Do the Fiscal Size and Composition Matter on Growth?
Empirical Evidence from Asian Economies

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Abstract
This paper examines the impact of fiscal size and composition on per capita GDP growth in Asian economies spanning from 1991 to 2012. The uniqueness of this research is that it accounts for both the size and composition of government expenditure and tax simultaneously under the government budget constraint. The finding concludes that a higher size of expenditure is negatively related to economic growth. However, no significant relationship can be measured between the size of tax revenue and growth although they are positively correlated. The results also suggest that raising the tax size does not harm growth in Asian countries. Regarding the composition, tax on property is found to be positively associated with growth, whereas the tax on payroll and workforce is found to be negatively associated with growth. Furthermore, expenditure on housing and amenities is found to be positively linked with growth, but surprisingly, expenditures on health and education are not productive. Moderate fiscal size and composition, accompanied by effective governance would enhance economic growth.

1. Introduction

Achieving higher and sustained economic growth is an important objective of both developed and developing nations. For this, fiscal policy has been and is being used, though there has been considerable debate over its effectiveness. A large number of studies have been performed to explore whether a larger or smaller government enhances economic growth. However, empirical findings are often inconclusive and conflicting. Moreover, recent fiscal debate has been diverted to the composition rather than the size of the government. There are some sorts of consensus among economists that not only the size of government spending and taxation, but also the composition and way of deliberating matters on growth. Previous works regarding this issue are theoretically unclear (Gemmell and Au, 2012) and also focused on size rather than its composition. Recently, some studies have dealt with fiscal composition with improved econometric techniques. However, the result is still confusing and coverage is lagging far behind, especially in the case of developing countries in Asia. Also, traditional perception regarding the link between the composition of public expenditure and economic growth is not derived from the experiences of developing countries (Devarajan et al., 1996).

There are a number of motivations for this study. First, the existing researches in this field are highly concentrated on OECD or developed countries. A few remarkable studies are available which focus on developing countries. However, it is largely untouched in case of Asian economies, particularly the low income countries in Asia. Second, pre-1990`s researches suffer from misspecification of growth model and fail to recognize government budget constraint. Recent researches are able to address this issue. However, it is still not enough to deal with the institutional impact simultaneously. Third, both fiscal size and composition are equally important for the desired output growth, which is largely ignored in previous literature. Researchers have focused either on size or on the composition. Fourth, a number of previous studies categorize the expenditure into productive and unproductive expenditure, and accordingly derive the conclusion. But we argue that government expenditure is not homogenous; the effect of different components of expenditure varies largely based on the country-specific characters and institutional quality.

When we observe the fiscal scenario of Asian countries, we find that the share of government expenditure and the share of tax revenue in GDP are low. They accounts for 27.5 percent and 12.4 percent respectively. This region is experiencing average annual growth of 3.13 percent. After 1991, high income countries are able to increase the tax size rapidly whereas low and middle income countries have no significant improvement in terms of raising taxes. High income countries are decreasing their expenditure, but expenditure in low and middle income countries remains constant. Regarding the composition of tax, the tax on goods and services accounts for the highest proportion, which is 4.84 percent of GDP; the tax on payroll and workforce accounts for the smallest proportion, which is 0.09 percent of GDP. Similarly, expenditure on general public service accounts for the highest proportion followed by expenditure on general economic affairs. Their percentages of GDP are 7.09 and 4.24 respectively. During the study period, it is clearly observed that the tax on international trade and the expenditure on defense are in decreasing trend. Making decision towards

the selection of optimal fiscal size and composition that fosters economic growth is the prime concern of developing countries in recent times.

Hence, we conclude arguing that either size or composition alone is not enough for analyzing the growth pace. This study tries to explore the link between fiscal size and composition with growth, accounting for both aspects simultaneously. It covers the annual data of 36 Asian economies spanning from 1991 to 2012. Due to the heterogeneous nature of fiscal and geographical situation, we break the whole sample into: low and middle income group and high income group; Arabian and non Arabian countries[1]. Our effort extends not only for finding a link from econometric result, but also for analyzing the trend of government spending and taxation from graphical and descriptive approaches. Government expenditure and tax variables are decomposed into different subcomponents to see the compositional effect, and conclusions are drawn accordingly.

2. Review of Literature

Two kinds of theoretical literature, referred to as exogenous and endogenous model, explain the growth process of the economy. Exogenous model advocates that dynamics of population and technology determines the long run growth path of the economy and fiscal policy is only helpful to induce the output level. In contrast, endogenous-growth literature advocates that transitional effects of fiscal policy transforms into permanent effect, meaning that fiscal policy has a long term effect on economic growth (Romer, 1986; Barro, 1990; Rebelo, 1991).

It is quite important to note the research overview of Gemmell (2004). Depending upon the specification of econometric model and robustness, he categorizes the studies of previous literature into first, second and third generation studies. First generation studies (approximately pre-1990) were generally motivated, however, theoretically unclear and empirical methods were generally cross-section in nature and poorly specified regressions with results, not surprisingly, non-robust. Second generation empirical studies (mainly during 1990s) came with the emergence of endogenous growth theory and refinements of the neoclassical model. Barro (1990), King and Rebelo (1990), and others provided clearer theoretical foundations, however, failed to account government budget constraints (GBC). Third generation studies (generally post-2000) used panel or time series rather than cross-section and also recognized the implications for testing of the GBC; allowing for potential growth differences from the government expenditure or taxation. Third generation evidence appears more robust than suggested by earlier approaches (Gemmell, 2011).

The results of previous researches vary largely from one to another. Nijkamp and Poot (2004) conducted a meta analysis and found that among 41 studies, 29 percent supported that higher government spending hampers growth and 17 percent supported positive result and 54 percent were inconclusive. Regarding tax revenue and defense expenditure, he also proved same perception that bigger the size lowers the growth rate. However, other researchers have also argued that there may be thresholds in the links between the size of government and growth (Tanzi and Zee, 1997, Chen and Lee, 2005; Gray et al. (2007). Similarly, Chobanov and Mladenova (2009) showed that the optimal size of government is less than 25 percent of GDP. Some Pioneer papers like Landau (1983),

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[1] One of the reasons for the division of Arabian and non Arabian countries is that the fluctuation of fiscal size is more prominent in Arabian countries, and most of them are oil based economies.

Barro (1991); Engen and Skinner (1992); Devarajan et al. (1996) argue that bigger size of government is negatively related to growth. However, Atkinson (1995), Slemrod (1995,1998) and Agell et al. (1999) found no stable negative correlation between the size of government and economic growth.

Kneller et al. (1999) contributed more regarding to this literature by advancing the growth model. He specified growth model with the inclusion of GBC and calibrating government spending into productive and unproductive; taxation into distortionary and non-distortionary. His result from OECD countries found that distortionary taxation reduces growth, while non-distortionary taxation does not, and productive government expenditure enhances growth, whilst non-productive reduces growth. This line of view has been true in many studies. Easterly and Rebelo (1993) found that spending on transport and communication are productive, but an effect of taxation is difficult to identify. However, same components of government expenditure and tax revenue are not found significant in different studies. The significant relationship between different fiscal components and growth is quite random among various studies.

While turning into recent studies, Afonso and Jalles (2011), from the data set of a large panel of developed and developing countries, found that government expenditure is negatively associated with growth whereas revenue has no significant impact on growth. The result showed that spendings on education and health favor growth, whereas social spending is detrimental to growth. Similarly, Gemmell et al. (2014), from the OECD countries, revealed that spending on infrastructure and education enhances growth, however, social welfare spending reduces the GDP level. Afonso and Furceri (2008), from the sample of 44 developing countries, found that human capital spending is associated with higher growth in Africa and spending on agriculture and education is linked with higher growth in Asia.

Similarly, Benos (2009), from the evidence of small sample (14 EU countries) found that public expenditure on infrastructure enhances growth, however, spending on education, health, housing-community amenities, environmental protection, recreation and culture has no significant impact on growth. Also, he found that distortionary taxation has negative impact on growth. In contrast, Ormaechea and Morozumi, (2013), from the studies of 56 countries, found that expenditure composition doesn't have a robust effect on growth. However, reallocation involving a rise in education expenditure compensated by a reduction in social protection spending has a positive and statistically robust effect on growth. In contrast, Christie and Rioja (2011) claimed that initial fiscal condition and composition is important for the long-run growth. Their result revealed that for the countries which have already low share of tax revenue, public investment financed by the increase in tax gives a positive result, but if tax share is already high, only suitable adjustment in the composition of public expenditure gives positive growth.

Regarding Asian economies, Abdullah et al. (2009), from the evidence of 13 Asian countries, found that health and education expenditure, aggregate of government expenditure and aggregate of other fiscal variables have positive and statistically significant impact on real per capita GDP. Whereas defense expenditure, distortionary taxation have significantly negative impact on real per capita GDP. Abdon, et al. (2014) also showed that composition of tax and expenditure matters on growth in developing Asia. The Result concluded that tax on property and expenditure on education are growth inducive.

There is no common consensus regarding the impact of individual fiscal components. Theory and some empirics show that productive expenditure enhances growth and unproductive does not. Similar is the case of non-distortionary and distortionary taxation. However, if we try to see the impact of individual components in different samples for different time periods, generalization of the result seems to be more complex. Research gap in the Asian region, especially in low income countries is notable and hence, this study tries to fulfill this gap.

