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Internalizing the Social Value of Employment :
A New Approach to Employment Policy in a Globalized Economy

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Abstract

In modern societies, employment has not only economic functions, such as income creation, but also social functions, such as alleviating inequality or enhancing social stability (high unemployment threatens social stability). Since utilities stemming from the social functions of employment cannot be exclusively enjoyed by the firm making the employment decision, externalities arise in the firm's employment decision.

Even without employment's social function, employment externality can arise when there is government expenditure against unemployment and/or deficient aggregate demand with involuntary unemployment. Particularly, corporate globalization raises the possibility of employment externality as it brings about discrepancies more often between private firm's profit maximization and national economy's welfare maximization.

Existence and properties of employment externality offers a new rationale and means for employment policy. Since a precise estimation of the scale of externality is extremely difficult, a practical remedy for externality is a 'standard and price' approach where a socially agreeable target (standard) is set and an appropriate subsidy or tax (price) is implemented to attain the target (Baumol and Oates 1971). We can think of two kinds of policy based on such an approach: a price-setting policy (carbon tax type) and a quantity-setting-flexible-price policy (emission trade type). Since the latter type policy seems to be more appropriate for our case, this paper introduces and investigates the 'employment credit trading system (ECTS)', a tradable-credits approach to employment targeting. Under this system, firms that hire

employees are given the right to issue a corresponding quantity of employment credits, which they could then sell on the credits trading market. Firms that lay off their workers would be required to purchase the corresponding credits. The government would administer a market for trading employment credits and participate in the market as a credit consumer by setting a job creation target. The price of credits would be determined by market supply and demands for credits that reflect the labor market conditions and government's job creation target.

ECTS seems to have several comparative advantages over existing policies. First, as the tradable-permits approach is theoretically proved to be a social-cost-minimizing policy for emission control, ECTS can be a feasible social-cost-minimizing policy for employment targeting under certain conditions. Second, it will be fiscally more efficient than existing policy such as fiscal stimulus: creating jobs with a smaller budget. Third, it can be a 'smart' job creation policy: an employment targeting policy with high precision and less risk. The government can achieve the employment target accurately with ECTS. It has only to adjust the bid price of employment credit so that its credit demand is met. In addition, since fiscal input is exactly proportionate to the size of job creation in ECTS, there will be no possibility of fiscal squander. Fourth, it seems to be able to address better structural unemployment issues such as ones stemming from globalization and/or automation than existing policies. Fifth, it can also address quality of jobs by setting the unit of credit as a job with a certain amount of wage, say, a full-time equivalent job with minimum wage.

If the policy proposed here is as practically feasible as examined theoretically, then it may lead to a broader notion of employment-centered economic policy. Employment targeting by means of

employment credit trading may become one of two pillars of macro stabilization policy along with inflation targeting by monetary policy. Employment-centered economic policy where policy authority puts more emphasis on managing unemployment than aggregate demand or income growth can be a better option in the sense that it can ensure not only efficiency, but also some degree of equity.

Ⅰ. Introduction

Most countries view full employment as one of the chief goals of economic policy. The presumption behind this view is that policies can affect private employment. This idea, however, has a relatively short history.

Nicholas Kaldor, the 20th century economist, observed that the idea of full employment as one of a government's chief responsibilities can be traced back only as far as the post- Second World War era, when the economic principles of John Maynard Keynes entered mainstream discussion. This is not to say that governments were unconcerned with employment issues before that, but prior to the emergence of Keynesian economics, few argued that governments had much of a role to play in increasing private sector employment. A clear illustration of this mindset can be seen in comments by former British Prime Minister Neville Chamberlain, who, during his term as Chancellor of the Exchequer in the 1930's, remarked that trying to influence employment was as foolhardy a task for a government as trying to control the weather.[1] It was in this context that Keynesian economics emerged, with a growing sense among governments that it was possible to achieve full employment through economic policy. Full employment was regarded not just as a major eco-

1) Kaldor (1980), p. 97.

nomic policy goal, but also as one of a government's chief obligations.

In recent years, however, this belief has been challenged by worldwide unemployment that has remained high despite intensive efforts by various nations to stimulate their economies and create jobs in the wake of the global financial crisis of 2008~2009.

