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# The properties of the taxes on ability to pay changing in the IT period

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## I.Introduction

A tax system influences on the various aspects concerning a nation. For example, It changes the economy through the impact on investment or savings. In this paper, I focus on the taxes on ability to pay which are often utilized to levy the burden to supply the public goods, and analyze how IT influences the properties of those taxes. Needless to say, It is important to analyze its point to minimize bad influences on the various aspects concerning a nation in the IT period.

In this paper, I treat the  $S=H=S$  type comprehensive income tax, the expenditure tax in the Meade report, and the property tax on the value of the whole properties which a person possesses.<sup>1</sup> It is important to analyze these taxes, because the alternativeness between the income tax and the expenditure tax or the property tax related to the income tax or the expenditure tax is often analyzed.

In this paper, concerning the income tax or the expenditure tax, by assuming that the problems with regard to the implementation of those taxes are resolved, I theoretically analyze that point. It is the original analysis to argue the relationship between the political aspects of these taxes and IT, or argue the relationship between the various aspects of the

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<sup>1</sup> Ohata Satoshi "Syotoku ze to shisyutsu ze: syosokumen karano kosatsu" *Tohoku keizai gakkaiishi* 2005, Tohoku keizai gakkai, 2006, Ohata Satoshi "Shisan kazei: Syosokumen karano kosatsu" *Zeisei kenkyu*, Zeisei keiei kenkyujo, 2007

expenditure tax and IT. From the practical viewpoint, there are a number of those problems. For example, in the income tax, there are problems like the difficulty of the evaluation of the tax base which includes the factors like the inflational factor. The expenditure tax also has the practical problems. The problems are the followings; in evaluating the tax base it is necessary to administrate vast economic records, the problems with regard to the equity on registered assets or unregistered assets will arise, and so on. The expenditure tax has many merits. In this case, the double taxation on savings doesn't arise, or theoretically this tax brings about the administrative simplicity.

The property tax as well as these taxes is often utilized to collect the revenue. It is also true that the other aim of utilizing this tax is to amend the gap on properties between individuals. In this paper, I assume that a government levies this tax on the whole value of the properties of the individuals, and this property tax is implemented without the difficulties with regard to its implementation, and the amount of an individual's income rises in accordance with the rise of the amount of his properties.

Moreover, in this paper, I put some assumptions concerning IT.<sup>1</sup> In this paper, IT designates the electronic commerce and the IT on the administrative affairs of taxes. The electronic commerce is implemented without the difficulties like the leakage of private information.<sup>2</sup> Also, the IT on the administrative affairs is implemented without the difficulties like the of information of economic transactions.

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1 There are many homepages which present the explanation of many kinds of the evolution of IT. For example, there is the homepage in organizations like the ministry of finance in Japan. The relationship between the regional democracy and the IT is analyzed in [Sudo Osamu "Denshi jichitai to chiiki maneijimento" *Johosyori* 458, vol. 44, 4, *Johosyori gakkai*, 2003, pp. 430-431.]. The relationship between new IT and productivity growth is analyzed in [Ann Bartel, Casey Ichniowski, Kathryn Shaw "How does Information Technology Affect Productivity?: Plant-Level Comparisons of Product Innovation, Process Improvement, and Worker Skills" *The Quarterly Journal of Economics*, vol. CXXII, The MIT Press, 2007, pp. 1721-1758.]

2 The international problems are argued in the OECD committee, and so on.

As there is the limit on the number of words, the international aspects like the deduction of the burden which is taxed in foreign countries aren't taken into account.

## **II. The various aspects of taxes-on the relationship with the IT**

As there are the circumstances like the spreading e-commerce, to construct more efficient or more effective tax system, the IT over the administrative affairs like tax payment by self-assessment is spreading. Moreover, the IT in educational affairs of a private or public sector is spreading. In the United States, since the 1980s, this tendency is strengthened. This tendency is the factor which raises the productivity in the world by spreading education.

