

The Effect of Fiscal Drag¹ on Tax Revenue and Tax Burden

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Abstract

Fiscal drag refers to the effect that inflation has on average tax rates. If tax allowances are not increased in line with inflation, and taxpayers' incomes increase with inflation, then they will be moved up into higher tax bands and so their tax bill will go up. In other words, fiscal drag refers to the increase in tax revenue caused when the threshold of a tax is not increased in line with either inflation or earnings growth.

In general, fiscal drag refers to the process where tax thresholds are either not adjusted for inflation (nominal fiscal drag), or fail to keep pace with earnings growth (real fiscal drag), causing in either case an automatic rise in tax revenues. For instance, in a progressive tax system, a rise in inflation will cause wage earners to pay a higher proportion of their income in tax, even though their real wages are unchanged; this is nominal fiscal drag. On the other hands, real fiscal drag occurs when all taxpayers pay a higher proportion of their income in taxation, as a result of rising real wages. In these circumstances, there is a rise in government tax revenues as a proportion of gross domestic product.

Fiscal drag creates uneven tax burden. Recently, OECD (2007) investigates the interaction between income, inflation and tax obligations in OECD countries. Notably, workers in several countries saw their nominal tax burden rise in response to high earnings growth. This phenomenon, known as "fiscal drag", occurs in countries where tax rates increase as nominal taxable income rises. Workers are thus forced to pay higher taxes due to inflation or after experiencing increases in real income. Despite concerted legislative efforts to ease tax burdens, such high growth in earnings in many countries pushed enough workers into a higher income bracket to create 'fiscal drag'. At present, the personal income tax thresholds in Korea are not indexed both to inflation and earnings growth. Thus, the tax rate schedule must be indexed in order to offset fiscal drag.

Keywords: fiscal drag; inflation; earnings growth; indexation

I. Introduction

¹ Literally, the word 'drag' has two different meanings. On the one hand, if something is a *drag* on the development or progress of something, it slows it down or makes it more difficult. On the other hand, to *drag* something or someone *into* an event or situation means to involve them in it when it is not necessary or not desirable.

As far as income tax is concerned, most of OECD countries seem to have had a similar experience in recent years. That is, ‘statutory rate cuts’ combined with ‘base broadening’ and/or ‘fiscal drag’ have left income tax burdens *not reduced* as a proportion of GDP. In addition, the combination of fiscal drag, base broadening and statutory rate cuts has meant that income tax revenues as a proportion of GDP or total tax revenues has changed *little* over the past 25 years across OECD countries.

For instance, Ireland is a typical example of a country in which in recent years the progressive income tax system has allowed Irish government revenues to swell due to both nominal and real fiscal drag without either increases in the tax rates or decreases in the thresholds. This is because the Ireland has experienced considerable economic growth, and this resulted in high wage inflation.

Fiscal drag describes the phenomenon whereby more people move into higher tax brackets because tax allowances and tax thresholds are not adjusted in line with inflation or earnings growth. Particularly, for the case of earnings growth, since incomes tend to rise more quickly than prices, if tax allowances and thresholds are only up-rated with prices, then over time *more people will pay tax and more of them at higher rates*.

Fiscal drag is not a trivial issue, since fiscal drag is a sly way of extracting more tax from earners while avoiding headline increases in tax rates. Over time, people pay higher average and marginal tax rates and they don’t really know why. And with these higher marginal rates come reduced work incentives, resulting in damaging effects on the economy.

Normally, with unchanged tax policies, the tax burden is expected to increase, reflecting the effects of *real fiscal drag*. Fiscal drag is a feature of the tax system which means that the total tax burden has a tendency to rise each year unless the government takes action to stop it. In addition, where taxes are indexed, only price inflation is adjusted, but the growth in earnings is not adjusted. Given that earnings tend to grow faster than prices, the result is that the government automatically collects more tax revenues each year without having to raise taxes.

In general, fiscal drag is the phenomenon appeared in the income tax. In addition, fiscal drag also occurs in other taxes where allowances fail to keep pace with underlying growth in the tax base. For instance, fiscal drag phenomenon can be seen, even on a smaller scale, for such taxes such as capital gain tax and stamp duty on properties, where the tax base tends to grow more quickly than the rise in thresholds.

We attempt to explain the significance of fiscal drag in both tax revenue and tax burden in an illustrative way, and then to obtain some policy implication to eliminate the fiscal drag. Public finance scholars often propose that government should reform tax system in a “*low tax rate and broad tax base*” way. Instead of following this fundamental principle, government seeks a different scheme: “*narrow tax band and broad number of taxpayers*”. The most widely advocated remedy for fiscal drag is the indexation of tax thresholds. However, this research will imply that the institution making fiscal policy should be transparent in order to avoid fiscal drag.

This essay is organized as follows. Section II describes conceptual definition of 4 different fiscal drags which I classify. In section III, we examine the relationship between fiscal drag and tax revenue and in turn, in section IV, we analyze the effect of fiscal drag on the tax burden based on the OECD (2007) result. Section V deals with several implications derived from the fiscal drag and some policy adjustments to offset it. Finally, section VI presents concluding remarks and further research.

II. Fiscal Drag: Conceptual Framework

In this section, we discuss briefly the mechanics and driving factors of the fiscal drag in a conceptual framework. Studies looking at the effects of fiscal drag have mainly focused on the role of inflation². The mechanisms are, however, the same regardless of whether rising earnings levels are due to inflation or real earnings growth. But, tax increases as a result of inflation are likely to be of greater concern as they may occur in the context of largely unchanged real earnings so that real after-tax incomes may decline when tax burdens go up.

Inflation reduces the real value of tax-band limits. In a progressive income tax, this pushes taxpayers with unchanged real incomes further up the tax schedule into higher marginal rates (hence the term bracket-creep). However, as greater proportions of their taxable income are taxed at higher rates, tax burdens change even for those who do not move into the next tax band. In addition, inflation erodes the real value of tax-free allowances, flat-rate tax deductions, tax credits and cash benefit. As some of these are targeted towards low-income taxpayers, fiscal drag can make tax systems *less progressive*.

² For instance, see Heinemann (2001).

Empirical results show, however, that this does not necessarily mean that they become less redistributive³. The reason is that, even with reduced progressivity, income taxes still reduce inequality as tax burdens are higher for the rich. In fact, because fiscal drag increases overall income tax revenues, the equalizing effect of income taxes is likely to be strengthened despite declining progressivity.

1. Traditional Fiscal Drag and Fiscal Dividend

The definition of ‘fiscal drag’ was first developed by the Council of Economic Advisers (1962) in the U.S. They state that “automatic stabilizers work in a fashion that may inhibit the long-run expansion of demand. As the economy moves along the potential output path with reasonably stable prices, the Federal tax system generates an increase in revenues of about 6% a year. Unless this revenue growth is offset by reductions in taxes or by increases in expenditures, it acts as a ‘fiscal drag’ by siphoning off income”⁴.

Moreover, according to Heller (1966), “in a growth context, the great revenue-raising power of our Federal tax system produces a built-in average increase of \$7 to \$8 billion a year in Federal revenues. Unless it is offset by such ‘fiscal dividends’ as tax cuts or expansion of Federal programs, this automatic rise in revenues will become a ‘fiscal drag’ siphoning too much of the economic substance out of the private economy and thereby choking expansion”⁵.

