The Linkage between Religion and Growth

By Inchul Kim and Minkyung Ko

Abstract

The mass media the world over frequently report that people complain about their increased tax burden. Nevertheless, however, the records of recent times indicate that the tax-income ratio for many countries has been constantly increasing. This implies either that the majority of the people acquiesce or that they are willing to accommodate the increasing role of the government. When people cannot tolerate the ever-increasing tax burden, they attempt to demonstrate tax revolt against the government. So it can be hypothesized that the tax-burden ratio curve will take an inverted "U" shape.

This paper examines the linkage between religion and growth. In this paper we argue that the income elasticity of the demand for government services is greater than unity for a certain range of income. When comparing the believers and non-believers, the income range with the income elasticity greater than unity for the believers tends to be wider than that for the non-believers. We also demonstrate how religion influences the people's attitude toward the efficiency of government services and how religion influences growth productivity over time.

JEL Classification Code (H71)
Keywords: economic growth, religion, government service, tax burden, and management skills,

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1. Introduction

In the literature studies have been done to examine relationship between religion and economic growth. At the intuitive level, people would accept the hypothesis that religion influences growth and growth influences religiosity. It can be argued that religious beliefs such as heaven, hell, after life, God and so on may positively influence growth. It can also be argued that economic growth may cause individuals to become less religious as measured by church attendance and religious beliefs.

A series of studies have been made as to the relation between religion and growth. Weber (1930) argues that religious practices and beliefs have important consequences for economic growth and development. Huntington (1996), Lands (1999) and Inglehart and Baker (2000) argue that explanations for economic growth should include a nation's culture. Culture is usually thought to influence economic outcomes by affecting personal traits such as honesty and work ethic. Religion is of course one important dimension of culture. McCleary (2003) investigates the effects of church attendance and religious beliefs on economic growth. In a similar manner Daniels and Von der Ruhr (2005) argue that religious affiliation has an important impacts on individual's view of others and therefore impacts attitudes toward trade and immigration policy. Guier (1999) concludes based on the pooled data for the years 1961-1990 for all of the major British, French, and Spanish ex-colonies that Protestantism is correlated with growth and development. Nath (2006) explains the causality, one way or both, between religion and economic growth. Tyer (2007) argues that viewing religion as spiritual capital; religious network externalities can play a vital role in fostering economic development.

In this paper we attempt to explain the following puzzling phenomenon.
According to the records of recent times, the tax-income ratio has been constantly increasing. This would be true of many countries regardless of whether they are developed or developing countries. This implies either that the majority of the people acquiesce or that they are willing to accept the increasing role of the government. If people cannot tolerate the ever-increasing tax burden, they attempt to demonstrate a tax revolt against the government.

What would make them tolerate their increasing tax burden? First of all, they do not have power enough to challenge the authority of the government. They have very little to do except paying the tax at the moment. Later on, however, they can petition for a tax readjustment if they find some errors in the tax amount computed by the tax officials. They may tolerate the increased amount of tax if their income has increased

at least at the same proportion as the tax. Then the critical question is what would be the highest value the ratio can go up to. Certainly it will not exceed unity.

We conjecture that the curve for the tax-income ratio would be of a mountain shape. We also conjecture that the income- elasticity for government services is a function of income and its elasticity is increasing in the early stage but decreasing after it reaches its peak. For a certain range of income, its elasticity can be greater than unity. Based on this conjecture we can explain that the people's tax payment increases more than proportionately. After a certain level of income, however, it may decline.

The structure of this paper is the following. After introduction, we set up a theoretical model in section 2 which demonstrates the determination of the amount people are willing to pay for the government services. In section 3, we develop a framework within which the managerial skills of taking the religious attitude of 'serve others' contribute to growth productivity. In section 4 we examine the actual data for the tax-income ratios for many countries. In section 5, we draw conclusions.

2. The Theoretical Model

To illustrate the scope of tax burden, we formulate a theoretical framework where people try to maximize their utility subject to their budget constraint. Consumption of private goods and services, X and use of government services, T are two elements in their utility function. Government services include national defense, provision of social welfare, education, etc. So the nation's utility function is expressed as:

$$U = U(X, T) \qquad (1)$$

The nation's budget constraint can be expressed as:

$$I = P_X X + P_T T \text{, where} \qquad (2)$$

I refers to money income, GDP. P_X is the market price of X and P_T, the shadow price of government services. Then we can hypothesize that if the government inefficiency increases, its shadow price increases and people buy less of the government services. Then we can establish the people's maximization problem as follows:

$$MaxL = U(X, T) + \lambda(I - P_X X - P_T T) \qquad (3)$$

$$\frac{\partial L}{\partial X} = MU_X - P_X\lambda = 0 \quad (4)$$

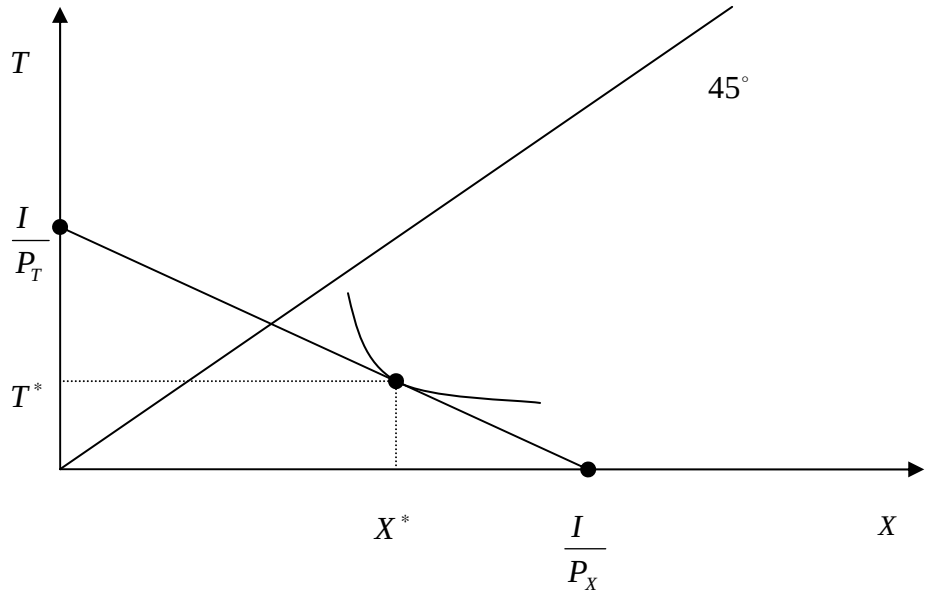
$$\frac{\partial L}{\partial T} = MU_T - P_T\lambda = 0 \quad (5)$$

From (4) and (5) we get

$$\frac{MU_X}{MU_T} = \frac{P_X}{P_T} \quad (6)$$

The price ratio becomes equal to the marginal utilities ratio as shown in (6).