In this paragraph, I explain the relationship between the IT and the various aspects of taxes. There are various aspects over a tax.

### the aspects from economics

the motivation over working, the motivation over saving or investing, the motivation over taking risks concerning economic activities, the equity, the administrative costs, the compliance costs, the aspect from macroeconomics

### the aspects from sociology

the ladder classified by income, the pressure which promote emigration

### the aspects from politics

The support of the party with the reins of government in a democratic nation, The support of that party influenced by inflation, The administrative procedure over the taxes.

In this paper, I define that the administrative costs are the costs which the government spends on the evaluation of tax bases, and the compliance costs are the burden which the taxpayers bear in calculating the amount of the taxes.

Next I explain the criteria from the political viewpoints.

The support of the party with the reins of government in a democratic nation: The spread of the inequity of the income distribution leads to social instability. The support is declined by this point.

The support of that party influenced by inflation: If we take the inflationary factor into account in calculating the amount of the taxes, we become anxious about our life in the future. The support is declined by this point.

The administrative procedure over the taxes: For the politicians who are intended to be selected again in voting, it is desirable to give much expedience to the voters. For the bureaucrats who are intended to enlarge the administrative organizations, it is desirable to explain much expedience to the politicians. This explanation leads to the presentation of the large administrative authority to the politicians.<sup>1</sup>

We can explain the background of various plans of e-government by this third political criterion. The bureaucrats who propel them can explain much expedience to the politicians in the transitional period over tax payment by self-assessment. This explanation leads to that presentation. In this period, the politicians can explain much expedience to the voters. This situation is desirable to the politicians who are intended to be selected again in voting. Moreover, when we consider that the IT of the hardware is spreading, propelling the plans is desirable to the politicians because the voters consider that the plans have adaptability in the future society. Also, this situation with regard to the politicians leads to the good opportunity to enlarge the administrative organizations or the administrative significance which the bureaucrats are seeking.<sup>2</sup>

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1 Yokoyama Akira Zaisei no kokyo sentaku bunseki Toyokeizai shimpo sya, 1995, pp.30-31.

2 In [Ihori Toshihiro Kazei no keizai riron Yuhikaku, 2002], and so on, there is the mathematical analysis concerning the relationship between the tax system and the political factors.

The spread of e-commerce has the following effects. <sup>1</sup>As there are situations that we can participate in economic transactions through the internet from all over the world, or we can simply do economic transactions through the internet, and so on, the spread lowers transaction costs. We can get the more information about economic transactions by the spread of the internet or the network type of NPO which combines networks like the citizen or the industries. <sup>2</sup>This situation leads to the variety of goods and promotes economic transactions. Needless to say, investment is promoted, and it becomes a factor which raises GDP. GDP is also raised by the rising demand by the promotion of the industrial or administrative IT or the spread of the IT in educational affairs, and so on. Also, the motivation over saving is stimulated by the effect of promoted investment, and savings are promoted. Moreover, the pain accompanied by working is mitigated by the falling costs of economic transactions. The motivation over working or the wage is changed by this mitigation. In this paper, I consider that the personal motivation over working is raised by the spread of the IT, because this motivation is raised by the heightened efficiency concerning costs, and so on. The maldistribution of income to the rich who have many

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1 The problems of the e-commerce is pointed out in [Organisation for Economic Co-operation and Development, *Electronic commerce : opportunities and challenges for government*, Organisation for Economic Co-operation and Development, 1997, Richard M. Bird "Taxing Electronic Commerce: The End of the Beginning?" ITP Paper 0502, University of Toronto, 2005], and so on. The transactions of bills by utilizing the IT are analyzed in [Tomo Daisuke "Denshi syo torihiki niokeru kessaisyudan no genjo nitsuite" *Syokei gakuso*, vol.52,2, Kinki daigaku syokei gakkai, 2005, pp.361-370.], and so on. Also, in [Harada Tamotsu, Teramoto Yoshiya *Intanetto jidai no denshi torihiki kakumei Toyokeizai shimposya*, 1996], and so on, the relationship between the development of the e-commerce and the behavior of the consumer or the influences of its development on the social system is analyzed. The influences of the IT on the real variables of economy like price is analyzed in [Nihonginko Kinyu Kenkyujo *hensyu Denshi mane denshi syo torihiki to kinyu seisaku Tokyo daigaku syuppan kai*, 2002]. As to the IT, the tax system of promoting investment of the IT is implemented. The effect of this tax system is presented in [Kenneth Flamm *Creating the Computer-Government, Industry, and High Technology- The Brookings Institution*, 1988], and so on. The properties of the e-commerce from economics that the information is deeply spread by the e-commerce on the relationship with the property of the market, and so on.

