AN EMPIRICAL STUDY OF TAXATION & ECONOMIC GROWTH

By

Bishnu Prashad Pokharel

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Abstract

The study is to investigate the relationship between tax reforms & Economic growth Per capita income in ten countries among them the five countries are from South Asian Countries and fives are from Organization for Economic Co-operation and Development (OECD). The cross sectional panel data analysis is used here from 1990 ~ 2012. It goes further to examine whether tax reforms on the economy tax on 'Goods and services' & 'Other taxes' are should be affect in the gross domestic product per capita income . The regression analysis (OLS), the fixed effect regression model, Random Effect model, the Hausman test & Bruesch and Pegan LM are the major test.

First of all, the group of model means the equations of the Regression Analysis which are denoted just numbers and another are Model 1, Model 2, and Model 3. This means that in Model one there are ten countries' regression analysis result between dependent variables and independent variables. Different types of GDP variables are related to the independent variables and the GDP per capita income is the dependent variables. The variables all are significant in five percent level except the openness of trade. In model two, the result of Regression analysis of the five South Asian countries which are related to the South Asian Association for Regional Co operations (SAARC). Here the different kinds of tax variable Trade, Unemployment rate, FDI, Government expenditure & GDP per capita growth rate are independent variables and the GDP per capita income is dependent variable. Among the ten countries, which country's per capita

income is below 5000$ & the Population growth rate is very high are related to the SAARC countries. In this model the two kinds of tax variables, Government expenditure and the growth rate are significance level in 5 %. But the FDI, unemployment rate, Trade & tax revenue are not significance in 5 % level. In Model three there are five OECD countries which per capita income is very high and also called the emerging economy in the world. In this model the dependent variables is GDP per capita income and the independent variables are different types of taxes and the related variables of GDP. Here is some difference within the SAARC and whole countries result the five variables are significant in 5% level & other three variables are significance in 1% & 10%.

This thesis investigates that the effects of changes in taxes & economic growth by different variables. Using annual data from 1990 to 2012 for a panel of ten economies, the results show that the effect of an increase in taxes on real GDP per capita is negative and persistent. The significant level an increase in the total tax rate measures as the total tax ratio to GDP by 1% has a long-run effect on real GDP per capita. The findings also imply that the FDI contributions & other taxes have a larger negative effect on per capita output than an increase in the tax on goods and services.

After the regression analysis here I used the fixed and random effect model. In the panel data analysis the result shows that one model is best model by testing in the Hausman Test. After the HM test in all three models, the fixed effect model is appropriate for GDP per capita income growth

dimensional equations and taxation in the economics.

In the SAARC countries result and the OECD result there is a little different in same equations. When the openness of the trade in SAARC is positive to the GDP but in same result in OECD the openness is negative. Because of SAARC countries trade rate and the dependent economy to the other countries economy. The poor political situation do not completely positive followed the rules of the government & to meet sustainable growth.

개요

세금의 사정 및 경제 성장의 실증적 연구

-포카랠 비스누 프라사드

경제학과 박사과정

전북 대학교

지도 교수 **안진**

본 논문은 열 국가의 과세와 경제 성장의 실증 연구이다. 다섯 국가는 남아시아 지역에 있는 SAARC 국가. 그리고 경제 협력 개발 기구 (OECD)에서 다섯 개 국가 이다. 그 들 사이에 10개 국가에서 과세와 경제 성장과 일인당 GDP 소득의 관계를 조사하는 것이다. 단면 패널 데이터 분석을 이용했다. 여기에 사용되는 자료는1990 년부터 2012년까지 '상품이나 서비스'및 '기타 세금'에 관한 경제 세금 추이에 대한 분석을 제시한다. 개혁은 소득 기준 국내 총생산에 영향을 주어야 한다. 회귀 분석 (OLS) 및, 고정 효과 모델, 확률 효과 모형, 하우스 맨 테스트 및 Bruesch과 Pegan LM 가 중

요한 테스트이다.

본 논문의 모델은 세 가지 종류가 있습니다. 첫 번째 모델에서 전체 10 개국을, 그리고 두 번째 모델에서는 다섯 SAARC 국가, 셋 번째 모델에서는 OECD 다섯 나라가 있다. GDP 변수의 다른 유형의 독립 변수에 관련하고 있으며, 국민 소득 일인당 GDP가 종속 변수입니다. 모든 변수는 무역 개방을 제외하고 5 % 수준에서 유의한다. 두 번째 모델에서 는 지역의 공동 작업을 위한 남아시아 연합 (SAARC)에 관련 국가의 회귀 분석 결과를 제시한다. 여기에서는 세금 변수 전시회 실업률, FDI 정부 지출 & 일인당 GDP 성장률 다른 종류의 독립적 인 변수이며, 국민 소득 당 GDP 가 종속 변수입니다. 국가의 일인당 소득이 5000 $ & 인구 증가율을 밑돌고 있는 다섯 개 국정 SAARC 국가에 관련되어 매우 높습니다. 이 모델에서는 세금 변수 정부 지출 및 성장률의 두 종류의 5 % 유의 수준이다. 그러나 FDI 실업률은 무역 및 세수는 5 % 수준에서 유의 한 차이는 없습니다.

세 번째 모델에서 일인당 소득이 매우 높고, 또한 세계의 신흥 경제라는 다섯 게 OECD 국가들이 있습니다. 이 모델에서 종속 변수는 국민 소득 일인당 GDP이며, 독립 변수는 세금의 다른 유형과 GDP의 관련 변수이다. 여기에 SAARC와 전체 국내 일부 차이는 있지만 5개의 변수가 5 % 수준 및 다른 변수에 유의 한 결과이다.

본 논문은 세금, 다른 변수에 의한 경제 성장의 변화의 영향을 조사한다. 10 경제위원회를 위해 1990 년부터 2012 년 연례 데이터를 사용하여 결과는 일인당 실질 GDP에 대한 세금 증가의 효과는 마이너스가 영구적임을 보여주고 있다. 유의 수준 1 %의 GDP 합계 세금의 비율로 총 세율 조치의 증가는 일인당 실질 GDP에 대한 장기적인 효과가 있다. 조사 결과는 또한 FDI의 기여 및 기타 세금이 상품이나 서비스에 대한 세금의 증가보다 일인당 출력에 큰 부정적인 영향을 주는 것을 시사하고 있다. 본 논문에서 회귀 분석 후에, 고정 및 확률효과 모델을 사용했습니다. 패널 데이터 분석 모델 에있는 하우스 맨 테스트에서 테스트하여 가장 좋은

모델을 보여주고 있다. 따라서 모든 세 개의 모델 HMLM 시험 후, 고정 효과 모형은 경제 일인당 소득의 성장 차원 방정식 당 GDP와 과세에 적합합니다.

SAARC 국가에 연결하면 OECD는 같은 방정식으로 조금 다르지만 있는 결과 나타난다. SAARC 무역의 개방성이 GDP에 긍정적이지만, OECD에서 같은 결과가 된다고 개방성은 부정적이다. 다른 나라의 경제에 SAARC 국가의 무역 비율 의존 경제를 위해. 가난한 정치 정세는 완전하지 양수는 지속 가능한 성장을 충족하기 위해 정부와 규칙을

본 논문 은 다음과 같이 구성되어 있다. 먼저 일 장에서는 서론 제2장에서는 선행연구에 대한 분석을 제시하며, 제 3 장에서는 연구에 대한 나라에 있는 조세 그리고 인구. 제 4 장 에서는 본 논문의 분석에 이용된 그리고 제 5 장에서는 패널 데이터 분석, 실증분석 모형을 설정하며 회귀 분석한 결과를 제시한다. 제 6 장 하고 제 7 장 에서 논문 요약과 결론을 제시한다.

Table of Contents

List of Tables

List of Figures

AN EVALUATION OF TAXATION & GDP GROWTH CROSS SECTIONAL ANALYSIS

1. Chapter 1: Introduction

Economic growth is the basis of augmented fortune. Investment in new capital (both human and physical), the implementation of new production techniques and the introduction of new products are the fundamentals of the growth process. Through its effect on the return to investment or the expected profitability of research and development, taxation can affect what choices are made and, ultimately, the rate of growth. In most developed countries, the level of taxes has risen steadily over the course of the last century. Such significant increases in taxation raise serious questions about the effect they have had upon economic growth.

One can now see what Lucas was referring to in his paper Taxation is levied in money. The method of taxation and the government expenditure of taxes raised are often highly debated in politics and economics. According to the tax forecaster the weight arranged upon individuals or property owners to support the government expense exacted by governmental authority. It's not a deliberate expense or contribution, but an enforced contribution, exacted pursuant to governmental authority.

The tax first involves ownership of the assets of a firm and often defined as the acquisition of percent of the assets of a foreign endeavor then it absorb the choice of a host country for these assets. The assessment of where to invest will depend on asking price circumstances and the extent to which speculation gives special access to the local market, and both of these

deliberations depend on trade restrictions and other policies in the host country.

In this respect, the decision of firms to invest abroad will be a complement to the international trade policies of the countries involved. It involves the decision of which activities to keep internal to a firm, and which to contract on the market: only the activities internal to a firm will be included while other activities can be pursued by arms-length.Tax collection is performed by a government agency such as the Inland Revenue department as like the Internal Revenue Service (IRS) in the United States, or Her Majesty's Revenue and Customs (HMRC) in the United Kingdom. When taxes are not fully paid, civil penalties (such as fines or forfeiture) or criminal penalties (such as incarceration)[1] may be imposed on the non-paying entity or individual

The economic growth and taxation are two aspects of the development of a country. Sometime the taxation is the broadband for the development and sometime it is negative effect for the development. Mostly the researchers are shows there results in the negative effect of taxation in the economic growth. Some rare cases are there which are positive in the world

[1] Internal revenue code

economy. In the twenty references paper only three are positive in the economic growth.

In one side the OECD countries economy is very big and the all kinds of indicators are positive even in the human capital in the development countries they try to use the tax for the development of country. The developed countries mostly their per capita income is high and also the economy is also strong for the country. They utilize their resources and use their power in public as tight in Taxation. Their hard labor and public investment is highly appreciated for the development of nation.

In other side the least developed country, also called the SAARC countries in this dissertation, is a nation with a lower living standard, underdeveloped industrial base, and low HDI[2]. When we see these countries economy there are two questions are raised, Do the taxation is the cause of underdeveloped? Is the high tax rate of a country is the main problem for the development of country? The thesis could be approach in these question directly or indirectly by linking taxes to development of one could as micro as macro data for this question.

In a neoclassical setting, growth simply depends on the accumulation of physical and human capital. In the long-run, any given tax structure generates a steadiness capital labor ratio and an equilibrium level of

[2] Human development index 2013

education per worker. Any further growth in output simply arises from an exogenous rate of technical change. There should be no permanent effects of the tax structure on the growth rate in per capita output, regardless of the size of the misallocations generated by the tax arrangement. Changes in tax policy however, can generate changes in equilibrium values, generating transitory growth effects. These transition periods can be measured in decades, however. As seen in Hall and Jorgenson (1967) and much succeeding literature on taxes and rates of capital investment, low current effective tax rates on new investment suggest faster short-run growth, due to an investment boom in response to the temporarily lower tax rates. Our best available proxy for this is periods with a lower corporate income tax rate.

In addition, however, any tax on the return to savings lowers the individual's discount rate, leading to an increase in GDP. Furthermore, government expenditures are one of the largest uses of public funds, so that higher tax rates provide the resources for more. Forecasted effects of the personal income tax on firms are then not clear-cut. In the empirical work, we control directly for rates of firms attendance, so that the estimated effects of the tax structure should not include effects on rates of growth.

The Growth rates can also be higher during periods when public infrastructure increases relative to other factor inputs. This should occur when government revenue is unusually high. We will control for government revenue relative to GDP to capture such effects. In addition, if tax policy is used to respond to business-cycle fluctuations, this could also induce a short-

run correlation between tax rates and the growth rate. We try to avoid any short-run business-cycle effects, we will focus on the links between tax rates and average growth rates over a longer period of time so that these short-run effects will tend to average out.

It usually involves participation in management, joint ventures, transfer of technology and experience. It has the potential of becoming a vibrant region in the world by its resources like manpower, technological, agricultural and mineral/ assets further it has an attractiveness for tourism and historical art and cultural civilization tax combines aspects of both in goods and financial flows, and is more complex than either of these, as its name suggests.

Either effect of taxes on aggregate economic activity is one of the least contested areas in theoretical macroeconomics or neoclassical and Keynesian theoretical models. For example, predict that higher taxes reduce economic activity, even though there is less agreement on the exact mechanisms that generate this result[3]. However, in spite of this, the imperfect, the issue has not been pursued empirically with anything like the dedication that has characterized the much more vigorously debated effects of monetary policy. The most recent important exception has been the study by Roomer and

[3] See, for example, Eaton (1981), Dotsey (1990), King and Rebelo (1990), Rebelo (1991), Jones et al. (1993, 1997), Stokey and Rebelo (1995), Milesi-Ferretti and Roubini (1998), Kims (1998).

Roomer (2007)[4] who construct a novel measure of exogenous[5] tax shocks and estimate its short-run and long-run economic effects.

Because of the negative effect of the taxation in the GDP growths the lower developed countries are not satisfactory on development. Of course, within a neoclassical[6] framework, as in Solow (1970), growth simply depends on the accumulation of capital and labor, so that the existing empirical work studying tax effects in investment and labor supply does not capture the relevant effects on growth. In this framework, however, there would be no effects of changes in the development of total factor productivity. The more recent literature on endogenous growth, however, suggests that positive externalities omitted from the traditional neoclassical

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[4] Romer's early research made him one of the leaders of the New Keynesian economics 1993, 1997), Stokey and Rebelo (1995), Milesi-Ferretti and Roubini (1998), Kims (1998).

[5] The work of Kenneth Arrow (1962), Hirofumi Uzawa (1965), and Miguel Sidrauski (1967) formed the basis for this research. Paul Romer (1986), Robert Lucas (1988),[3] and Sergio Rebelo (1991)

[6] Neoclassical economics is characterized by several assumptions common to many schools of economic thought. There is not a complete agreement on what is meant by neoclassical economics, and the result is a wide range of neoclassical approaches to various problem areas and domains ranging from neoclassical theories of labor to neoclassical theories of demographic changes.

models play an important role in explaining long-run growth.

What government policies have been effective at correcting for these externalities, thereby encouraging more productivity growth? There is clear evidence that patent protection and R&D subsidies affect the amount of R&D activity. A significant number of countries now offer the critical operational pre-requisites for successfully conducting effective research and development (R&D), i.e., access to growing markets/customer base, access to talent, intellectual property protection, stable economy/government and information technology infra-structure.

Accordingly, many countries are promoting optimization of R&D operations including re-location as part of their innovation-led economic development strategies. R&D tax incentives are an important component of these strategies. Countries offering R&D tax incentives are often regarded as a favorable location for internationally R&D. When efficiently allocated, companies can effectively leverage their global R&D infrastructure resulting in the development of valuable intellectual properties in the country. R&D incentives vary by country with regard to the following “key” considerations: Computational mechanics; the certainty of realizing an economic benefit from the tax incentive.

Although the basic definition of “research and development” is similar across many countries, distinctions exist within sovereign laws. Some countries offer particularly lucrative incentives, subject to few restrictions on

the location of the qualified research activity, funding of R&D, ownership of IP, etc.; while others offer basic incentives with significant limitations, including eligible industries, qualified costs, and applications procedures. Most research incentives are designed to encourage companies to maintain a certain level of R&D, with additional incentives for increased research spending. A few regimes offer tax benefits for capital investments in R&D, while most offer incentives for operational costs, i.e., wages, supplies and contractor fees. Moreover, many countries offer enhanced tax incentives for startup companies. This global survey summarizes and compares R&D tax incentives available in the countries typically considered as viable locations for conducting R&D.

Impact of Tax Reforms and Economic Growth of Nigeria: A Time series Analysis G.N & Appah Ebimobowei (2012), the study concluded that tax reforms improves the revenue generating machinery of government to undertake socially desirable expenditure that will translate to economic growth in real output and per capita basis. However, it was recommended that sustainable economic growth cannot be attained with tax reform processes except obsolete tax laws and rates are reviewed in line with macro-economic objectives, corrupt-free and efficient tax administrative machinery with personnel's and accountability and transparency of government officials in the management of tax revenue.