3. Empirical Model

We specify the growth model accounting the core theme of neoclassical and endogenous growth models. Both models accept that production is a function of labor and capital. Y= f(K, L). The Neoclassical model explains that output growth depends on population dynamics and technological change. However, Endogenous model argues that technological progress is just the result of capital accumulation and fiscal policy plays important role in determining the long-run growth. Based on the theoretical underpinning of Landau (1983), Levine and Renelt (1992), standard growth regression contains fixed regressors like initial income, investment, population growth and primary/ secondary enrollment. Sala-i-Martin (1997) again checked the robustness of the research of Levine and Renelt (1992) through his paper "I just ran four million regression" and found that 59 variables correlate with the growth rate. Following Sala-i-Martin (1997), we specify the growth regression as:

$$g_{it} = \alpha + \sum_{i=1}^{k} \beta_i X_{it} + \sum_{j=1}^{m} \lambda_j Y_{jt} + u_{it} \dots\dots\dots\dots\dots\dots\dots\dots\dots(1)$$

Where, g_{it} is growth of GDP per capita (output) of country i at time t.

X_{it} is fixed variables of growth regression and

Y_{jt} is other fiscal and non fiscal variables

u_{it} is the disturbance term

Fixed variables[2]: initial per capita GDP, investment, population growth rate, primary/ secondary education rate

Following Kneller et al. (1999), the previous growth model suffers from the specification bias. It ignores the government budget constraint (GBC). Hence growth regression should contain financing side of the expenditure, meaning that taxation and other income resources should be included. However, to avoid from perfect multicollinearity, one component of government budget should be omitted. Hence the growth model contains both fiscal and non fiscal variables (control variables). Equation (1) can be modified as:

$$g_{it} = \alpha + \sum_{i=1}^{k} \beta_i X_{it} + \sum_{j=1}^{m-1} \lambda_j Y_{jt} + u_{it} \dots\dots\dots\dots\dots\dots\dots\dots\dots(2)$$

Where, m[th] variable of Yjt is assumed to be omitted to avoid perfect multicollinearity.

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[2] Fixed variables are those which are found to be always significant throughout all growth equation (Levine and Renelt, 1992) and which was also supported by Sala-i-Martin (1997).

X_{it} is non fiscal variables and Y_{jt} is fiscal variables
To accept the aforementioned fact, we redefine the growth model as:

g_{it} = f(initial gdp_pc, investment, education, popln_gr, fdi, trade_open, labor_force, inflation, exp_totl, tax, gov_effectiveness) .... (3)

To measure the compositional effect, we insert different components of expenditure and tax instead of aggregate variables. The details of the variables are shown in appendix 1.

The major reformation we performed in the equation (3) is the proxy and a selection of the growth determinants. The proxy for labor is labor force participation and that of capital is capital formation or investment. Since growth is also dependent on human capital, education is taken as a proxy but it is different than previous researchers. They have assumed the literacy rate or primary school enrollment or secondary school enrollment as a proxy for education. It is because of the situation of data they used, generally the period of the 1960s-1990s. However, in this globalized and competitive world, tertiary education is being needed for enhancing human capital. Since our data cover the recent periods, from 1991 to 2012, it is important to take tertiary education as a proxy for education.

In developing countries, foreign direct investment also plays an important role in development (Dabour, 2000). It not only provides necessary investment, but also reflects the stability of politics and policy. Hence, this variable has also been included in the model. Similarly, expansion of output also depends on net export and that depends on trade openness condition. In other words, trade openness creates extra opportunity to develop competitive capacity in production. Thus, the variable trade openness has also been taken into account. Another important macroeconomic determinant of growth is inflation. Inflation is also negatively correlated to output growth as it slows down the efficiency of the factors of production (Andres and Hernando, 1997). However, majority of empirical evidences suggests that some level of inflation is linked with higher growth, but after certain level it starts to retard growth. Many researchers also argue that growth does not only depend on factor productivity, but also depends on administrative quality of the government. Their views emphasize the role of effective governance for higher growth. Hence, we use government effectiveness index as a proxy for institutional quality.

Total government expenditure and tax revenue are the fiscal variables of interest. We want to find the impact of these variables. Hence, these variables are taken as a major regressors once in aggregate form and decomposed from in the latter.

The technique that we use to estimate this model is Fixed Effects Regression (FER). Since our data consists of relatively short period and we also assume that time invariant fixed factor affects each country`s economy, and hence Fixed Effects Regression is applied. However, to avoid the possible cross sectional dependence and econometric problem like heteroscedasticity and autocorrelation, we report the p-value associated with robust standard error developed by Driscoll-Kraay (1998)[3]. Alternatively, to check the robustness of the results, Arellano and Bond`s Generalized Method of Moments (GMM), which checks possible endogeneity problem, is also used.

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[3] This method applies nonparametric covariance matrix estimation techniques providing robust standard errors. It is free from the problem of cross-sectional dependence as well as heteroscedasticity and autocorrelation.

4. Data and Data Analysis

4.1 Data

The data include the annual data of 36 Asian countries covering the period 1991-2012. Most of the data are taken from World Bank Indicator-2014 and some are from World Economic Outlook, 2014, International Monetary Fund (IMF). Decomposed variables of government expenditure and tax are taken from Government Finance Statistics (GFS), IMF. Classification of tax and expenditure is based on the functional classification of Government Finance Statistics (2001), IMF. To accommodate the composition, all expenditure and tax variables are measured in terms of percentage of total expenditure and total tax respectively. Government Effectiveness Indicator [4] covers the data from 1996. Sampling of data has been focused towards the developing countries and especially for low and middle income countries. The data have been analyzed dividing the whole data into low and middle income countries; high income countries[5]; Arabian and non Arabian Countries. Although many previous researches regarding this field take the data of 5 years average, we do not do so because our data do not cover for long time period and averaging of data may significantly reduce the number of observations. Also, to avoid the loss in generality of the data, taking average has not been allowed.

4.2 Data Analysis

Average per capita GDP growth performance of Asian countries has been 3.1 percent percent per annum. It was 2.0 percent per in 1991 and 3.35 percent in 2012 (for detail summary, see Appendix-3). Any increasing or decreasing trend cannot be predicted in general. When we go through the country-wise performance, Bangladesh, India, Mongolia, Myanmar have shown improved performance after around 2000, whereas the opposite is true for Korea and Bahrain. In case of U.A.E., the growth performance has not been satisfactory during the sampling period. It has almost negative performance of growth every year. After 2000, it can be observed that Myanmar has very good growth performance and is around two digit growth, but in case of China, it has been always good during the period. Average growth performance can be seen in Figure: 1.

Figure: 1

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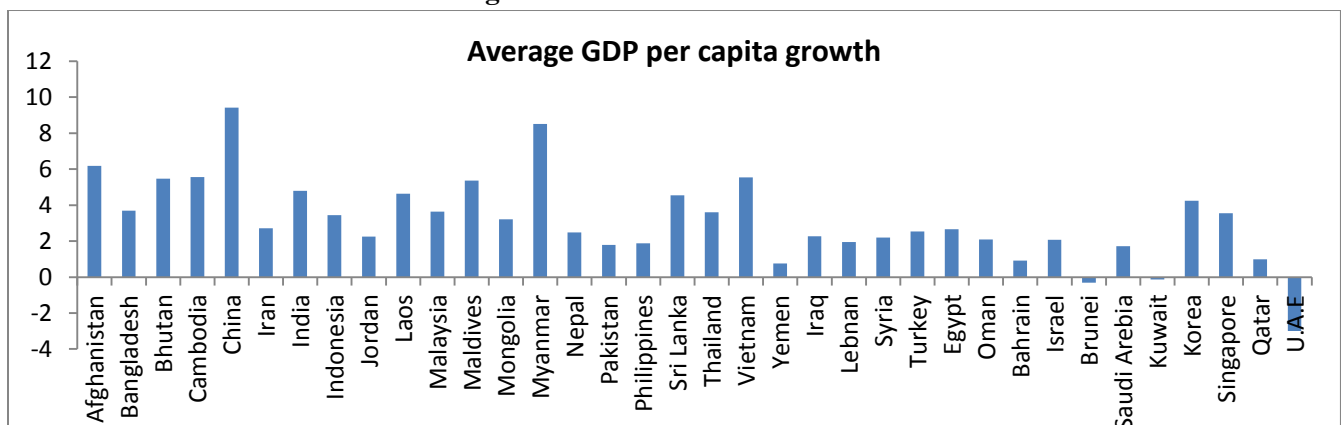
4 It is the indicator formed on the basis of a number of surveys comprising the large number of respondents by Daniel Kaufmann, Aart Kraay and Massimo Mastruzzi to measure the perception of the quality of public services, the quality of civil cervices and the degree of its independence from the political forces, the quality of public policy formulation and credibility of the government`s commitment and level of implementation accordingly.
5 Classification is done as of World bank, 2015. Low income countries are defined as those with a GNI per capita of $1,045 or less in 2013; middle-income economies are those with a GNI per capita of more than $1,045 but less than $12,746; high-income economies are those with a GNI per capita of $12,746 or more. Lower-middle-income and upper-middle-income economies are separated at a GNI per capita of $4,125.