2 [Sudo Osamu, Goto Reiko *Denshi mane Chikuma shinsyo* 1998] and so on

opportunities to earn is occurred by the factors like promoted economic transactions or promoted investments which cause “digital divide”.<sup>1</sup>This situation causes the poor to emigrate to foreign countries.<sup>2</sup>The support of the party with the reins of the government is declined by this situation. But the promotion of the factors like the previous network type of NPO leads to the amendment of that maldistribution by the amendment of “digital divide”. In this paper, I consider that “digital divide” causes the serious economic gap.<sup>3</sup>

The spread of the IT concerning tax payment by self-assessment is proceeding in governments.<sup>4</sup>By e-government, taxpayers can pay their burden from all over the world through the internet, or the administrative procedure over taxation becomes simple. This situation leads to the fall of the administrative costs or the compliance costs. Also, under the situation that the IT spreads, the promotion of residents participating in the policy making processes has the effect that the information about the tax system spreads, or the promotion of the network type of NPO causes both costs to fall.<sup>5</sup>By the situation like this one, the amount of the expedience which the politicians give the citizen decreases, or the amount of the expedience which the bureaucrats give the politicians decreases. This situation is inconvenient to the politicians or the bureaucrats from the political viewpoint of the

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1 [Nishigaki Toru IT kakumei: Netto syakai no yukue, Iwanami shinsyo, 2001, Tamaoka Masayuki Kazeisyugi no zaiseigaku Keiso syobo, 2006, p.132.] are referred. In the latter literature, the bit tax is argued.

2 [Ryokichi Hirono “Liberalisation, Information Technology and Globalisation: Impact on Cross-border Human Movements” The Journal of the Faculty of Economics Seikei University, 36.2, 2006] and so on

3 Nishigaki Toru IT kakumei: Netto syakai no yukue, Iwanami shinsyo, 2001, p.50.

4 The outline of e-tax is designated in [Ito Yoshiyuki, Okada Yukio “Kokuzei denshi shinkoku □ nozei shisutemu (e-tax) no genjo to kongo no torikumi” Sozei kenkyu 675, Nihon sozei kenkyu kyokai, 2006, Iwabuchi Hiroyuki “Kokuzei no nofu syudan no tayoka (kombini nofu no donyu)” Fainansu vol.43.10, Zaimusyo koho, 2008], and so on.

5 [Maria Manta Conroy, Jennifer Evans-Cowley “E-participation in planning: an analysis of cities adapting on-line citizen participation tools” Environment and Policy C: Government and Policy, 24, 2006 ] and so on

administrative procedure over the taxes. Moreover, as the spread of the IT concerning tax payment by self-assessment has the effect that taxpayers come not to recognize inflation, the support of the party with the reins of the government declines by this spread.

### III. Taxes on abilities to pay and IT

The tax base of the  $S=H=S$  type comprehensive income tax is defined as “ $Y(\text{income})=C(\text{consumption})+\Delta W(\text{the net accretion of the properties})$ ”. The tax base of the expenditure tax in the Meade report is defined as “ $C(\text{consumption})=Y(\text{income})-\Delta W(\text{the net accretion of the properties})$ ”. In the expenditure tax  $C$  is evaluated by this form, because we can't evaluate  $C$  by collecting the vast amount of the individual's receipts. This expenditure tax is based on the thought that the individual's lifetime income equals his lifetime consumption, and government taxes the consumption per year. This expenditure tax is a direct tax, not an indirect tax like a consumption tax.