Tax policy can also be used to affect the amount of entrepreneurial activity more broadly e.g. Gentry and Hubbard (2000) provide evidence that a progressive personal tax structure discourages risk-taking. Gordon (1998) shows that the option to incorporate means that a low corporate tax rate relative to personal tax rates encourages risk-taking. Cullen and Gordon (2002) explore the many potential effects of the tax system on entrepreneurial activity, and find strong empirical support for these tax effects using US individual income tax return data during (1964–1993).

Imputation tax rate when the shareholder receives credit for (some or all) tax paid by company "full imputation" means all the domestic corporation tax paid on distributed profits is credited to shareholder so we conclude the another by Split- rate Corporate tax levied at lower rate on distributed profits provides some relief for double taxation at the company level. If entrepreneurial activity is an important source of economic growth, as argued by Schumpeter (1942), then these same characteristics of the tax law should also generate a higher growth rate.

1.1 The main Objects of the dissertation

This thesis is the studies of the relations of the various types of Taxation and different indicator of GDP. I used the cross section panel data analysis for the OLS regression analysis. Where the GDP per capita income is the dependent variables and the different eight kinds of variables are in independent variables. In the independent variables there are three kinds of

taxes property tax, which is symbolized the other taxes, the tax on goods and services and the tax revenue are shown in the model. Another five kinds of independent variables are the openness of trade, the unemployment rate, the government expenditure, FDI & the GDP per capita income growth percent. I used ten countries and the time period is 1990 to 2012.

After using the Regression analysis I used the Panel data analysis in the two different models the fixed effect model & the random effect model. After using these three models then I used the Hausman Test & Bruesch & Pegan LM test for the appropriate result. After finished these method test I have categorized in three dimensional models.

For the comparisons between these three models I have divided in three categories. The first model the whole ten countries are used for the analysis, in model second those five countries which are related to SAARC countries & in third model I used those five OECD countries. The vast difference is seen between these SAARC & OECD countries. The South Asian countries, Nepal, India Pakistan, Bangladesh and Sri Lanka are sampling for the research, whereas from the OECD countries Sweden, Austria, Korea, Denmark & the Singapore are sampling. The SAARC countries economic condition is very critical level and this level means neither developed and nor undeveloped but try to developed. The OECD countries per capita are very high whereas the SAARC countries per capita income is very low and also the human development indicator is too much critical situation.

The results of world economy there are totally fractions in the development. The OECD countries lead the development of the world economy. Some countries are fighting for lodging, feeding and for the shelter and some countries are going in moon. So what is the absence of these countries' development? I will try to found the norms & value with these ten countries. Various indicators are used in the model. The reasons of the misbalance economy what is the relation of taxation on the GDP per capita income. These all ten countries are practiced the taxation but there is some gape between them. There is the lack of research so here I will used the whole ten countries at first for the find out of weakness and new formulas.

In this field when I was analyzing the data per capita income is very high than the SAARC countries. The OECD country's population growth rate is very low. In other side which countries population growth rate is high, these countries per capita income is very low are SAARC countries. In the taxation rate we also seen that the OECD countries were reduced the tax rate whereas the SAARC countries like Nepal Pakistan they are only primary stage of the taxation so they have no actual effect by the taxation. Last year 2012 Nepal increased the vat rate areas and also the increase in the corporate tax area.

The introduction of the taxation and growth model is in the first chapter of the dissertation. Second chapter is the Review of literature where discussing about the various researcher views of the taxes and GDP per capita income growth. The tax rates and population's growth rate in ten

countries are in the third chapter which has also the strategies of taxation. Theoretical analysis of data and econometric relations between Taxes and GDP growth are described in chapter four. By through the model of Panel data analysis, the fixed effect model, the random effect model, Hausman Test & the Breusch- Pagan LM Test, are described in the fourth Chapter.

In the fifth chapter the empirical result of the interpretations of the data are uses. In the regressions analysis the relations of the GDP per capita growth rate and the difference types of taxations are in Negative way as like the increasing of tax rate and decreasing the GDP per capita growth rate. The result is that the fix effect model is appropriate for the all three models and also in the Hausman Test. The sixth & seven chapters are related to the conclusion & the Reference the Appendixes is in the last.

From the above facts, I can enumerate the main objectives of this thesis is as below:

- To investigate the taxation and GDP per capita growth relation in ten different countries and those countries per capita income is to what extent the tax influence.

- To raise revenue for ensuring resource mobilization in the developed to undeveloped countries and their development.

• To compare the level of taxation and the GDP per capita income growth in the panel data analysis.

• To contribute to the enforcement of government policy for the development of a country through the taxation.

1.2 The methodology

Actually the thesis in the Economics is similarity in various research papers because different persons or institutions are choosing different researched topic. In my thesis I used the different ten kinds of countries five are very high level of countries from OECD and another fives are from SAARC countries. We know that the OECD countries are very rich and the developed countries. The per capita income is also very high whereas the population growth rate is very low. While my thesis finds that the result of various measures of tax rates are significantly associated with economic growth rates. The estimated effect is quite similar in the cross-sectional and time-series estimates, and with or without fixed effects in the time series specification is appropriate with various appropriate. Any inference that these effects of the taxes are due to effects on entrepreneurial activity of course is speculative are so many model and theory in the field of taxation and the GDP growth begin by considering the following minimalist specification of how tax changes affect real output growth . According to Myles (2007), taxation enters the endogenous growth model because different

taxes or public policy instruments can have an effect on some of the variables that are important to economic growth such as the rate of investment and the level of educational attainment. For example, if the growth rate of output is

$$y = F(x)$$

$$g_y = f(\alpha_1(t_1), \alpha_2(t_2)$$

Where α_1 and α_2 are two kinds of researcher & t_1 and t_2 are two kinds of taxes the Other Taxes (Property tax, VAT) and the tax on goods and services with the effect of the tax. So in the independent variable, the different kinds of taxes & the economic indicator are used whereas the dependent variable is GDP per capita income. After this getting result of the regression analysis in the panel data analysis is big achievement for the other researcher for all sector.

In every country, the government collects its revenues though different sources. Out of which, taxes contribute a significant amount in the public revenues. The government mobilizes its revenues through budget in development activities for the public welfare and interests. It has low per capita income and more than one third people of the nation are living under the poverty line. The economic development and prosperity is very low. Foreign dependency and internal leakages has made government think for another option which is expected to increase the revenue in the countries. Moreover, fiscal deficit has been increasing due to the continuously growing expenditure and the low revenue performance in the least development countries mean SAARC countries.

The mostly SAARC countries budget has highly resource gap it means the deficit budget. The expenditure is higher than revenue and foreign aid. The gap is fulfilling by internal and external loans, which is the main economic problem of SAARC countries. The tax and non-tax revenue is the major source of the internal revenue where tax revenue is playing more vital role than non-tax revenue. So all kinds of difficulties the data of the taxation is not available straightforwardly.

Tax revenue refers to compulsory transfers to the central government for public purposes. Certain compulsory transfers such as fines, penalties, and most social security contributions are excluded. The experiences of the developed countries clearly indicate that income tax may be one of the major elements for the increment of internal revenue but in developing countries its contribution has not increased significantly during the long period.

It is mentioned above that there is significant resource gap in this area. The gap between income and expenditure is increasing steady state. Even though the governments try to tight in the taxes, therefore the gap has been a serious problem as the same bottle neck of the process of economic development revenue, it is very necessary to raise its resource of revenue. Therefore this study has been centralized to show the role of taxation to the GDP per capita income.

Chapter 2: Review of Literature

2.1 Introduction

The effects of taxes in GDP per capita income has been a widely debated topic over the long history of economic thought .Specially applied to this theoretical & empirical question. Sophisticated econometric analysis has been undertaken and the empirical results obtained. Yet a clear and robust channel through which two variables are related remains an important but unanswered question among prominent economists. It should remain clear that our research discusses the relationships of taxes affecting the economic growth & not the reverse. Although empirical literature does exits this reverse namely the effect growth has on taxes. We focus our study on taxes' effect on growth.

Through casual observation, we seem to advance very little in identifying an absolute ruling on the relationship. An example of this uncertainty could be represented by the fact that many Northern European countries have consistently achieved commendable economic growth and development, all the while maintaining a very egalitarian distribution of income. Meanwhile, the United States has likewise grown quite robustly, but has been defined by significantly higher levels of growth. These conflicting examples indicate that both high and low levels of income inequality can allow for subsequent high growth rates. The political, Economic and Social development of any country depends on the amount of revenue generated for

the provision of infrastructure in that given country. However, one means of generating the amount of revenue for providing the needed infrastructure is through a well-structured tax system. In this section the discussion of the different authors, books and the journals are used different views about the taxation and the other variables.

So in the various papers, journals & publications of the results are in mostly negative relations between the various types of taxation and the average per capita income growth rate in the various part of the world. There are so many publications are there which are related to the taxation and GDP in developed countries but so rare cases are found in the least developing countries. There is some scarcity of the research for such kinds of research in the rest of world. The types of GDP growth, taxations & within types of taxation variables related research are not sufficient in the field of research.

Even though the only taxations sector is very small in the economy but in Revenue expenditure the huge part is the taxation. Even in the taxation the variables are so small. But the slogans is there that the not to negligence for the small things that also make big results. Actually there are so many papers and research results in the economic field between taxation and the GDP growth rate. In this thesis I will discuss some review of the papers and books and dissertations. I found there are two kinds of results some are favor of the taxation in economic growth and some are negative relationship between them. First of all I will show some favorable papers and then negative effected papers.

2.1.1 Some findings of positive relations between Taxation and the Economic Growth

Enrique Mendoza, G. Milesi-Ferretti, & P. Asea, On the Effectiveness of Tax Policy in Altering Long-Run Growth: Harberger's Super neutrality Conjecture, 66 Journal of Public Economics 99-126 (1997) on the 18 OECD countries (1965-1991, 5 year panels) Estimated effective tax rates on labor and capital harm investment, but effect on growth is insignificant. Effective consumption taxes increase investment, but not growth. Overall tax burden levels have no effect on investment or growth.

William Easterly & S. Rebelo, Fiscal Policy and Economic Growth: An Empirical Investigation, Journals of Monetary Economics 417-458 (1993). Developed and developing countries 'Effects of taxation' difficult to isolate empirically this paper describes the empirical regularities relating fiscal policy variables, the level of development and the rate of growth the findings of the results are a strong association between the development level and fiscal structure poor countries rely heavily on international trade taxes, while income taxes are only important in developed countries , the fiscal policy is influenced by the scale of the economy measured by its population and investment in transport and communication is consistently correlated with growth while the effects of taxation are difficult to isolate empirically.

Such example is also in the Claudio J. Katz, Vincent A. Mahler & Michael G. Franz, The impact of taxes on growth and distribution in

developed capitalist countries: a cross-national study, American Political Science Review 871-886 (1983). Taxes reduce saving but not growth or investment the scope of public planning in contemporary capitalist economies promoted or hindered economic growth and income distribution It explores by assessing the impact of various mechanisms for raising government revenues on investment, growth, and income distribution in 22 developed market economy countries. The article considers whether growth and distribution are affected differently by governments' relative reliance on personal and corporate income taxes, social security contributions, property taxes, and value added taxes, or by the relative progressivity of tax mechanisms.

In the Taxation and Economic Growth in Latin America Gustavo Canavire-Bacarreza, Jorge Martinez-Vazquez & Violeta Vulovic 2013 they conclude that the taxation is Tax policy is among the most common and relevant instruments of policy-makers when thinking about promoting growth, yet there is not compelling evidence regarding its effect in Latin American countries. Using a variety of approaches, they estimate the effects on growth of the most important taxes for the region, namely personal income tax, corporate income tax, general taxes on goods and services, including value added and other sales taxes, and revenues from natural resource.

Their results suggest that greater reliance on consumption taxes has significant positive effects on growth in Latin American in general, although

we again find slight negative effects in some of the selected countries. On the other hand, natural resource revenues do not seem to contribute to growth.

The findings lend support to the assertion that fiscal instruments (especially personal income taxes) can be used successfully to achieve greater income equality. On the other hand, these findings run counter to the conventional notion that an automatic trade-off exists between an active public sector and a dynamic, expanding economy: although there is surely some tension between the economic goals of growth and equality, it is not at all clear that they are necessarily incompatible or that government can contribute.

2.1.2 Findings of Negative results for Taxation and Economic growth

According to the Slain (2000), is analyzed the taxation and growth the case study of Turkey is interpret the empirical study that his paper empirically investigates long-run equilibrium relationship between economic growth and tax revenues in Turkey by using the bounds test and Johansen technique for co integration. Results suggest that the existence of long-run equilibrium relationship between economic growth and taxation cannot be confirmed in the case of Turkey as a result of the bounds and Johansen tests for co integration. Thus, further investigation such as error-correction model and/or causality analysis cannot be preceded between these two variables in the case of the Turkish economy.

Similarly, ‘The regression analysis of taxation, economic growth and foreign direct investment’ Andrew Sentence, Senior Economic Adviser, he analysis in his short research supports that the tax system creates a drag on economic growth, through three main channels the absolute size of the tax rate faced by companies; the burden of the number of tax payment systems which a business is required to deal with; and changes in the complexity of the tax system which reflects a weighted aggregate of the time and payments measures in the Paying tax survey.

Ihtsham ul Haq Padda & Naeem Akram (2008) The Impact of Tax Policies on Economic Growth: Evidence from Asian Economies: Tax based fiscal policies have been regarded as less policy tool to overcome the fiscal deficit in developing countries. Tax revenue may be a possible source to correct the deficit which reduces economic growth and social welfare. The empirical analysis of this study shows that changes in tax rate may have permanent effects on output, but will have only temporary effects on its growth rate in selected Asian Economies. This implies that an increase in the tax rate has permanently reduce the level of output per capita, but have no permanent effect on growth rate.

The findings suggest that the relationship between output and the tax rate in these countries is best described by the neo-classical growth model. Rummana Zahir (2013) the Economic Performance of SAARC Seven Member Countries this paper attempts to examine the impact of trade liberalization over the macroeconomic structure of four SAARC member

countries –Pakistan, India, Bangladesh and Sri Lanka during1985 to 2006. The data set consists of a 21 years (1985-2006) time series data of trade variables The data provides the substantial evidence, which shows the benefits of intra-regional trade expansion: larger markets and fuller utilization of production capabilities, transfer of suitable production technologies, comparative advantage and complementarities, economies of scale due to expanded markets and better utilization of entrepreneurial capabilities, capital, manpower and natural resources. In addition to that such an arrangement is also expected to foster closer economic ties among member countries and enhance their bargaining power with respect to other countries and economic blocs.

Likewise, the economist Engen and Skinner (1999), he suggested that five possible mechanisms by which taxes can affect economic growth: (1) investment rate can be inhibited through taxes like corporate and personal income, and capital gains taxes; (2) taxes can slow down growth in labor supply by distorting labor-leisure choice in favor of leisure; (3) tax policy can affect growth in productivity through its discouraging effect on R&D (research and development) expenditures; (4) taxes can lead to a flow of resources to other (lower taxed) sectors that may have lower productivity (Harberger Framework); and (5) high taxes on labor supply can distort the efficient use of human capital by discouraging workers from jobs having high tax burdens (See also Tosun and Abizadeh, 2005).

Again, the Gareth D.Myles (2000) Taxation and Economic Growth

Past research has enumerated a wide variety of ways in which the tax structure can affect observed economic growth rates. In this section, D. Myles summarizes these effects, focusing in turn on particular subsets of this literature. Since the objective here is to motivate the empirical work, they focus on those effects that can be measured given the limited information them about tax structures in a large panel data set of countries.

Adema and Ladaique (2005) found that adjusting gross social spending for the impact of direct taxation cross-country divergences in aggregate social spending are much smaller than implied by the raw numbers. The implication is that a similar relation would hold in the area of taxation, with raw numbers of tax burdens exaggerating cross-country differences.

According to Åsa Johansson, Christopher Heady, Jens Arnold, Bert Brys and Laura Vartia to the OECD working paper 602, 2006 has been a persistent and largely unbroken upward trend in the ratio of tax to GDP across the OECD area increasing on average in the by over six percentage points of GDP (Figure 1, see Annex 1 for Tables and Figures and Annex 2 for a description of the tax indicators), followed by some more recent signs of stabilization in the tax revenue in the OECD as a whole. Several countries deviate from this trend. Iceland, Italy, Portugal and Spain all increased their tax to GDP ratios by more than ten percentage points over the period (although all starting from lower than average tax levels), while the increase for the United States was less than three percentage points and the Netherlands experienced a fall in the ratio of over one percentage point. In

addition, the Czech Republic, Hungary and the Slovak Republic have reduced their ratios since joining the OECD.