<Figure 1> Determination of the Optimum Consumption of Private Goods and Services and Optimum Provision of Government Services



This is depicted in Figure 1. The use of government services or put differently the amount of tax payment is measured on the vertical axis whereas the consumption of market goods and services is measured on the horizontal axis. The equilibrium is attained at a point where the community's indifference curve is tangent to the budget constraint. If the government becomes less efficient and wastes national resources more, then the budget line becomes flatter.[1] In Figure 2, the budget line changes from AB to AC. Consequently the country's welfare falls from U_1 to U_2 with less consumption of both X and T.

Now we can explain how the tax-income ratio can increase with GNP growth. To that end we hypothesize that the income elasticity of demand for government services is greater than unity for some range of income and the path for the income elasticity is of an inverted "U" shape. As is depicted in Figure 3, the income elasticity of the nation's demand for government services by non-believers is greater than unity over the income range between Y1 and Y2. For the income either less than Y1 or larger than Y2, the elasticity is less than unity. According to this model, so long as the gross

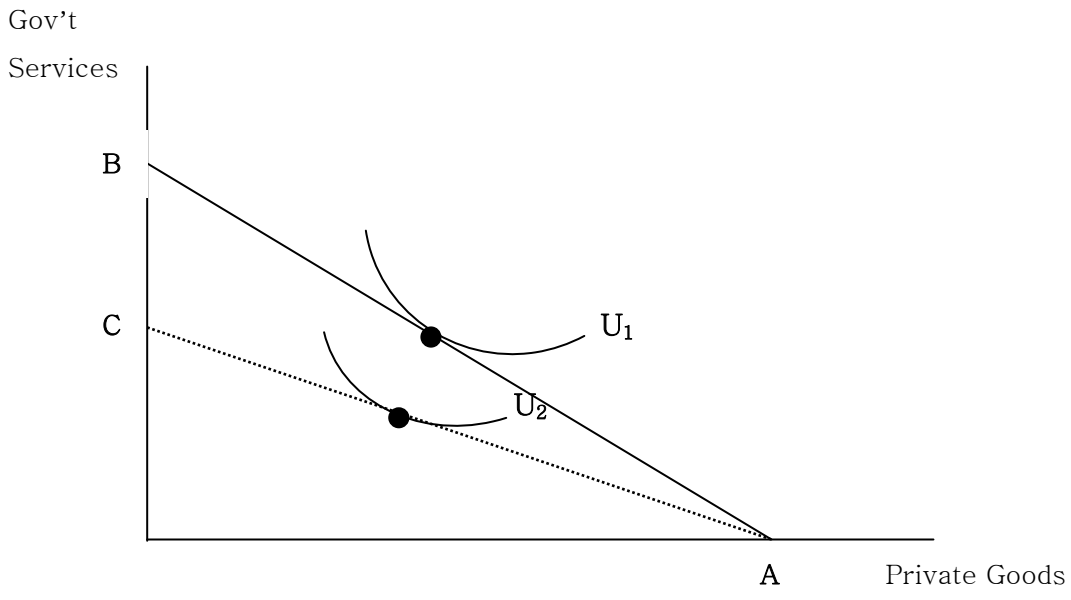
[1] See Gary Becker (1995).

national product is within this range, demand for government services increases more than proportionately and therefore the measured tax-income ratio will tend to increase as income grows.

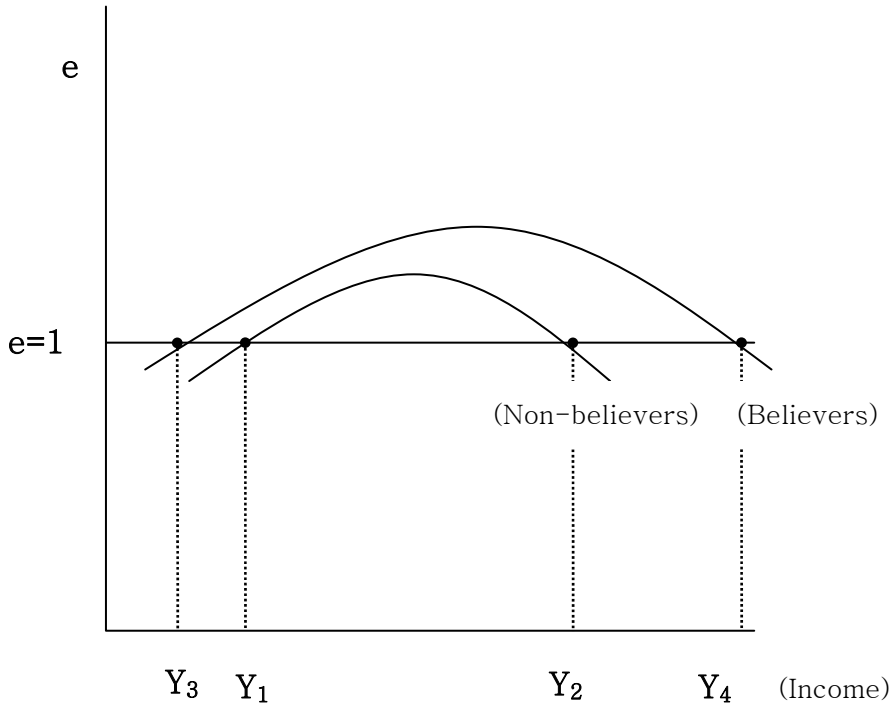
Based on this model, we can analyze the effect of religion on the demand for government services, namely tax burden. The common traits of all religions are justice, compassion, love-neighbors-as-yourself. Therefore, believers would appreciate the government services more than before, thereby shifting the elasticity curve upward. As a result, the income range over which the elasticity is greater than unity expands from Y1Y2 to Y3Y4. This is depicted in Figure 3.