The average share of expenditure in GDP during the period is found to be 27.4 percent. Similarly, the average share of tax in GDP is 12.4 percent, which are slightly higher in high income countries and lower in low and middle income countries within Asian economies. Average expenditure of high income countries is 33.1 percent and that for low and middle income countries is 26.1 percent. Similarly, tax in high income countries is 13.9 percent and in low and middle income countries is 12.0 percent.

Figure 2 shows the general trend of expenditure and tax for different income groups. In case of high income countries, the size of government expenditure has been declining whereas tax revenue has been increasing rapidly. On the other hand, the size of government expenditure has been almost constant from 1991 to 2012 in low and middle income countries, however, it was declining up to 2000 (first half) and then it started rising. It can be observed that the size of the tax has been gradually increasing from 1991 to 2012 in these countries. Also, we observe that government expenditure has been declining in the first half period and again inclining up in second half period. Gap between expenditure and tax was higher in high income countries before 2000 but it is higher in low and middle income countries after 2000. It means that high income countries are raising their tax effort faster than low and middle income countries.

Figure 2: Trend of Government Expenditure and Tax Revenue
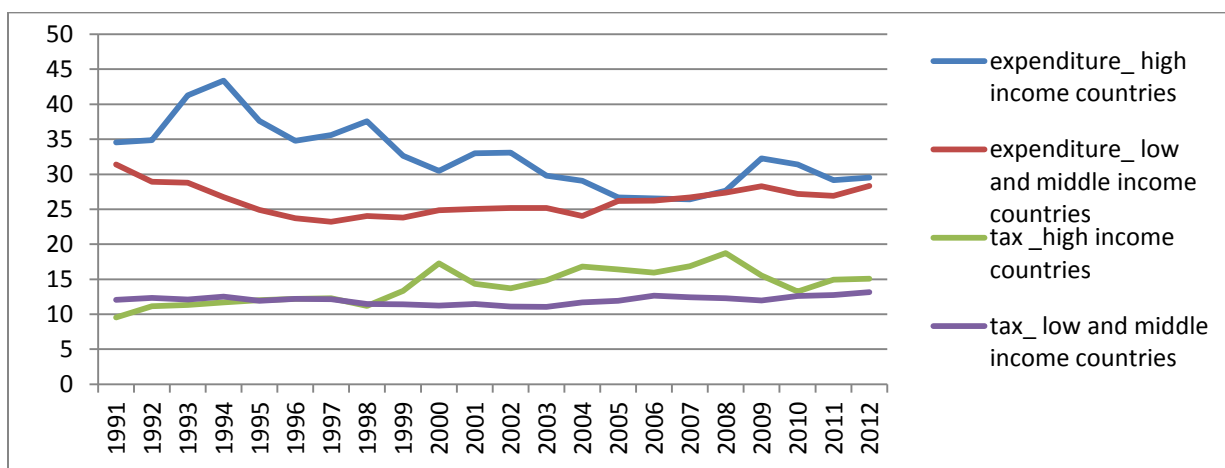
4.3 Fiscal Size and Growth from Graphical View

Figure 3 shows the link between fiscal size and economic growth. We observe a negative link between per capita GDP growth and size of expenditure during the period. Almost, every ups and downs are in opposite directions for expenditure and growth. However, in case of tax revenue, no negativity can be realized. Instead, somehow a positive correlation can be experienced. If we compare the growth performance against the size of expenditure and tax country-wise (see Appendix-4), it can be observed that those countries which have lower size of government expenditure (average expenditure between 10-20 percent), have higher growth performance (For

example: China, Korea, Afghanistan, Myanmar, India). Conversely, Arabian countries have higher size of expenditure, but lower growth performance.

Figure 3: Trend of Expenditure and Tax against Per capita GDP growth
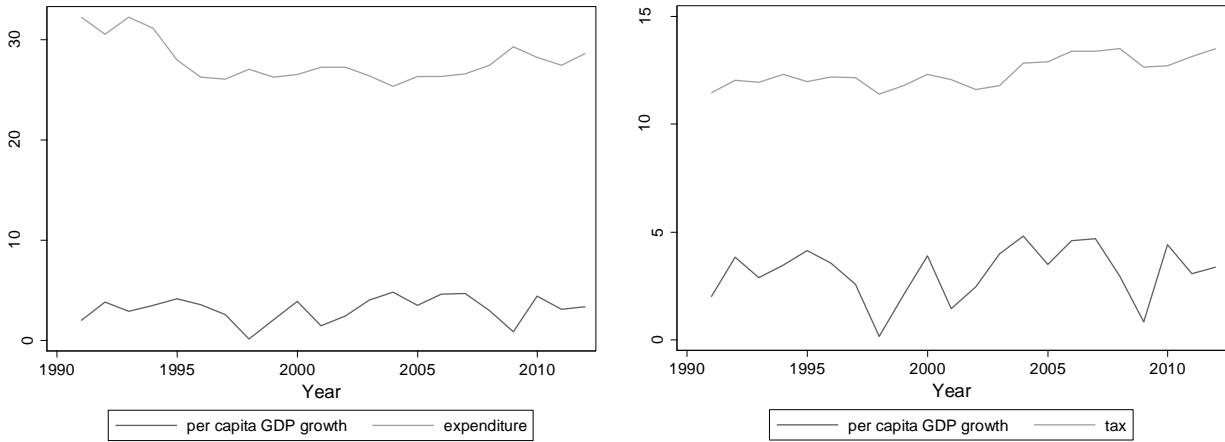
To justify whether these trends are virtual or not, we fit scatter regression line. Figure: 4 shows that there exists a negative relationship between government expenditure and per capita GDP growth. In case of tax revenue, no significant negative relationship with growth can be observed. Interestingly, for low level of tax size (less than average), it is positively related to growth (see Figure 4- 3rd).

Figure: 4. Correlation between Government Expenditure and Tax with Per capita GDP growth
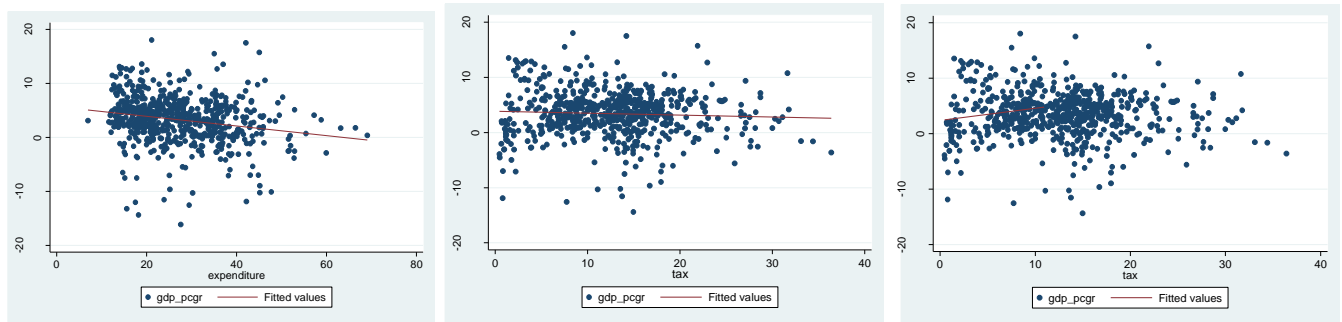
4.4 Fiscal Composition and Trend

Composition of expenditure in Asian countries has not been changed remarkably from 1991 to 2012. Figure: 5 shows that expenditure on general public services accounts for the highest proportion among all. Expenditure on defense also accounts for a larger portion. A significant change can be observed in the case of expenditure on defense and expenditure on social protection. Defense expenditure has been decreasing gradually from 1991 to 2012 whereas expenditure on social protection is increasing rapidly. As we see the total size of expenditure, it has been reduced gradually.

Figure 5: Composition and Trend of Government Expenditure (percent of GDP)
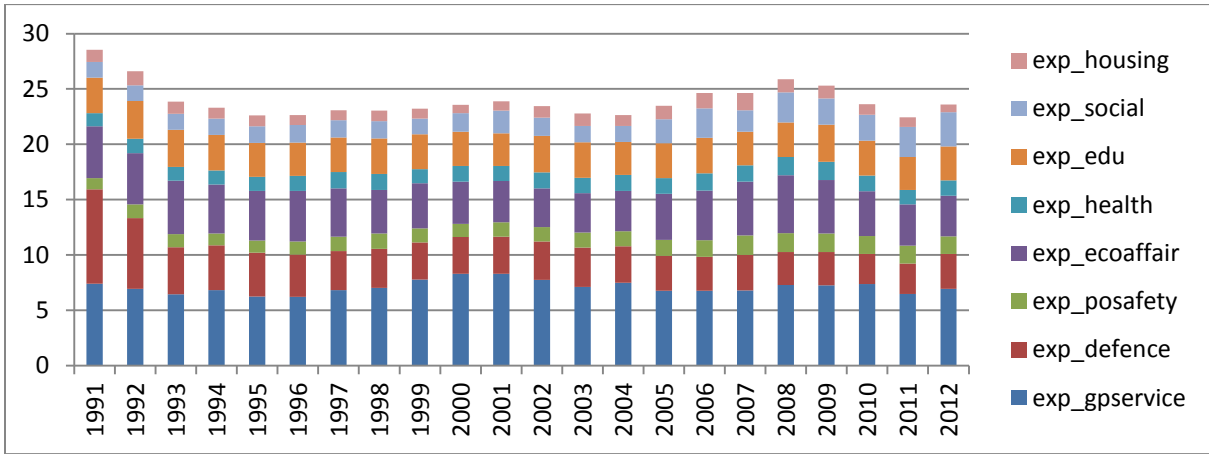
When we turn out to the composition of tax revenue (Figure: 6), it shows that the average share of tax on goods and services in GDP accounts for the highest proportion among all. In contrast, tax on payroll and work force accounts for the lowest proportion. From 1991 to 2012, there has been a drastic increase in tax on goods and services, but decrease in tax on international trade. Tax on property has no significant contribution to revenue.