Measures of total tax to GDP ratios are routinely used for international comparisons of overall tax burdens, but these measures can be influenced by measurement issues. For example, in some countries transfers to households (such as benefits) are taxed in the same way as earnings, in others they are taxed at reduced rates, consequently affecting the measure of the tax to GDP ratio. Despite these conceptual and statistical problems, it is useful for policy analysis to consider the level and structure of taxation

Prof Lee and Roger young Gordon 'Tax structure and economic growth' analyzed the taxation past theoretical work the higher tax rates should decrease economic growth rates, while the effects of high personal tax rates are less clear. In this paper, they explore how tax policies in fact affect a country's growth rate, using cross-country data during 1970–1997. They find that statutory corporate tax rates are significantly negatively correlated with cross-sectional differences in average economic growth rates, controlling for various other determinants of economic growth, and other standard tax variables. In fixed-effect regressions, they again find that increases in corporate tax rates lead to lower future growth rates within countries. Their results shows that the coefficient estimates suggest that if cut in the corporate tax rate by 10 percentage points will raise the annual growth rate by one to two percentage points.

Davide Furceri &Georgios Karras in their paper Tax changes and economic growth: Empirical evidence for a panel of OECD countries, this paper investigates the effects of changes in taxes on economic growth. Using annual data from 1965 to 2007 for a panel of twenty-six economies, the results show that the effect of an increase in taxes on real GDP per capita is negative and persistent: an increase in the total tax rate (measures as the total tax ratio to GDP) by 1% of GDP has a long-run effect on real GDP per capita of –0.5% to –1%. Our findings also imply that an increase in social security contributions or taxes on goods and services has a larger negative effect on per capita output than an increase in the income tax.

The more recent endogenous growth literature provides models forecasting permanent growth, even with a stable tax structure, due to externalities generated through the accumulation of physical or human capital. While effects on growth can be permanent, the key issue remains the current incentives to investment in physical or human capital. During periods of greater incentives, growth rates should be faster. We will not be using a long enough time period to judge whether effects on growth die out after perhaps several decades (as in the neoclassical model), or are permanent as in an endogenous growth setting.

Much earlier than this endogenous growing literature, Schumpeter (1942) emphasized the role of entrepreneurial activity in generating new ideas that raise productivity. Here, rather than stashes in physical or human capital per se generating growth, explicit investments by entrepreneurs in the

creation of new ideas generate growth. How does the tax structure affect the rate of entrepreneurial activity, and so the rate of creation of new ideas? There is now a recent literature investigating this question. The paper by Cullen and Gordon (2002) provides the most general analysis so far, and shows that there are several possible routes through which taxes can affect the amount of entrepreneurial risk-taking. To begin with, there is a tax encouragement to being self- employed when the effective tax rate on business income is less than the tax rate on wage and salary income. This would occur to the extent that the corporate tax rate is below marginal personal tax rates.

Again, The Tax Structure and Economic Growth an OECD Analysis by Luke Raynor 2013 in his dissertation attempts to gather results so that governments may better structure their tax system in order to promote more pro-growth friendly structures of taxation. The measures of taxation that he will be testing are three of the most prominent methods of taxation in most OECD countries; the Value-Added Tax, the Labor Income Tax, and the Corporate Income Tax. This is a very popular topic in today's media, especially in Europe where there has been fallout from the recent financial crisis which is leading to measures of austerity throughout the region. Even in the U.S. there has been much debate on how to move forward from the financial crisis in order to generate more economic growth, and fiscal policy has been at the forefront of some of these debates. There has been recent evidence of governments lowering or raising taxes in order to try and

promote economic growth, such as Sweden reducing their corporate tax rate to 22% from 25%. The

<Table 2.1> Lists of Research Paper and their Results

	Empirical studies on the Effects of taxes on Economic growth			
	Reference	Method/Data	Effects	Summary of findings
1.	Ergete Ferede & Bev Dahlby, (2012).	Canadian provinces (1977-2006)	Negative	Reducing corporate income tax 1 percentage point raises annual growth by 0.1 to 0.2 points.
2	Karel Mertens & Morten Ravn (2012).	U.S. Post-II	Negative	A 1 percentage point cut in the average personal income tax rate raises real GDP per capita by 1.4 percent in the first quarter and by up to 1.8 percent after three quarters.
3	Norman Gemmell, Richard Kneller, & Ismael Sanz (2011).	17 OECD (Early 1970s to 2004)	Negative	Taxes on income and profit are most damaging to economic growth over the long run, followed by deficits, and then consumption taxes
4	JENs et. all	21 OECD (1971 to 2004)	Negative	Consumption and property taxes would increase GDP per capita by between 0.25 percent and 1 percent in the long run.
5	Robert Barro & C.J. Redlick,	U.S (1912 to 2006)	Negative	Cut in the average marginal tax rate of one percentage point raises next year's per capita GDP by around 0.5%.

6	Christina Romer & David Romer, (2010).	U.S. Post-War 65 Countries	Negative	Tax (federal revenue) increase of 1% of GDP leads to a fall in output of 3% after about 2 years, mostly through negative effects on investment.
7.	Alberto Alesina & Silvia Ardagna,	OECD countries, (1970 ~2007)	Negative	Fiscal stimuli based upon tax cuts more likely to increase growth than those based upon spending increases.
8.	Lee Young & Roger Gordon	70 countries (1980~1997)	Negative	Reducing corporate income tax 1 percentage point raises annual growth by 0.1 to 0.2 points.
9.	Randall Holcombe & Donald Lacombe, (2004).	OECD(1960 to 1990)	Negative	States that raised income taxes averaged a 3.4% reduction in per capita income.
10.	R. Kneller, M. Bleaney & N. Gemmell, (1999).	OECD (1970 to 1995)	Negative	Distortionary taxes reduce GDP growth.
11.	William Easterly & S. Rebelo (1993).	Developed& Developing	None	Effects of taxation difficult to isolate empirically
12.	C. J. Katz, (1983).	22 developed countries	None	Taxes reduce saving but not growth or investment
13.	E. Mendoza, G. M. Ferretti, & P. Asea, 1997).	18 OECD (1965-1991)	None	Overall tax burden levels have no effect on investment or growth

14.	Luke Raynor 2013,	Dissertation OECD	Negative	governments lowering or raising taxes in order to try and promote economic growth
15.	D Uceri Georgios Karras	OECD countries.	Negative	The increased in the total tax rate (measures as the total tax ratio to GDP) by 1% of GDP has a long-run effect on real GDP per capita of –0.5% to –1%.

After researched literature review table 2.1 explain on the basis of various papers & researcher's result the relationship of the kinds of taxation the actually the corporate tax, income tax, vat and the tax on goods and services & their effects in the GDP per capita income growth. These all are not equal effect for the GDP per Capita rate. Sometimes the small amount change of taxation has big changed in the development of growth. The variable of taxes are negative effects Margareta (Dackehag Åsa Hanssonin 2013) the GDP per capita income growth rate in ten countries on the basis of the panel data analysis.

Chapter3: Strategies of the Taxation & the Economic Growth

3.1 Introduction

A purely growth-oriented tax strategy would also likely tax consumption more than income. The difference between consumption and income is saving, and from a strict growth perspective, more saving is better than less. So if domestic savings are essential to financing domestic investment, there is a "growth" argument for taxing income from savings more lightly.

In developing economies resource gap is critical and widening resulting to huge fiscal and budgetary deficits. The growing resource gap is frequently of by mobilizing internal and external borrowings and consequently shifting the burden of debt to descendants. Therefore, revenue mobilization is challenging proposition in developing economy like where a mainstream of the people live in object poverty and the people engaged in economic activities have extremely limited taxable capacity. In addition, legal base of taxation is compressed with unlimited tax shelters and tax administration lacks innovative mechanism to identify new taxpayers and bring them into tax net. The tax system suffers from structural constraints with tremendous administrative and procedural complexities envisaged in the existing Income Tax Act, which lacks simplicity and transparency.

The tax system calls for a periodic reforms to ensure growth, equity and stability. The studies and reports on taxation exhibit that several reforms have had been undertaken by the government in the past to simplify and modernize the tax system. These reforms were confined to improving tax structure by designing appropriate policy instruments. The reforms in taxation consist of three types: Reforms in tax laws and regulations, Reforms in environment, and Reforms in tax administration.

People pay taxes to the Government on the basis of what they earn, what they own and what they purchase for the development of nation. It is a compulsory payment levied to the companies to meet the expenditure incurred on conferring common benefits upon the people of a country. Two aspects of taxes follow from this definition: One is a compulsory payment, another is the used for common benefits or general purposes of the state. On the basis of tax rate there are three types of corporate taxes. Classical tax ratio relief for distributed profits (at either company or shareholder level) tax liability of company completely independent of that of its shareholders distributed profits taxed twice, once through corporation tax, and as income of shareholder.

For the economic development tax has been one of the most popular almost the developing countries and all over the world. Similarly, Most of the countries tried to grab the achievement of high rate of economic growth rate, reduction of income disparities and poverty and improvement of living standard of people. These are some development strategies towards which

most of the government efforts have been directed. This is known as the government needs more revenue mobilization for overall economic development and state welfare. Besides this, for meeting day-to-day expenditure, the government also requires some sources of income. However, resource mobilization is very low compelling the government to rely heavily on foreign assistance. Because of lower tax rate the FDI has increased for the development expenditure has been dependent almost entirely on the foreign aid.

External assistance is uncertain, precarious, inconvenient and not conducive to the healthy and overall development should there be heavy dependence on it. The foreign aids are not bad for economic development of the nation. But the experience of the most of the developing countries shows that there are negative effects of increasing tax rate and loans to finance the public development activities. Thus the government should depend on its own resources for generating revenue in order to finance these regular and development activities and also increasing the collect of tax by developed countries.

The higher volume of resource is available for making constructive and productive investments. Taxations may also play an important role in the economic development of a big economy country Sweden vat rate is 45% so on the one hand, tax may be used to make the maximum volume of resources accessible to public segment and the other hand, it may be used to encourage constructive speculation in the confidential segment and to avert their source

from being dissipated over speculative and unproductive investment as well as over lavish and luxurious consumption. Thus, taxes in developed countries serve as the ruthless earnings of heavy revenue. If the tax may be utilized by the administration as an efficient tool for giving encouragement to the appropriate augmentation of economy, speculation and disgusting conjugal should be product in positive.

The government can assemble revenue from taxable and non-taxable sources. Tax is a center foundation for income production and recruitment. Different persons have definite taxation in different ways. In this respect, it would be better to take the definition given by Prof. Seligman; Tax is the compulsory contribution from a person to the government to defray expenses incurred in the common interest of all without reference to special benefit conferred

There are so many possessions of taxation; no particular tax is absolutely wonderful. Accordingly, in attendance must be a configuration of taxation, combining a number of taxes, which the governments can vary from time to time, to changes in emphasis on different objectives. Depending on the methods of payment of taxes, it can be classified into two major categories direct taxes and indirect taxes.

Under direct taxes the person makes payment direct to the revenue authorities the Inland Revenue Department (IRD) or the confined influence. In the words of Dr. Dalton, “A direct tax is really paid by the person on

whom it is with authorization forced". Each individual's tax liability is assessed discretely. The power of direct taxation applies to every being. It cannot be evaded resembling the substance of imposts or excise, and will be paid, because all that a man hath will he give for his head. This tax is so pleasant to the environment of authoritarianism, that it has ever been a favorite under such governments. The power of direct taxation will further apply to every individual however oppressive, the people will have but this alternative, either to pay the tax, or let their assets be taken for all confrontation will be ineffective.

Under income tax, it is subject to a basic tax rate, which is arrived at after allowing deductions depending on conditions from on expenses incomes. The taxable income is derived by deducting allow able educations depending on marital status and other personal circumstances from admissible incomes and is subject to a basic rate with increasing tax rates. Tax imposed on income of corporate bodies is called corporate tax. All profits, whether distributed or not, are related to the taxes. A part is transferred to shareholders and deducted in advance when the dividend is paid. A tax is levied on any capital gain when as asset is disposed of. These possessions are land, buildings, long term investments and etc., which is owner-occupied houses, cars, National Saving Certificates and goods chattels worth less than a limit, are excluded, and losses may be offset against gains, such as property tax, tax on goods and services.

Direct taxes yield more than two-thirds of total revenue. Their great worth is that being progressive and assessed, according to the individual's circumstances. They ensure that the heaviest burdens are placed on the broadest backs and their progressive character also gives additional influence to the role as built-in-stabilizers.

Indirect taxes on goods and services are so called because the revenue manipulate (the Department of Customs/Excise) collects them from the trader, as far as possible, passes the burden to the consumer by including the duty in the final selling price of the good. In the words of Dr. Dalton, "An indirect tax is imposed on one person but paid partly or wholly by another". In other words, tax is levied on one person who does not bear it from his/her own income, instead, the tax liability is transferred by collecting it from customers by adding it to the price of goods or services. Indirect taxes may be specific or ad valorem. The first is the Customs duty, means the payable at rates prescribed by Law from time in the direction of time on exports or imports. The eliminate duty is thrilling on import and production of those goods and services, which are specifically mentioned in the schedule forming part of the Act. These goods or services are not covered by the Schedule and free from the boundary of the Act.

Value Added Tax is other indirect taxes which constitute the main topic and focus of the present research as well. What is VAT and how it is levied forms the main concern of the subject. So, this section obviously does not need any description in that the introductory description follows in the

next section below. In the least developed countries like SAARC the role of indirect tax is seen to be more important. VAT is probably the best tax system and the most important innovation of the second half of the twentieth century, which is considered effective means to collect revenue as a reformed sales tax of indirect tax system.

The VAT system has proven to be effective in avoiding problems that normally might arise out of the double taxation of goods and services. The lesson learnt of tax reforms in developing countries proves that VAT is the most important choice and ingredient of tax reform. It may be adopted by a developing country with no difficulty and is an important instrument for the mobilization of internal resources and the pressure of VAT on economic activities is minimal or n to at all. The tax reform and adoption of a VAT, is therefore, essentially connected with the efforts of many underdeveloped countries to achieve the goal of economic development. The taxation and economic growth relationship between the Developed countries and the lower developed countries what is the change in between them. So there are some objectives of this dissertation.

One manifest forewarning in any study looking at the effects of government policies on growth is the opportunity of incidental or reverse causation. Certainly, tax structures in richer countries differ from those in poorer countries, with more reliance on the personal income tax and a tendency to higher tax rates in richer countries. During periods of high growth, there will be heavy demand for new infrastructure investment,

suggesting high tax rates generally to finance these investments. Certainly, there is no clear case dismissing a possible effect from high growth rates to tax rates, and government policies more generally.

The approach we use to deal with the possible indigeneity of the tax instruments the weighted average & tax rates in other countries, weighting by the inverse of the distance between the two countries. The correlation in the tax rates in nearby countries is remarkably high in the data. Yet the growth rate in a country that is small relative to the regional and world economy should have virtually no effect on the tax rates in these other countries, making the weighted average tax rates elsewhere a good instrument for the local tax rates.

3.2 Difference types of Data Indicators

The different taxations are running in different countries all countries have own tax systems in developed and SAARC countries. The tax rate is high in OECD than the SAARC countries which are seen table 3.1.

< Table 3.1 > Distribution of the taxation rates in 2013, in ten Countries (in %)

Country/Tax rate	Vat Rate	Corporate Tax Rate	Income Tax Rate
Srilanka	12	0-35	35
Bgds	15	30	25
India	18	12.5	33
Nepal	13	30	25
Pakistan	17	35	35
Korea	10	22,20,10	38+3.8
Austria	18	30	14
NewZeland	15	28	33
Sweden	25	22	57
Singapore	7	17	20

Source: world Data Indicator 2013

There exists large variation in statutory top corporate tax rates across countries, as seen in Table 3.1. Statutory top individual income tax rates by world indicator data the tax rate also vary greatly. The ratio of the vat rate in SAARC countries and five OECD countries difference has been 2% because

the SAARC Vat rate is 15 and whereas the ratio of vat rate in five OECD has 17 %. The income tax rates in SAARC countries and OECD have near about 3.6 and 3.4 for example in Korea 2013 the vat rate is only 10% but in corporate tax rate there is below 10% to above 38.5%. The highest corporate tax rates in Pakistan & Srilanka in SAARC countries. The Vat rate and the Income tax rate are high in Austria 18% and Sweden 57% respectively. So in comparatively the per Capita income is also high in Sweden. The whole tax rate of Nepal is not bad it has 13 % vat, 30% in corporate tax and the 25 in income tax that is the cheapest rate but and its effected by the criteria. If the minimum amount is two thousand dollars per year in Nepal it will be 20 thousands dollar in Korea.