In terms of income, the global economy as a whole has largely recovered from the recession that came after the U.S. financial crisis, and GDPs have been passing pre-crisis levels in most countries except a few advanced economies. Employment has remained slack, however, with unemployment levels still exceeding pre-crisis levels in most countries. According to the 'World Employment Outlook' recently published by OECD, average unemployment rate for OECD member countries as of April 2013 is still around 8%, with the ranks of the unemployed up by as much as 50% from the pre-crisis year 2007.[2] Korea's official unemployment rate is relatively low – in the 3~4% range – but it too suffers from a serious lack of jobs: as of July 2013, the rate of unemployment, including underemployment and those who have given up on finding work, was about 7%, and youth unemployment was above 8%.

The failure to break through this severe hiring slump, despite concerted policy efforts to increase jobs, seems ultimately to suggest limitations with current policy approaches. In more concrete terms, these limitations appear to stem from two main situations. The first is a worsening policy environment,

2) OECD (2013), p. 20.

the combined product of recent economic conditions and characteristics of established policy approaches. For the most part, existing job creation policies have required massive financial outlays, and as public finances in most countries have deteriorated in the wake of the global financial crisis, the high costs of employment policies and the financial risks attendant on their failure have functioned to severely hamper such an approach. Indeed, these constraints have had the effect either of preventing policy implementation or of diminishing its scale.

A second factor is the weakening of policy effectiveness, particularly due to globalization. Higher levels of offshore production and trade dependence have undermined the link between policies and job creation at home in advanced economies. Higher trade dependence has lowered policy's income creation effects as more of them are lost overseas, while globalization of production has undercut the process through which the created income and demand leads to higher domestic employment. Theoretically, the Mundell-Fleming model shows that fiscal stimulus' income creation effect (and accordingly job creation effect as well) is reduced in an open economy.

As unemployment remains high despite the policy efforts, phenomena similar to a return to Chamberlainian thinking have emerged recently. With the growing skepticism about the ability to solve unemployment through economic policy, a tendency to leave the matter to be addressed through an overall economic recovery and focus on other issues, has become more prevalent in several advanced economies.

High unemployment, however, is too serious an issue to be

dismissed because of the limitations of established policies. Addressing unemployment is important as its effects are visited most harshly on relatively low-income class – people with no option but to depend on wage income. This is especially true at a time when the most economically vulnerable segments of the population are bearing the brunt of the hardship.[3] Just as an ill patient demands a new method of treatment if the old ones do not work, so an employment slump that persists despite the policy efforts to solve it demands a new policy approach.

Keynes once said that it was harder to abandon old ideas than to discover new ones. The British economist ushered the world out of the Chamberlainian era, when people believed it impossible for governments to solve unemployment, and into a golden age of postwar capitalism with his prescription for policies aimed at full employment. But under a combined assault from the onward march of globalization and deteriorated post-crisis fiscal conditions, the current policy approaches, Keynesianism included, are failing to achieve a breakthrough on employment. Such a situation demands not a rejection of the policy efforts and a return to Chamberlainian thinking, but proactive efforts to find alternative approaches to overcome the problems of current policies.

Any new alternative aimed at resolving the low employment problem must be capable of both acknowledging and transcending the limits of the current policies. In an environment of intensified fiscal constraints, new policies need to be able to do more with

3) Ibid., p. 21.

less – that is, to create more jobs with fewer financial resources. Also, given the weakened political support for such policies, any policy ideas will have to be capable of minimizing uncertainties about their effectiveness and risks of failure. Finally, the new employment policy approach must be able to respond to the employment issues that are associated with globalization. As a phenomenon in which firms are engaging in production at a global level rather than that of the national economy, globalization increases the risk that firms' efforts to maximize profits will come into conflict with policy authorities' efforts to optimize the national economy. An employment policy approach that is responsive to globalization must be structured to control the global pursuit of profits by businesses in such a way that it coincides with optimization from the perspective of the national economy.

The aim of this study is to develop new policy alternatives aimed at job creation. The framework, as indicated in the title, is one of incorporating the social value of employment into business decisions in that area. The research here shows that situations may frequently occur in which the social benefits of job creation are significantly larger than the private benefits to be gained from employment by the decision-maker. The result is potentially a situation where the employment level determined by the market falls short of the optimal level from a social perspective. In this case, an employment level close to the social optimum can be achieved through policies aimed at incorporating the social value of employment into businesses' hiring decisions. This perspective offers a new theoretical underpinning for employment policy. Perhaps more importantly, it can also contribute

to efforts to find new policy approaches that are more effective than the current ones. The latter section of this paper outlines some specific policy ideas from this perspective, suggesting that they may have a comparative advantage over the old ideas in terms of their efficiency of resource use, reduced risk of failure, and responsiveness to globalization.