Figure 6: Composition and Trend of Tax Revenue
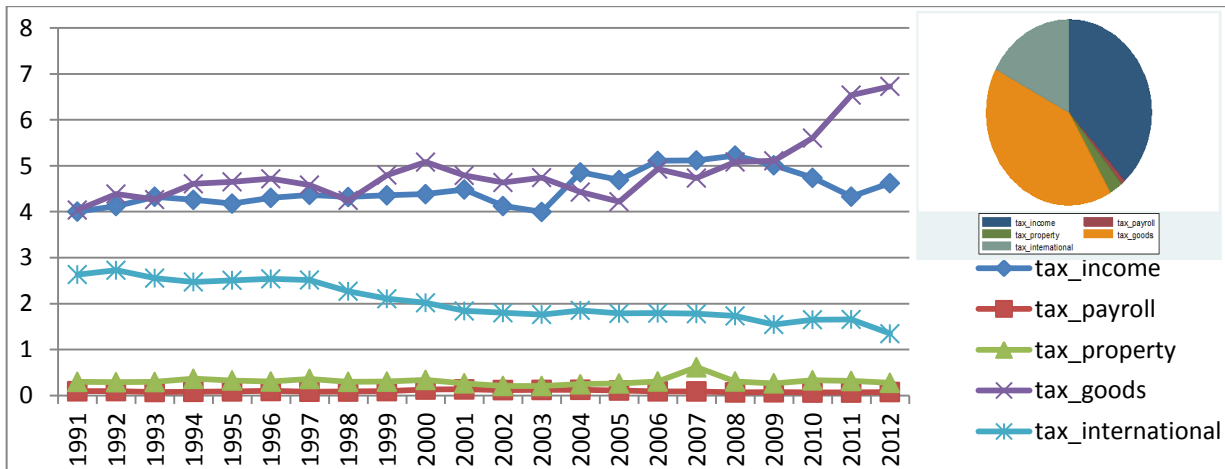
5. Empirical Result

I. Result from Fiscal Size

We analyze the result at first through the panel regression of fixed effects technique. After observing the nature of data, we find that variables suffer from heteroscedasticity and autocorrelation as indicated in table1. Also, in cross-country analysis, macroeconomic variables are more likely to be suffered from the cross sectional dependence causing biasness in estimation (Driscoll-Kraay, 1998).

Hence we report the fixed effects (within) regression result with Driscoll-Kraay`s robust standard error. Hausman test also suggests that Fixed Effects model is suitable for our model.

Table 1 gives the regression result to accommodate the fiscal size measured in terms of share of government expenditure and share of tax in GDP. Different control variables are applied for each specification. This shows how the results are robust when the control variables vary. We find that results for expenditure and tax are robust irrespective to a number of control variables.

Specifications 1 and 2 of table 1 include only four regressors namely initial per capita GDP, investment and population growth as control variables, and the size of government expenditure or the size of tax altering to each other. We find, the size of government expenditure and tax both have a significant relationship with per capita growth. Size of government expenditure is found to be negatively related to growth, whereas the size of tax is found to be positively related to economic growth. Similarly, in specification 3, both the size of tax and expenditure have been included to account the government budget constraint. In this specification, tax shows no significant relationship with growth. Further, from specification 4 to 6, variables like foreign direct investment, trade openness and inflation have been added one after another. The effect of the size of government expenditure does not alter after adding these variables. Same is the case for the tax. Tax is not always significant, but it is positively related to economic growth. While reaching to the final specification 9, additional variables; labor force participation rate, education and government effectiveness are accounted. In all specifications, size of government expenditure is strongly negative towards growth. However, coefficient of tax is found to be almost positive in all specifications, although it is not significant in all cases.

Table 1: Fixed Effects Regression

	Dependent variable: Per capita GDP growth								
Determinants	1	2	3	4	5	6	7	8	9#
initial gdp_pc	-0.001	-0.001	-0.001**	-0.001**	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(-1.07)	(-1.40)	(-0.001)	(2.65)	(-4.41)	(-3.42)	(-3.85)	(-4.64)	(-4.37)
investment	0.17***	0.15***	0.17**	0.13**	0.11***	0.14**	0.21**	0.24***	0.27***
	(3.95)	(3.43)	(3.78)	(2.36)	(3.66)	(2.81)	(3.36)	(5.26)	(4.74)
popln_gr	-0.84***	-0.85***	-0.94***	-0.89***	-0.86***	-0.82***	-0.91***	-0.85***	-0.84***
	(-5.48)	(-3.50)	(-3.71)	(-3.50)	(-5.15)	(-3.56)	(-3.79)	(-4.51)	(-4.06)
exp_totl	-0.17***		-0.16***	-0.23***	-0.25***	-0.23***	-0.20***	-0.20***	-0.41***
	(-3.81)		(-4.06)	(-4.06)	(-5.81)	(-3.56)	(-4.25)	(-4.44)	(-6.90)
tax		0.11*	0.11	0.10	0.14**	0.06	0.07	-0.01	0.01
		(1.18)	(1.61)	(0.26)	(2.17)	(1.13)	(0.73)	(-0.16)	(0.13)
fdi				0.18***	0.19***	0.14***	0.14***	0.45	0.08
				(4.03)	(4.81)	(3.14)	(3.14)	(0.70)	(1.52)
trade_open					0.01	0.02*	0.008	0.01	0.2
					(1.20)	(2.03)	(0.45)	(0.72)	(0.84)
inflation						-0.08**		-0.08*	-0.14***
						(-2.08)		(-1.96)	(-3.47)
education							0.14**	0.08	0.11*
							(2.23)	(1.15)	(1.90)

labor_force							0.19* (1.97)	0.08 (0.95)	0.03 (0.30)
gov_effectiveness									5.04** (2.45)
constant	5.57** (2.73)	0.41 (0.27)	5.16** (2.20)	8.06*** (2.87)	8.76*** (2.87)	9.47*** (4.08)	2.48 (1.43)	2.90 (0.52)	7.38 (1.16)
No. of observation	568	578	514	500	493	489	351	347	243
R^2	0.29	0.21	0.24	0.26	0.26	0.30	0.31	0.38	0.43
# Modified wald test for group-wise Heteroscedasticity: $\chi 2$ =2407.58 prob> $\chi 2$ = 0.000 Wooldridge test for autocorrelation in panel data F(1,26) = 5.59 prob> F= 0.027									

Note: ***, ** and * indicate that variables are significant within 1%, 5% and 10% level respectively. Values in the brackets are corresponding t-statistics. Standard errors are reported from Driscoll-Krray Method.

As per the expectation, it is found that initial GDP per capita and population growth have a negative impact on growth and investment have a positive impact on growth. Similarly, foreign direct investment is also found to be positively associated with per capita growth. Interestingly, inflation is found to be significant and negatively associated with growth. Other non fiscal variables labor force participation, trade openness and education are also found to be positively associated with growth but not significant in some specifications. The proxy for institutional variable, government effectiveness, which has been largely ignored in previous literature, is also found to have a positive impact on growth. The result is robust across the different specifications in the model as specified in table 1.

Initial GDP per capita has coefficient -0.001. Negative sign implies that there is a negative association between previous year`s GDP per capita and economic growth. When GDP per capita of previous year increases by US $ 100, per capita GDP growth rate decreases by 0.1 percent. The negative relationship between the initial GDP per capita and economic growth is due to conditional convergence of the economy implying that countries which have higher initial GDP per capita experience lower growth in the future. It is due to the neoclassical perception that countries which have a lower capital labor ratio at starting point, leads to low per capita output, are expected to faster growth due to diminishing returns to investment.

Investment or gross fixed capital formation has the coefficient ranging from 0.11 to 0.27 and significant within 1 percent level of significance in the majority of cases. The positive sign indicates that there is a positive association between investment and per capita GDP growth. The strength of impact is that, 1 percent increase in the share of investment in GDP causes 0.11 to 0.27 percent increase in per capita GDP growth. Similarly, education enrollment has also positive coefficient ranging from 0.08 to 0.14. Education is associated with human capital formation and obviously it has a positive impact on growth. The significance of this variable is that nowadays tertiary education is an important factor which has more impact on growth rather that primary and secondary enrollment.

On the other hand, population growth is associated with retardation of per capita GDP growth. It is strongly negative to growth. Other variables like foreign direct investment, labor force participation and trade openness are not significant in all specifications. However, theoretically, they have a positive impact on growth. The significance of this result is that investment in physical capital and tertiary education enhances growth, implying that fiscal policy should be oriented to increase the capital formation and human capital development. Inflation is found to be one of the important determinants of growth. It is also negatively related to growth. This is in line of research of Andres and Hernando (1997) that inflation decreases the real income of the people and business investment as well. It also causes to decrease the efficiency of productive factors and ultimately it retards growth.