Now let us examine how the taxpayers would possibly change their behavior when their income has increased. In Figure 4, the people with no belief become better off with increased consumption of both private goods and government services. For example, depending on the magnitude of the income elasticity for X and T, the tax burden ratio increases or decreases. If the new equilibrium point is attained at a point above the 45 degree line, it means that the income elasticity of demand for government services is greater than unity. The believer's income elasticity tends to be above that of the non-believer. Therefore, path Ⅱ connecting points a, d, and e is above path Ⅰ connecting points a, b, and c. Their welfare increases from U_1 to U_2 and to U_3 as the income budget expands out to the right.

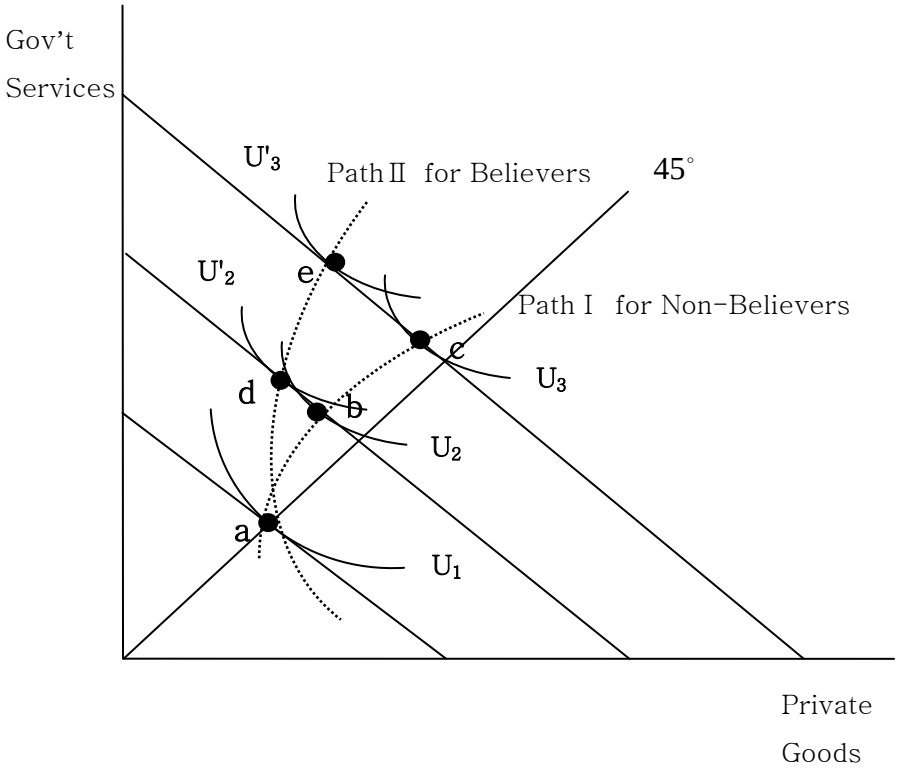
<Figure 2> Effects of an Increase in Government Inefficiency



<Figure 3> The Elasticity Paths for the Believers and Non-Believers



<Figure 4> The Effects of Increases in Income on the Use of Government Services



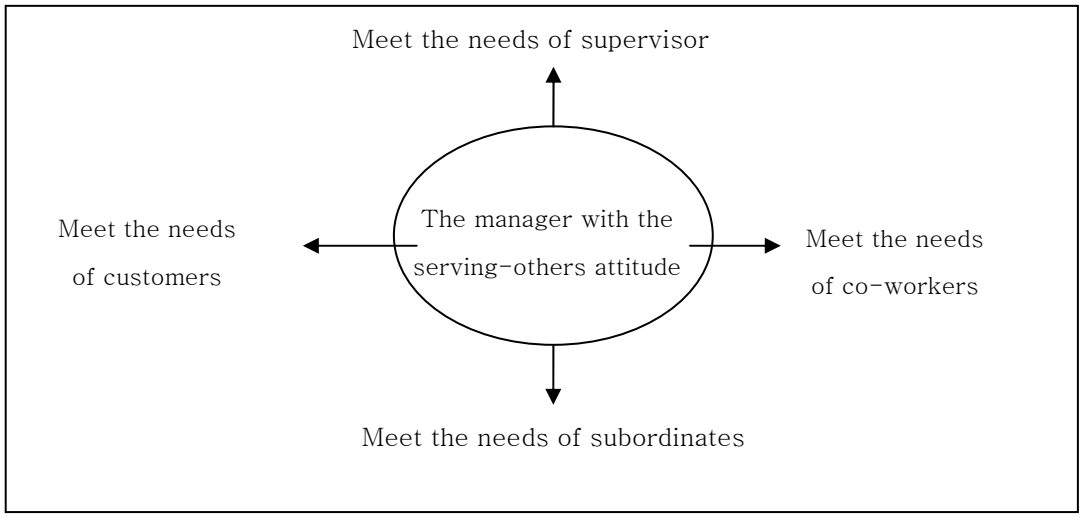
3. The Effects of Religion on Production

Love, trust, compassion, and serve-others are the traits that any religion would commonly share. If workers and management trust each other, if they love each other, and if they serve each other, then the nation's overall output will surely increase. As an example, we can focus on the business management strategy with the serve-others attitude. This is depicted in Figure 5. The manager serves every one around him, trying to meet the needs of his supervisor, coworkers, customers, and subordinates. Management skills with faith and mutual trust can enter the production function as in (8)

$$Y = A(R,\pi)L^{\alpha}K^{\beta}, \qquad (8)$$

Where 'R' refers to a religion factor and 'π' to all other parameters including production technology.