< Table 3.2 >Total population in selected countries (In Million)

Country/year	1990	1995	2000	2005	2010	2013
BGDS	107.386	119.870	132.383	143.135	151.125	154.695
India	868.891	955.804	1042.262	1127.144	1205.625	1236.687
Pak	111.091	126.690	143.832	157.971	173.149	179.160
Nepal	18.111	20.587	23.184	25.292	26.846	27.474
SRI Lanka	17.015	18.136	19.102	19.644	20.653	20.328
Sweden	8.559	8.827	8.872	9.030	9.378	9.519
Korea	42.869	45.093	47.008	48.138	49.410	50.004
Austria	7.678	7.948	8.012	8.228	8.390	8.430
Denmark	5.141	5.233	5.340	5.419	5.548	5.592
Singapore	3.047	3.525	4.028	4.266	5.077	5.312

Source: WDI 2013

The table 3.2 has introduced the population of five SAARC countries and five OECD countries. The South Asian countries population is very high among the all ten countries. The Indian, Pakistan & Bangladesh have huge populated countries where as the Singapore and Denmark is low populated countries. The population of India has 1236.687 million which is the highest in 2013 in the table, whereas the Singapore has only 5.312 million. In OECD countries Korea has only 50.004 million population other fours have no more two digit numbers in millions.

< Table 3.3 > Population growth rate in Selected Countries (1990~2012)

(In Percentages)

Country/year	1990	1995	2000	2005	2010	2012
BGDS	2.457	2.108	1.842	1.336	1.079	1.220
India	2.037	1.832	1.669	1.476	1.293	1.242
Pak	2.946	2.590	2.287	1.801	1.780	1.651
Nepal	2.412	2.567	2.154	1.474	1.128	1.169
Sri Lanka	1.123	1.360	0.241	1.070	0.988	0.760
Sweden	0.773	0.525	0.161	0.400	0.853	0.766
Austria	0.762	0.153	0.240	0.681	0.292	0.518
Korea	0.985	1.006	0.836	0.205	0.463	0.429
Denmark	0.162	0.521	0.334	0.275	0.444	0.395
Singapore	3.888	3.039	1.733	2.351	1.771	1.621

Source: WDI 2013

The population rate is in the table 3.3 where we see that the high population rate is in SAARC countries accept Singapore. The rate is slightly

decreasing in all over the countries but actually the decreasing ratio is high in SAARC countries. 1n 1990 the Pakistan population growth is 2.946 which is very high in the table & Austria in 1995 there is just only 0.15%. Because of lowest population in Singapore in 1990 the rate was so high.

<Table 3.4> Total GDP in Selected Countries

(Current US $ in billion)

Country/year	1990	1995	2000	2005	2010	2013
BGDS	30.129	37.940	47.125	60.278	100.360	129.857
India	326.608	366.600	476.609	834.215	1708.460	1876.800
Pak	40.010	60.636	73.952	109.502	177.166	236.625
Nepal	3.628	4.401	5.494	8.130	15.994	19.294
Sweden	248.425	253.680	247.260	370.580	463.062	557.938
Austria	164.753	238.562	192.071	304.984	377.680	415.844
Korea	284.757	559.330	561.633	898.134	1094.500	1304.550
Denmark	135.838	181.984	160.083	257.676	312.949	330.814
Singapore	38.900	87.892	95.836	127.418	236.420	297.941

Source: WDI 2013

All ten countries have gradually increasing the GDP from 1990 to 2013. The Highest GDP has 1876.8 in India in 2013, whereas Nepal has only 19.294 billion. The Indian GDP in 1990 is only 326.6 billion, after that the gradually increasing year by year. This table shows that the GDP is not only indicator of development.

3.3 The strategies distressing taxes of access & GDP growth

Many other government policies can affect the rate of entrepreneurial activity. To isolate the effects of taxes, we will want to control for other relevant policies. Some direct policies, such as R&D subsidies, may be effective at stimulating innovation. However, we have not been able to find any information on the size of such R&D subsidies for our sample. In many countries corruption, i.e. the need to pay endless bribes to government officials to obtain necessary incenses discourages small business activity. Governments can also use tariff and nontariff barriers to protect favored existing industries, thereby putting other industries at a competitive disadvantage. Governments on occasion use inflation as an important source of finance, raising the costs to new entrants that rely more heavily on cash transactions, while leaving relatively unaffected the costs faced by large existing firms that normally rely more heavily on financial intermediaries.

The greater these barriers to entry, the lower the amount of entrepreneurial activity and presumably the slower the growth rate is smaller. In an attempt to capture the effects of taxes per sawn include some available controls for these other policies in the empirical work.

$$\frac{dg_y}{dt_i} = \frac{dg_y}{d\alpha_i}\frac{d\alpha_i}{dt_i}$$

And also

$$\Delta Y_t = \alpha_i + \alpha_j \Delta T_t + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots (1)$$

Where, Y_t is the logarithm of real GDP and ΔT is a measure of legislated tax changes. Presumably tax changes do not affect output only in the current quarter. However, for simplicity, we ignore these dynamics for now. Obviously, many developments besides legislated tax changes affect to the real growth. Government spending, monetary policy shocks, natural disasters, and expectations about a wide range of future developments are all likely components of ε_t. Thus, we can think of ε_t as being composed of a large number of disparate factors:

$$\varepsilon_t = \sum_{i=1}^{K} \varepsilon_t^i \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (2)$$

There is no reason to think that the various $\varepsilon_t^{i'}s$ are uncorrelated with each other. Now consider a specification for the determinants of legislated tax changes:

$$\varepsilon_t = \sum_{i=1}^{K} b_t^i \varepsilon_t^i + \sum_{i=1}^{L} \omega_t^j \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (3)$$

Where the $\varepsilon_t^{i\prime}s$ are the same as before and the ω_t^j are additional influences on tax policy Equation (3) captures the crucial fact that some tax changes are taken in response to factors likely to cause output growth to be different from normal (the $\varepsilon_t^{i\prime s}$). Policymakers may see a recession coming and cut taxes to offset it. Or, they may increase spending to fight a war and increase taxes to pay for it. This reflects the fact that legislated tax changes are inherently discrete events. In many episodes, policymakers do not respond to the various shocks to output at all, while in others they respond to varying degrees. Furthermore, how much policymakers respond to a given may depend on the other$\varepsilon_t^{i\prime}s$; for example, policymakers may respond more to an increase in government spending if other factors are also tending to increase output.

Our main empirical strategy will then be to look for effects of the above tax effects on per capita income GDP, using a cross-sectional data set of ten countries. In particular, assume for simplicity that the production function for domestic output can be approximated by a Cobb–Douglas function, so that the taxes output satisfies.

Trade openness has been added as an important factor affecting economic growth (e.g. Frankel and Romer, 1999; Dollar and Kraay, 2003), though Rodrik and Rodriguez (1999) presented a skeptical view on the existing evidence on the effects of trade openness on growth. The effect of institutions and corruption on economic growth has become an active

research area since the late 1990s (e.g. Knack and Keefer, 1995; Mauro, 1995), and recently Hall and Jones (1999) from colonial origin and settler mortality, respectively.

3.4 Theoretical analysis

Let, A consumer who lives two periods and whose labor supply is inelastic he gets in the first period a wage w, consumes some part of it and saves the rest according to the below equation.

$C_1 + E = w$. In the second period he doesn't work and consumes the net income from his savings. Given an interest rate r and taxation of income from savings at a proportional rate this budget constraint in the second period is $C_2 = \big(1 + r(1-t)\big)E$. Assuming perfect financial markets, the consumer can save as much as he likes, and the two budget constraints can be aggregated in an inter temporal constraint $C_1 + pC_2 = w$

Where p is the relative price of second period consumption that is $P = \frac{1}{1+r}$ without taxation and

$P = \frac{1}{1+r(1-t)}$ With taxation

As usual, the increase in p due to taxation has two effects an income effect: the increase in p reduces both C_1 and C_2 if consumptions in both

periods are normal goods which increases savings $E = w - c_1$ a substitution affect the increase in p makes second-period consumption more expensive and thus tends to reduce savings

More precisely, denote U (C_1, C_2) the utility function of consumer

We can write

$$\frac{\partial C_1}{\partial P} = \left\{\frac{\partial C_1}{\partial P}\right\} - C_2 \frac{\partial C_1}{\partial W} \dots\dots\dots\dots\dots\dots\dots\dots (3.4)$$

Define the inter temporal elasticity of substation as

$$\sigma = \langle \frac{\partial \log(C_{1/C_2})}{\partial LOGP} \rangle U$$

Hicksian demands are the derivatives of the expenditure function $e(P, U)$

With differentiating in p that

$$\left(\frac{\partial C_1}{\partial P}\right) = P\left(\frac{\partial C_2}{\partial P}\right) = 0$$

By definition

$$\sigma = \left(\frac{\partial log C_1}{\partial log P}\right) - \left(\frac{\partial log C_2}{\partial log P}\right)$$

We obtain

$$\sigma = \left(\frac{P}{C_1} + \frac{1}{C_2}\right)\left(\frac{\partial log C_1}{\partial log P}\right) = \frac{w}{PC_2}\left(\frac{\partial log C_1}{\partial log P}\right)$$

And

$$\left(\frac{\partial log C_1}{\partial log P}\right) = e\sigma$$

Where $e = E/W = PC_2/w$ denotes the saving rate

$$(1+n) = S\left(w_{t,} r_{t+1}\right) = S\left(f(k_t) - k_t f'(k_t), f'(k_{t+1})\right) \ldots\ldots\ldots\ldots\ldots\ldots (3.5).$$

This equation defines of the capital accumulation process. Unfortunately, it is very nonlinear which raises several difficulties. First note that k_{t+1} appears on both sides of the equation, so the dynamics is only defined implicitly we will assume that a unique solution k^*.

3.4.1 Taxation and Capital accumulation

For simplicity, we assume that every generation has only one type of agent: redistributive considerations are not essential here since we focus on

the capital accumulation process. As before, generations grow at rate *n*; labor supply is now assumed to be inelastic (each young person supplies one unit of labor). Capital does not depreciate, and there is no technical progress. The analysis by assuming that there is no taxation to begin with. Recall that it is in a closed economy, so savings must directly feed investment.

With an inelastic labor supply, the representative agent of generation t maximizes $U(C_{yt,}C_{0,t-1})$ without taxes.

Under his budget constraint $\begin{cases} C_{yt} + S_t = W_t \\ C_{0,t+1} = (1 + r_{t+1})S_t \end{cases}$

Where S_t the savings of generation t then the budget constraint is

$$C_{yt} + \frac{C_{0,t+1}}{1 + r_{t+1}} = w_t$$

The first order condition is

$$\frac{U'_y(C_t)}{U'_0\ (C_t)} = 1 + r_{t+1}$$

This generates demand functions $C(W_t, r_{t+1})$ and savings

$$S(W_{t,}r_{t+1}) = w_t - C_y(w_{t,}r_{t+1})$$

So we denote F (K, L) production (net of capital), and we denote $f(k) = F(k, l)$ net production per capita .As usual profit maximization gives factor incomes.

$$\begin{cases} w_t - f(k_t) - k_t f'(k_t) \\ r_t = f'(k_t) \end{cases} \quad \dots\dots\dots\dots (3.7)$$

Where we used the notation $k_t = K_t / L_t$

Finally equilibrium on the market for capital implies the equality between the savings of the youngS_t, and the capital stock in the next period

Taking into account demographic growth this gives

$$k_{t+1}(1+n) = S(w_{t,} r_{t+1}) = \ S\big(f(k_t) - k_t f'(k_t), f'(k_{t+1})\big) \dots\dots\dots\dots (3.9)$$

This equation defines of the capital accumulation process. Unfortunately, it is very nonlinear which raises several difficulties. First note that k_{t+1} appears on both sides of the equation, so the dynamics is only defined implicitly we will assume that there exist a unique solutionk^*.

3.4.2 Taxation & labor income

In most countries, income taxation bears both on labor and on income from savings. With perfect financial markets, taxation of labor income only changes the savings rate in that the latter depends on permanent income. It has focused here the effect of taxation of income from savings on

the time profile of consumption over the life cycle. Therefore start by neglecting the taxation of labor income. It assumes an exogenous interest rate, which neglects general equilibrium effects.

We now ask whether our two available types of taxes (property and the tax on Goods & services) have similar effects on per capita real GDP growth with those we observed above for the total tax rate, and whether differences exist among them, as often suggested by economic theory.

Interestingly, an increase in the social security contributions is predicted have the largest negative growth effects, both in the short- and long-run. The sum of the estimated for the other tax coefficient is. 751.3236 (standard error -163.7855), which is twice as high as the corresponding value we estimated for total taxes, and highly statistically significant.

Higher taxes on goods and services have the second most detrimental growth effects, with a sum of estimated equal -364.50 (standard error 0.020). This is both statistically not significant and somewhat larger than the effect of total taxes. Finally, and somewhat surprisingly, taxes on income, profits, and capital gains, have a smaller effect than either social security taxes or taxes on goods and services. Their effects, however, are consistently negative and statistically significant, with a sum of estimated *b*'s equal to 364.5014 (standard error is 68.01). We know from the subsection that model (1) may overestimate the growth effects of a tax change. Therefore, all other models discussed above for the total tax have also been

estimated for each of the four specific tax types.

As expected, the responses of GDP to those exogenous tax shocks are smaller in absolute value (roughly by one half) than the corresponding responses to raw tax changes. The general picture, however, is unaffected. With the exception of the property tax (whose short-term and long-term effects are statistically insignificant, just like before), an increase in any of the other two types of tax has a negative and persistent effect on GDP.

3.4.3 Taxation & Economic growth

Economic growth defined as the increase in the size of an economy between two time periods. When the economic growth is increased it concerned with a country's gross domestic product (GDP). GDP is defined as the final value of all finished goods and services produced between countries borders during a specific time period. It is calculated as the sum of private consumption, government expenditures, private capital investment and net exports at market prices in an open economy. The equation for GDP is shown below.

$$Y = C + I + G + NX$$

Where Y means the total output, C means the Private consumption, I mean the investment of all spending on capital and G means the sum of Government spending and NX is equal to total net exports, which mostly negative. Economic growth Economic growth is the basis of future standards of living and prosperity among different nations. As stated earlier, small

differences in growth rates can lead to a substantial difference in future levels of per capita GDP, or standards of living. I will be using these terms inter changeably because GDP per capita is the common measure to compare standards of living across countries.

In the economic observations there are various model of Growth theory, The Solow starts with cough Douglas production in a closed economy (1956) is the first model of exogenous technological theory. This is shown that taxation has an effect on the level of GDP only.

$$\mathrm{Y} = \mathrm{A}K^{\alpha}L^{1-\alpha}$$

Where the Y is the GDP K is the capital and l is the labor A is the technological progress.

$$\mathrm{y} = \mathrm{A}k^{\alpha}$$

Where k denotes the amount of capital per worker. Capital is constantly being created through investment and constantly destroyed through depreciation in the Solow model.

The first new growth model, provided by Romer (1986), is presented next. It turns out that taxation influences not only the level of GDP but also its growth rate. The third model presented to going back to Barro (1990), shows under which circumstances a public sector is required for an economy to grow. The optimal size of the public sector is derived. Finally, a brief

outlook for the current research of this thesis is including the debate on scale-effects of taxation and growth.

The basic idea in Roomer's model is the external effect of capital.

$$\mathrm{Y} = \mathrm{A}k^{\alpha}l^{1-\alpha}f(K), \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.10)$$

$$where\ K = \Sigma k$$

The consumption and investment good y is produced by using capital k and labor ℓ with total factor productivity being given by A. In addition to the usual Cobb-Douglas-structure, the term f (K) captures the knowledge-externality of capital. This externality is by assumption positive $f'(K) > 0$.