Musgrave (1989) described that “given a passive policy which holds tax rates and expenditure programs unchanged, a built-in increase in revenues leads to a rising surplus at a full-employment level of income, thereby exerting a drag on the economy”. The slowdown of the economy in the late 1950s and early 1960s was attributed to this development. Thus, a *passive* or *do-nothing policy*, which leaves tax rates and expenditure levels unchanged, is in effect *a policy of restriction* as the economy grows. This implies that discretionary action is needed to offset it. Musgrave also argued that fiscal drag can be offset through *fiscal dividend*⁶.

Income tax burdens are expected to increase automatically as a result of a progressive rate structure, coupled with an increasing growth in nominal income. Inflation tends to accelerate

³ See Immervoll (2005).

⁴ See Council of Economic Advisers (1962), pp. 72-73.

⁵ Refer to Heller (1966) and Blinder and Solow (1974).

⁶ See Musgrave (1989).

the tempo of such growth. This function of the individual income tax system is often regarded as a stabilizing effect which compensates counter-cyclically for the fluctuations in national income over changing business conditions. This is referred to as the *built-in flexibility* of taxation.

However, this flexibility does not always have a beneficial effect on the economy. In the long-run process of economic growth, it tends to depress the level of aggregate demand especially during recoveries, and to slow down the potential path of economic growth. Thus, it is generally acknowledged that the depressing effect of progressive income taxes is not desirable from the standpoint of long-term policy objectives.

Even if the distortion of inflation on income taxes can fully be offset, tax revenues grow faster than real incomes, and thus effective tax rates increase constantly. In the U.S., the phenomenon has been called the '*fiscal drag*', drawing attention to the fact that it is one of the shortcomings in the mechanism of built-in tax stabilizers in a growing economy. There are two policy measures that can cure the fiscal drag: (1) tax reductions and (2) increases in government expenditures. These remedies together are frequently called the '*fiscal dividend*', in contrast to the concept of fiscal drag⁷.

The most conspicuous characteristic of postwar tax policy in Japan is the successive rounds of annual tax reductions which occurred until the late 1970s, focusing primarily on the individual income tax. This policy seems closely related to the fiscal dividend. The Japanese government adopted 'tax reductions', rather than increases in government expenditures, as the means of making the fiscal dividend effective, mainly because it considered the tendency towards increasing tax burdens as undesirable. As a result, this policy option has prevented the level of government expenditures from expanding rapidly in the past years, and has contributed to the construction of a comparatively small government.

On the other hand, the Japanese government has not adopted any measures of inflationary correction in the income tax system in 1980s. As a result, there are two points worth noting related to the fiscal drag. First, real tax burdens rose in Japan because of bracket creep as nominal income increased. Thus, the fiscal drag was occurred, demanding a higher proportion of the taxpayers' rising money income as tax. Second, the government automatically received increasing tax revenues as a result of inflation. Thus the impact of

⁷ See Ishi, H., *The Japanese Tax System*, 1993, p. 133.

inflation on the Japanese tax system was obvious that individual income tax revenues *rose* relatively rapidly, while revenues from indirect taxes *fell* throughout the whole tax system in Japan. This represents *a switch from indirect to direct taxation*, and thus this could be regarded as an unintended byproduct of inflation in the absence of proper adjustments in Japan⁸.

2. Fiscal Drag: Nominal and Real

Fiscal drag refers to the process where tax thresholds are either not adjusted for inflation or fail to keep pace with earnings growth and thus it causes in either case an automatic rise in tax revenues. On the other hand, fiscal drag means the effect of inflation on tax revenues. If tax allowances are not kept in line with inflation, individuals pay relatively higher amounts of tax, thus dragging down post-tax incomes. Consequently, the demand for goods and services falls⁹.

In order to understand the concept, we can take an example of nominal fiscal drag as follows. Suppose a person earns \$20,000 per year and is liable to pay 20% tax on earnings above a threshold of \$5,000 per year. Then he pays $(20,000 - 5,000) \times 0.20 = \$3,000$ in tax, or 15% of income. Now suppose that due to inflation, their wage goes up by 5%, but the government only increases the tax threshold by 2%. Now he must pay $(21,000 - 5,100) \times 0.20 = \$3,180$, or 15.14% of income. The proportion of income as tax has increased and this process is referred to as '*nominal fiscal drag*'. Thus, nominal fiscal drag refers to the increase in tax revenue caused when the threshold of a tax is not increased in line with inflation.

Nominal fiscal drag is conceptually the same as the '*bracket creep*'. Bracket creep is the process by which inflation pushes wages and salaries into higher tax brackets. Progressive tax system is usually not adjusted for inflation. As wages and salaries rise in nominal terms under the influence of inflation, they become more highly taxed, even though in real terms the value of the wages and salaries has not increased at all. The net effect is that in real terms taxes rise unless the tax rates or brackets are adjusted to compensate.

⁸ See Ishi, H., *The Japanese Tax System*, 1993, p. 134-138.

⁹ This definition comes from the *Wikipedia*.

On the other hand, '*real fiscal drag*' takes place when tax thresholds are increased in line with price rises (inflation) to avoid nominal fiscal drag, but where a growing economy means that earnings rise faster than inflation, thus increasing taxes as a proportion of earnings¹⁰.

3. Modern Fiscal Drag

Finally, thresholds are as important as rates in the income tax. In recent years, increasing attention has been devoted to how many people are paying higher tax rates in addition to the overall number of income taxpayers. Much of the rise in the *number of taxpayers* and in the *number of higher-rate taxpayers* can be explained by the process of *fiscal drag*. Income tax and national insurance thresholds are increased every year in line with inflation unless the government explicitly decides to adopt measures for adjustments. But incomes tend to rise more quickly than prices, so over time an increasing number of people's incomes cross the thresholds and move into higher tax brackets. Fiscal drag is not restricted to income tax and national insurances: it applies to any tax or benefit with thresholds that increase less quickly than the 'tax base' over time. Thus, the government explicitly overrides the statutory up-rating arrangements, means-tested benefits will cover ever fewer people, while inheritance tax, for example, will capture ever more.

The rises in the number of taxpayers and in the number of high-rate taxpayers are not solely due to above-inflation income growth. Fiscal drag can be accelerated if thresholds are increased by less than inflation. For instance, this can happen if the personal allowance is frozen or the basic rate limit is frozen. Conversely, fiscal drag can be slowed if thresholds are increased by more than inflation. Moreover, the increased number of people in tax band will increase inequality in pre-tax incomes. For example, high-income people will have faster income growth than the average, while low-income people will have lower-than-average income growth. This means that the number of higher-rate taxpayers will increase even more quickly, but the total number of taxpayers more slowly, than average real income growth.

Clearly, *increases in the number of taxpayers and in the number of high-rate taxpayers increase government revenues*, both in real terms and as a proportion of GDP. To an extent, therefore, *fiscal drag can do the same job as raising tax rates*. Thus, for example, in U.K., normal fiscal drag is already built into the Treasury's medium-term revenue forecasts.