<Figure 5> Management Skills with the Serving- Others Attitude



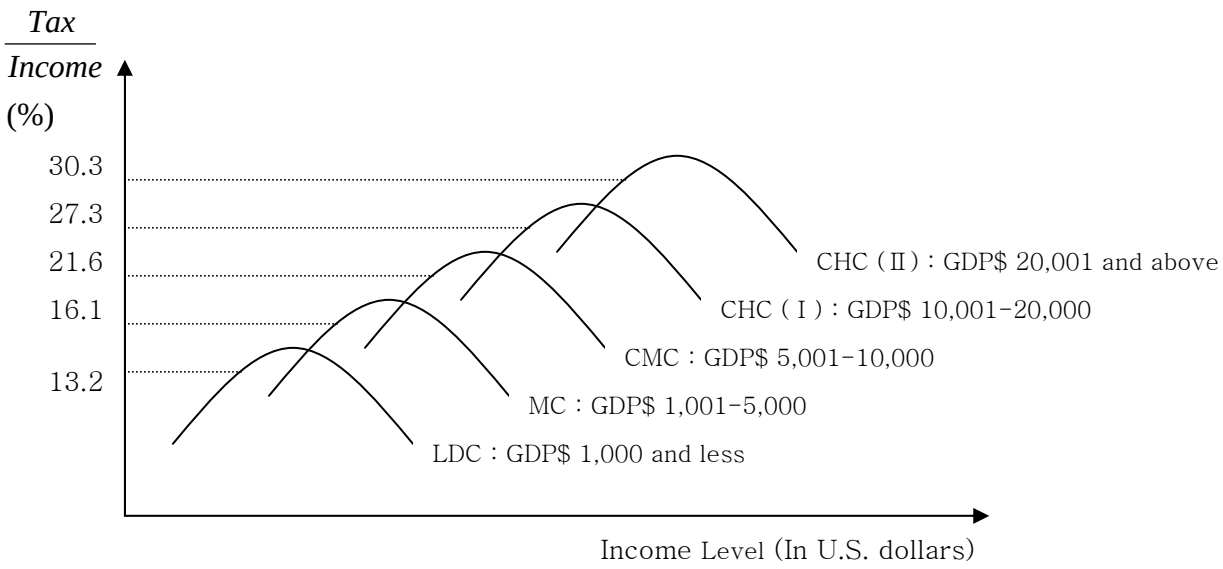
4. The Empirical Analysis

In this section, we try to make comparison of the tax-burden ratios for different countries. We project that the tax-burden curve for each country takes a mountain shape and that this curve shifts up to the right as the country's income level increases.

Furthermore, we postulate that the tax-burden curve for a Christian country is placed above that for a non-Christian country. Figure 5 compares the tax-burden curves for 44 countries. The data for this is presented in Table 1.

The vertical axis measures the average tax burden ratio whereas the horizontal axis measures the level of dollar income.

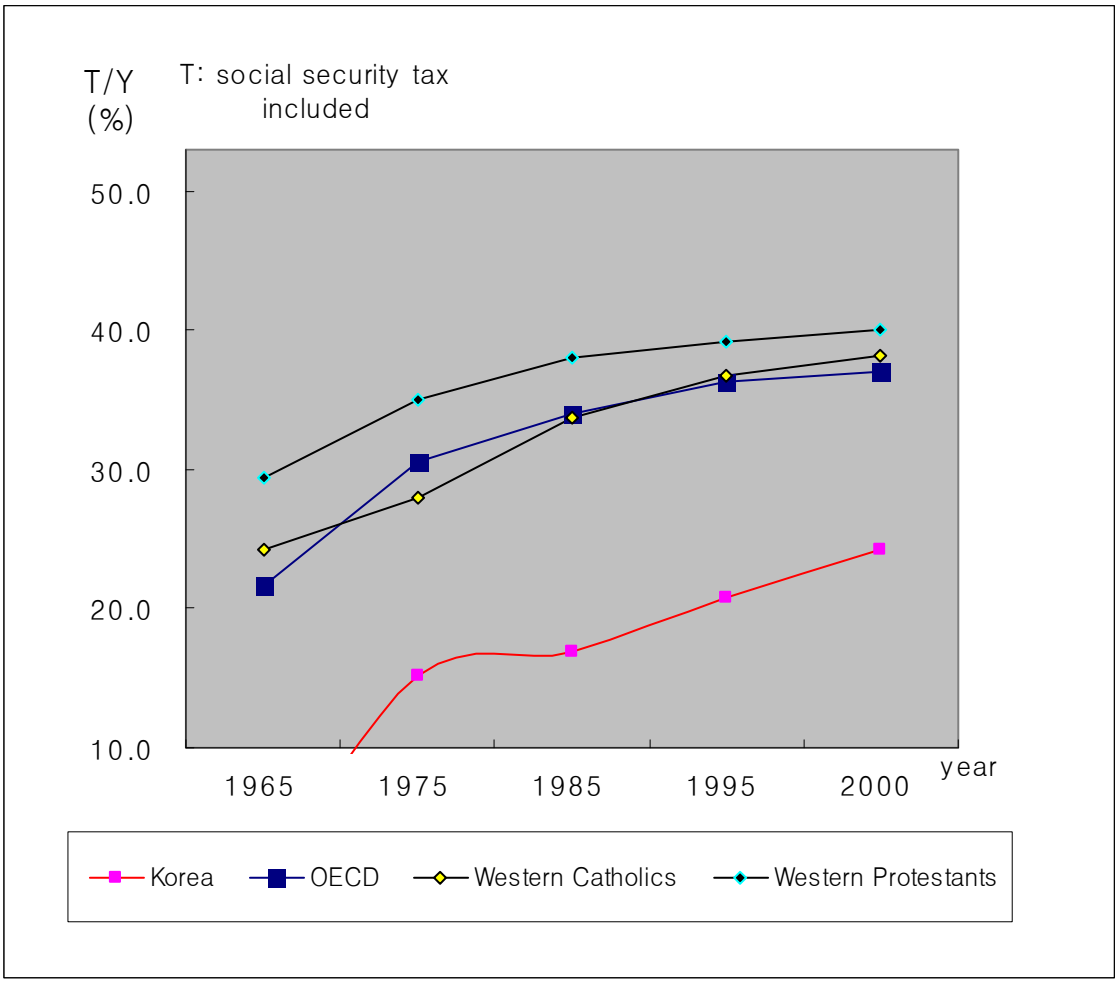
<Figure 5> Comparison of Tax burden Ratios by Income and Religion



LDC: Less Developed Countries
MC: Middle-Income Countries
CMC: Christian Middle-Income Countries
CHC: Christian High-Income Countries

Figure 6 shows the trend of tax burden ratio for Korea, OECD, Western Catholic countries, and Western Protestant countries. Korea's tax burden ratio has been increasing but the level is the lowest. The average ratio for protestant countries is uniformly higher than that for catholic countries. The tax revenue includes social security tax. Figure 7 compares the tax burden ratios for Korea, Japan, and Christian countries. The ratio for Japan is higher than Korea but the ratio for Christian countries is the highest. Figures 6 and 7 were drawn on the basis of Table 2. The trend of the tax burden ratio for each country is attached in the Appendix. The classification of countries by religion was obtained from the 2000 CIA World Fact Book.