Our major concern is to find the impact of the size of government spending and tax on growth. The size of the government expenditure has a coefficient ranging from -0.16 to -0.41 which is significant within 1 percent level across all specifications. Negative sign implies that share of government expenditure in GDP (size of government) retards growth. The result shows that when share of government expenditure in GDP increases by 1 percent, per capita GDP growth reduces by 0.16 to 0.41 percent. It implies that exceeding the size of government expenditure in GDP has been experiencing a negative impact on growth. Regarding the size of the tax, we don`t observe any negative relationship with growth. This result is a little bit different than the majority of previous researchers. It is due to one of the reasons that, size of tax in Asian economies is comparatively lower than the rest of the world. Moreover, tax structure or composition in Asia is quite different from that of the world. Indirect tax is higher in Asian countries whereas, direct tax is greater by 50 percent than the indirect tax in world`s average and by 100 percent in Organization for Economic Co-operation and Development (OECD) countries (Martinez-Vazquez, 2011). We see scope for the expansion of the size of tax in Asian economies. First, the share of tax in GDP is already lower in Asian economies. Second, raising the tax size does not harm growth. Rather, it reduces the fiscal deficit and supports to enrich the source for public finance.

Table 2: Fixed Effects Regression on the basis of Income and Geographical Regions

Dependent variable: Per capita GDP growth			
Determinants	Low and Middle Income Countries	High Income Countries	Non-Arabian countries
initial gdp_pc	-0.001	-0.001**	-0.001***
	(-0.83)	(-2.53)	(-3.14)
investment	0.16*	0.40***	0.19*
	(2.04)	(3.78)	(2.02)
popln_gr	-1.95***	-0.16	-9.99***
	(-6.37)	(-0.50)	(-4.22)

exp_totl	-0.28***	-0.40***	-0.22***
	(-3.06)	(-5.64)	(-3.85)
tax	0.04	0.48	0.17**
	(0.28)	(0.83)	(2.44)
fdi	0.19**	-0.12	0.21**
	(2.80)	(-1.51)	(2.65)
trade_open	0.008	0.03	0.008
	(0.45)	(0.28)	(0.14)
inflation	-0.18***	-0.74*	-0.19***
	(-7.06)	(-2.13)	(-6.26)
education	0.04	-0.09	-0.01
	(1.39)	(-0.76)	(-0.33)
labor_force	0.18**	0.63	0.29*
	(2.18)	(0.52)	(1.90)
gov_effectiveness	4.27**	9.61**	6.97**
	(2.38)	(2.25)	(2.26)
constant	3.91	21.3	7.08
	(0.51)	(2.27)	(0.54)
No. of observation	190	39	179
R^2	0.47	0.50	0.44

Note: ***, ** and * indicate that variables are significant within 1%, 5% and 10% level respectively. Values in the brackets are corresponding t-statistics. Standard errors are reported from Driscoll-Krray Method.

5.1 Robustness and Possible Explanation

To check the robustness and hence to explore the possible explanation of the result, we divide the whole sample into different subgroups on the basis of geography, income level and fiscal performance as well. We find that the result obtained from the full sample is similar to that of low and middle income countries, high income countries and non Arabian countries (See table 2). The share of government expenditure in GDP is still found to be significantly negative towards growth. Tax is found to be significantly positive only in non Arabian countries. However, it is positively correlated to growth in other samples. The control variables; investment, population growth, inflation and government effectiveness are significant determinants and also found to be robust in all samples. There is no remarkable change in the results obtained from the sample groups as compared to the original sample.

We further suspect whether the result is different in accordance with fiscal and administrative performance. For this, we divide the countries with different performance: countries having low tax and low expenditure performance; high tax and high expenditure performance; only low tax performance; only high tax performance; only high expenditure performance and high government effectiveness. The rationale behind this division is; countries performing low tax and low expenditure are characterized by low per capita income and low size of the government with low fiscal deficit. Similarly, countries with high tax and high expenditure are characterized by higher per capita income and low budget deficit. In contrast, countries performing high expenditure are mainly characterized by high level of deficit and higher government size. Countries with government effectiveness are

characterized by not only by the high administrative quality, but also a medium level of tax and expenditure as well as higher growth performance.

Table 3: Regression Result on the basis of Fiscal and Institutional Performance

Dependent Variable: Per capita GDP growth						
Determinants	Low tax and low expenditure countries	High tax and high expenditure countries	High tax countries	Low tax countries	High expenditure countries	High government effectiveness countries
initial gdp_pc	-0.001**	-0.001	-0.001**	-0.001	-0.001***	-0.001***
	(-2.11)	(-1.37)	(-2.56)	(-0.49)	(-6.43)	(-2.67)
investment	0.07*	0.42***	0.43***	0.10	0.11**	0.69***
	(1.86)	(4.10)	(4.94)	(1.47)	(2.29)	(4.71)
popln_gr	-2.08***	-6.06**	-4.2*	-1.56***	-0.56*	0.25
	(-2.95)	(-2.97)	(-1.92)	(-4.64)	(-1.77)	(0.14)
exp_totl	0.13	-0.29*	-0.21**	-0.18*	0.24**	-0.45
	(1.10)	(-2.04)	(-2.75)	(-1.98)	(-2.76)	(-1.08)
tax	-0.32**	0.19	0.14	0.20	0.01	-0.12
	(1.97)	(1.35)	(1.50)	(1.43)	(0.13)	(-0.18)
fdi	0.57***	0.12	0.05	0.004	0.18**	0.41
	(3.49)	(1.09)	(1.20)	(0.03)	(2.74)	(0.91)
trade_open	0.04***	-0.04	0.001	0.01	0.08**	-0.09
	(3.36)	(-0.62)	(0.06)	(0.73)	(2.35)	(-0.39)
inflation	-0.26***	-0.12***	-0.11*	-0.17**	-0.03*	-0.56
	(-10.33)	(-3.02)	(-1.92)	(-2.57)	(-2.00)	(-1.61)
education	0.09***	0.01	0.03	0.08**	-0.04	0.24**
	(2.86)	(0.37)	(0.75)	(2.31)	(-0.84)	(2.32)
labor_force	-0.14***	0.64	0.37	0.05	0.22	0.67
	(-4.09)	(1.63)	(1.34)	(0.70)	(0.90)	(1.33)
gov_effectiveness	1.09	11.28	12.89**	0.98	-	15.1**
	(0.75)	(1.62)	(2.45)	(0.52)		(2.94)
constant	13.73***	11.30	21.72	3.83	8.31	39.38
	(3.57)	(1.17)	(1.26)	(0.66)	(0.51)	(1.11)
No. of observation	72	64	89	110	107	41
R^2	0.58	0.55	0.54	0.57	0.39	0.62

Note: ***, ** and * indicate that variables are significant within 1%, 5% and 10% level respectively. Values in the brackets are corresponding t-statistics. Standard errors are reported from Driscoll-Krray Method.

Regression results, as in table 3, reveal that those countries which have very low level of expenditure and tax (far less than average) show positive correlation of expenditure with per capita growth although it is not significant. It implies that government size is not necessarily negative in case of very low level. Similarly the negative and significant correlation between tax size and growth indicates that at least tax limit should exceed the certain level to achieve a higher growth rate. Another interesting result we see is about the impact of government effectiveness. Regression results obtained from the sample of the countries having a high government effectiveness show that government effectiveness is essential to support growth. For this sample, the coefficient of expenditure is negative, however, statistically insignificant. It implies that government effectiveness increases the productivity of government expenditure.

Table 4 shows the alternative estimation of the parameters through Arellano-Bond`s GMM technique. The overall results are almost same as like in Fixed Effects Regression. Government expenditure is found to be negatively related to growth. This is robust among all sample specifications. Tax is positively correlated with growth, but it is only significant in low and middle income countries. Slightly different results can be observed for other control variables. However, it is not so remarkable. Government effectiveness is found to be positively correlated to growth, but not significant in all samples.

Table 4: GMM Regression for Fiscal Size

Determinants	Dependent variable: Per capita GDP growth		
	Whole Country Sample	Low and Middle Income Countries	High Income Countries
initial gdp_pc	-0.001*	-0.001	-0.001**
	(-1.91)	(-0.67)	(-2.52)
investment	0.16**	0.15*	0.58***
	(2.18)	(1.83)	(2.86)
popln_gr	-2.76***	-1.24***	-1.74***
	(-3.18)	(-3.44)	(-2.57)
exp_totl	-0.39***	-0.32***	-0.54***
	(-4.44)	(-2.65)	(-2.71)
tax	0.03	0.17***	0.04
	(0.27)	(2.74)	(0.19)
fdi	0.29***	0.24**	-0.17*
	(3.80)	(2.24)	(-1.72)
trade_open	0.04*	0.05**	0.08
	(1.94)	(1.97)	(1.49)
inflation	-0.06	0.004	-0.21
	(-0.70)	(0.09)	(-0.96)
education	0.06	-0.07	0.20**
	(0.85)	(-0.53)	(2.17)
labor_force	0.24	-0.03	0.62
	(1.13)	(-0.20)	(0.84)
gov_effectiveness	1.46	2.17	-
	(0.76)	(1.32)	
constant	3.54	7.15	18.47
	(0.24)	(0.60	(0.36)
No. of observation	175	153	50
P-value: AR(1)	0.07	0.00	0.06
AR(2)	0.14	0.08	0.39
Sargan Test	0.53	0.17	0.15

Note: ***, ** and * indicate that variables are significant within 1%, 5% and 10% level respectively. Values in the brackets are corresponding t-statistics. Note: ***, ** and * indicate that variables are significant within 1%, 5% and 10% level respectively. Values in the brackets are corresponding t-statistics. The set of other control variables as in previous table have been applied, but reported only the variables of interest. AR (1) and AR (2) are the Arellano-Bond test for autocorrelation at first and second order respectively. Sargan test is for the over-identifying restrictions, which tests the overall validity of the instrument.