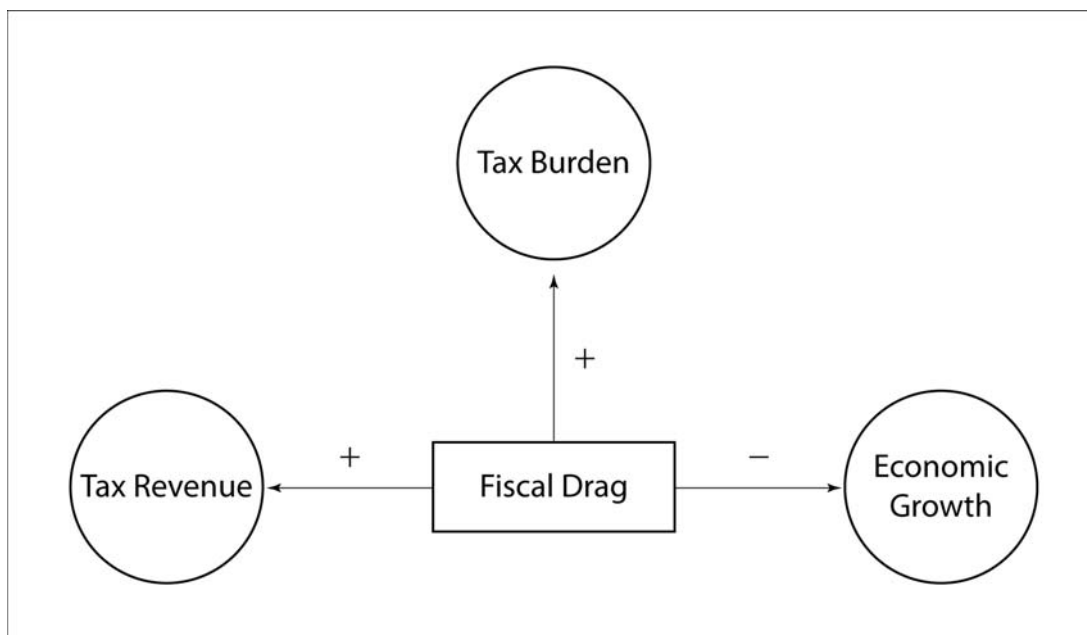
¹⁰ See the *Wikipedia*.

Taken together, the [Table 1] and [Figure 1] classify the fiscal drag based on these arguments as follows:

[Table 1] Classification of fiscal drag

Type	Cause	Solution
Traditional Fiscal Drag	Economic growth	Fiscal Dividend
Nominal Fiscal Drag	Inflation	Price indexation
Real Fiscal Drag	Earnings growth	Earnings indexation
Modern Fiscal Drag	Not adjusted to thresholds	Fiscal Transparency

[Figure 1] Effect of fiscal drag on economic growth, tax revenue and tax burden



III. Fiscal Drag and Tax Revenue

In this section, we first examine the relationship between fiscal drag and tax revenue. Tax revenues as a share of GDP tend to increase over time. In effect, tax revenues as a share of GDP have increased during the past two decades across OECD countries. There are various reasons why the ratio of taxes to national income can change. The most important of which are economic growth and discretionary tax change.

We attempt to discuss the effect of economic growth on fiscal drag. A given tax system will tend to produce tax revenues that are higher as a share of GDP during periods when the economy is running above trend output and lower when the economy is operating below trend. This is due to, for example, changes in levels of employment and profits affecting income tax and corporation tax receipts. In addition to this *cyclical* effect, there is over time a tendency for taxes to increase as a share of GDP as the economy grows. This phenomenon is known as *fiscal drag* and is partly a product of the progressivity of the tax system. Income tax allowances are normally raised in line with retail price inflation, while earnings tend to grow in real terms. As a result, more income is taxed at each rate of income tax. The government will also tend to receive more revenue in social security taxes. Therefore, the government must take into it account in its fiscal projection that in the absence of offsetting measures, the ratio of taxes to GDP will rise by, for example, 0.23% points a year when the economy is growing at close to trend rate.

Second, we examine the discretionary budget and tax measures. The proportion of national income taken in taxation is affected by discretionary changes in taxation. These can be implemented in several ways: changes in tax rates, changing the tax base and introducing new taxes.

The increase in tax revenues over time is usually influenced by the following four factors:

- (i) *discretionary budget and tax measures*: explicit net tax increases announced by the government's Budget Report.
- (ii) *real fiscal drag*: the government's decision not to raise thresholds and allowances in line with growth in the underlying tax base: for example, through not increasing income tax thresholds in line with growth in incomes.
- (iii) *economic cycle*: tax revenue is higher when national income is thought to be stronger.
- (iv) *other economic factors*, such as the composition of national income and the health of financial sector.

In particular, an important factor that contributes to boost tax receipts is the phenomenon known as 'fiscal drag'. In general, the government conventionally assumes that income tax allowances and thresholds rise in line with prices rather than earnings. However, as earnings

tend to grow in real terms over time, this definition of ‘unchanged policy’ will see revenues increase as a share of national income or GDP over time as people migrate into higher tax brackets. Acquiescing in this fiscal drag is, in effect, a *policy choice* of government. This implies that if unchecked, fiscal drag will raise tax revenues. In fact, fiscal drag is gone largely unchecked, which helps explain why the number of people paying income tax has risen and why the number paying it at the higher rate has risen.

For instance, the following [Table 2] shows the impact of discretionary policy measures (i.e., budget/tax measures) over 1997~2008 periods in U.K. In addition, it shows the decomposition into the cumulated impact of fiscal drag, the economic cycle and other economic factors on revenues of 2007/2008 in U.K.

[Table 2] Cumulated contributions to change in tax revenues in 1997~2008 in U.K.

Main factors	Impact on revenues in 2007/2008 budget (% of GDP)
Budget/tax measures	2.0%
Fiscal drag	2.2%
Economic cycle	0.2%
Other factors	-2.3%

Source: IFS, *The Green Budget 2008*, 2008.

Note: 1) The figures are cumulated number for 11 years starting from 1996/97 to 2006/07.

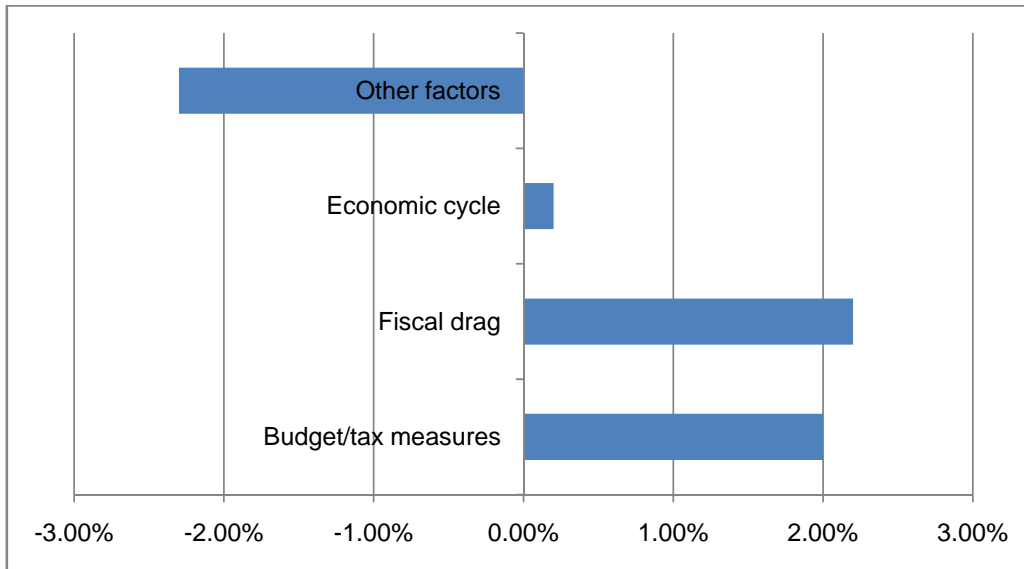
2) Fiscal drag estimated using the U.K. Treasury’s estimate of 0.2% a year.