We have the aggregating over all firms gives an economy- wide production function

$$\mathrm{Y} = \mathrm{A}K^{\alpha}L^{1-\alpha}f(K) \ldots\ldots\ldots\ldots\ldots (3.11).$$

The model can be completed by the usual equation describing capital accumulation

$$K = s\dot{Y} - \ \delta K \ldots\ldots\ldots\ldots\ldots\ldots (3.12)$$

Now we have the Simple model $\mathrm{f(K)} = K^{\beta}$, $\beta > 0 \ldots\ldots\ldots\ldots\ldots (3.13)$

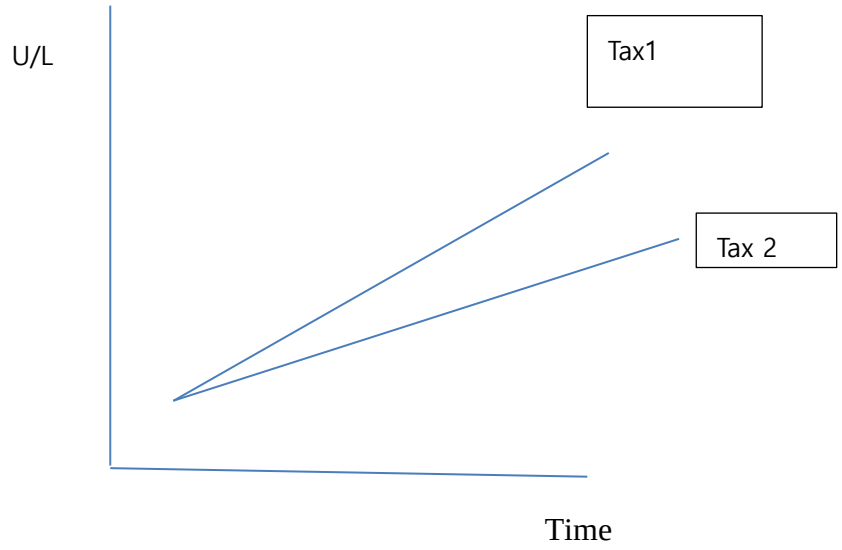
Inserting the expression into the technology (3.10) and the resulting expression in the capital accumulation equation (3.11)

We get

$$K = s\dot{A}K^{\alpha+\beta}L^{1-\alpha} - \delta K \ldots\ldots\ldots\ldots (3.14)$$

Capital l grows at the rate $\frac{\dot{K}}{K} = sAK^{\alpha+\beta-1}L^{1-\alpha} - \delta$

<Figure 3.3>Taxation and Growth of GDP per capita



We now introduce taxes in this setup as well. With an identical tax rate ψ on capital and labor income again, the equation for capital accumulation (3.14) is modified to

$$K = \dot{s}(1 - \psi)AL^{1-\alpha} - \delta K$$

The growth rate in such an economy now reads for

$$\beta = 1 - \alpha$$

$$g = s(1 - \psi)AL^{1-\alpha} - \delta$$

The impact of taxation on GDP per capita is illustrated in figure 3.3. Again, the GDP per capita is plotted over time. Economies that start with the same GDP per capita diverge over time. The economy with lower taxes grows faster.

So in my thesis I conclude that taxation is not totally good for the GDP per capita growth rate for the middle level income and middle level corporations. Because of high rate of taxation may be occurred dangerous for the growth of a country. Actually if the Lower tax rate in big economy has big market of the taxation but sometime it could positive effect for the development of a country. Such as Korea in 1960~1968 the high tax rate did positive role for the development.

Chapter4: Theoretical Analysis of Data

4.1 Introduction

The theoretical analysis of data is a research analysis used to meet the specified objectives. It is a systematic way to find out the probable solution. It refers to the various sequential steps along with rational of each step to be adopted by a researcher in studying the problem with certain objectives in view. Thus the research method designed to achieve the objectives of this thesis contains research design sample, data collection procedure, tools for analysis & methods of presentation analysis

4.2 Data Collection

This study is under taken to analyze the present taxation system in ten countries and to find out the reforming activities to other variables which are related to the GDP per capita and taxes. Actually there are two types of data collection techniques in the statistics. The primary and the secondary, but here used the secondary data.

The required data have been collected from various sources i.e. World development Indicators Reports, Asian Development Bank's Reports, various Bulletins of World Banks, IMF, The United Nations, Asian Development Bank, Country Reports of Economic Policy and Trade Practice-Bureau of Economic and Business Affairs, websites of World Bank, IMF, WTO, & RBI.

4.3 Research Design

The research design is a plan, structure and strategy of investigation conceived so as to obtain answers to research questions and to control variance. The plan is the overall scheme or program of the research. It includes an outline of what the investigator will do from writing the hypothesis and their operational implications to the final analysis of the data. The purpose of the research design is to provide a maximum amount of information relevant to the problem under investigation at a minimum cost. This research study is concerned with past phenomena both depend upon quality & quantity as well as descriptive & analytical.

The Panel data analysis for the OLS Regressions analysis, the fixed effect model, Random effect model & Housman Test are the main design of the thesis. At first I calculate the ten whole countries regression analysis after that the analysis of the five SAARC countries & at last five OECD countries data by annual from the date 1990 to 2012. The E-views program also I use for the analysis of the DW test result. The per Capita income is the dependent variable and the different types of taxes & the economic variables are independent variables for used economic growth literature. There are mostly two types of taxes I used here, tax in Goods and services & other taxes (property tax, education tax & etc.)

4.4 The Model

The cross section panel data analysis calculates of the OLS[7]. The data and the relevant data ratios have been collected form the period 1990 to 2012 in ten different countries from various sources. Firstly we are analyzing the ten countries regression analysis on the panel data analysis. The firstly we choose five countries those countries which are situated in the South Asian region means SAARC. Secondly we choose the five OECD countries those which GDP per capita income is very high in Current US$ in 2013. This is devoted to the research methodology applied in the study for the achievement of desired objectives. The economic model we used in this paper.

$$y = f(x)$$

$$\text{GDP Per Capita Income(y)} = f(x_1, x_2, x_3, x_4, x_5, x_{6,} x_7, x_8) \dots\dots\dots\dots (4.1)$$

Where,

$$(Y) = GDP\ per\ capita\ income\ growt(current\ US\$)$$

$$(x_1) = Other\ Taxes\ (property, education\ \&\ Vat)$$

[7] Ordinary Least Square model

$$(x_2) = Tax\ \ on\ \ Goods\ \ \&\ \ Services\ \ \ (x_3) = revenue\ \ of\ \ tax\ \ (\%of\ \ GDP)$$

$$(x_4) = Trade(\%\ \ of\ \ GDP)$$

$$(x_5) = Unemployment\ \ (\%\ \ of\ \ Labor\ \ force)$$

$$(x_6) = Government\ \ Expenditure\ \ (\%\ \ of\ \ GDP)$$

$$(x_7) = FDI\ \ (\%\ \ of\ \ GDP)$$

$$(x_8) = GDP\ \ per\ \ capita\ \ income\ \ growth(\%\ )$$

a) Model One ……...Total ten Selected Countries

b) Model Two ……Five SAARC countries

c) Model Three ……...Five OECD countries

4.4.1 OLS Regression analysis

As stated earlier, the first method that I have chosen to test is whether or not statutory top rates of taxation on goods and services Per capita income & the Government expenditure have any effect on the rate of GDP per capita income. I will do this by regressing GDP growth per capita on initial GDP per capita growth, Unemployment growth rates, and then adding the selected tax variables to the estimating equation.

I use the multiple linear regression models where the relationship between two or more explanatory variables and a response variable by fitting a linear equation to observed data. Every value of the independent variable *x* is associated with a value of the dependent variable *y*. The population regression line for *p* explanatory variables is

$X_1, X_2, X_3 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots, X_n$

Is defined to be

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots \ldots\ldots\ldots\ldots\ldots + \mu_n \ldots\ldots\ldots\ldots \quad (4.2)$$

This line describes how the mean response μ_y changes with the explanatory variables. The observed values for *y* vary about their means μ_y and are assumed to have the same standard deviation σ The fitted values b_0, b_1, ..., b_p estimate the parameters $\beta_0, \beta_1, \ldots\ldots\beta_p$of the population regression line. Since the observed values for *y* vary about their means μ_y, the multiple regression models include a term for this variation. In words, the model is expressed as

Data = Fit + Residual,

Where the "FIT" term represents the expression,

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots \ldots\ldots\ldots\ldots \beta_p x_p.$$

The "Residual"[8] term represents the deviations of the observed values y from their means μ_y which are normally distributed with mean 0 and variance σ. The notation for the model deviations is ε.Formally, the model for multiple linear regressions[9], given *n* observations, is

$$Y_{it} = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \cdots \ldots \ldots \ldots \ldots + \beta_p X_{ip} +$$

ε_i.....(**4.3**)

---

[8] How much a fixed asset is worth at the end of its lease, or at the end of its useful life? If we lease a car for three years, its residual value is how much it is worth after three years. The residual value is determined by the bank that issues the lease before the lease begins. It is based on past models and future predictions. It is an important factor in determining the car's monthly lease payments (the other factors are the interest rate and tax). In capital budgeting projects, residual values reflect how much you can sell the asset for after the firm has finished using it or once the asset-generated cash flows can no longer be accurately forecasted.

[9] In the least-squares model, the best-fitting line for the observed data is calculated by minimizing the sum of the squares of the vertical deviations from each data point to the line (if a point lies on the fitted line exactly, then its vertical deviation is 0). Because the deviations are first squared, then summed, there are no cancellations between positive and negative values. The least-squares estimates $b_{0,}$ b_1 $\ldots b_p$ are usually computed by statistical software

The values fit by the equation $b_0 + b_1 x_{i1} + \cdots\cdots\cdots b_p X_{ip}$ are denoted $\dot{\hat{Y}}\iota$ and the residuals e_i are equal to $y_i - \hat{y}_i$, the difference between the observed and fitted values. The sum of the residuals is equal to zero. The variance σ^2 may be estimated by $S^2 = \frac{\sum e^2 i}{n-p-1}$, also known as the mean-squared error also known as the mean-squared error (MSE). The estimate of the standard error *s* is the square root of the MSE.

4.4.2 The Fixed Effect Model

This model is exploring the relationship between predictor and outcome variables within an entity as here we used the country's GDP per capita income and the taxes. Each entity has own individual characteristics influence the predictor variables could influence the opinion toward certain issue or the particular country could have some effect on taxes or GDP that may or may not influence. Actually the Fixed effect model also show the time invariant characteristics are unique to the individual and should not be correlated with other individual characteristics. Each entity is different therefore the entity's error term and the constant should not be correlated with the others.

The equation for the fixed effects model[10] becomes:

$$Y_{it} = \beta_1 x_{it} + \alpha_i + u_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.4).$$

Where, α_i (i=1….n) is the unknown intercept for each entity (n entity-specific intercepts). Y_{it} The dependent variable (DV) where i = entity and t = time. x_{it} Represents the independent variables. β_1 is the coefficient u_{it} is the error term we have another way to see the fixed effects model is by using binary variables. So the equation is, for the fixed effects model becomes:

$$Y_{it} = \beta_0 + \beta_1 x_{1,it} + \cdots \ldots + \beta_k x_{k,it} + Y_2 E_2 + \cdots + Y_n E_n + u_{it} \quad \ldots\ldots\ldots (4.5)$$

Where $Y_{it}$is the dependent variable, i means = entity and t = time. $x_{k,it}$ Represents independent variables β_k is the coefficient for the independent variables, u_{it} is the error term E_n is the entity n. Since they

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[10] The key insight is that if the unobserved variable does not change over time, then any changes in the dependent variable must be due to influences other than these fixed characteristics." (Stock & Watson, 2003, p.289-290).

"In the case of time-series cross-sectional data the interpretation of the beta coefficients would be "…for a given country, as *X* varies *across time* by one unit, *Y* increases or decreases by β units" (Bartels, Brandom, "Beyond "Fixed Versus Random Effects": A framework for improving substantive and statistical analysis of panel, time-series cross-sectional, and multilevel data", Stony Brook University, working paper, 2008).

Fixed-effects will not work well with data for which within-cluster variation is minimal or for slow changing variables over time.

are binary (dummies) we have n-1 entities included in the model. Y_2 Is the coefficient for the binary repressors (entities?)[11] .We will add time effects to the entity effects model to have a time and entity fixed effects regression model:

$$Y_{it} = \beta_0 + \beta_1 x_{1,it} + \cdots \ldots + \beta_k x_{k,it} + Y_2 E_2 + \cdots + Y_n E_n + \delta_2 T_{2+} \ldots + \delta_t T_2 + u_{it} \quad \ldots\ldots\ldots (4.6)$$

Where Y_{it} The dependent variable where *i* = entity and *t* = time. $x_{k,it}$ Represents independent variables, β_k is the coefficient for the independent variables, u_{it} is the error term, E_n is the entity n. Since they are binary (dummies) we have n-1 entities included in the model. Y_2 is the coefficient for the binary repressors (entities), T_t is time as binary variable (dummy), so we have t-1 time periods. δ_t the coefficient for the binary time regresses. Control for time effects whenever unexpected variation or special events my affect the outcome variable. But in the thesis there is only the 4.4 method is used for the fixed effect model.

4.4.3 Random Effect model

The random effect model is that the variation across entities is

[11] "The slope coefficient on *x* is the same from one [entity] to the next. The [entity] specific intercepts in [eq.1] and the binary repressors in [eq.2] have the same source: the unobserved variable *Z*i that varies across states but not over time." (Stock and Watson, 2003,p.280)

assumed to be random and uncorrelated with the predictor or independent variables included in the model: "The crucial distinction between fixed and random effects is whether the unobserved individual effect embodies elements that are correlated with the regressed in the model, not whether these effects are stochastic or not" (Green, 2008, p.183). If we have reason to believe that differences across entities have some influence on our dependent variable then we should use random effects.

An advantage of random effects is that we can include time invariant variables. In the fixed effects model these variables are absorbed by the intercept.

The random effects model is:

$$Y_{it} = \beta X_{it} + \alpha_i + u_{it} + \epsilon_{it}, \qquad t = 1,2,3 \ldots\ldots, T \ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.7)$$

Where x_{it} is 1*K and can contain observable variables that change across *i* but not *t* & variables that change across *i & t.* Random effects assume that the entity's error term is not correlated with the predictors which allows for time-invariant variables to play a role as explanatory variables. In random-effects we need to specify those individual characteristics that may or may not influence the predictor variables. The problem with this is that some variables may not be available therefore leading to omitted variable bias in the model. RE allows generalizing the inferences beyond the sample used in the model.

4.4.4 The Hausman Test Comparing the FE and RE model

For the decision of the fixed and random effects we can run the Hausman test where the null hypothesis is that the prefers model is random effects vs the alternative the fixed effects (Green 2008, chapter 9).It basically tests whether the unique errors are correlated with the regressed not the Null hypothesis.

Consider the linear model $y = b_1 x + e$ where y is the dependent variable and x is vector of regressors, b is a vector of coefficients and e is the error term. We have two estimators for b: b_0 and b_1. Under the null hypothesis, both of these estimators are consistent, but b_1 is efficient (has the smallest asymptotic variance), at least in the class of estimators containing b_0. Under the alternative hypothesis, b_0 is consistent, whereas b_1 isn't.

Then the Hausman statistic

$$H = (b_1 - b_2)'\big(Var(b_0)\big) \dagger (b_1 - b_2) \dots\dots\dots (4.8)\dots\dots$$

Where † denotes the Moore–Penrose pseudoinverse. Under the null hypothesis, this statistic has asymptotically the chi-squared distribution with the number of degrees of freedom equal to the rank of matrix

$$var(b_0) - var(b_1)$$

If we reject the null hypothesis, it means that b_1 is inconsistent. This test can be used to check for the endogeneity of a variable (by comparing instrumental variable (IV) estimates to ordinary least squares (OLS) estimates). It can also be used to check the validity of extra instruments by comparing IV estimates using a full set of instruments *Z* to IV estimates that use a proper subset of *Z*. Note that in order for the test to work in the latter case, we must be certain of the validity of the subset of *Z* and that subset must have enough instruments to identify the parameters of the equation. Hausman also showed that the covariance between an efficient estimator and the difference of an efficient and inefficient estimator is zero.

Hausman test can be also used to differentiate between fixed effects model and random effects model in panel data. In this case, Random effects (RE) is preferred under the null hypothesis due to higher efficiency, while under the alternative fixed effects (FE) is at least consistent and thus preferred.