The ideas about employment externalities and their policy implications that are presented in this paper have been developed and expanded from previous papers by the author (2008, 2010). While the overall idea of employment policy as a method of compensation for employment externalities follows along similar lines, comprehensive revisions and additions have been made in terms of the detailed principles for deriving externalities, the specifics of the policy plans, and the estimation and comparison of policy effects.

The paper consists of two main sections. The first, consisting of Chapters Ⅱ through Ⅳ, is focused on the social value of employment, employment externalities, and the theoretical principles for employment policy to be inferred from them. The second, consisting of Chapter Ⅴ through Ⅶ, examines specific ideas for employment policy based on this theoretical perspective. Chapter Ⅴ offers policy ideas, while Chapters Ⅵ and Ⅶ examine their predicted effects and offers a comparison with current policies in terms of their strengths and weaknesses.

Ⅱ. Two Functions of Employment

This section starts from one fundamental question about employment policy.

In the modern economy, most governments devote policy efforts and resources to increasing employment. This is true even for countries with an economic system based upon market principles. The question that arises, then, is why the governments are committing such effort and resources to raising employment.

The first answer may be that a direct link exists between employment and income. In economics, higher levels of income mean greater utility, other things being equal. Even under market capitalism, there are cases that policy interventions produce higher income levels than those without such intervention. Thus, government efforts to increase employment may be justified if the policies bring about higher income levels by means of higher employment. From this perspective, employment policy (policies to increase employment) may be regarded primarily as efforts to increase income by means of employment. It can be said that employment policy is justified when addressing employment is a more efficient way to increase income than directly addressing income.

However, it can hardly be said that all of the job creation policies actually seen today are of this nature. A clear illustration can be found in the case of 'jobless growth'. If the main interest

for policymakers would be whether and how much income levels are growing, and employment was regarded as merely a mean or a sub-indicator for income, then whether the growth is "jobless" or "with jobs" would be of no concern for policymakers. Jobless growth might be a topic of academic interest for economists, but not an issue worthy of policy attention. Obviously, this is not the case in reality.

Besides the example of jobless growth, there seems to be several cases in which employment is viewed in today's economy not simply as a sub-indicator for income, but as a variable almost equal in importance to income or economic growth. One well-known example can be found in the Federal Reserve Board of the United States, where full employment is stated as the first of its monetary policy goals.[4] The Full Employment and Balance Growth Act of the United States is another example, which lists full employment as the first of four targets of government economic policy.[5]

In this light, policy authorities would seem to be assigning a value to employment far beyond its significance as a determinant for income. The question, then, is in what regard employment holds such value. It will be argued here that the reason can be defined in terms of employment being a key variable in social stability.

A number of factors can be cited in attributing these effects to

4) "Conducting the nation's monetary policy … in pursuit of full employment and stable prices.", www.federalreserve.gov/faqs/about_12594.htm, "What is the purpose of FRB?"

5) United States Congress, Pub.L., 95-523.

employment. First, employment in modern society has meaning beyond simply providing the means for subsistence. Rather, it is seen as one of the chief channels through which the individual interacts with society and realizes the self. Likewise, the loss of employment has negative effects on the individual that go far beyond the loss of associated income. Indeed, many studies measuring subjective utility have shown that loss of employment produces disutilities that far outweigh the lost utility from the income (Clark and Oswald, 1994; Oswald, 1997; Winklemann and Winklemann, 1998; Blanchflower and Oswald, 2004; Layard, 2005). This function of employment arguably holds even greater value in modern society, where families are increasingly nuclear, and local communities are weakened.

Second, employment functions as an effective means of alleviating income inequality and relative poverty. Though they may differ in degree, all capitalist economies have policies or systems in place for redistribution. These are based on the notion that when the distribution is solely left to the market mechanisms, inequality runs the risk of exploding to levels that threaten the very sustainability of society. In that sense, economic policies aimed at redistribution typically function to promote social stability and sustainability (or, as Polyani might put it, to "save society from the market"). The importance of such policies is increasing in the modern economy, as can be seen in the fact that welfare budgets account for the largest portion of government spending in most of the advanced economies. Yet employment – that is, the creation and supply of jobs – is still the single most effective means of guaranteeing welfare, at least for people who

are capable of economic activity. Academics like Hyman Minsky have contended that the answer to eradicating poverty and guaranteeing welfare must be sought not in conventional welfare policies, but in policies aimed at full employment.[6] In short, employment is an effective means of controlling inequality and poverty that can have a crucial impact on the degree of stability in a given society.