The effect of budget and tax measures on the government revenues in 2007/2008 in U.K. was 2.0% of national income. On the contrary, the fiscal drag has increased tax revenues in a cumulate way by 2.2% of GDP in U.K. That is, by 2007/2008, fiscal drag has contributed 2.2% of national income for 11 years. In addition, the economic cycle is estimated to have contributed 0.2% a year and other economic factors have decreased revenues by 2.3% of GDP a year¹¹.

[Figure 2] Impact on U.K. Tax Revenues in 2007/2008

(Unit: % of GDP)

¹¹ Refer to *The Green Budget 2008*.



Source: IFS, *The Green Budget 2008*, 2008.

IV. Fiscal Drag and Tax Burden

In this section, we explain the effect of fiscal drag on the tax burden based on the OECD (2007) result. Changes in tax burden do not only result from policy action. But in a changing economic environment, they can also occur if policies are *not adjusted*. In particular, since tax rates depend on income levels, higher or lower earnings will alter the share of gross earnings that taxpayers are liable to pay in taxes. In a *progressive* tax system, rising earnings levels result in higher tax burdens. This mechanism is often referred to as ‘fiscal drag’.

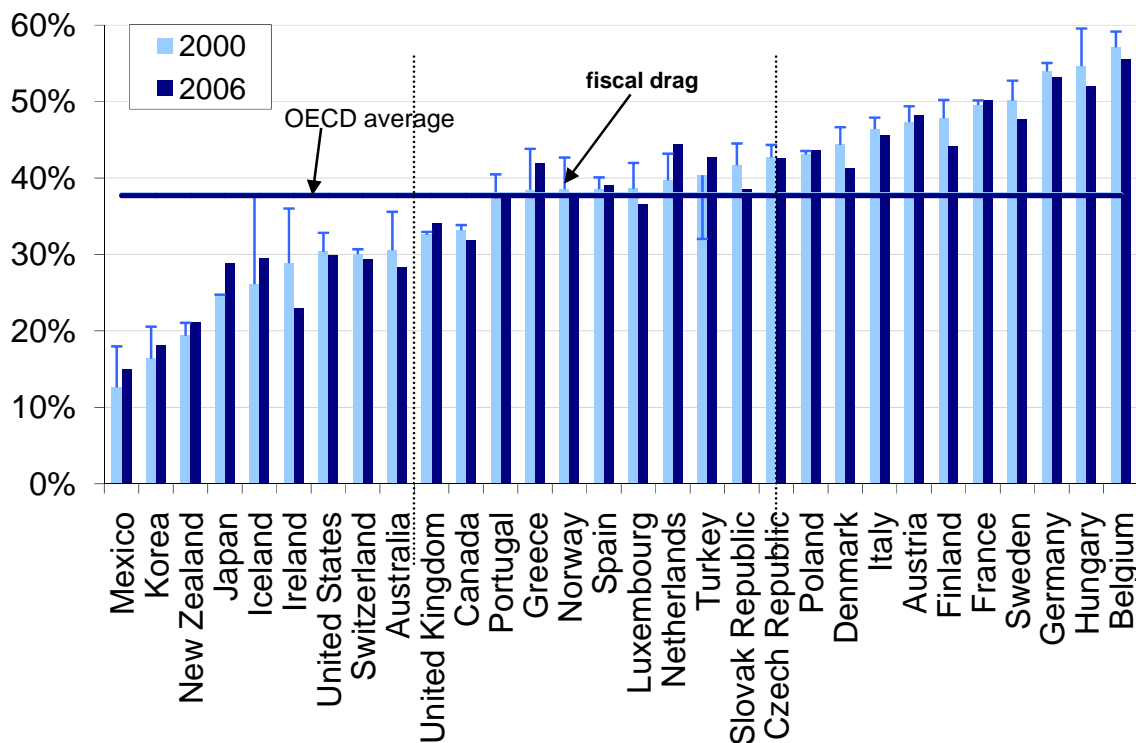
Fiscal drag tends to impact on both tax burden and tax revenue. Here, we will focus on the tax burden aspect. If the earnings of many taxpayers move in the same direction which is due to either inflation or real earnings growth, then the effect on average tax burdens and total tax revenues can be substantial and thus this must be taken explicitly into account when addressing tax policy. Therefore, we can raise one important question: whether policy must be changed or adjusted so as to offset the fiscal drag and furthermore, to what extent each government rely on the fiscal drag effect as a means of increasing tax revenues.

Inflation and real earnings growth increase the tax burden, which is often measured by the ‘tax wedge’. The tax wedge denotes the difference between labor cost to the employer and after-tax pay by the employee.

OECD (2007) uses the ‘tax wedge’ to measure the tax-burden indicator¹². The tax wedge denotes the difference between labor cost to the employer and after-tax pay received by the employee¹³. The tax wedge is expressed in percent of a measure of labor cost to the employer.

The following [Figure 3] shows both the tax wedge between 2000 and 2006 for single worker in average wage and the fiscal drag effect. First, tax wedges for a single worker earning the average wage remained unchanged on average across OECD countries. But a number of countries, such as Japan, Iceland, and Finland, observed substantial changes in tax burden between 2000 and 2006 year. Second, we can observe *significant fiscal drag effects* in some countries such as Mexico, Ireland, Greece and Hungary. In spite of these effects, tax wedge in 2006 was not substantial. This implies that these countries appear to have offset policy measures that tended to lower tax burdens for average-wage earners. In the absence of either automatic or discretionary policy adjustments, inflation and real earnings growth would have increased tax wedges by 2.6% points on average. (See the [Table 3])

[Figure 3] Tax wedge in 2000 and 2006 and fiscal drag effect: in the case of average wage for single worker



¹² See OECD, *Taxing Wages 2006-2007*, 2007.

¹³ It includes social security contributions paid by employees and payroll taxes paid by employers, and income taxes minus any family cash benefits. Thus it is a comprehensive measure.

Source: OECD, *Taxing Wages 2006-2007*, 2007.

In the above [Figure 3], the *fiscal drag effect* accounts for both inflation and real earnings growth. It is the change in tax burdens that would have been observed between 2000 and 2006 in the absence of any discrete policy measures or automatic adjustments, such as ‘indexing for inflation’. The fiscal drag effect in the [Figure 3] was added to the tax wedge in 2000. This implies that the *sum* of the fiscal drag effect and the tax wedge in 2000 represents the tax wedge that would result in the unadjusted tax system from the year 2000 for someone earning the 2006 average wage.

The following [Table 3] shows the tax-wedge change between 2000 and 2006 in the case of average wage. In most countries that saw rising tax burdens, increases in tax burden tended to fall short of the fiscal drag effect. This implies that the fiscal drag was partly offset by automatic or discretionary tax policy adjustments. In Korea, the fiscal drag effect exceeded the actual change in tax wedge. That is, the actual change of tax wedge is increased by 1.8% point in 2006, but the fiscal drag effect is 4.2% point. But three countries are exceptions: New Zealand, Japan and Turkey. In New Zealand, the tax-wedge increases of 1.7% point were entirely due to positive fiscal drag. In Japan, tax wedges went up by 4.0% point in the absence of fiscal drag. In Turkey, in the absence of counter-balancing measures, inflation was running at more than 200% over the 6 year period and this resulted in negative fiscal drag of 8.3% point.