<Figure 6>


T/Y
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T: social security tax
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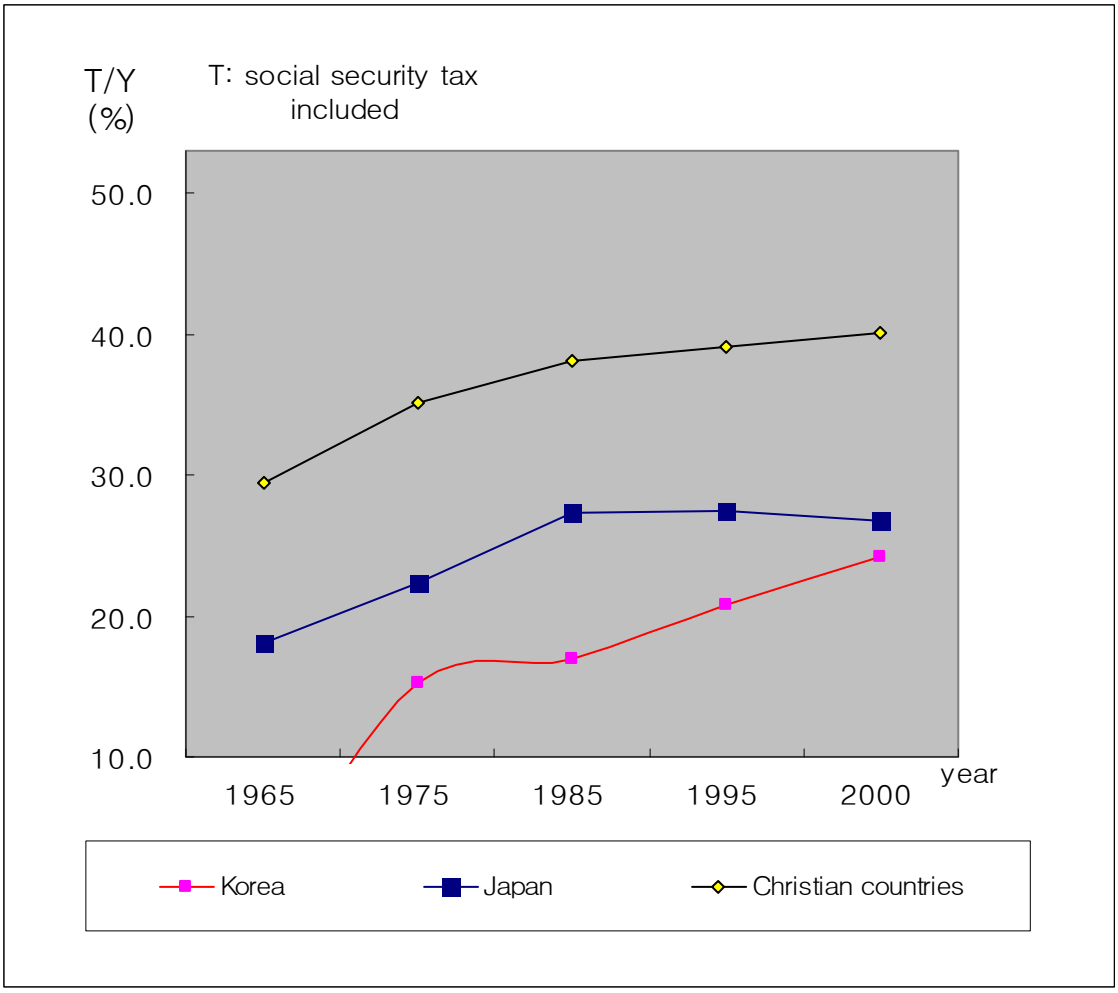
Korea
OECD
Western Catholics
Western Protestants

<Figure 7>



5. Conclusion

Citizens in any country tend to resist against the government's proposal for a new tax or an increase in tax. Their resistance can be justified if their government is corrupt and incompetent. Surprisingly, however, historical records show that the tax burden ratio has been increasing for many countries. It is because the government had to finance increased projects by force. It is also because the citizens are willing to accept the increasing tax burden. Otherwise, the increasing trend of tax burden would not have sustained.

In this paper we made three hypotheses. The first hypothesis is that the income elasticity of demand for government services is greater than unity over a certain range

of income. The second hypothesis is that its income elasticity takes a mountain shape. The third hypothesis is that the income elasticity path for the believer is above the income elasticity path for the nonbeliever. Using the 2000 US CIA World Fact Book, we find that the tax-burden ratio for 44 countries has been increasing and that the ratio for the Christian countries is greater than the ratio for non-Christian countries. Interestingly, the tax-burden ratio for the Western protestant countries is greater than the ratio for the Western Catholic countries. Although the data is not ample, it supports our hypotheses significantly.

<Table 1>

Country name	Primary Religion	GDP per capita (constant 1995 US $) 1999	Tax revenue (% of GDP) 1999
GDP $ 1,000 and less			13.2
Nigeria	Muslim	250	...
Kenya	Protestant	337	...
India	Hindu	450	9.1
Pakistan	Muslim	508	13.1
Zimbabwe	Muslim	703	...
Sri Lanka	Buddhist	814	14.9
Indonesia	Muslim	962	15.7
GDP $ 1,001-5,000			16.1
Philippines	Catholic	1,138	14.4
Egypt, Arab Rep.	Muslim	1,191	...
Ecuador	Catholic	1,419	...
Jordan	Muslim	1,604	18.3
Colombia	Catholic	2,261	10.6
Peru	Catholic	2,346	13.8
Thailand	Buddhist	2,717	13.7
Turkey	Muslim	2,965	21.3
Venezuela, RB	Catholic	3,213	12.8
Mexico	Catholic	3,613	14.3