Third, the distinctiveness of employment in terms of its social functions is borne out by historical example. Historically, markets for labor, land, and currency appeared far later than the typical goods market, and, in particular, the labor market emerged the latest among them.[7] This delay was attributable to the strong resistance to the notion of marketing of labor. Such widespread resistance to the marketing of labor occurred because labor is "not produced for sale" like conventional commodities, to borrow Polanyi's words, and "cannot be separated from other realms of human activity". Thus, if the market mechanism was made "sole director of the fate of humans", the result would be tensions beyond the power of any society to endure.[8] The argument, then, is that society needs some complementary mechanisms for its own survival to protect labor from the market. Institutional or customary means of controlling the marketing of labor continue to exist broadly in modern economies, differing only in degree; examples include the various policies aimed at

6) H. Minsky (2013), *Ending Poverty: Jobs, not Welfare*.
7) See Ch. 6, "The Self-Regulating Market and the Fictitious Commodities", in Polanyi, K. (2009; Korean trans. by Gi-bin Hong).
8) Ibid., pp. 243-244.

protecting employment, assisting the unemployed and promoting employment. These facts – the fact that resistance to marketing was strongest in terms of labor than any other area of the economy, and the fact that systems to supplement or control the marketing of labor exist widely – can be interpreted as a reflection of the particularity of labor and employment. In other words, they may be seen as saying that non-market or social functions are present to a greater degree in labor or employment than in any other area of the economy.

If employment is construed in these terms-as a crucial variable influencing social stability-then employment policy can be described as having two functions. The first is the generation of income through the use of idle resources (i.e., hiring of the unemployed). This is the policy stratum aimed at boosting financial efficiency. Such functions are possessed by most economic policies, while employment policies are used in cases where the effective means of promoting efficiency lie in employment. The second function consists of policies geared toward boosting social sustainability and stability. Employment policies of this kind largely overlap in function with social service policies, as with the effectiveness of employment in reducing inequality and poverty. In that sense, such policies can be described as possessing some level of welfare policy function. But the second layer described here covers a broader scope than can be explained purely in terms of such welfare functions. As an example, the above characterizations of employment as a window for the individual to encounter society, or an avenue for achieving self-realization, represent functions beyond those of the typical welfare policy.

For convenience, these two functions of employment policy can be defined as "economic" and "social". The economic function involves boosting economic efficiency and generating income through the use of untapped resources, while the social function involves contributing to social stability and unity, with some welfare policy functions included. In both cases, employment policy assumes great import – boosting financial efficiency on one hand, stabilizing and uniting society on the other. It is in this sense that it seems most distinct from other economic policies. The two functions may be present there too, but it is generally the case for other economic policies that one function is emphasized to an overwhelming extent, while the other is only minimally present. Welfare and redistribution policies, for example, are socially centered, while the majority of other economic policies are more purely economic (i.e., oriented toward boosting efficiency). The distinctiveness of employment policy arguably lies in the way that it responds simultaneously to both functions (growth / equity or economic efficiency / social stability, to simplify somewhat grossly) and accounts for an important part of each.

A clear understanding of the two functions, or of the peculiarity they create in employment policy, may help to develop a new perspective for a theoretical basis or specific policy measures. The next section will examine this aspect in more detail.

Ⅲ. The Social Value of Employment and Externalities in Employment Decisions

It was observed above that employment has both an income creation function (economic function) as well as a function of contributing to sustainability/stabilization of the society (social function). Unlike the utility from income creation, however, the utility from social stability cannot be the exclusive property of any special economic agents within a society; the benefits (and burdens) must be shared by all members. In other words, the social function of employment produces social stability that is enjoyed by society as a whole, which might be termed, "employment's social value (in the narrow sense)[9]".

The very fact that this social value is not excludable means that it may give rise to externalities. For example, a firm that hires new workers or lays off existing ones causes changes to the level of employment and the total amount of social value, but the effects from these changes redound not just to the firm making

9) The "social value in the narrow sense" here is intended to distinguish it from the broader sense of social value that will be discussed later. Social value in the narrow sense is the result of employment's social stabilization function. This is the concept for all discussions of social value in Chapter Ⅲ, if it is not otherwise stated. As will be discussed in Chapter Ⅳ, employment may be accompanied by financial externalities, as in times of recession, and social value in the broader sense can be understood to encompass both the narrow sense of social value as well as these externalities.

the employment decisions, but to all members of society. The existence of such employment-related externalities creates the possibility that the level of employment determined in the market may differ from the optimal level of employment for a given society, when employment's social value is taken into account. This fact may offer some new basis for employment policies in the perspective of correcting externalities and bringing employment closer to the social optimum.