[Table 3] Tax-wedge change between 2000 and 2006 for average wage of single worker

(Unit: % points)

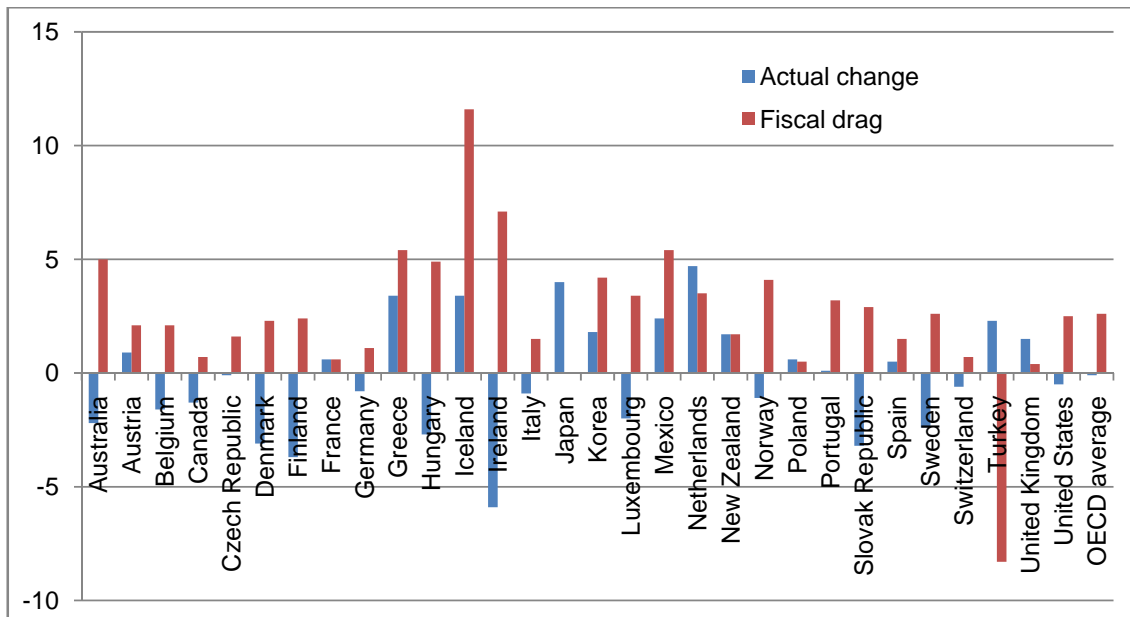
Country	Actual change	Fiscal drag
Australia	-2.2	+5.0
Austria	+0.9	+2.1
Belgium	-1.6	+2.1
Canada	-1.3	+0.7
Czech Republic	-0.1	+1.6
Denmark	-3.1	+2.3
Finland	-3.7	+2.4
France	+0.6	+0.6
Germany	-0.8	+1.1
Greece	+3.4	+5.4
Hungary	-2.7	+4.9
Iceland	+3.4	+11.6
Ireland	-5.9	+7.1

Italy	-0.9	+1.5
Japan	+4.0	-0.0
Korea	+1.8	+4.2
Luxembourg	-2.0	+3.4
Mexico	+2.4	+5.4
Netherlands	+4.7	+3.5
New Zealand	+1.7	+1.7
Norway	-1.1	+4.1
Poland	+0.6	+0.5
Portugal	+0.1	+3.2
Slovak Republic	-3.2	+2.9
Spain	+0.5	+1.5
Sweden	-2.4	+2.6
Switzerland	-0.6	+0.7
Turkey	+2.3	-8.3
United Kingdom	+1.5	+0.4
United States	-0.5	+2.5
OECD average	-0.1	+2.6

Source: OECD, *Taxing Wages 2006-2007*, 2007.

The [Table 3] and [Figure 4] show that inflation and real earnings growth would have increased tax wedges by 2.6% points on average in OECD countries between 2000 and 2006. In particular, in Greece, Iceland, Ireland, and Mexico, the fiscal drag effect amounted to more than 5% points.

[Figure 4] Tax-wedge change between 2000 and 2006 for average wage of single worker



Most importantly, the size of potential fiscal drag effects is, to a large extent, determined by the magnitude of changes in *wage levels* rather than inflation. The following [Table 4] demonstrates that, during the 2000~2006 period, average wages was increased by more than 40% in 9 countries: Czech Republic, Greece, Hungary, Iceland, Korea, Mexico, Portugal, Slovak Republic, and Turkey. This implies that in the absence of automatic or discretionary counter-balancing policy measures, fiscal drag effects would have been *sizable* in these countries. Moreover, in 5 countries of them, *inflation* was the main driving factor of higher nominal wages: Iceland, Mexico, Portugal, Slovak Republic and Turkey. But, in remaining 4 countries, real wage growth exceeded inflation: Czech Republic, Greece, Hungary and Korea.

[Table 4] Inflation and Real Earnings Growth in OECD from 2000 to 2006

Country	Change in Average Wage	Inflation	Real Average Wage Growth
Australia	32.7%	16.1%	14.3%
Austria	21.1%	10.1%	10.0%
Belgium	17.8%	13.2%	4.0%
Canada	13.5%	10.5%	2.7%
Czech Republic	43.0%	10.9%	28.9%
Denmark	17.4%	11.5%	5.3%
Finland	24.7%	7.6%	15.8%
France	17.7%	9.9%	7.1%
Germany	12.6%	9.0%	3.3%
Greece	47.9%	19.6%	23.6%
Hungary	76.5%	31.0%	34.7%
Iceland	48.9%	29.2%	15.3%
Ireland	37.8%	19.3%	15.5%
Italy	16.5%	17.0%	-0.4%
Japan	0.2%	-5.1%	5.6%
Korea	58.1%	20.7%	30.9%
Luxembourg	21.2%	14.5%	5.9%
Mexico	51.2%	37.5%	9.9%
Netherlands	23.6%	14.7%	7.8%
New Zealand	21.9%	11.0%	9.8%
Norway	33.3%	10.8%	20.3%
Poland	18.9%	14.3%	4.1%
Portugal	40.4%	19.2%	17.8%
Slovak Republic	56.3%	34.8%	16.0%
Spain	22.9%	21.7%	1.0%
Sweden	24.4%	9.3%	13.7%
Switzerland	12.0%	5.8%	5.8%
Turkey	204.1%	245.0%	-11.8%

United Kingdom	30.6%	13.0%	15.6%
United States	18.7%	14.6%	3.7%

Source: OECD, *Taxing Wages 2006-2007*, 2007.

The following [Table 5] and [Figure 5] show the link between earnings increases and fiscal drag across OECD countries. In addition, [Figure 6] illustrates a strong link between the fiscal drag effect and tax progressivity across OECD countries, where progressivity indicator is the elasticity of the total tax burden for a single worker in the base period, or 2000 year.