II. Result from Fiscal Composition

Keeping all other control variables same as in previous specification, the regression result including the decomposed variables is shown in table 5[6]. This model contains the fiscal size as well as fiscal composition. Many of the studies of previous literature ignore the fact that fiscal size and fiscal composition matter simultaneously. Here we include composition of expenditure in terms of percentage of the total size of expenditure and composition of tax in terms of total size of the tax. Specifications 1 and 2 in the table 4 include only the variables of expenditure composition omitting tax composition. Similarly, specification 3 and 4 include only the variables tax composition omitting expenditure composition, and specifications 5 and 6 include the variables of both size and composition in the presence or absence of government effectiveness. The results show almost the same effect of other control variables as in previous models. The only noticeable thing is; education is positive and significant towards growth in all specifications.

Table 5: FE Regression Results for Fiscal Composition

Dependent Variable: Per capita GDP growth						
Determinants	1	2	3	4	5	6
initial gdp_pc	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(-7.84)	(-5.36)	(-5.08)	(-4.54)	(-5.27)	(-6.21)
investment	0.32***	0.27***	0.25***	0.27***	0.28***	0.33***
	(3.52)	(4.5)	(4.94)	(4.35)	(5.15)	(3.55)
popln_gr	-1.09***	-0.70***	-0.86***	-0.89***	-0.72***	-1.00***
	(-9.83)	(-2.91)	(-5.31)	(-4.03)	(-3.97)	(8.41)
fdi	0.08*	0.08	0.07	0.09	0.14***	0.10**
	(1.84)	(1.37)	(1.21)	(1.52)	(3.81)	(2.31)
inflation	-0.17***	-0.09*	-0.08	-0.10*	-0.10*	-0.17***
	(-5.77)	(-1.96)	(-1.66)	(-2.01)	(-2.01)	(-4.72)
trade_open	0.009	0.004	0.01	0.03	-0.005	0.008
	(0.34)	(0.20)	(0.62)	(1.07)	(-0.26)	(0.36)
education	0.22***	0.21***	0.12**	0.14**	0.24***	0.25***
	(8.16)	(3.76)	(2.36)	(2.95)	(4.49)	(7.22)
exp_totl	-0.66***	-0.39***	-0.30***	-0.44***	-0.44***	-0.67***
	(-8.46)	(-4.75)	(-3.93)	(-8.51)	(-5.88)	(-7.78)
tax	0.16	0.03	-0.10	0.12	-0.03	0.06
	(1.18)	(0.47)	(-1.18)	(0.99)	(-0.45)	(0.36)
gov_effectiveness	3.24***			5.00**		2.41***
	(3.54)			(2.54)		(3.33)
tax_income			0.08	-0.02	-0.04	-0.04
			(0.87)	(-0.41)	(-0.76)	(-0.48)
tax_payroll			-0.13**	-0.07	-0.20***	-0.10
			(-2.28)	(-0.87)	(-3.34)	(-0.92)
tax_property			0.19***	0.13**	0.32***	0.27**
			(2.93)	(2.71)	(2.97)	(2.75)
tax_goods			0.001	-0.03	-0.02	0.01
			(0.09)	(-0.50)	(-0.47)	(0.16)
tax_international			0.07	0.001	0.05	0.03
			(1.05)	(0.50)	(0.80)	(0.35)
exp_gpservice	0.12*	0.12**			0.06	0.09
	(2.03)	(2.21)			(1.22)	(1.44)
exp_defense	-0.04	0.13			0.04	-0.03
	(-0.41)	(1.03)			(0.52)	(-0.31)

[6] Labor force participation rate has been omitted considering the possible mulcollinearity problem in the model.

exp_posafety	-0.57***	-0.14			-0.29**	-0.63***
	(-3.70)	(-1.23)			(-2.55)	(-6.14)
exp_ecoaffair	0.07	0.14**			0.04	0.04
	(1.61)	(2.20)			(0.59)	(0.53)
exp_housing	0.24*	0.23***			0.21***	0.22*
	(1.87)	(3.73)			(3.76)	(1.88)
exp_health	-0.05	-0.28**			-0.41**	-0.10
	(0.50)	(-2.46)			(-2.62)	(-.69)
exp_edu	-0.10*	-0.10			-0.14**	-0.13**
	(-1.78)	(-1.58)			(-2.55)	(-2.19)
exp_social	-0.017	0.04			-0.04	-0.03
	(0.75)	(0.89)			(-0.68)	(-0.73)
constant	13.52**	7.28	7.86	13.05**	16.08**	15.60
	(2.73)	(1.40)	(1.43)	(2.22)	(2.38)	(1.44)
No. of observation	190	268	319	227	268	190
R^2	0.60	0.44	0.38	0.45	0.50	0.61

Note: ***, ** and * indicate that variables are significant within 1%, 5% and 10% level respectively. Values in the brackets are corresponding t-statistics. Standard errors are reported from Driscoll-Krray Method.

While we observe the results of fiscal composition, expenditure on housing and amenities is found to have a positive relationship with growth, which is significant in all specifications. Similarly, expenditure on general public service and expenditure on economic affairs are found to be positively associated with growth. However, these expenditures are not statistically significant in all specifications. Interestingly, health expenditure and education expenditure are negative towards growth. This result is against the general perception that education and health expenditures are productive.

Similarly, for the composition of tax, we find that property tax is positively associated with growth. This is robust across all specifications. The positive effect of property tax is due to the fact that the tax on property does not distort the incentive of the people to invest in the private project. However, tax on payroll and workforce is negatively related to growth. It is because of the fact that it exerts the direct burden to the wage earning people and reduces the income. Ultimately, there will be disincentives for investment. Another component of tax, tax on international trade, is positively correlated with growth but not significant.

5.2 Robustness Check

To check whether the effect of composition varies in different income group and geographical regions, we use the same sample as before and add another suitable sample which contains the set of countries performing medium level of expenditure and high level of tax (See table 6). Since we find the higher size of expenditure is not favorable towards growth, we assume that medium level of size is preferred. Similarly, high tax performance is better, assuming that it helps to reduce fiscal deficit. Hence, we choose tentatively suitable sample countries called medium expenditure and high tax.

We find that health and education expenditure are negatively linked with per capita growth in low and middle income countries but not in high income countries. Similarly, housing expenditure is positive and significant in high income countries, but not in low income countries. This explains the

possible variability of effect of different expenditures across countries. Regarding tax composition, it is almost robust and concludes that the tax on property is positively linked and tax on payroll and work force is negatively linked with per capita growth.

Table 6: Regression results for Fiscal Composition

Determinants	Low and middle income countries	High income countries	Non Arabian Countries	Medium expenditure and high tax countries
	Dependent Variable: Per capita GDP growth			
initial gdp_pc	-0.003***	-0.001***	-0.002***	-0.002***
	(-5.24)	(-4.36)	(-3.81)	(-2.93)
investment	0.31***	0.79**	0.36***	0.39***
	(4.18)	(2.03)	(3.31)	(3.97)
popln_gr	-0.66***	-0.95	-0.62***	0.86
	(-4.50)	(-0.81)	(-0.52)	(0.39)
fdi	0.09	-0.39	0.05	-0.12
	(1.55)	(-1.60)	(0.42)	(-0.86)
inflation	-0.09***	0.53	-0.04***	-0.21***
	(-2.09)	(1.37)	(-3.44)	(-4.92)
trade_open	-0.008	0.12	-0.01	-0.02
	(-0.37)	(1.11)	(-0.66)	(-0.92)
education	0.30***	0.37**	0.30**	0.29**
	(4.40)	(2.10)	(2.75)	(2.29)
exp_totl	-0.46***	-1.14.***	-0.59***	-0.59***
	(-8.22)	(-3.06)	(-7.56)	(-2.90)
tax	-0.03	-0.27	-0.06	0.25
	(-0.32)	(-0.64)	(-0.74)	(0.93)
tax_income	-0.02	0.20	-0.03	-0.08
	(-0.61)	(0.63)	(-0.56)	(-0.49)
tax_payroll	-0.29***	-2.34*	-0.93***	-
	(-3.34)	(-2.04)	(-3.27)	
tax_property	0.08	0.61*	0.47***	0.60**
	(0.63)	(1.86)	(3.07)	(2.22)
tax_goods	-0.04	0.44	-0.02	-0.10
	(-1.26)	(1.60)	(-0.39)	(0.50)
tax_international	0.04	-0.18	0.05	0.22
	(1.09)	(-0.84)	(0.84)	(1.19)
exp_gpservice	-0.08	1.50***	-0.10	-0.23
	(-1.27)	(3.11)	(-1.24)	(-0.21)
exp_defense	-0.19	1.03	-0.24	-0.97**
	(-0.52)	(1.57)	(-1.59)	(-2.62)
exp_posafety	-0.55***	2.76***	-0.65***	-0.51
	(-3.80)	(3.64)	(-3.05)	(-1.06)
exp_ecoaffair	-0.09	1.07**	-0.08	-0.35**
	(-1.07)	(2.31)	(1.56)	(-2.37)
exp_housing	0.01	2.05***	0.02	0.05
	(0.19)	(2.59)	(0.31)	(0.35)
exp_health	-0.45**	0.70	-0.37*	0.18
	(-2.29)	(1.00)	(-1.82)	(0.32)
exp_edu	-0.29***	0.61	-0.35**	-0.71***
	(-3.93)	(0.66)	(-3.04)	(-3.32)
exp_social	-0.18**	0.72	-0.04	-0.36**
	(-2.55)	(1.35)	(-0.44)	(-2.42)
constant	29.33***	59.55	29.60***	22.33**
	(3.96)	(1.47)	(3.29)	(2.29)
No. of observation	223	45	182	78
R^2	0.56	0.80	0.54	0.75

Note: ***, ** and * indicate that variables are significant within 1%, 5% and 10% level respectively. Values in the brackets are corresponding t-statistics. Standard errors are reported from Driscoll-Krray Method.