#### 1. The income tax

The influence of the income tax on the motivation over working is uncertain. This thought is also true in general in the mathematical research. By the income tax, there is the possibility that they work hard to earn the costs for the matters like their living, or the possibility that they don't work seriously because of the reduction of their fruit. In the both cases, the spread of the IT heightens the taxpayers' motivation over working.

As to the taxpayers' savings or investment. In the income tax, the double taxation on savings prevents the taxpayers from saving or investing or taking risks concerning economic activities. As investment or savings is increased by the increased information about economic transactions by the spread of the IT, this spread mitigates the bad effect incurred by that double taxation, or the downward pressure as to GDP in the income tax is mitigated. This mitigation is occurred in the case of the rising demand by the promotion of the industrial or administrative IT or the spread of the IT in educational affairs leading to the strengthened productivity.

In the income tax, the administrative costs concerning taxation or the compliance costs are increased because of the necessity of the factors like the inflationary adjustment in calculation of the amount of the income tax. The spread of the IT concerning the tax payment by self-assessment mitigates the increase of those costs. The effect of the policy of the income redistribution by the progressive income tax is strengthened by this reduction concerning the compliance costs. The taxpayers must spend the compliance costs at the same time as the tax payment. The compliance costs are the factor which lowers the effect of that policy.

The income tax is usually progressive and mitigates the inequality of the income distribution. But, as the maldistribution of income is occurred by the spread of the IT concerning economic transactions, the effect of that policy concerning the income tax is lowered. In this case, as the motivation of the rich emigrating to the foreign countries is heightened by the mitigating effect of the income tax, the concentration of wealth to the rich by that spread mitigates this pressure of the emigration.

In the case of the income tax, as the effect of mitigating the inequality of the income distribution is the factor which leads to the heightened social stability, the support of the party with the reins of the government is heightened. But the spread of the IT concerning economic transactions which has the effect of concentrating income to the rich lowers the support of the party. Also, the income tax which has the difficulties of calculating the tax base is desirable to the politicians or the bureaucrats from the viewpoint of the administrative procedure over the taxes. But as the spread of the IT over the tax payment lowers the administrative costs or the compliance costs, the income tax becomes inconvenient to them by this spread from that viewpoint. Moreover, as the taxpayers come not to recognize the inflationary factor in the tax base by that spread, the support of the party with the reins of the government declines by this spread.

### **Mathematical explanation concerning the influence of the spread of the IT on savings or investment**

$K_0$  : At the beginning of the term, the taxpayer has the capital to investment.

$R_t$  : the profit in the term  $t$

$i$  : the discount rate or the interest rate in the market

$C_t$  : the cost in the term  $t$

$x(0 < x < 1)$  : the rate of the income tax

Under the situation without the income taxation, the taxpayer invests in the case of the sum of the discounted present value concerning  $R_t - C_t$  being over  $K_0$ . In this case,  $R_t > C_t$ . Needless to say,  $K_0, R_t, C_t$  are positive. If the government levies the tax at the same rate in all terms, that condition concerning investment is showed as the following.

$$\left\{ \frac{R_1 - C_1}{(1+i)} + \frac{R_2 - C_2}{(1+i)^2} + \dots + \frac{R_N - C_N}{(1+i)^N} \right\} - x \left\{ \frac{R_1}{(1+i)} + \frac{R_2}{(1+i)^2} + \dots + \frac{R_N}{(1+i)^N} \right\} \geq K_0 - xK_0$$

.....(1)

I show (1) as the following. ( $R'' > R'$ )

$$R' - xR'' \geq K_0 - xK_0 \quad \dots\dots(2)$$

In the (2), the effect that investment is prevented by the income tax is designated. Clearly, this criterion is more difficult one to meet the condition than in the case which they aren't taxed.

the increased information about economic transactions:  $C_t \downarrow \rightarrow R' \uparrow \rightarrow W \uparrow$

the spread of the IT in the educational affairs:  $R' \uparrow$

the increased demand by the spread of the IT in the industrial or the administrative affairs:

$$i \uparrow \rightarrow R' \cdot R'' \downarrow$$

(in the short time, the necessitated money is increased)

These effects have the effect that that prevention is mitigated. We can easily assure this point. But in the last case, the effect of this mitigation is occurred only in the case that the declining amount with regard to  $R'$  is lower than the one with regard to  $R''$ .