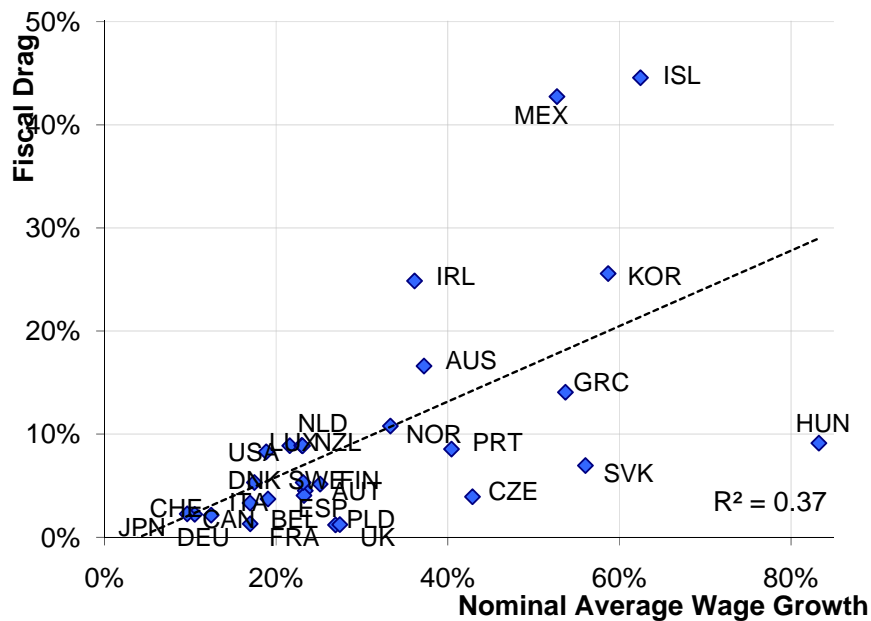
[Table 5] Earning Growth, Tax Progressivity and Fiscal Drag

Country	Change in Average Wage	Progressivity Indicator: Tax Wedge Elasticity	Fiscal Drag
Australia	0.372354	1.772865	+16.5%
Austria	0.234039	1.196391	+4.4%
Belgium	0.190557	1.288541	+3.6%
Canada	0.105103	1.19802	+2.1%
Czech Republic	0.428834	1.153765	+3.8%
Denmark	0.174654	1.488082	+5.2%
Finland	0.251354	1.355321	+5.1%
France	0.169783	1.13108	+1.2%
Germany	0.124315	1.114389	+2.0%
Greece	0.537132	1.480457	+14.0%
Hungary	0.832406	1.247093	+9.0%
Iceland	0.624635	2.357229	+44.5%
Ireland	0.3613	2.09096	+24.8%
Italy	0.169685	1.251551	+3.2%
Japan	-0.0075	1.458417	-0.1%
Korea	0.586858	1.874463	+25.5%
Luxembourg	0.215916	1.618628	+8.8%
Mexico	0.527326	2.614819	+42.7%
Netherlands	0.229744	1.389584	+8.8%
New Zealand	0.230908	1.746364	+8.8%
Norway	0.33306	1.513201	+10.7%
Poland	0.269286	1.062485	+1.1%
Portugal	0.404283	1.397931	+8.4%
Slovak Republic	0.560441	1.240724	+6.9%
Spain	0.232389	1.199677	+3.9%
Sweden	0.231568	1.331814	+5.2%
Switzerland	0.096291	1.430106	+2.2%
Turkey	-	0.601527	-20.6%
United Kingdom	0.274085	1.293796	+1.1%

United States	0.188587	1.636188	+8.2%
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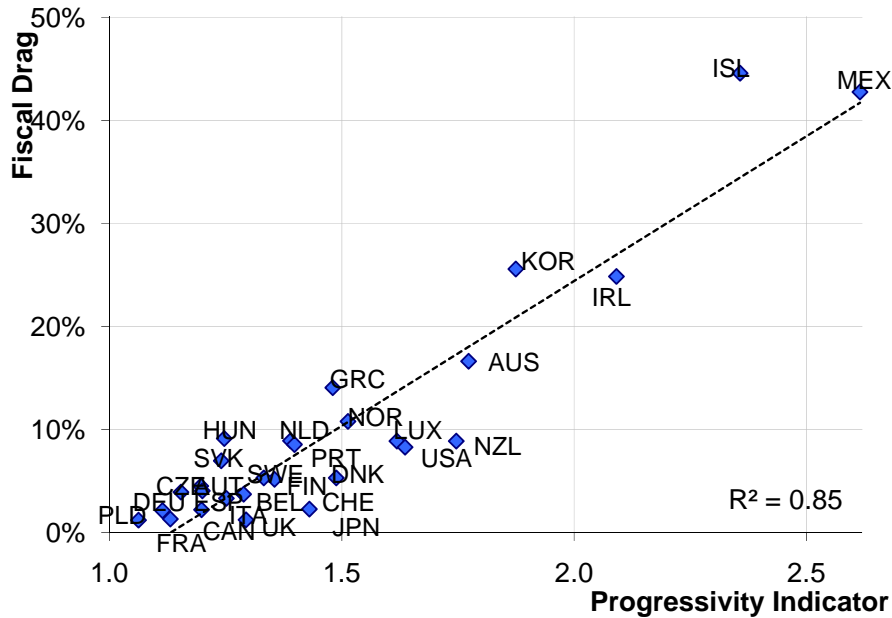
Source: OECD, *Taxing Wages 2006-2007*, 2007.

[Figure 5] Earnings Growth and Fiscal Drag



Source: OECD, *Taxing Wages 2006-2007*, 2007.

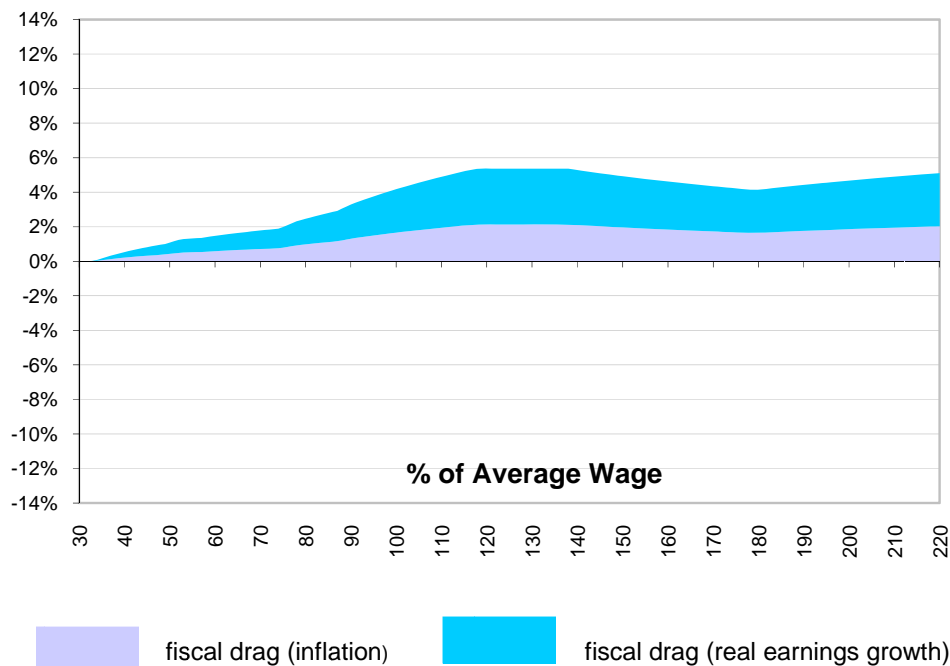
[Figure 6] Tax Progressivity and Fiscal Drag



Source: OECD, *Taxing Wages 2006-2007*, 2007.