South Africa	Protestant	3,904	25.6
Brazil	Catholic	4,479	…
Malaysia	Muslim	4,526	…
GDP $ 5,001-10,000			21.6
Chile	Catholic	5,121	18.4
Uruguay	Catholic	6,208	24.7
Argentina	Catholic	8,100	…
GDP $ 10,001-20,000			27.3
Korea, Rep.	Buddhist, Protestant	12,086	19.5
Portugal	Catholic	12,309	25.4
Greece	Greek Orthodox	12,652	25.5
Israel	Judaism	1,6438	35.5
Spain	Catholic	16,989	22.8
New Zealand	Protestant	17,210	34.9
GDP $ 20,001 and above			30.3
Italy	Catholic	20,174	30.9
United Kingdom	Protestant	21,069	30.1
Canada	Catholic	21,754	31.0
Australia	Protestant	23,554	30.7

Ireland	Catholic	25,158	27.1
France	Catholic	28.959	29.3
Belgium	Catholic	29,687	31.0
Sweden	Protestant	29,866	38.8
Netherlands	Catholic	30,135	25.2
Finland	Protestant	30,355	34.9
United States	Protestant	30,845	22.0
Austria	Catholic	25,519	29.0
Germany	Protestant	31,721	23.0
Denmark	Protestant	37,308	49.1
Switzerland	Catholic	45,496	22.2

<Table 2>

Country	Primary Religion	1965 (1966)	1975	1985	1995	2000	1999
Korea	Buddhist, Protestant	...	15.2 (15.2)	16.7 (16.9)	19.1 (20.8)	21.8	(24.2)
Japan	Buddhist	14.3 (18.1)	15.1 (22.3)	18.9 (27.3)	17.7 (27.5)	17.2	(26.7)
OECD		21.1 (26.5)	23.7 (30.6)	25.9 (34.0)	26.7 (36.3)	27.9	(37.1)
Western countries							
Australia	Protestant	21.9 (21.6)	29.6 (26.5)	29.1 (29.4)	29.7 (29.6)	31.5	(31.0)
Canada	Catholic	24.1 (26.7)	28.7 (32.0)	28.2 (32.7)	30.7 (35.6)	30.7	(36.0)
Denmark	Protestant	28.3 (31.3)	39.5 (41.1)	45.7 (47.6)	47.8 (49.7)	46.5	(50.0)
Finland	Protestant	28.3 (31.5)	31.2 (37.1)	33.1 (40.1)	32.6 (46.3)	34.9	(46.6)
France	Catholic	22.7 (34.5)	21.3 (36.0)	24.8 (43.6)	25.2 (44.3)	29.0	(45.4)
Germany	Protestant	23.1 (32.0)	23.3 (35.7)	23.6 (36.9)	23.3 (37.9)	23.1	(37.6)
Greece	Greek Orthodox	13.7 (21.3)	15.4 (22.2)	18.4 (29.1)	21.9 (31.6)	26.4	(36.8)
Italy	Catholic	16.8 (25.7)	14.1 (26.3)	22.5 (35.1)	28.1 (41.8)	30.0	(42.6)
Netherland	Catholic	22.7 (34.0)	25.6 (41.1)	23.8 (43.0)	24.4 (42.3)	25.3	(40.9)
New Zealand	Protestant	24.7 (25.2)	30.4 (30.4)	32.9 (32.7)	37.5 (36.6)	35.1	(34.9)
Norway	Protestant	26.1 (31.0)	29.6 (39.8)	34.3 (43.5)	31.8 (41.4)	31.2	(41.8)
Portugal	Catholic	12.4 (16.4)	13.6 (20.7)	19.7 (27.2)	23.7 (32.2)	25.6	(33.9)
Spain	Catholic	10.5 (15.1)	9.9 (18.2)	16.3 (28.4)	21.0 (33.0)	22.8	(34.7)
Sweden	Protestant	30.8 (35.8)	34.0 (43.3)	36.4 (49.2)	33.7 (48.7)	39.0	(52.6)

Switzerland	Catholic	15.2 (20.1)	19.8 (27.7)	20.5 (30.7)	20.8 (33.2)	23.7	(35.0)
U.K.	Protestant	25.7 (31.6)	29.1 (35.0)	31.0 (37.8)	28.7 (34.4)	31.2	(36.9)
U.S.A	Protestant	21.4 (25.2)	21.4 (26.8)	19.5 (25.8)	20.7 (27.6)	22.7	(29.1)

* Notes: 1.The numbers in parenthesis indicate the tax-burden ratio with social security.

2. Contributions included.

The sources are: (1) OECD, Revenue Statistics, 2002.

(2) International Statistics Yearbook, Korean National Statistical Office, 2004.

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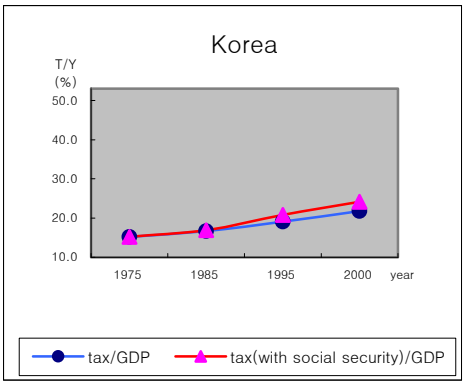
7. Appendix


Korea
T/Y
(%)
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1975
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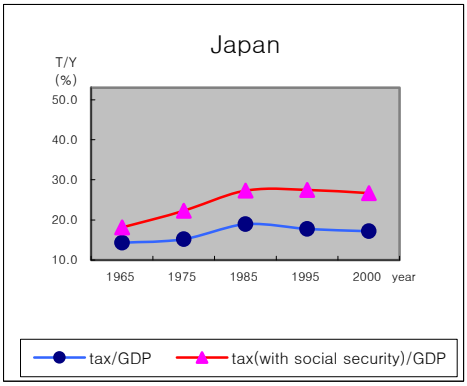
year
tax/GDP
tax(with social security)/GDP


