22.06
1975-76	5.31	1.02	2.09	2.20
1976-77	5.31	0.60	1.95	2.76
1977-78	5.31	0.88	1.64	2.79
1978-79	5.31	1.08	2.59	1.64
1979-80	5.31	0.81	30.67	-26.17
1980-81	5.32	0.83	7.99	-3.51
1981-82	5.32	5.39	-13.04	12.98
1982-83	5.32	5.00	-6.68	7.00
1983-84	5.32	4.58	1.25	-0.51
1984-85	5.32	4.05	16.05	-14.78
1985-86	5.33	3.67	-5.78	7.44
1986-87	5.33	3.28	16.86	-14.81
1987-88	5.33	3.14	1.51	0.68
1988-89	5.33	2.66	5.35	-2.68
1989-90	5.33	2.22	4.43	-1.32
1990-91	5.34	1.97	13.06	-9.70
1991-92	5.34	2.52	0.51	2.31
1992-93	5.34	2.64	9.02	-6.33
1993-94	5.34	2.93	3.51	-1.10
1994-95	5.34	2.47	3.86	-0.99
1995-96	5.35	1.86	2.67	0.82
1996-97	5.35	1.92	11.44	-8.01
1997-98	5.35	1.86	3.71	-0.21
1998-99	5.35	2.06	2.05	1.24
1999-00	5.36	2.15	-5.05	8.26
2000-01	5.36	2.27	8.75	-5.67
2001-02	5.36	2.42	-0.33	3.26
2002-03	5.36	2.05	4.43	-1.12
2003-04	5.36	1.88	5.40	-1.91
2004-05	5.37	1.88	3.67	-0.18

Continued ...

F.13: Factorization of Growth Rates of Gross Value Added of Public Administration & Defence

	Output Growth	Contribution of Capital	Contribution of Labour	TFP
1971-72	6.91	0.63	22.65	-16.37
1972-73	14.12	0.36	19.46	-5.70
1973-74	14.79	1.38	-4.06	17.48
1974-75	32.92	2.70	-6.49	36.70
1975-76	-2.74	3.09	3.54	-9.37
1976-77	7.42	2.69	3.59	1.13
1977-78	12.66	2.71	3.73	6.22
1978-79	5.56	1.91	3.58	0.07
1979-80	6.32	1.69	13.11	-8.48
1980-81	10.61	0.99	31.19	-21.56
1981-82	2.00	1.76	-6.51	6.75
1982-83	9.79	2.78	-18.65	25.67
1983-84	7.80	2.66	1.25	3.89
1984-85	3.19	2.49	10.53	-9.83
1985-86	5.36	2.46	-7.18	10.07
1986-87	5.54	2.49	15.53	-12.49
1987-88	4.20	2.69	0.91	0.60
1988-89	7.66	2.41	10.82	-5.57
1989-90	2.84	1.91	9.96	-9.03
1990-91	3.37	1.69	0.94	0.74
1991-92	2.62	2.47	0.44	-0.29
1992-93	2.46	2.65	9.03	-9.22
1993-94	1.27	2.80	3.33	-4.86
1994-95	3.08	2.21	3.49	-2.61
1995-96	3.06	1.84	8.71	-7.49
1996-97	1.66	1.70	4.81	-4.85
1997-98	2.12	0.81	2.21	-0.90
1998-99	2.47	1.05	-3.31	4.73
1999-00	9.33	1.07	-2.61	10.86
2000-01	2.17	1.17	-0.03	1.03
2001-02	6.74	1.07	4.74	0.92
2002-03	7.89	1.08	3.05	3.76
2003-04	3.11	1.52	4.88	-3.29
2004-05	0.53	2.02	3.87	-5.36

Continued ...

F.14: Factorization of Growth Rates of Gross Value Added of Other Services

	Output Growth	Contribution of Capital	Contribution of Labour	TFP
1971-72	5.11	0.71	35.83	-31.43
1972-73	5.27	0.67	23.53	-18.93
1973-74	5.46	0.69	-12.39	17.16
1974-75	5.65	2.09	-2.07	5.64
1975-76	5.73	1.00	2.25	2.49
1976-77	3.51	1.15	2.25	0.12
1977-78	8.15	1.77	2.24	4.13
1978-79	5.75	1.39	1.96	2.40
1979-80	12.09	1.50	45.15	-34.56
1980-81	1.79	3.32	18.44	-19.96
1981-82	4.90	-0.36	-15.51	20.77
1982-83	6.48	-0.23	-15.83	22.54
1983-84	6.91	-0.21	9.89	-2.77
1984-85	7.48	-0.13	-5.41	13.01
1985-86	6.99	-0.10	-10.16	17.25
1986-87	7.93	0.12	11.60	-3.79
1987-88	6.48	0.43	7.99	-1.94
1988-89	6.44	0.50	4.97	0.97
1989-90	5.61	0.15	4.43	1.04
1990-91	6.00	0.12	-2.44	8.32
1991-92	7.71	0.37	-5.39	12.73
1992-93	6.44	0.59	-6.80	12.65
1993-94	6.37	0.67	-19.37	25.07
1994-95	6.71	0.93	54.42	-48.63
1995-96	4.60	0.79	2.67	1.14
1996-97	6.94	1.00	8.31	-2.37
1997-98	7.15	1.42	3.40	2.32
1998-99	6.72	1.85	2.05	2.82
1999-00	7.20	1.71	-5.97	11.46
2000-01	5.99	1.78	-0.03	4.24
2001-02	6.84	1.76	6.66	-1.58
2002-03	7.08	1.69	3.92	1.47
2003-04	5.18	1.39	4.68	-0.89
2004-05	5.86	1.55	3.19	1.12