4.4.5 Bruesch and Pegan LM test.

$$\mathrm{y} = \alpha + \beta_1 x_1 + \cdots \ldots \ldots \ldots . + \beta_p x_p + u$$

$$\mathrm{var(u/x)} = \sigma^2$$

$$\mathrm{v\sim(u/x)} = \sigma^2 f(x)$$

$$= \sigma^2(\alpha_0 + \alpha_1 x_1 + \alpha_2 x_2 + \cdots \ldots \ldots \ldots \ldots + \alpha_p x_{p)} \ldots \ldots \ldots . . (4.9)$$

The LM test helps us decide the random and pooled OLS which one is appropriate for this estimate. We have

Null hypothesis : Pooled Regression analysis is appropriate,
Alternative : Random effect model is appropriate

Chapter5: Empirical Results

5.1 OLS Regression Analysis

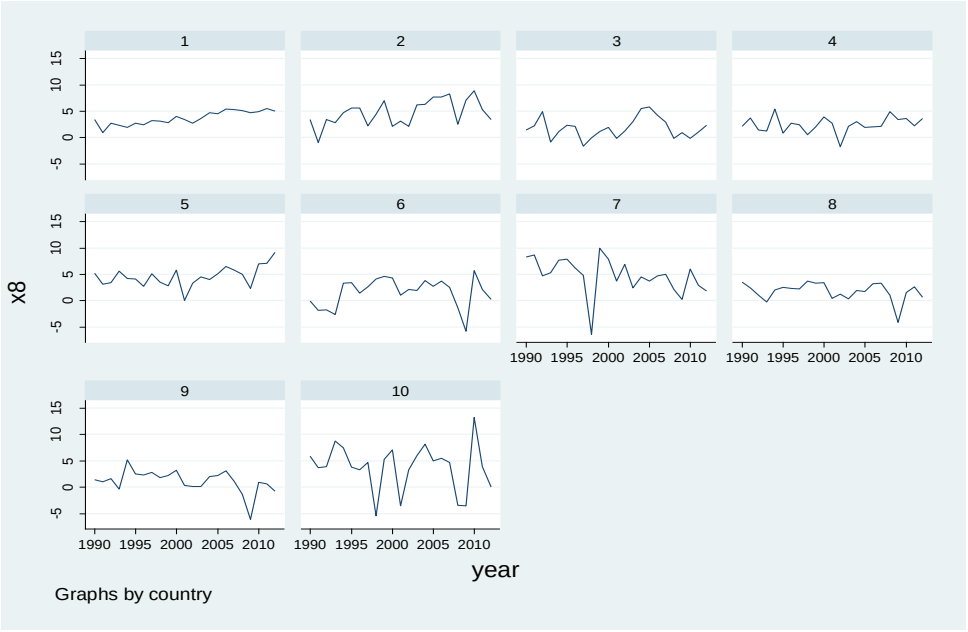
We will begin by performing a regression analysis with the control variables that I have chosen and without the selected tax rates to test and see. If the variables that I have chosen do not have the expected signs are insignificant, then these variables will not be ideal for usage to test if the statutory tax rates have any effect on the rate of economic growth. I expect to get a negative coefficient of initial GDP per capita as did Mankiw, Romer, and Weil (1992). The reason for the expectation of a negative sign on initial GDP per capita is because of the convergence hypothesis, which states that poorer countries should grow faster than rich countries. Mankiw, Romer and Weil (1992) tested for this convergence hypothesis and they found that the coefficient on initial GDP in OECD countries was negative and highly significant.

Convergence occurs because countries may be outside of their steady state long run growth path and the countries that are further away from their steady state growth path will tend to grow faster than those that are closer or that are. This analysis investigates the effects of changes in taxes to economic growth using annual data from 1990 to 2012 for a panel data analysis of ten countries. In the OLS Regression analysis there are 230 observations in the table where the five countries are from SAARC and five are from OECD. In the ten countries regression result shows that the value

of R- Squared is 0.8133 percent of residual and the Adj-R Squared is 0.8066 & the Prob > F is 0.0000 which is less than 5 percent so the data are significant and have good result.

As I will take a graph between the Per capita income growth rates in ten countries. What kinds of situation they take in various years 1990-2012.

<figure 5.1> Graph of the Twenty Countries with PCI



The figure 5.1 is calculated that the basis of GDP per capita income growth rate from 1990 to 2012. We see in this figure there are ten countries ten tables, the table 1~ 5 are SAARC countries table and 6~10 are the OECD countries. In SAARC countries the per capita income growth percent is not very flexible than OECD countries. The OECD countries there are so many flexible and steady going up and down because the big economy felt some problems in different time period likewise in 1997 the IMF problem in Singapore & Korean economy so the growth rate also fall down at that period. Least squares Regression Analysis with GDP per capita income is Dependent variable in the 10 countries are seen.

5.2 Panel Data Analysis with Per capita income Taxes in Whole ten countries

The regression result of the equations 4.2 is dependent on the data of the whole ten countries. The variable in this model is used for the Panel data analysis. The dependent variable is GDP per capita income and the in independent variable there are two types of taxes and other economic indicator. In this matter it is possible to test whether sector specific characteristics are relevant to explanation of the taxes and GDP

<Table 5.1> Least Squares Analysis with PCI and variables

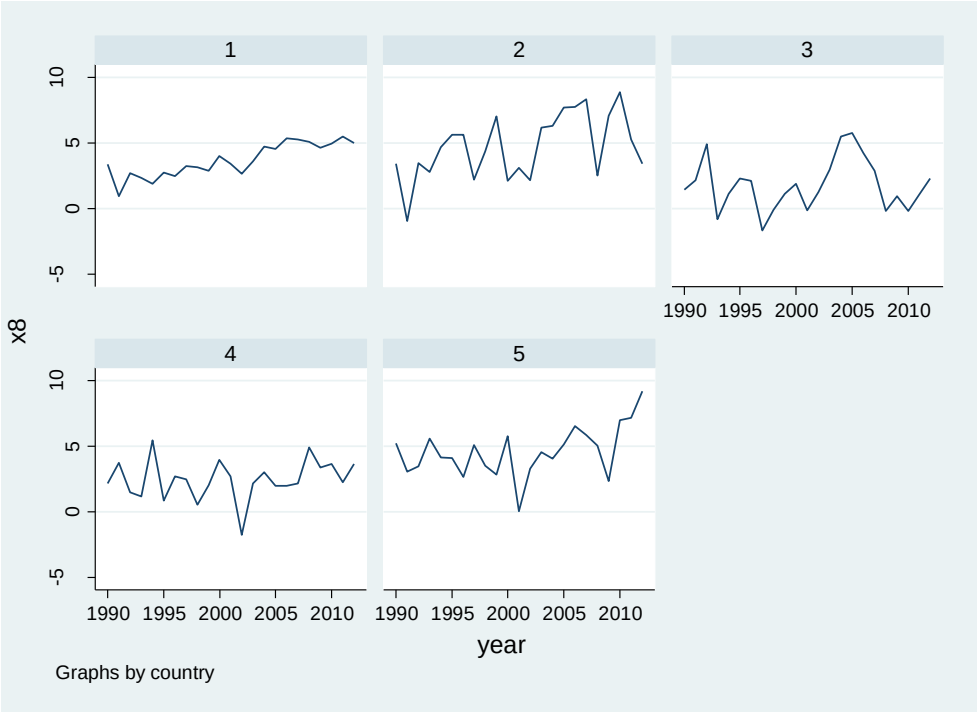
Variable	Coefficient	t-value	P > (t)	Comment
Other Taxes	751.3236** (163.7899)	4.59	0.000	Significance
Tax on Goods & Services	-364.5014** (68.0167)	-5.36	0.000	Significance
Tax Revenue	1974.446** (93.7621)	21.06	0.000	Significance
Trade	30.4258** (7.6028)	4.00	0.000	Significance
Unemployment	-86.5678** (39.6639)	-2.18	0.030	Significance
Government Expenditure	-141.5004** (22.2017)	-6.37	0.000	Significance
FDI	105.0235 (74.0796)	1.42	0.158	Not Significance
GDP PCI growth	-862.0215** (202.3742)	-4.26	0.000	Significance
cons	-3182.036 (2431.661)	-1.31	0.192	Not Significance
Total observations 230 230 230				
Standard errors are in brackets *Significance at 1 % level ** Significance at 5 % level *** significance at 10 % level R^2=.8133 Adjust R^2=0.8066 Prob >(t)=0.000				

The ordinary least squares regressions without dummy variables a pooled regression model assumes a constant intercept and slope regardless of firm types. In the following regression equation β_0 is the intercept β_1 is the slope of net tax in 1990 and ε_i is the error term in Model 4.1 the regression model fits the data well at the Table 5.1 the significance level is 5 percent and (prob >F=0.0000) R^2 of 0.8133 says that this model accounts for 81.33 percent of the total variance. The model has the intercept of per capita income is -3182.036 and slope of coefficients of Other Taxes is 751.3216, tax on goods and services, tax revenues, Total trade, Unemployment rate, Government expenditure , FDI and GDP growth 751.3236, -364.5014, 1974.446, 30.4258, -86.5678,-141.5004, 1005.0235, & -862.0215 for change in taxation then changed in GDP per capita growth.

In the model we see that the other taxes, tax on goods and services, tax revenue, trade, GDP growth rates & unemployment rates are significant at 5% level and others two are significant at 1% level. Where the GDP per capita income is dependent variable and the different types of taxes & other indicator are independent variables. The total number of time is 460 and after missing value so original value of F (8,221) is 120.38.

The p value means the Prob > F = 0.000 which is below five percent, meaning that the p value is less than five percent and the prediction said that if the p value is less than five percent then we reject the null hypothesis.

<figure 5.2>Figure of the SAARC Countries PCI Growth



The figure 5.2 is calculated on the basis of GDP per capita income growth rate from 1990 to 2012 we see in this figure there are five SAARC countries five tables the table. In SAARC countries the per capita income growth percent is flexible in different period of times because of these countries all are fascinated the Civil war various times. Because of political disturbance these countries didn't get chance to development. So they couldn't change their GDP growth rate accept India. But India has also so many economic problems.

In the same model the countrywide data analysis for the test

<Table 5.2> Countrywide DW test between per capita income and Variables in total 10 countries

COUNTRY	MEAN	S.D	R^2	$Adjusted\ R^2$	F-statistic	p-value	DW stat
BGDA	414.26	144.20	0.90	0.84	16.19	0.0000	0.68
INDIA	682.15	402.92	0.95	0.92	33.02	0.0000	1.63
PAKISTAN	651.94	281.96	0.91	0.87	19.70	0.0000	1.76
NEPAL	321.42	160.74	0.98	0.97	16.28	0.000	2.62
SRILANKA	1212.86	739.39	0.94	0.91	29.30	0.0000	1.10
SWEDEN	36300.41	10634.95	0.81	0.70	7.51	0.0005	1.37
KOREA	14626.42	5729.03	0.90	0.85	16.66	0.0000	1.67
AUSTRIA	32834.01	9759.77	0.93	0.89	25.45	0.0000	1.45
DENMARK	40418.18	12484.00	0.96	0.93	43.44	0.0000	1.83
SINGAPORE	26784.56	10590	0.85	0.77	10.63	0.0000	1.61

The countrywide analysis of the Regression analysis is held over in table 5.2. The total ten countries data are used for the test.

5.3 Least Squares Analysis with PCI, Taxes and other economic variables in SAARC countries

The regression result of the equations 4.2 is dependent on the data of the SAARC countries. The variables in this model, I use the least squares method for the find out the result of the model. The set of independent variables are adjusted for each of the eight kinds of variables which are same as (5.1), where the dependent variable is the GDP per capita income. In this matter it is possible to test whether sector specific characteristics are relevant to explain.

<Table 5.3 > Least Squares Analysis with PCI and variables in SAARC Countries

Variable	Coefficient	t-value	P > (t)	Comment
Other Taxes	47.2667**	3.32	0.001	Significance
Tax on Goods & Services	38.2692**	5.01	0.000	Significance
Tax Revenue	-9.2606	-0.51	0.609	Not significance
Trade	-6.3688	-1.35	0.181	Not Significance
Unemployment	-5.7930**	-2.70	0.008	Significance
Government Expenditure	.79055	0.51	0.612	Not Significance
FDI	2.8838	0.71	0.478	Not Significance

GDP PCI growth	71.8662**	3.88	0.000	Significance
cons	-634.5541**	-3.61	0.000	Significance
Total observations	230	230	230	
Standard errors are in brackets *Significance at 1 % level, ** Significant at 5 % level, *** significant at 10 % level R^2=.5450 Adjust R^2=0.5107 Prob >(t)=0.000				

In the Table 5.3 the Coefficient of the variables are in the strongly regress the Model 4.2 means the Regressions analysis between GDP per capita income and different types of taxes which is related ten different countries from (1990 ~2012). The dependent variable is GDP per capita income rate and the independent variable is different types of taxes and economic variables.

The regressions analysis between five SAARC countries among ten countries those GDP per capita income is less than US $5000 and the population growth rate is higher than the rest of the world. Where the different types of taxation and related variables are used in independent variables & the GDP per capita income rate is in dependent variable where I use the data from (1990~2012).

Here we see that the coefficients of the variables are in Negative way, because the intercept value is -634.5541 and the tax variables slopes are 47.2667 in other taxes and the 38.2692 in the goods & the services which

means that taxes also have negative effect in the GDP per capita income in SAARC countries. The R^2 value is only about 0.5450 meaning that the change by 54.5 percent and the adjusted value is 0.5107. The intercept of the model is -634.5541 and the slope of other variables like revenue taxes is -0.51,Total trade is -6.3688, the Unemployment rate is -5.7930 Government expenditure is the .7905, FDI has the 2.8838 & at last the GDP per capita growth has 71.8662.

In this model the variables of other taxes, tax on goods and services, Unemployment rate GDP growth rate are in significance level in five percent because of the p values of the variables are 0.001, 0.000, 0.000 & 0.000 respectively meaning that the p value is less than five percent and the prediction said that if the p value is less than 5 percent we reject the Null hypothesis. So in the prob > F is 0.0000 means the p value is less than five percent. In this model we conclude that the variables of taxes can effect for the per capita income growth.

5.4 OLS with PCI, Taxes & other Economic variables in OECD

According to the Arnold (2008) and also Xing (2011) it could be said that this control variable has a negative coefficient because public spending could possibly be crowding out private spending or private investment. However, this subject would be a whole different study in itself and cannot be concluded from these regression results. The information taken away from this coefficient is not significant in these results. There should also not be any premature policy implications resulting from the government revenue as a percentage of GDP Variable because we are not certain as to what the governments are using these revenues for. Some of the spending could be productive government spending while some of it could be unproductive government spending. The variable still has to be included in the analysis as a control variable when trying to analyze different shifts in the tax structure.

The equation 4.3 the regression result of the equation dependent on the data of the OECD countries. I use the least squares method for the find out the result of the model. The set of independent variables are adjusted for each of the eight kinds of variables which are same as (5.1) & (5.2) where the dependent variable is the GDP per capita income. In this matter it is possible to test whether sector specific characteristics are relevant to explain.

<Table 5.4> Least Squares Analysis with PCI and variables in OECD Countries

Variable	Coefficient	t-value	P > (t)	Comment
Other Taxes	59.3114	0.22	0.829	Not Significance
Tax on Goods & Services	615.9909**	3.42	0.001	Significance
Tax Revenue	3674.013**	11.34	0.000	Significance
Trade	172.9130**	7.95	0.000	Significance
Unemployment	-295.9121	-0.68	0.498	Not Significance
Government Expenditure	-839.6430**	-8.75	0.000	Significance
FDI	-261.2482	-1.71	0.090	Not Significance
GDP PCI growth	-802.6449**	-3.33	0.001	Significance
cons	-49862.98**	-6.83	0.000	Significance
Total observations	230	230	230	

Standard errors are in brackets

*Significance at 1 % level ** Significant at 5 % level *** significant at 10 % level R^2=.7064 Adjust R^2=0.6842 Prob >(t)=0.000

In this model the regression result is the five OECD countries. The Dependent variable is the GDP per capita income and the independent

variables are different kinds of economic indicator which are used from 1990 to 2012 because of the lack of taxation data I used only five OECD countries.