Japan
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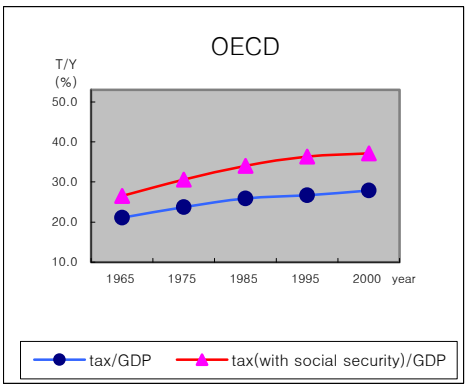
OECD
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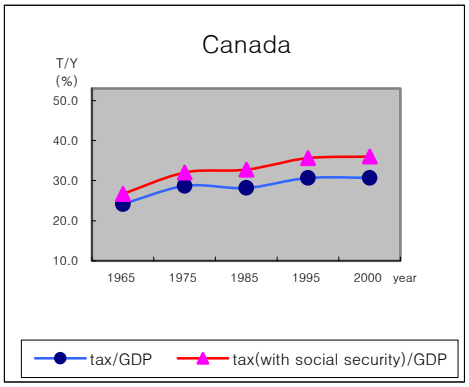
Canada
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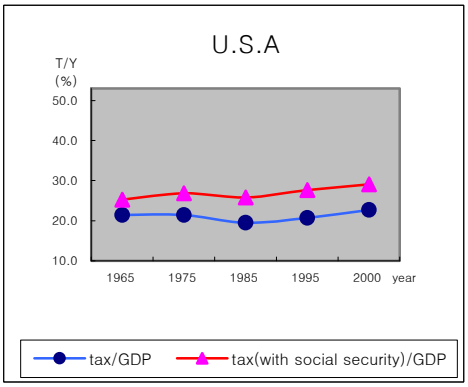
U.S.A
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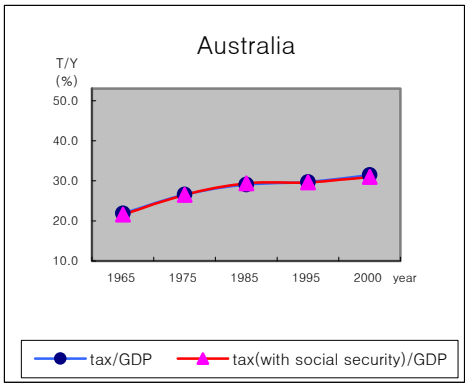
Australia
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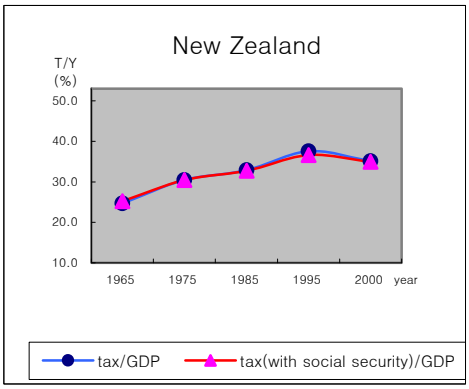
year
tax/GDP
tax(with social security)/GDP


New Zealand
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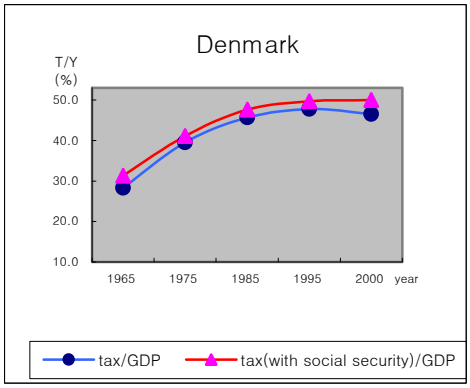
tax/GDP
tax(with social security)/GDP


Denmark
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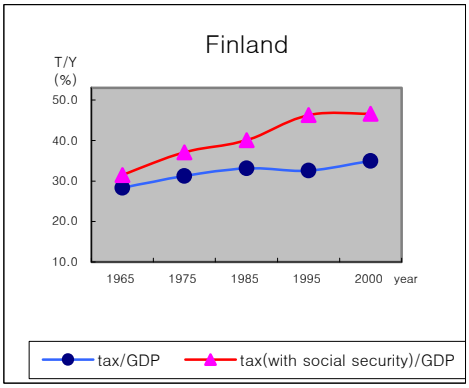
Finland
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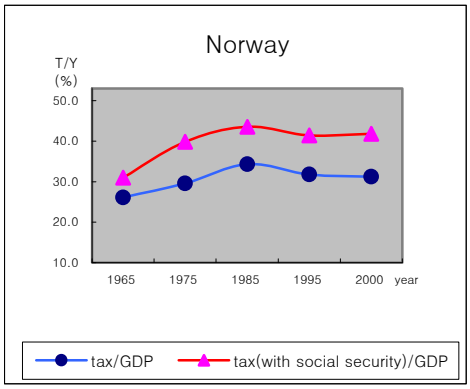
tax/GDP
tax(with social security)/GDP