Table 7 provides the results from GMM estimation for fiscal composition. Coefficient of the size of government expenditure is negative and robust in all specifications. The coefficient of the size of tax is almost positive, but not significant in all cases. Expenditure on housing has positive coefficients and significant in the majority of cases. Similarly, expenditure on education has negative coefficient and almost significant in all cases. Furthermore, expenditure on public order and safety is also negatively related to growth. Expenditure on health also has almost negative coefficients although it is not significant. Countries having high government effectiveness show the positive coefficients of expenditure components, meaning that negative performance of the major components of expenditure can be avoided through the improvement on governance quality.

Table 7: GMM Regression Results for Fiscal Composition

Determinants	Dependent Variable: Per capita GDP growth				
	Whole country group	low and middle income countries	High income countries	Non Arabian Countries	Countries with high government effectiveness
exp_totl	-0.58***	-0.57***	-1.14.***	-0.73***	-0.84***
	(-5.47)	(-6.81)	(-6.02)	(-7.39)	(-2.22)
tax	0.02	0.39***	0.44	0.43**	-1.23
	(0.18)	(2.75)	(1.55)	(2.19)	(-1.62)
tax_income	-0.04	-0.05	0.32***	0.05	0.01
	(-0.62)	(-0.87)	(2.77)	(0.62)	(0.15)
tax_payroll	-0.27	-0.43***	-1.7	-0.81	-0.80***
	(-1.59)	(-4.45)	(-1.27)	(-1.35)	(-3.15)
tax_property	0.14*	-0.14	2.55***	0.27	1.07***
	(1.93)	(-0.33)	(3.17)	(1.27)	(2.72)
tax_goods	-0.10**	-0.09**	0.49	-0.03	0.10
	(-2.01)	(-2.24)	(1.53)	(-0.44)	(0.59)
tax_international	-0.03	0.06	0.27*	0.03	0.005
	(-0.64)	(1.01)	(1.90)	(0.52)	(0.05)
exp_gpservice	-0.11	-0.08	0.75***	-0.24*	0.14
	(-1.18)	(-1.08)	(6.31)	(-1.85)	(1.03)
exp_defense	0.14	-0.11	0.99**	-0.26*	0.07
	(0.97)	(-1.06)	(2.04)	(-1.88)	(0.40)
exp_posafety	-0.56***	-0.44**	-3.17*	-0.59**	-0.52
	(3.01)	(-2.32)	(1.72)	(-1.88)	(-1.03)
exp_ecoaffair	0.10	-0.04	0.56***	-0.23	0.19
	(1.25)	(-0.59)	(6.90)	(-2.27)	(1.03)
exp_housing	0.31***	0.21**	0.86***	0.01	0.32
	(2.70)	(2.17)	(3.83)	(0.87)	(1.50)
exp_health	-0.08	-0.17	-0.46	-0.12	0.60
	(-0.037)	(-0.77)	(-0.73)	(--0.36)	(1.21)
exp_edu	-0.13**	-0.27***	-0.20	-0.44***	0.52*
	(-2.19)	(-4.29)	(1.28)	(-3.34)	(1.68)
exp_social	0.01	-0.15**	0.65*	-0.02	-0.01
	(0.23)	(-2.05)	(1.65)	(-0.17)	(-0.11)
No. of observation	248	182	34	148	59
P-value: AR (1)	0.01	0.01	0.07	0.01	0.02
AR (2)	0.08	0.15	0.15	0.07	0.17
Sargan Test	0.12	0.18	0.80	0.26	0.67

6. Explanation of the Results

Most of us prefer the positive impact of government expenditure on economic growth. But the reality is different than the expectation in Asian economies. However, we can be optimistic to some extents with regards to taxation. The unique nature of such a result is justified by its model selection and anatomy of the data through a different angle.

Since we measure the fiscal size in terms of percentage of GDP, it does not necessarily mean government expenditure is unproductive whenever the growth of expenditure remains less than the economic growth rate. It implies that countries with high growth performance, but slower rise in expenditure may experience positive results. Countries performing extremely low government expenditure are also facing difficulty in achieving the desirable growth due to lack of needed investment.

For those countries that have high size of expenditure are not making the expenditure productive for some reasons. First, the majority of Asian economies have a low size of tax revenue, which is not sufficient for financing desired investment in productive sectors. Those countries which expend more may face debt-trap due to low resource mobilization and low productivity. Spending financed by deficit may not be productive because of a low level of government effectiveness and high level of corruption that persists in developing countries. Second, higher size of public investment may crowd-out the private investment in one hand, and also yields diminishing returns on the other hand. Third, the most probable reason for negative relationship may be due to the low quality of financial administration, which is more common in developing Asian economies. Poor administration and low level of commitment leads to dissolve the effectiveness of government expenditure. Evidences show that higher quality of administration results higher growth performance (Gray et al., 2007). Fourth, some of the countries which have high size of government expenditure, but facing low growth, are increasing expenditures to achieve comparatively higher growth. This also may cause a negative impact on growth. The results are more or less similar in line of researches like Devarajan et al. (1996); Borro (1990); Engen and Sinker (1992).

Regarding taxation, the size of the tax in the majority of Asian countries has been low. We observe that there is no negative relationship between higher tax size and growth. The results suggest that up to the average level of tax (12.4 % of GDP), it is positively correlated to growth. This implies that the minimum level of tax is needed to run even for normal government function. After crossing the average size of tax, it is neutral towards growth. The increase in the tax effort reduces the government debt and contributes for the desired public spending. Hence, it supports for growth rather than creating distortion in the economy. Again, when we observe the composition, tax on payroll and work force creates the burden and reduces the incentives to invest. Hence, it has a negative impact on growth. But, the tax on property does not create any distortionary impact on incentives for investment. Hence, it shows positive impact on growth.

We assume government expenditure is not homogenous. Different expenditures have distinct productivity. Health and education expenditure are found to be negative towards growth. This may be either due to poor administrative quality or due to the misallocation in expenditure composition. Graphical relationship shows that up to a certain level health and education expenditure (around up to average level) both expenditures are negative and after this, both expenditures are positive (see Appendix-5). It means countries which have very low level of health and education expenditure are not productive. Further, Devarajan et al. (1996) and Ghosh and Gregoriou (2006) also argue that capital expenditure in developing countries is unproductive due to misallocation of expenditure in terms of priorities.

Regression results also show that for the composition less than average level, coefficients of both health and expenditure are negative, but for the composition more than average level, coefficients are positive. However, only the coefficient of education which contains the composition less than average is significant (see table 8). This also justifies that a certain minimum level of expenditure is needed to achieve higher growth.

Table: 8. Regression Results for Low and High Composition of Health and Education Expenditure

Dependent Variable: Per capita GDP growth				
Sample/ Independent variables	1	2	3	4
Composition of Education Expenditure more than average (12.7 percent)	0.05 (0.28)			
Composition of Education Expenditure less than average (12.7 percent)		-0.33** (2.00)		
Composition of Health Expenditure more than average (5.1 percent)			0.12 (0.26)	
Composition of Health Expenditure less than average (5.1 percent)				-0.17 (-0.58)
Other control variables	yes	yes	yes	yes

Note: ***, ** and * indicate that variables are significant within 1%, 5% and 10% level respectively. Values in the brackets are corresponding t-statistics. Standard errors are reported from Driscoll-Krray Method.

7. Conclusion

The growth performance of any country varies depending on various fiscal parameters supported by administrative quality and the other macroeconomic variables. Neither fiscal size nor composition alone is sufficient to analyze the growth pace. The accepted fact is: fiscal size, composition and administrative capacity largely matter on growth. However, the level of effectiveness of fiscal size and composition depends on the initial fiscal situation and country-specific characteristics. Moreover, government expenditure is not homogeneous and has a distinct productivity in each sector. Nevertheless, experience and performance of any country are comparable to another and it is therefore equally beneficial to learn from others.