As the number of the words in this paper is limited, I can't designate the case of the property tax. But we can easily analyze this case like the analysis in this part.

## 2. The expenditure tax

The influence of the expenditure tax on the motivation over working is uncertain. This thought is also in general in the mathematical research. By the expenditure tax, there is the possibility that they work hard to earn the costs for the matters like their living, or the possibility that they don't work seriously because of the reduction of their fruit. In the both cases, the spread of the IT heightens the taxpayers' motivation over working.

About savings or investment. In the expenditure tax, there isn't the double taxation on the taxpayers' savings. Their savings is promoted by this property over the expenditure tax as well as by the maximization of the taxpayers' profit. This point leads to the promotion of their investment or the promotion of their taking risks. By the spread of the IT concerning economic transactions this property is strengthened. Needless to say, GDP rises. This promotion is occurred in the case of the rising demand by the promotion of the industrial or administrative IT or the spread of the IT in educational affairs leading to the strengthened productivity.

In the case of the expenditure tax, the administrative costs or the compliance costs is lower than in the case of the income tax, because in calculating the amount of the expenditure tax there isn't the necessity of the factors like the inflationary adjustment. In the expenditure tax, by the spread of the IT concerning the tax payment by self-assessment, the reduction of those costs is promoted. The effect of the policy over the income redistribution by the progressive expenditure tax is strengthened by this reduction concerning the compliance costs.

In the expenditure tax, the concentration of wealth to the rich who have many opportunities to invest their savings is occurred. This property is strengthened by the spread of the IT concerning economic transactions. Also, as, in the expenditure tax, the effect that the inequality of the income distribution rises leads to the effect that the poor emigrate to

foreign countries, this spread which causes the concentration of income to the rich promotes the latter effect.

As the effect of wealth concentrating to the rich is the factor which leads to the promotion of social instability in the expenditure tax, the support of the party with the reins of the government is lowered. Also, the spread of the IT promoting the effect promotes the decline of the support. Moreover, in the expenditure tax which is simpler over the calculation of the tax base than in the case of the income tax the expenditure tax is undesirable to the politicians or the bureaucrats in the aspect of the previous administrative procedure over the taxes. The spread of the administrative IT over the taxes which lowers the administrative costs or the compliance costs promotes this situation. As to the inflationary criterion this IT doesn't have the effect of mitigating the bad influence on the support of that party.

### **Mathematical explanation concerning the influence of the spread of the IT on savings or investment**

$x'$  ( $0 < x'$ ) : the rate of the expenditure tax

The other marks are the same one as the case of the income tax.

Under the situation without the income taxation, the taxpayer invest in the case of the sum of the discounted present value concerning  $R_t - C_t$  being over  $K_0$ . In this case,  $R_t > C_t$ . Needless to say,  $K_0, R_t, C_t$  are positive. If the government levies the tax at the same rate in all terms, that condition concerning investment is showed as the following.

$$\left\{ \frac{R_1 - C_1}{(1+i)} + \frac{R_2 - C_2}{(1+i)^2} + \dots + \frac{R_N - C_N}{(1+i)^N} \right\} - x' \left\{ \frac{C_1}{(1+i)} + \frac{C_2}{(1+i)^2} + \dots + \frac{C_N}{(1+i)^N} \right\} \geq K_0$$

.....(3)