Now, we turn to examine the fiscal drag effect in Korea from the OECD (2007) result. The following [Figure 7] shows how fiscal drag have affected tax burdens at lower, average and higher earnings levels for single individuals in the case of Korea. That is, this Figure shows tax-burden differences between 2000 and 2006 year for single individuals earning between 30% and 220% of the average wage. The horizontal axis represents earnings levels between 30% and 220% of the average wage. The outer area represents the fiscal drag effect due to real earnings growth and the interior area is the one due to inflation. In the absence of either automatic or discretionary policy adjustments, *fiscal drag effects would have caused tax wedges to rise significantly in Korea*. This phenomenon is the same as almost all OECD countries. Tax increases resulting from fiscal drag are often pronounced at lower earnings levels. The main factor driving this pattern is tax reliefs or reductions targeted to low-income taxpayers. The reason is that once earnings increase above a certain limit, these tax concessions may no longer be available for them.

[Figure 7] Tax wedge difference between 2000 and 2006 for single individuals in Korea's case



Source: OECD, *Taxing Wages 2006-2007*, 2007.

V. Some Policy Implications

In this section, we examine several implications derived from the fiscal drag and some policy adjustments to offset it.

1. Policy Adjustment and Fiscal Drag

To avoid inflation-induced tax increases, many OECD countries operate ‘automatic inflation adjustments’ that are known as *indexing*. The scope of these measures varies across countries, however, and they generally fall short of adjusting all tax-relevant amounts, thresholds, and limits¹⁴. Only three OECD countries, such as Denmark, Norway and Sweden, report that income tax schedules are regularly adjusted to changes in real earnings.

The counter-balancing measures can be used to offset the fiscal drag. The following [Table 6] shows such measures adopted in OECD countries. In Korea, we saw there are no measures to offset the fiscal drag due to either inflation or earnings growth.

¹⁴ In addition, adjustments can operate with significant time lags and may be suppressed if inflation remains below a certain thresholds.

[Table 6] Automatic and discretionary adjustments to prevent fiscal drag in OECD countries

Country	Income tax: <i>adjustments for inflation</i>	Income tax: <i>adjustments for real earnings growth</i>	Family benefits	Social contributions
Australia	No	No	Yes	n.a.
Austria	No	No	No	Yes
Belgium	Yes	No	Yes	No
Canada	Yes	No	Yes	Partly
Czech Republic	-	No	Yes	n.a.
Denmark	Yes	Yes	Yes	Yes
Finland	Yes	-	-	n.a.
France	Yes	No	-	Yes
Germany	No	No	No	Partly
Greece	No	No	n.a.	Yes
Hungary	Yes	No	Yes	Yes
Iceland	Yes	-	Yes	Yes
Ireland	No	No	Yes	Yes
Italy	No	No	No	Yes
Japan	No	No	No	-
Korea	No	No	No	n.a.
Luxembourg	No	No	Yes	Yes
Mexico	Partly	No	n.a.	Yes
Netherlands	Yes	No	Yes	Yes
New Zealand	No	No	No	n.a.
Norway	Yes	Yes	No	Yes
Poland	No	No	Yes	Yes
Portugal	Yes	No	Yes	n.a.
Slovak Republic	Yes	No	Yes	Yes
Spain	Yes	No	n.a.	Yes
Sweden	Yes	Yes	No	Yes
Switzerland	Yes	-	Yes	-
Turkey	Yes	-	n.a.	Yes
United Kingdom	Yes	No	Yes	Yes
United States	Yes	No	Yes	Yes

Source: OECD, *Taxing Wages 2006-2007*, 2007.

Thus, in order to keep revenues and their composition remain broadly unchanged as shares of GDP over the longer term, the government needs a comprehensive form of ‘*real indexation*’: this means tax allowances and thresholds must rise in line with growth in the relevant tax base which is often faster than prices.

2. Fiscal Drag as a Policy Choice

The government tends to *exploit* fiscal drag, over the short to medium term, with the increase in marginal, as well as average, income tax rates for many people. Exploiting fiscal drag is the most sensible way for the government to raise the extra revenues. But the government will not make this explicit. Therefore, this would, in effect, be a *policy choice* of the government, rather than an economically neutral assumption¹⁵.

3. Institutional Tax Reform for Fiscal Drag

On average across the OECD countries, tax wedges at most earnings levels have declined somewhat during the 2000~2006 period. While most OECD countries have implemented tax-cutting measures, such as lowering tax rates or making tax concessions more generous, these measures have not always led to the significant decreases in tax burden¹⁶.

Where the effect of measures aimed at reducing tax burdens was limited, the main reason was a *lack of regular adjustments* of tax policy parameters to higher earnings levels. In many OECD countries, average full-time earnings have increased considerably over the 2000~2006. With progressive tax systems in place, higher earnings usually translate into higher tax burdens: this phenomenon is known as ‘fiscal drag’. Unless tax systems are *adjusted* to compensate these effects, the evolution of earnings levels can have substantial effects on the tax burdens faced by employees.

Without counter-balancing policy measures, the combination of inflation and real earnings growth would have led to significant tax-wedge increases in almost all OECD countries. The fiscal drag effect is especially strong where tax systems are particularly progressive or where earnings growth has been above-average which was commonly appeared in Greece, Iceland, Korea and Mexico.

Most OECD countries employ some form of *adjustments*, such as *indexing* tax band limits for inflation, in order to prevent large tax-burden changes as a result of inflation or real earnings growth. But, these adjustments are incomplete or infrequent in most countries. As a result, the impact of tax reform that aim at lowering tax burdens in a given year can, to a large extent, offset fiscal drag effects accumulated over extended periods. In a small number of countries that observed tax burdens grow up over the 2000~2006 period, the fiscal drag

¹⁵ See IFS, *The Green Budget 2007*, 2007.

¹⁶ See OECD, *Taxing Wages 2006-2007*, 2007.

effect has, in fact, been the main driver of these developments¹⁷.

4. Price and Earnings Indexation to Eliminate Fiscal Drag

The government must take policy decisions so as to offset fiscal drag effect. To illustrate it, we take an example of U.K. case and thus we can gain some insights from the U.K. example¹⁸. In 2003-2004, the higher-rate taxpayers were 3.3 millions in U.K. The following [Figure 8] shows projections of the number of people in each income tax band in 2009-10 year under three alternative assumptions for tax thresholds: price indexation, earnings indexation and freezing. Price indexation represents all thresholds increasing in line with inflation, while earnings indexation means thresholds increasing in line with average earnings growth. Freezing is remaining the same in cash terms. First, if income tax thresholds were increased in line with earnings ('earnings indexation scenario') over 6 years from 2003-04 to 2009-10, then the number of higher-rate taxpayers would remain virtually *unchanged* over that period. Second, if income tax thresholds were increased in line with prices ('price indexation scenario'), then some 300,000 extra people would start paying income tax and more than 1 million would move into the higher-rate band compared to those of 2003-2004 year. Finally, if thresholds were frozen ('frozen scenario'), there would be 2.6 million more higher-rate taxpayers compared to those of 2003-2004 year¹⁹.