The share of government expenditure and tax revenue in terms of GDP is comparatively lower in Asian economies as compared to developed countries and other regions of the world. Although size of government expenditure is not so high, empirical results show that it is negatively related to growth. This is robust irrespective of samples and model specifications. The result does not solely predict that government expenditure retards growth. Rather, it implies that government expenditures are not productive in the Asian region. Having an inappropriate size of expenditure, low government effectiveness, low tax effort performance and wrong choice in prioritizing the expenditure are some of the reasons that explain the cause of growth retardation.

The performance of some countries which have a very low size of expenditure reveals weak support that low size of expenditure is positively associated with growth. Similarly, countries with high government effectiveness have no significant negative relationship between government expenditure and per capita GDP growth. When we observe the tax size, no significant negative relationship with growth can be measured. It is contrary to the traditional perception which claims that the tax is negatively linked with growth. Most of the specifications show positive correlation between the size of tax revenue and per capita GDP growth in Asian economies although the relationship is not significant. The implication of this result is that expansion of tax size from its low level can at least strengthen the sources of finance and thus reduce the deficit.

Decomposed fiscal components controlled by the size show that the pattern of allocation of expenditure and taxation really matters on growth. We find that tax on property is positively correlated to growth, but payroll and workforce is negatively correlated to growth. On the expenditure side, expenditure on housing and amenities is positively linked with growth, but expenditure on health and education are negatively linked with growth. It is also generally expected that health and education expenditure would have a positive impact on growth, but surprisingly their impact is found to be negative. Although the results are not so robust, it clearly indicates that some categories of expenditure like health and education expenditures are not productive. This is due to mismatch in the composition and presence of weak institutions.

The implication of the result is that increase in tax size does not hamper economic growth. As the size of tax is found to be low, it provides some scope for its expansion to enrich the government finance. It has also been noticed that a certain level of fiscal size with improved government effectiveness is expected for higher growth. Hence, government should focus on tightening the rule of law and administration along with maintaining a moderate fiscal size and composition. Similarly, attention has to be given for the readjustment of the fiscal composition. On the taxation side, property tax, whose share in the composition is very low, is positively associated with growth. Hence it can be increased to have a positive result. Countries which have a low level of expenditure and tax can increase their size to achieve the desired benefit. Furthermore, effective government and fiscal composition at an optimal size increases the productivity of government expenditure.

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Appendix-1: Variable Definitions

Symbol	Indicator	Source
gdp_pcgr	Per capita GDP growth annual (percent)	WDI, World Bank
gdp_pc	GDP per capita (US $ Constant 2005)	WDI, World Bank
exp_totl	General Government Total Expenditure (% of GDP)	WDI, World Bank
tax	Tax Revenue (% of GDP)	WDI, World Bank
investment	Total Investment (% of GDP)	WDI, World Bank
popln_gr	Population Growth annual (percent)	WDI, World Bank
labor_force	Labor force participation rate, total (% of total population ages 15-64)	WDI, World Bank
fdi	Foreign Direct Investment inflow (% of GDP)	WDI, World Bank
trade_open	Trade (% of GDP)	WDI, World Bank
inflation	Inflation percent (Average Consumer Prices)	WEO, IMF
gov_effectiveness	Government Effectiveness Index	WGI, World Bank
education	School Enrollment Tertiary (% gross)	WDI, World Bank
Composition of Tax		
tax_income	Taxes on Income, Profits and Capital Gains as percent of GDP	GFS, IMF
tax_payroll	Taxes on Payroll and Work Force as percent of GDP	GFS, IMF
tax_property	Taxes on Property as percent of GDP	GFS, IMF
tax_goods	Taxes on Goods and Services as percent of GDP	GFS, IMF
tax_international	Taxes on International Trade as percent of GDP	GFS, IMF
	Composition of Expenditure (by function):	
exp_gpservice	General Public Services as percent of GDP	GFS, IMF
exp_defense	Defense as percent of GDP	GFS, IMF
exp_posafety	Public Order and Safety as percent of GDP	GFS, IMF
exp_ecoaffair	Economic Affairs as percent of GDP	GFS, IMF
exp_housing	Housing and Community Amenities as percent of GDP	GFS, IMF
exp_health	Health as percent of GDP	GFS, IMF
exp_edu	Education as percent of GDP	GFS, IMF
exp_social	Social Protection as percent of GDP	GFS, IMF

Appendix-2: Sampling Countries (36)

Division on the basis of Income

| Low and middle income countries (27)	High income countries (9)
Afghanistan. Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka, Cambodia, Indonesia, Malaysia, Philippines, Laos, Vietnam, Myanmar, Thailand, Mongolia, China, Egypt, Iraq, Iran, Oman, Jordan, Turkey, Syria, Lebanon, Yemen	Brunei, Singapore, South Korea, Bahrain, U.A.E., Saudi Arabia, Kuwait, Qatar, Israel,

Division on the basis of Territory

Non Arabian countries (24)	Arabian countries(12)
Afghanistan. Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka, Cambodia, Indonesia,	Bahrain, U.A.E., Saudi Arabia, Kuwait, Qatar, Egypt, Iraq, Oman,

Malaysia, Philippines, Laos, Vietnam, Myanmar, Thailand, Mongolia, China, Iran, Israel, Turkey, Brunei, Singapore, South Korea	Jordan, Syria, Lebanon, Yemen

Appendix-3: Data Summary

Variables	Mean	Std. Dev.	Min	Max	Observations
gdp_pcgr	3.13	4.24	-16.14	18.06	740
gdp_pc	8256.40	12256.95	231.97	60874.38	720
expenditure	27.50	10.46	6.94	69.09	655
tax	12.41	6.49	0.11	36.4	659
investment	26.00	9.06	5.47	63.94	724
popln_gr	2.35	2.10	-2.96	17.48	787
fdi	3.20	4.85	-5.29	53.81	710
education	22.60	18.61	0.74	101.75	518
labor_force	64.44	12.88	41.9	88.40	792
trade_open	91.67	63.54	0.30	444.10	734
inflation	8.80	13.13	-18.10	106.27	736
gov_effectiveness	-0.06	0.79	-2.32	2.43	434
tax_income	4.50	3.71	0.15	21.65	596
tax_payroll	0.09	0.26	0	1.67	596
tax_property	0.31	0.57	0	7.01	595
tax_goods	4.84	3.35	0	20.62	596
tax_international	2.03	1.94	-	11.18	596
exp_gpservice	7.09	4.30	0.45	31.45	529
exp_defense	3.76	5.18	0	107.04	535
exp_posafety	1.37	1.03	0	5.36	513
exp_housing	1.04	1.10	0	8.73	532
exp_ecoaffair	4.24	3.25	0.25	24.67	535
exp_health	1.39	1.09	0	5.5	532
exp_edu	3.15	1.78	0	9.91	535
exp_social	1.87	2.55	0	20.07	521

Appendix-4: Comparison of Government Expenditure and Tax against the per capita GDP growth
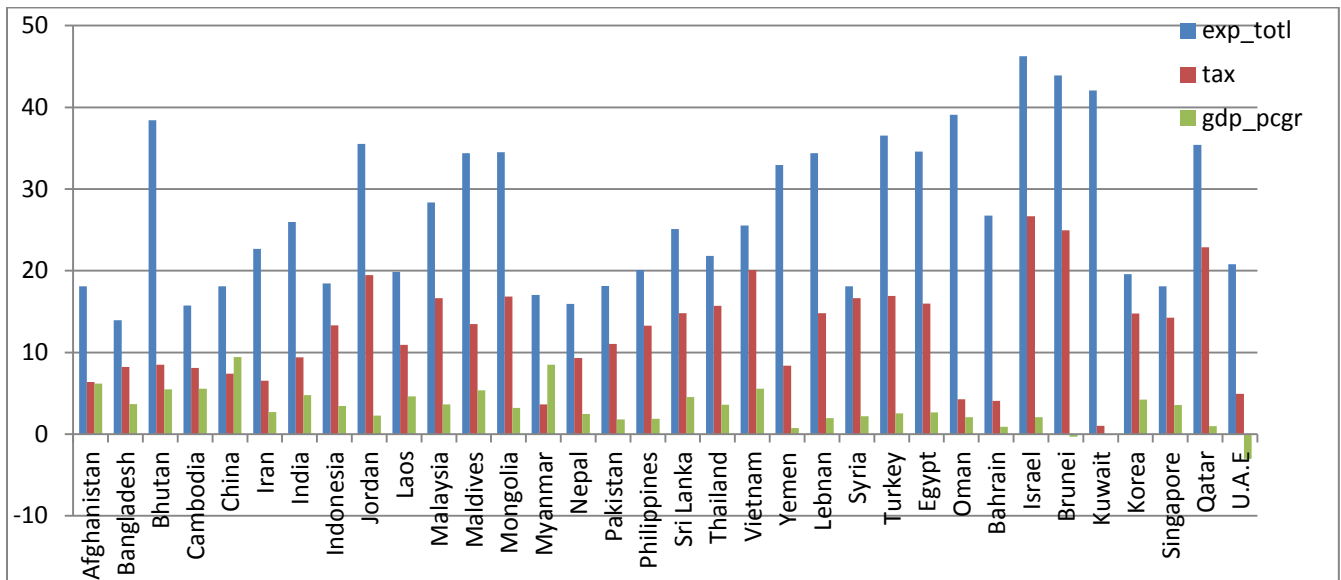
Appendix-5: Nonlinear relationship between health expenditure and education expenditure against growth