Here we see that the coefficients of the taxes variables are in Negative way, because the intercept value is -49862.98 and the tax variables slopes are 59.3114 in other taxes and the 615.9909 on the goods & the services which means that taxes have negative effect in the GDP per capita income in OECD countries Result that our result is also related to the Kim 2003. Here in the table 5.3 the R^2 value is only about 0.7064 meaning that the change by 70.64 percent and the adjusted R^2 value is 0.6842. The intercept of the model is -49862.98 and the slope of other variables like revenue taxes has 3674.01, Total trade has172.913, the Unemployment rate is -295.9121 Government expenditure has the -839.643 FDI has the 261.24 & at last the GDP per capita growth has -802.6449.

The model of the variables of tax of other taxes, the Unemployment rate & the FDI which P-values are .8290, .498 & 0.090 are not significance the tax on goods and services, revenue of taxes Total trade rate, government expenditure, FDI & the GDP per capita income growth are in significance level in five percent because of the p values of the variables are 0.001, 0.000, 0.000 0.001 & 0.000 respectively. If p value is less than 5 percent we reject the Null hypothesis. So in the prob > F is 0.0000 is less than five percent so we conclude that the variables of taxes can effect for the per capita income growth we reject the null hypothesis.

<figure 5.3 >Figure of the Five OECD[12] Countries

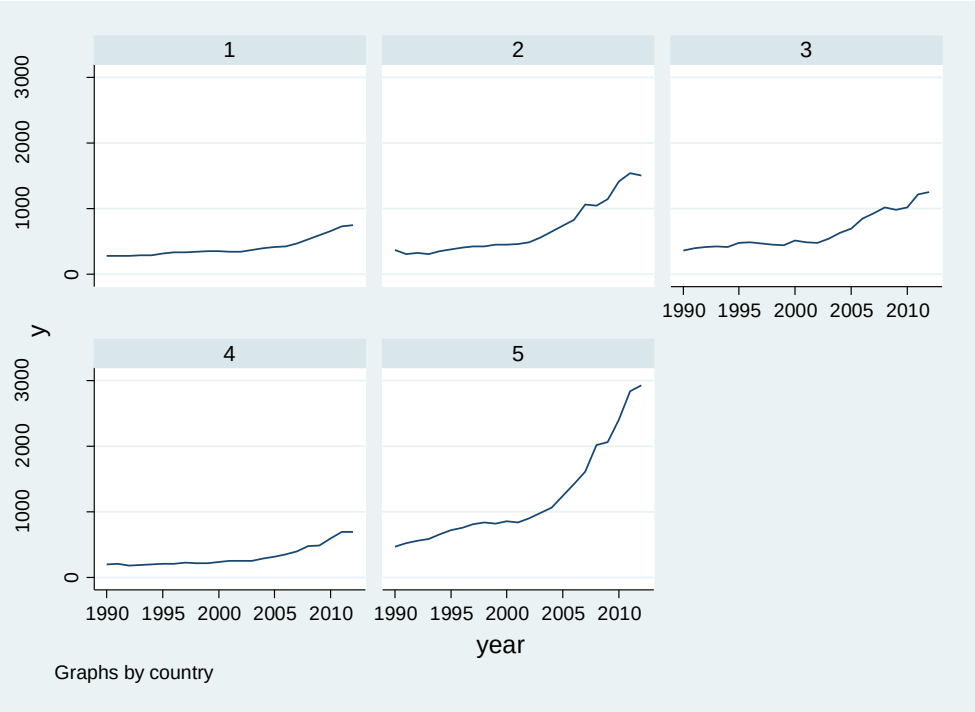


Figure 5.3 is the line of the regression result of the equations 4.2 which is dependent on the data of the Five OECD countries. The dependent variable is GDP per capita income and independent variables are different types of taxes and the economic indicator which are related to the GDP. The set of independent variables are adjusted for each of the eight kinds of

[12] Sweden, Korea, Austria, Denmark & Singapore among 34 OECD countries

variables. In this matter it is possible to test whether sector specific characteristics are relevant to explain.

5.5 Hausman Test

< Table 5.5> Hausman Test

Variables	Model 1	Model 2	Model 3
X_1	109.074	-44.0212	1352.512
X_2	347.278	-16.522	-341.638
X_3	-1390.345	29.027	-2019.113
X_4	204.874	2.730	97.537
X_5	-530.152	-79.399	-484.857
X_6	-11.670	98.100	667.548
X_7	-120.696	-3.642	20.913
X_8	304.370	-7.295	114.182
$Chi^2(8)$	696.31	74.80	34.43
Prob> Chi^2	0.0000	0.0000	0.0000

We can check the whether Random effect model is appropriate or fixed effect model is appropriate for our analysis. First of all we have checked the hypothesis.

Null : RE model is appropriate

Alternative : FE model is appropriate

If we get the statistically significant in p-value we shall use fixed effect model. In table 5.5 Model 1 we see the p value is 0.0000, Model 2 & model 3 there the p values are 0.0000 & 0.0000 approximately meaning that the p values are less than 5% which is also known that if the p value is less

than 5% we can reject the Null hypothesis. So in three cases all three models are appropriate the fixed effect regression analysis.

So we can say that the fixed effect model is appropriate for this regression analysis between the per capita income and the various kinds of taxes and the economic indicator. So we do the analysis the fixed effect model & Random effect model in the next part of the thesis.

5.6 The fixed effect model between the Per capita income and the Taxes in Ten Countries

The fixed effect model in this part the set of independent variables are adjusted different economic variables & the two kinds of taxes but the dependent variables is the GDP per capita income. In this matter it is possible to test whether sector specific characteristics are relevant to explain. The fixed effect model (4.5.2) we have the data from 1990 to 2012 different ten countries first, then after us analysis the test between five SAARC countries and five OECD countries in the fixed effect model. At last the find out the analysis of hypothetical either good or bad.

<Table 5.6 > The Fixed Effect Model with PCI and variables

Prediction	Model One		Model Two		Model Three	
Variables	Coefficient	P value	Coefficient	P value	Coefficient	P value
Other taxes	860.397** (179.340)	0.000	3.245 (13.735)	0.814	1411.823 (345.800)	0.000
Tax on Goods & services	-17.222 (86.638)	0.843	21.746** (5.763)	0.000	274.3529 (266.085)	0.305
Tax Revenue	584.101** (253.351)	0.022	19.766 (19.827)	0.321	1654.9 (520.065)	0.002
Trade	235.300** (23.302)	0.000	-3.638 (3.557)	0.309	270.4506 (31.708)	0.000
Unemployment	-616.720* (249.289)	0.014	-85.192** (20.429)	0.000	-780.7697 (466.259)	0.090
GVT Expenditure	-153.171 (194.156)	0.431	98.891** (15.220)	0.000	-172.0949 (404.908)	0.067
FDI	-15.673 (53.288)	0.469	-.758 (2.962)	0.799	-240.335 (139.104)	0.080
PCI Growth	557.65** (149.982)	0.000	64.570** (13.498)	0.000	-688.4629 (220.182)	0.002
Constant	-7240.949 (8401.915)	0.390	-1566.94** (537.958)	0.004	-47463.79 (21332.83)	0.028
FTest	21.15		23.89		18.64	
Prob>F	0.000		0.000		0.000	
Corr(U_i,Xb)	-0.789		-0.992		-0.906	
R^2 within	0.443		0.652		0.5938	
R^2 between	0.353		0.079		0.0101	
R^2 Overall	0.339		0.051		0.0498	

*Significance at 1 % level ** Significant at 5 % level *** significant at 10 % level

The total ten different countries are selected for the fixed effect model. The dependent variable is the GDP Per capita Income and the independent variables are the various kinds of economic variables including taxes from 1990 to 2012. In this table, the model 1 means that the ten countries among them five are SAARC and fives are OECD. We see that the coefficient of the dependent variables is in negative way. The Wald chi square is = 963.03 and the coefficients of independent variables are in positive and the coefficients of the slope is -7240.94. In the model except the FDI, all variables are significant. Another way there is negative relations in the GDP per capita income growth and the Taxes in the whole ten countries. So, we have the hypothesis is

Null : Random effect is appropriate

Alternative : Fixed effect model is appropriate

Meaning that the hypothesis test in model one the p value of the model is 0.0000 which means the p value is less than 5% and the model said if the p value is less than five percent we reject the null hypothesis. So, meaning that the fixed effect is appropriate for this model between GDP per capita income and the different kinds of variables including other taxes and taxes on goods and services.

In table 5.6 the model 2, which have five SAARC countries which have no more than 5000$ per capita income among whole ten countries. The per capita income is the dependent variable and the different types of taxes are independent variables. The intercept of the fixed effect analysis is -1566.94 and the slopes are 3.24 of other taxes 21.74 is the tax on goods and services where the number of observations are 115 and the absent of the data is F (8,102) = 23.89, and the R^2 within, between and overall is 0.6521, .0794 .0516.

The p value is 0.000 meaning that the p value is less than 5 % and the model given the prediction if the p value is less than 5 % we reject the null hypothesis and accept the alternative so in this model the fixed model is appropriate.

In the same table 5.5 model three the Fixed Effect regressions analysis is in the model. The dependent variable is GDP per capita income growth rate and the different type's economic variables including the other taxes and the tax on goods and services are in independent variables between OECD countries those which countries per capita income is highest in the world and the population growth rate is very low.

In this model the intercept is in Negative means -47463.79 and the slopes are .1411.823 has other taxes, 274.352 has the taxes on goods & services. In the fixed effect regression model the relationship between variables are negative. The Observations are115 but the data only have F

(8,102= 18.64) and the Prob> F is 0.000 meaning that the p value is less than 5 percent, meaning that the fixed effect model is appropriate for the analysis between taxes and the GDP per capita income. Normally we have concluded that the effects of the taxation in GDP per capita income growth rate also have negative relationship between them.

I will be monitoring for government revenue as a percentage of GDP to see how potential shifts in the tax structure may have an effect on the growth. For example, if one tax is to have a positive coefficient and the other tax variable has a negative coefficient then we can say that a shift from the tax with a negative coefficient to the one with a positive coefficient will be better for economic growth while maintaining the same amount of revenue for public expenditures.

5.7 Random Effect Model

The Random effect model 4.5 is calculated between ten among them five countries are from SAARC and fives are from OECD. The dependent variable is the GDP per capita income and the independent variable is the different types of taxes from 1990 to 2012. Then after we could take five countries among ten countries those countries per capita income is less than 5000$ & population is very high in this side but in another side GDP PCI is very high.

<Table 5.7 > The Random effect Model with PCI and the variables

	Model One		Model Two		Model Three	
Variables	Coefficient	Pvalue	Coefficient	P value	Coefficient	P value
Other taxes	751.323** (163.789)	0.000	47.266** (14.235)	0.001	59.311 (273.560)	0.828
Tax on Goods & services	-364.501** (68.0167)	0.000	38.269** (7.635)	0.000	615.990** (179.942)	0.001
Tax revenue	1974.446** (93.762)	0.000	-9.260 (18.064)	0.608	3674.013** (21.755)	0.000
trade	30.425** (7.602)	0.000	-6.368 (4.725)	0.178	172.913** (435.32)	0.000
Unemployment	-86.567* (39.663)	0.030	-5.793** (2.143)	0.007	-295.912 (96.007)	0.497
GOVT Expenditure	-141.500** (22.201)	0.000	.790 (1.555)	0.611	-839.643** (152.770)	0.000

FDI	105.0235 (74.079)	0.158	2.883 (4.052)	0.477	-261.248 (152.770)	0.087
GDP Growth	-862.021** (202.374)	0.000	71.866** (18.521)	0.000	-802.644** (241.109)	0.001
Constant	-3181.036 (2431.661)	0.192	634.554** (175.621)	0.000	-49862.98** (7302.521)	0.000
Wald chi2	963.03		126.97		254.98	
Prob>chi2	0.0000		0.000		0.000	
R^2 within	0.1135		0.3348		0.4792	
R^2 between	0.9673		0.9138		0.9820	
R^2 Overall	0.8133		0.5450		0.7064	
*Significance at 1 % level ** Significant at 5 % level *** significant at 10 % level						

Table 5.7 is the random effect model which has been various results in the model. There is no correlated across units with the Regressed. The Interpretation of the coefficients is tricky since they include both the within entity and between entity effects. In the case of TSCS data represents the average effects of X over Y when X changes across time and between countries by one unit. The dependent variable is GDP per capita income growth and the independent variables are the different types of economic variables including two kinds of taxes which are related to the ten countries from 1990 ~ 2012. In model one there is the ten countries & in model two, five SAARC countries those per capita income is less than 5000$ among ten countries. In the last third model, five countries those per capita income is very high OECD countries.

In the random effect model table 5.7 model one the numbers of observations are total 230. Wald chi square at 5 % level amount is 963.03 and the coefficients of the intercept is -3181.036 and the slopes are 751.323 has other taxes and the tax on goods and services has -364.501 and the R^2 within between and overall is continuously 0.1135, 0.9673, 0.8133 in the hypothesis of the model.

So here we have one guideline if the Wald chi square value is less than 5% then the model is appropriate in Random effects but in this case the chi square value is 963.03 which is more than five percent so in this case we cannot use the Random effect model. In another way we have the two tail test hypothesis that each coefficient is different from zero. The p value is 0.000 it means that the less than 5 percent and we have if the p value is less than 5% we reject the null hypothesis and accept the alternative.

In Model two, table 5.6 the intercept of the dependent variable is -634.554 and the slopes of the coefficient are 47.266 & 38.269 in other taxes and the tax on goods and services. The Wald chi square of the 5 percent level value is 126.97, but in the prediction also same as model one that if the Wald chi square value is more than 5% the model is not appropriate for the test. So also in model two the random effect model cannot appropriate for the analysis of dat. But because of the numerical value of GDP growth rate and the taxes in least developing countries the p value is 0.000 which means reject the null hypothesis and can accept the alternative.

In the model three table 5.7 the number of observations are 115 which is correct of the real observations there is no missing data here the intercepts is -49862.98 and the slopes are 59.311 & 615.990 for the other taxes and the tax on goods and services . The Wald chi square at 5 % level is 254.98. Which is more than 5 % and also in third model the random effect analysis is not appropriate. The p value of the test is 0.000 meaning that less than 5% and we reject the Null hypothesis.

The Chi squares of the test the hypothesis that each coefficient is different from Zero. To reject this p-Value has to be lower than 5 percent which means that the reject the Null hypothesis rather accept alternative and the variable also has significant.

5.8 Bruesch and Pegan LM test.

$$y = \alpha + \beta_1 x_1 + \cdots \ldots \ldots \ldots + \beta_p x_p + u$$

$$\text{var}(u/x) = \sigma^2$$

$$v\sim(u/x) = \sigma^2 f(x)$$

$$= \sigma^2(\alpha_0 + \alpha_1 x_1 + \alpha_2 x_2 + \cdots \ldots \ldots \ldots \ldots + \alpha_p x_{p)}$$

$$Y[country\ \ , t] = Xb + u[Country] + e[country, t]$$

<*Table 5.8* > *Bruesch and Pegan LM test.*

Estimated Results	Var	Sd=Sqrt(var)
y	3.09	17565.54
e	2.94	5425.47
u	0	0
Var (u)=0 , Chibar2(01)= 0.00, prob > chibar2 = 1 .0000		

The LM test helps us decide the random and pooled OLS which one is appropriate for this estimate. We have

Null hypothesis : Pooled Regression analysis is appropriate,
Alternative : Random effect model is appropriate

In Table 5.16 the model 1 chi square value is the 1.000 and the corresponding probability is the 0.0000. So the p value is Zero, meaning that p value is less than 5% meaning that we can reject the Null hypothesis and can accept the alternative so in this model the fixed model is appropriate in model 4. So Hausman Test and Bruesch Pegan Test both are telling that the fixed effect model to represent our data.

<Table 5.9> Testing for Heteroskedasticity

Walt Test for the group wise Heteroskedasticity in Fixed effect Regression Model		
Model1	Model 2	Model 3
Chi(10) = 1492.81	182.63	42.77
Prob>chi2=0.0000	0.0000	0.0000

Chapter6: Conclusion & Summary

The conclusion of this study is to investigate the relationship between tax reforms and economic growth in ten countries. It goes further to examine whether tax reforms on the economy Tax in Goods and services & other taxes affect the economic growth measured with gross domestic product. To capture this, Cross section Panel data analysis is used from 1990 - 2012.