Norway
T/Y
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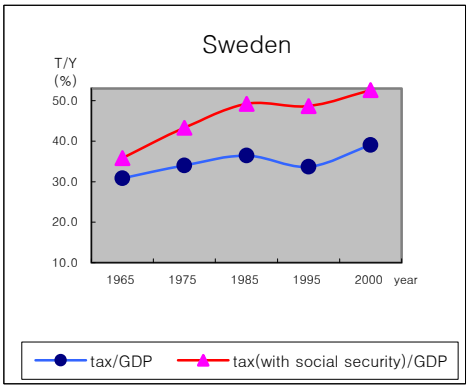
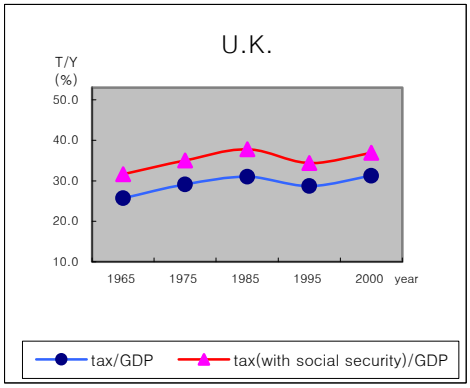
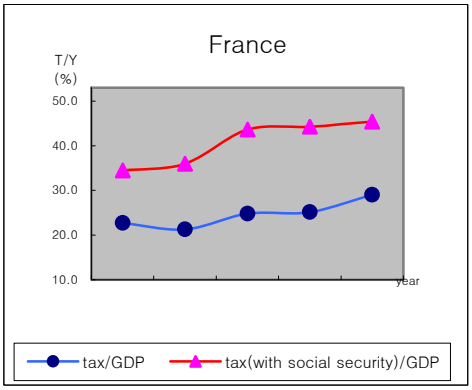
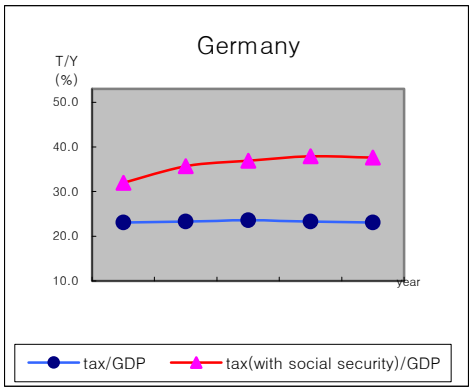
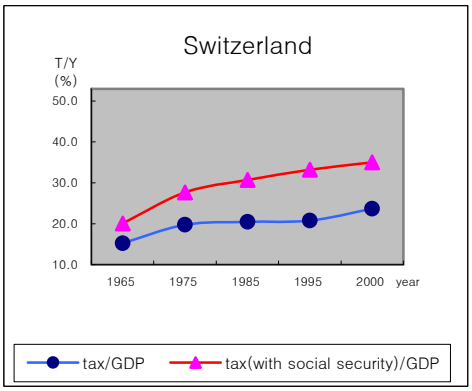
year
tax/GDP
tax(with social security)/GDP

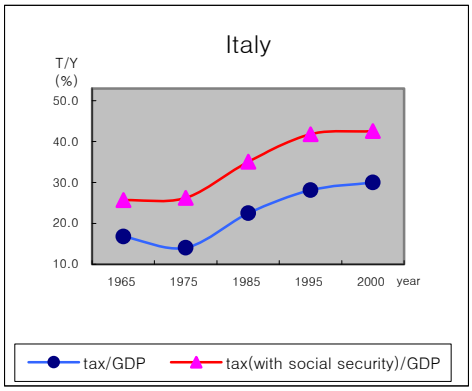

Sweden
T/Y
(%)
50.0
40.0
30.0
20.0
10.0
1965
1975
1985
1995
2000
year
tax/GDP
tax(with social security)/GDP

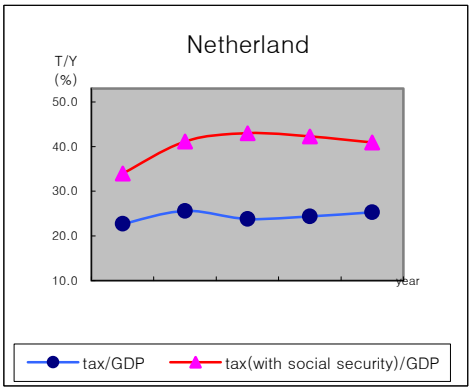

U.K.
T/Y
(%)
50.0
40.0
30.0
20.0
10.0
1965
1975
1985
1995
2000
year
tax/GDP
tax(with social security)/GDP

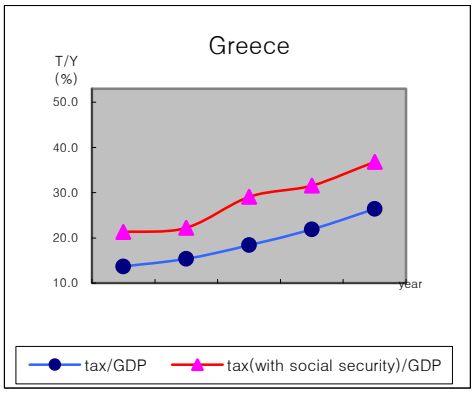

France
T/Y
(%)
50.0
40.0
30.0
20.0
10.0
year
tax/GDP
tax(with social security)/GDP

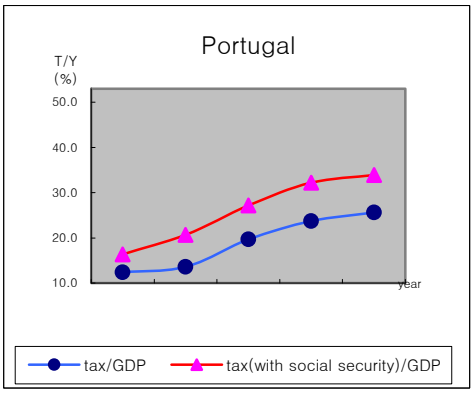

Germany
T/Y
(%)
50.0
40.0
30.0
20.0
10.0
year
tax/GDP
tax(with social security)/GDP

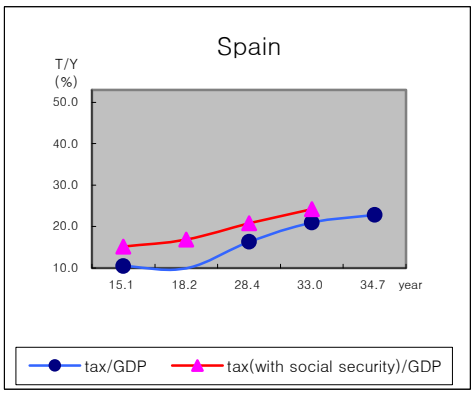

Switzerland
T/Y
(%)
50.0
40.0
30.0
20.0
10.0
1965
1975
1985
1995
2000
year
tax/GDP
tax(with social security)/GDP


Italy
T/Y
(%)
50.0
40.0
30.0
20.0
10.0
1965
1975
1985
1995
2000
year
tax/GDP
tax(with social security)/GDP


Netherland
T/Y
(%)
50.0
40.0
30.0
20.0
10.0
year
tax/GDP
tax(with social security)/GDP


Greece
T/Y
(%)
50.0
40.0
30.0
20.0
10.0
year
tax/GDP
tax(with social security)/GDP


Portugal
T/Y
(%)
50.0
40.0
30.0
20.0
10.0
year
tax/GDP
tax(with social security)/GDP


Spain
T/Y
(%)
50.0
40.0
30.0
20.0
10.0
15.1
18.2
28.4
33.0
34.7
year
tax/GDP
tax(with social security)/GDP