I show (1) as the following. ( $R'' > R'$ )

$$C' - xC'' \geq K_0 \quad \dots\dots(4)$$

The criterion concerning the decision of investment becomes hard by the expenditure tax. But as in the expenditure tax there isn't the double taxation on savings, savings to invest is promoted in contrast to the case of the income tax. In this case, the number of the opportunities of investment based on (3) is larger than the case of its tax, and the economic growth is promoted by this situation.

the increased information about economic transactions:  $C' \uparrow \cdot C'' \downarrow$

the spread of the IT in the educational affairs:  $R_t \uparrow, C_t \downarrow$

the increased demand by the spread of the IT in the industrial or the administrative affairs:

$$i \uparrow \rightarrow C' \downarrow \cdot C'' \downarrow$$

(in the short time, the necessitated money is increased)

These effects have the effect that the previous hardness of the criterion is mitigated. We can easily assure this point. But in the last case, the effect of this mitigation is occurred only in the case that the declining amount with regard to  $C'$  is lower than it with regard to  $xC''$ .

### 3. The property tax

In the case of the property tax, the bad influence on the motivation over working is a little thing, because this tax is applied to the taxpayers' past effort. By the spread of the IT, the effect is mitigated. In this tax, the influence on the motivation over saving or investing is uncertain. If this tax has the bad influences on the motivation, the spread of the IT mitigates its bad influences. As to the motivation over taking risks, this spread which raises the opportunities of increasing profits mitigates the bad effect on the motivation by the property tax.

About the administrative aspect. Though the difficulties in calculating the tax base increase the administrative costs or the compliance costs in general, the property tax is utilized to mitigate income distribution or achieve the equality of opportunity or make up with the income tax. This tax is suitable to the vertical equity. The spread of the IT in the administrative affairs over taxes mitigates that difficulties, and this effect lowers these costs. Though the compliance costs have the effect of lowering the effect of mitigating the gap over the property or the income between the taxpayers by this tax, the lowered compliance costs have the effect of mitigating the effect of the compliance costs.

About the property of this tax from the macroeconomics. In the property tax, there are the following properties; the property tax on physical properties causes the tendency that the taxpayers have their properties not as physical properties but as money or monetary properties, in the short term we don't know whether the property tax raises GDP or not, and so on. The spread of the IT concerning economic transactions strengthens the latter property. Also, the factors like the increased demand by the spread of the IT raises GDP.

About the properties from the sociological aspects. In the case of the property tax, this tax has the effect of making the rich have the motivation of emigrating to foreign countries due to its effect of mitigating the gap between the taxpayers' properties or their income. This effect becomes low by the spread of the IT concerning economic transactions, but by this IT the motivation of the poor emigrating to foreign countries rises.

About the properties from the political aspects. The support of the party with the reins of the government is heightened by the function of mitigating the gap in the property tax, and the support is lowered by the inflationary rise which influences on the tax base. The gap is increased by the spread of the IT concerning economic transactions, and the function of the property tax is weakened by this IT. That is to say, by this IT the rising support of that party by this function of the property tax is lowered. Also, from the viewpoint of the administrative procedure over the taxes, by the difficulties of calculating of this tax base this

tax becomes desirable to the politicians or the bureaucrats, but the spread of the IT over the tax payment by self-assessment decreases the expedience and comes to be the factor of lowering this desirability. Moreover, the taxpayers come not to recognize the inflationary factor in the tax base by this IT, and they come to support that party.

#### **IV. Conclusion**

In this paper, I insist that the spread of the IT has many demerits from the sociological or political viewpoints, but this spread has many merits like the achievement of the efficient administration, the promotion of the economic growth, and so on. As I explained in the introduction in this paper, some economists have been paying attention to the expenditure tax as the more efficient tax than the income tax. Though the expenditure tax has many practical demerits, that spread promotes the merits in the expenditure tax. I think that we should dwell the way of utilizing this tax.

In this paper, I explain that that spread promotes the inequality of income distribution by which the social instability is incurred. I also think that we should dwell the way of resolving this problem.