This thesis estimated the effects of tax changes on GDP per capita using annual data from the 1990 to 2012 period for a panel of 10 difference economies. The empirical findings show that an increase in taxes has a negative and persistent effect on real GDP per capita. The size of the effect depends on how the "tax shock" is measured, but our estimates suggest that an increase in the total tax rate by 1% of GDP will have a long-run effect on real GDP per capita of approximately 4% in GDP per capita income. This is larger than Roomer and Romer's (2007) rather large estimated effect (approximately 3%), but their identification of a "tax shock" is very different from ours, and their measure of GDP is aggregate. In addition, our estimates are much closer to those of Karras (1999) for a smaller OECD sample, and Blanchard and Perotti (2002) for the U.S.

The effects of what are usually the two types of taxes: taxes on taxes on property taxes (Other Taxes) & taxes on goods and services. Our findings imply that the in eight variables seven variables (Other Taxes, Tax on goods and services, tax revenue, total openness, unemployment rate, Government

expenditure, & GDP per capita income growth rate) are significance on the 5% level of GDP Per capita income. Only FDI is significance in the 1 % level. The study is also concluding that a number of interesting extensions can be pursued. It would be useful to examine the effects of taxes on variables goods and services which are related to the unemployment rate evidence on consumption and expenditure.

This goes to show that tax reforms have significantly altered the way the system and their agencies function resulting in improved impacts on economic growth. The reform process has indeed, charted a road map to drive the international relevance, as it is to provide adequate revenue for the government to undertake socially desirable expenditure that will translate to economic growth in real output and per capita basis for it is the only part to ensure efficient transport system, regular supply of water and electricity etc.

The dissertation results is that high relative taxation does effects the GDP, even when variable factors & the provision of public goods are controlled for. Therefore, although market potential does matter, tax differentials also play a significant role in driving GDP per capita income Growth.

Such as there is an asymmetry in the impact of tax differentials on GDP per capita income growth, while lower tax rates in the recipient countries fail to significantly attract foreign investment; higher taxes tend to discourage new FDI inflows finally rolled to decrease the GDP per capita

growth rate. Secondly, the impact of positive tax differentials is not homogeneous regarding the double-taxation arrangement in operation in the capital.

Tax competition for GDP is a reality in today's global environment. Investors routinely compare tax burdens in different locations, as do policy makers, with comparisons typically made across countries that are similar in terms of location and market size. A widely-held view is that taxes are likely to matter more in choosing an investment location as non-tax barriers are removed and as national economies converge.

There is broad recognition that international tax competition is increasing, and that what may have been regarded as a competitive tax burden on business in a given host country at one point in time may no longer be so after rounds of tax rate reductions in other countries. Where a higher corporate tax burden is matched by well-developed infrastructure, public services and other host country attributes attractive to business, including market size, tax competition from relatively low-tax countries not offering similar advantages may not seriously affect location choice. It is also clear that a low tax burden cannot compensate for a generally weak in GDP growth. Tax is but one element and cannot compensate for poor infrastructure, limited access to markets, or other weak investment conditions. Also, while attention often focuses on corporate income tax, the importance of other taxes must be recognized in this dissertation.

These results bear several policy implications. First, although tax differentials do matter for GDP growth this should not lead to zero taxation, because market potential and public investment also matter, and because Taxation reacts asymmetrically to positive and to negative tax differentials so that the incentive to cut taxes essentially falls on high tax countries. Second, because there is an asymmetry in Taxations variables stemming from countries applying exemption or credit to repatriated profits, the incentive for tax competition should depend on the composition of investing countries.

Summary

This thesis is the relationship between the GDP per capita income and the different kinds of taxation. I used the OLS method with panel data analysis. The GDP per capita income is the dependent variables and the three kinds of taxes 'the other tax, tax revenue and the tax on goods and services', the unemployment rate, the openness, FDI & the GDP per capita growth rate are the independent variables. The Fixed model, random effect model Hausman Test, the B & pegan Test, DW test are used for the analysis.

Actually there are three types model for the using OLS in my thesis at first I will take ten different countries fives are SAARC and others are from OECD countries. This is the combination of the rich and poor countries. Secondly what are the effect of taxes in GDP in poor countries and the effect in GDP in rich countries? So I will divide in three parts.

a) Whole ten Countries

b) The SAARC Countries and

c) The OECD countries.

Because of the data of the taxation in the SAARC countries I could not add all eight countries the Bhutan, Maldives, & Afaganisthan. They have no clear data about the taxations and the other variables. On the other hand there are so many developed countries in OECD but why I could choice the only five? Because of the Sweden Austria and Denmark are the rich and developed countries in the Europe. The Korea and Singapore are the Asian Tiger in Asia. So the fusions of the rich and poor economies countries are my target. Can us fusion these countries development to share with other countries for the good result through the tax variables effects on GDP per capita income.

Some research papers found that the tax is the negative variable for the GDP. But with these some countries as like the Sweden income tax is 57% and the GDP per capita income is near about the 56 thousands dollar. But in other hand the corporate tax in Nepal is 25% and the per capita income is only 6 hundreds dollar. In my thesis all kinds of results and tests delivered that the fixed effect model is the best appropriate model for the analysis of these tax variables and the economic indicator. Because in all model the P value is > 0.0000 in the 0.05 % level of significance the results of the Null

hypothesis are rejected and the alternative is accept.

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Appendixes A

Table

Walt Test for the group wise Heteroskedasticity in Fixed effect Regression Model		
Model1	Model 2	Model 3
Chi(10) = 1492.81	182.63	42.77
Prob>chi2=0.0000	0.0000	0.0000

Pesaran CD Test (Cross section Dependence)			
	Model 1	Model 2	Model 3
Pesaran test of dependence	10.165	0.0239	0.315
pr	0.0000	0.0000	0.0053
Average absolute value	0.239	4.450	2.789

Appendixes B

Model1: Time fix effect effects Model PCI and the variables in

```
       between = 0.0092                                avg =      23.0
       overall = 0.0002                                max =        23

                                               F(30,190)           =     13.76
corr(u_i, Xb)  = -0.8478                       Prob > F            =    0.0000
```

y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
x1	461.7644	154.5136	2.99	0.003	156.9819	766.5468
x2	-294.7361	75.30435	-3.91	0.000	-443.276	-146.1961
x3	184.2759	211.1496	0.87	0.384	-232.2227	600.7745
x4	80.41437	24.46827	3.29	0.001	32.15001	128.6787
x5	-276.8214	209.7983	-1.32	0.189	-690.6544	137.0116
x6	-1029.854	177.8782	-5.79	0.000	-1380.724	-678.9845
x7	-36.581	44.66349	-0.82	0.414	-124.681	51.51899
x8	-679.4094	141.6879	-4.80	0.000	-958.8927	-399.9261
year						
1991	-276.335	1950.845	-0.14	0.888	-4124.432	3571.762
1992	1267.814	1955.277	0.65	0.518	-2589.026	5124.654
1993	917.3993	1968.145	0.47	0.642	-2964.823	4799.622
1994	2661.887	1953.665	1.36	0.175	-1191.772	6515.547
1995	3522.078	1949.864	1.81	0.072	-324.0834	7368.239
1996	3754.335	1951.412	1.92	0.056	-94.87996	7603.55
1997	2070.724	1953.65	1.06	0.291	-1782.905	5924.354
1998	1011.186	1985.757	0.51	0.611	-2905.776	4928.147
1999	3415.224	1966.474	1.74	0.084	-463.7001	7294.149
2000	3455.107	1999.273	1.73	0.086	-488.516	7398.73
2001	1755.914	2025.605	0.87	0.387	-2239.648	5751.476
2002	3848.187	2011.443	1.91	0.057	-119.4402	7815.815
2003	6503.946	2024.257	3.21	0.002	2511.043	10496.85
2004	7996.149	2028.141	3.94	0.000	3995.584	11996.71
2005	8548.059	2046.788	4.18	0.000	4510.712	12585.41
2006	10046.15	2082.159	4.82	0.000	5939.027	14153.26
2007	11820.48	2073.759	5.70	0.000	7729.933	15911.03
2008	11569.7	2184.804	5.30	0.000	7260.108	15879.28
2009	10848.57	2151.931	5.04	0.000	6603.823	15093.31
2010	13884.64	2078.455	6.68	0.000	9784.829	17984.45
2011	14774.03	2102.367	7.03	0.000	10627.05	18921.01
2012	14938.3	2165.933	6.90	0.000	10665.93	19210.66
_cons	42462.34	8296.619	5.12	0.000	26097.02	58827.65
sigma_u	33950.701					
sigma_e	4314.0368					
rho	.98411036	(fraction of variance due to u_i)				

```
test that all u_i=0:     F(9, 190) =    25.07              Prob > F = 0.0000
```

Model 2: Time fix effect effects model between PCI and the variables

```
                                                F(30,80)          =     28.57
corr(u_i, Xb)  = -0.9284                        Prob > F          =     0.0000
```

y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
x1	20.64348	8.663081	2.38	0.020	3.403395	37.88356
x2	4.059914	3.586053	1.13	0.261	-3.07656	11.19639
x3	-33.3755	12.74024	-2.62	0.011	-58.72938	-8.021616
x4	-5.375737	2.155299	-2.49	0.015	-9.664918	-1.086556
x5	-69.30837	12.14163	-5.71	0.000	-93.47098	-45.14575
x6	-17.2174	12.93375	-1.33	0.187	-42.95638	8.52157
x7	-2.837695	1.854334	-1.53	0.130	-6.527938	.8525471
x8	25.92304	9.607357	2.70	0.008	6.803792	45.04229
year						
1991	94.93124	92.17182	1.03	0.306	-88.49653	278.359
1992	76.9022	91.25486	0.84	0.402	-104.7007	258.5052
1993	128.8516	92.71445	1.39	0.168	-55.65609	313.3592
1994	120.0614	92.82052	1.29	0.200	-64.65731	304.7801
1995	191.5449	92.74999	2.07	0.042	6.966495	376.1232
1996	219.3988	92.98032	2.36	0.021	34.36208	404.4355
1997	227.5834	92.32654	2.46	0.016	43.84768	411.319
1998	220.5763	94.07284	2.34	0.022	33.36537	407.7872
1999	237.3089	94.49324	2.51	0.014	49.26138	425.3565
2000	234.6592	96.26172	2.44	0.017	43.09227	426.2261
2001	265.257	96.58342	2.75	0.007	73.04988	457.4642
2002	316.7405	97.3988	3.25	0.002	122.9107	510.5703
2003	256.1883	97.45177	2.63	0.010	62.25314	450.1235
2004	340.1209	97.03279	3.51	0.001	147.0195	533.2223
2005	403.2372	98.21092	4.11	0.000	207.7913	598.6832
2006	480.1985	101.5874	4.73	0.000	278.0331	682.3638
2007	593.704	100.0325	5.94	0.000	394.6331	792.775
2008	752.6358	101.964	7.38	0.000	549.7209	955.5507
2009	768.8815	101.1946	7.60	0.000	567.4977	970.2652
2010	913.1412	101.8635	8.96	0.000	710.4264	1115.856
2011	1135.071	103.2673	10.99	0.000	929.5621	1340.579
2012	1244.386	111.7735	11.13	0.000	1021.949	1466.822
_cons	1984.676	445.5455	4.45	0.000	1098.012	2871.339
sigma_u	1326.0807					
sigma_e	140.0269					
rho	.98897275	(fraction of variance due to u_i)				

```
test that all u_i=0:     F(4, 80) =    72.43                 Prob > F = 0.0000
```

Model 3: Time fix effect effects model between PCI and the variables

				F(30,80)	=	41.96
corr(u_i, Xb)	= -0.8068			Prob > F	=	0.0000

y	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
x1	-270.278	180.8986	-1.49	0.139	-630.2776	89.72158
x2	434.0689	139.0773	3.12	0.003	157.2963	710.8415
x3	210.2328	275.4222	0.76	0.448	-337.8748	758.3403
x4	-137.6488	27.24596	-5.05	0.000	-191.87	-83.42765
x5	-249.1614	233.3144	-1.07	0.289	-713.4719	215.1491
x6	-118.6601	205.2116	-0.58	0.565	-527.0441	289.724
x7	-43.34872	72.54199	-0.60	0.552	-187.7119	101.0144
x8	-264.313	145.4095	-1.82	0.073	-553.6871	25.06103
year						
1991	-328.5214	1845.138	-0.18	0.859	-4000.462	3343.419
1992	569.3004	1887.701	0.30	0.764	-3187.344	4325.945
1993	-753.276	1945.095	-0.39	0.700	-4624.139	3117.587
1994	1679.464	1907.377	0.88	0.381	-2116.336	5475.265
1995	6289.579	1904.252	3.30	0.001	2499.997	10079.16
1996	7293.134	1936.621	3.77	0.000	3439.135	11147.13
1997	5735.73	1963.504	2.92	0.005	1828.232	9643.227
1998	4914.143	2085.491	2.36	0.021	763.8834	9064.402
1999	6508.13	2056.186	3.17	0.002	2416.19	10600.07
2000	6839.508	2081.726	3.29	0.002	2696.741	10982.28
2001	4010.108	2147.615	1.87	0.066	-263.7822	8283.998
2002	5366.621	2018.782	2.66	0.009	1349.116	9384.125
2003	9967.569	2118.547	4.70	0.000	5751.527	14183.61
2004	15895.88	2084.182	7.63	0.000	11748.23	20043.53
2005	19237.4	2234.575	8.61	0.000	14790.46	23684.35
2006	22725.89	2239.063	10.15	0.000	18270.01	27181.77
2007	27128.63	2367.776	11.46	0.000	22416.6	31840.65
2008	30914.86	2685.654	11.51	0.000	25570.24	36259.48
2009	22564.78	2559.503	8.82	0.000	17471.21	27658.35
2010	27462.8	2163.851	12.69	0.000	23156.6	31769
2011	33215.87	2344.48	14.17	0.000	28550.21	37881.53
2012	32471.3	2464.835	13.17	0.000	27566.12	37376.47
_cons	28357.46	12338.6	2.30	0.024	3802.874	52912.05

sigma_u	22470.58	
sigma_e	2892.5919	
rho	.98369923	(fraction of variance due to u_i)

test that all u_i=0: F(4, 80) = 44.17 Prob > F = 0.0000

Model1: Testing for cross sectional correlation BP LM test

```
Correlation matrix of residuals:

          __e1     __e2     __e3     __e4     __e5     __e6     __e7     __e8     __e9    __e10
__e1    1.0000
__e2    0.7035   1.0000
__e3   -0.6049  -0.2344   1.0000
__e4   -0.1486  -0.2834  -0.0422   1.0000
__e5   -0.2731  -0.4249   0.1640   0.4732   1.0000
__e6   -0.4515  -0.6300   0.1366   0.4507   0.5031   1.0000
__e7    0.0242  -0.0348   0.2288   0.2426   0.2924   0.2674   1.0000
__e8   -0.6100  -0.6084   0.2463   0.2303   0.3527   0.8739   0.0858   1.0000
__e9   -0.7358  -0.6379   0.4437   0.2539   0.3750   0.8249   0.1705   0.9396   1.0000
__e10  -0.4330  -0.1972   0.2475  -0.0861   0.1004   0.1729  -0.3942   0.3071   0.2709   1.0000

Breusch-Pagan LM test of independence: chi2(45) =   189.151, Pr = 0.0000
Based on 23 complete observations over panel units
```

Model 2: Testing for cross sectional correlation BP LM test

```
Correlation matrix of residuals:

          __e1     __e2     __e3     __e4     __e5
__e1    1.0000
__e2    0.6927   1.0000
__e3    0.1539   0.0510   1.0000
__e4    0.2411   0.3181   0.3635   1.0000
__e5    0.6955   0.7275  -0.0918   0.0466   1.0000

Breusch-Pagan LM test of independence: chi2(10) =    41.888, Pr = 0.0000
Based on 23 complete observations over panel units
```

Model 3: Testing for cross sectional correlation BP LM test

```
Correlation matrix of residuals:

           __e6      __e7      __e8      __e9     __e10
 __e6    1.0000
 __e7    0.2781    1.0000
 __e8    0.7648    0.0275    1.0000
 __e9    0.4886    0.0669    0.7639    1.0000
__e10   -0.2547   -0.3627   -0.0374    0.1040    1.0000

Breusch-Pagan LM test of independence: chi2(10) =    39.064, Pr = 0.0000
Based on 23 complete observations over panel units
```