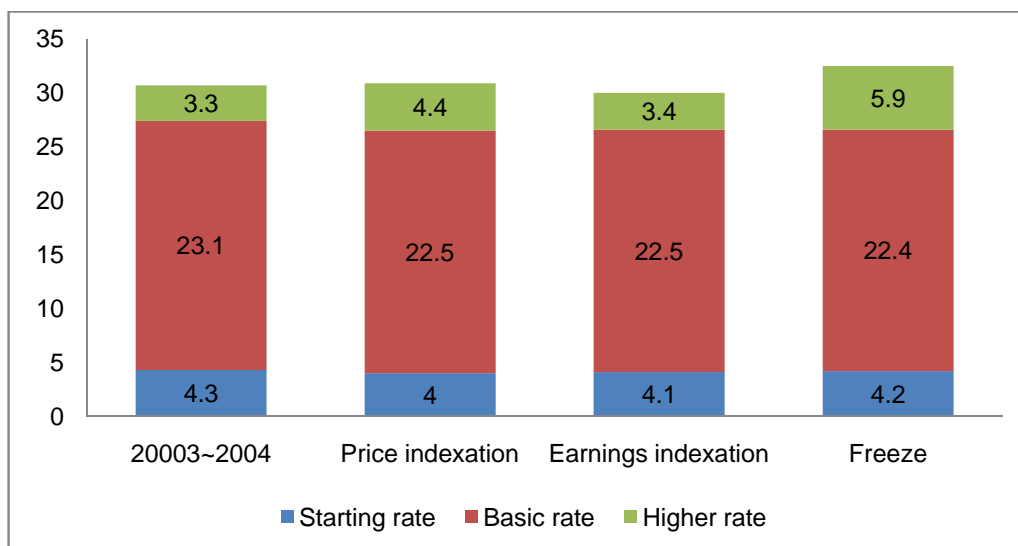
[Figure 8] U.K. number of taxpayers expected in 2009-2010: as of 2005-2006

(Unit: millions)

¹⁷ See OECD, *Taxing Wages 2006-2007*, 2007.

¹⁸ See IFS, *The Green Budget 2004*, 2004.

¹⁹ See IFS, *The Green Budget 2004*, 2004.



Source: IFS, *The Green Budget 2004*, 2004.

5. Political Dimension and Tax Transparency

Although nominal fiscal drag can easily be countered by a system of *index-linked tax brackets*, this may be politically undesirable. Many voters do not perceive the effects of fiscal drag, and so the government may prefer to adjust tax brackets manually once every few years - in effect restoring the real tax rates to their approximate pre-inflation levels, but in a way that either gives the government the appearance that they are cutting taxes, or makes the government seem like they are giving the taxpayer an additional benefit. Not surprisingly, such changes are usually made right before a general election is to be held.

6. Fiscal Forecasting and Fiscal Drag

The government should incorporate a structural increase in revenues arising from ‘fiscal drag’ in forecasting tax revenues. There is a case for presenting public finance forecasts in such a way that *unchanged* policies imply that, other things being equal, tax allowances and thresholds are adjusted to keep the tax burden constant. Specifically, in some countries, this reflects the government’s conventional forecasting assumption that tax allowances and thresholds must rise in line with prices. As earnings typically rise more quickly, this implies a continuous rise in the share of national income taken in income tax as more people find larger proportions of their income being taxed at higher rates. For instance, UK Treasury use estimates that *fiscal drag increases current receipts by 0.2% of national income, or GDP, a year*. Thus, the government uses a comprehensive form of ‘real taxation’ when projecting

some tax revenues beyond its short-term forecasting horizon²⁰.

VI. Conclusion

The number of higher-rate taxpayers tends to increase over time because tax thresholds are habitually indexed by price inflation from year to year whereas earnings normally grow by more than price inflation – a process known as ‘fiscal drag’. In order to compensate for fiscal drag, it is necessary to raise the higher-rate threshold of income tax. Otherwise, fiscal drag would increase the number of higher-rate taxpayers.

The tax burden (or increase in tax revenue) can change as result of discretionary policy measures, fiscal drag (the fact that ‘unchanged’ policies are defined in the government forecasts in such a way that they lead to a rise in the tax burden over time), the economic cycle or other economic factors (such as changes in the size and composition of national income and movements in asset and commodity prices, etc.). The government can choose to offset changes in the tax burden resulting from fiscal drag or economic factors with discretionary measures. Hence, over the medium term, all changes in revenues as a share of national income are, in effect, a *policy choice* of the government.

Over the medium term, any change in government revenues is discretionary since changes due to fiscal drag or economic factors could always be *reversed* through policy decisions of the government. For example, in order to prevent government revenues from increasing as a share of national income over time as a result of fiscal drag, the government could choose to *index tax thresholds or cut tax rates*.

At present, the personal income tax thresholds in Korea are not indexed both to inflation and earnings growth. As a result, as incomes and standards of living rise over time, a larger share of individual incomes is paid in tax even though their real pre-tax purchasing power may not have changed because of fiscal drag, implying that higher nominal incomes result in higher average tax rates.

Is it fair? It may not fair for low-income groups. Failing to account for fiscal drag by not indexing the thresholds, and especially the lower income thresholds, will affect low-income

²⁰ See IFS, *The Green Budget 2007* and *The Green Budget 2008*.

groups more in relative terms than those with higher incomes²¹. Is it efficient? It is not efficient. In general, taxes are said to invoke a degree of deadweight cost. Increasing the average tax share when people's real financial position has not changed will exacerbate this inefficiency. Then, what is a fairer alternative to it? It must introduce indexation system. The income thresholds at which the marginal income tax rates change must be *indexed* fully by real earnings growth rather than inflation in order to offset the effect of fiscal drag.

Finally, with these examinations, it might be of interest to perform the future research in two directions. First, it will be very interesting to estimate the *existence* of both nominal and real fiscal drag for different kinds of taxes and different countries by using the time series analysis. For this purpose, we can estimate the following panel equation for different tax categories:

$$\ln\left(\frac{T_{it}}{GDP_{it}}\right) = \ln\alpha + \beta_i \cdot \ln\left(\frac{GDP_{it}}{P_{it}}\right) + \nu_i \cdot \ln P_{it} + \mu_{it}$$

where T_{it}/GDP_{it} denotes the tax revenue as a proportion of GDP for country i and year t , P_{it} is price level, GDP_{it}/P_{it} is real economic growth, and μ_{it} is the random disturbance. This specification tells that tax revenues will be affected by real economic growth and inflation. From this estimation, we expect that there will be difference between tax categories.

Second, it would be more interesting to calculate the size of fiscal drag as a share of GDP. For instance, the contribution of fiscal drag in a revenue category to revenue receipts as a proportion to GDP is calculated on the basis of the elasticity of revenue receipts and growth rate (g_t) in trend GDP which is assumed to be the base for all revenue receipts. Elasticity of revenue receipts (ε_r) with respect to the tax base is calculated after netting out the impact of legislative changes from the revenue receipts. The contribution of fiscal drag to changes in structural revenue receipts is computed as :

$$FD = \frac{(\varepsilon_R - 1) \cdot g_t \cdot R_{t-1}}{NGDP_t}$$

where ε_R denotes the elasticity of revenue category R with respect to the tax base, g_t is

²¹ Buddelmeyer, H., P. Dawkins, J. Freebairn, and G. Kalb, *Bracket Creep, Effective Marginal Tax Rates and Alternative Tax Packages*, The Melbourne Institute, 2004.

the growth rate in nominal trend GDP, R_{t-1} is revenue category of past trend year, and $NGDP_t$ is trend nominal GDP. Thus, fiscal drag for a specific category arises when the elasticity of the revenue deviates from one. Kremer et al. (2006) applied this method for 6 European countries and suggested that the fiscal drag associated with a positive income change can even be *negative*. For instance, this applies to ‘excise taxes’: as they are volume-based, price increases may leave tax revenues unaffected or lead to revenue decreases while the corresponding nominal tax base would rise. Consequently, the ratio of excise taxes to the nominal trend base would decrease. The basic idea of the broader definition is to capture any change in the revenue ratio that arises automatically: that is, without changes in legislation, there will be trend growth differentials between the tax base and GDP.

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