This section provides a basic theoretical model for deriving employment externalities from the social value of employment. This model also helps to identify certain properties of employment externalities.

1. The Principle of Employment's Social Value and Employment Externalities

In order to develop a utility function that reflects the social value of employment, the following assumptions are made:

A1) Individuals prefer social stability.

Here, the individual utility function is a monotonically increasing function of social stability. Marginal utility from social stability declines as utility from other variables does.

A2) Unemployment negatively affects social stability.

The extent of social stability at a given time can be expressed as a monotonically decreasing function of the average unem-

ployment rate in the society over the period including the given time.[10)]

Under the above assumptions, a firm's decisions to hire or fire employees impact social stability through their effects on the unemployment rate of society. And, since the utilities from social stability are not excludable, the employment decisions consequently affect every individual's utility. In this sense, a firm's employment decisions in such a society produce externalities. This principle may be explained more easily by way of analogy to the well-known example of externalities; greenhouse gas emissions associated with corporate production activities.

To start, the effects of the firm's actions in both cases (social stability / changes in greenhouse gas levels) are not confined to the firm alone, but must be shared by all members of society. In other words, both effects of corporate activities are characterized by non-excludability. Second, this non-excludability is compounded by the low level of influence that any individual firm exerts from its own actions on the social stability/greenhouse gas level

10) The same ideas can be expressed with more or less equivalent meaning through the following two assumptions:
A1') Individuals seek to avoid employment insecurity and prefer employment stability. Thus, the individual's utility function is a monotonically increasing function of employment stability.
A2') Employment instability is proportional to the likelihood that an individual will enter a state of unemployment. Thus, the extent of employment stability at a given time is a monotonically decreasing function of the average unemployment rate for a set period that includes the time.
For these assumptions, the discussion in this paper applies when "social stability" is substituted with "employment stability".

for society as a whole. Indeed, the firm is likely not to feel any incentive to reflect the effects of its employment or production decisions on society at large (even if the firm, like other members of society, might personally prefer social stability and dislike increases in greenhouse gas emissions).

Strictly speaking, the first aspect alone is enough to account for the externalities that arise. The significance of the second aspect lies in that it amplifies these externalities. For the sake of convenience, these externalities from firms' employment decisions will henceforth be referred to as "employment externalities".

Employment externalities possess certain features that distinguish them from the above example of environmental pollution. First, they have a dual aspect owing to the symmetry between hiring and firing decisions. Hiring decisions produce positive externalities, while laying-off decisions produce negative externalities. Also, the size of externality in hiring a worker should be the same with an opposite sign as that in laying-off a worker.

Second, the extent of the employment externalities varies counter-cyclically. The effects that hiring or firing has on individuals' utility levels through the changes in social stability increase when employment is sluggish. Two reasons can be given for this. First, the marginal utility from social stability diminishes. Second, the effects of firms' employment decisions on the average unemployment rate vary inversely with economic conditions. As economic conditions worsen, the average duration of unemployment increases, and the impact of hiring

or firing decisions on social stability will grow. In the classical labor market, where the labor market clears instantly and the average duration of unemployment is close to zero, the effects of an individual firm's employment decisions on the average unemployment rate, as well as the size of employment externalities, will become negligible. Besides, the closer a society is to full employment, the greater the likelihood that the effects of an individual firm's employment decisions will manifest less through changes in the unemployment rate than through changes in working hours. For instance, in a full employment situation, a firm's hiring decisions will be manifested as an increase in career changes by the employed or the number of people holding two jobs, rather than an increase in hiring of the unemployed (and thus a drop in the unemployment rate). Conversely, when the unemployment rate is high, a firm's hiring or firing decisions are very likely to be reflected through changes in the unemployment rate.[11)]

2. A Mathematical Model of Employment Externalities

Based on the aforementioned assumptions regarding the social value of employment, this section attempts to provide a basic mathematical model for the occurrence and characteristics of employment externalities.

11) Additional support for the counter-cyclical variation of externalities can be found in empirical findings showing that the unit costs of unemployment grow under recession. See Davis & Wachter (2011).

In addition to Assumptions 1 and 2 from the previous section (i.e., utility as an increasing function of social stability and social stability as a decreasing function of the average unemployment rate), the following assumptions are made:

A3) Individuals regard the unemployment rate (and by extension the level of social stability) as a socially given variable that exists outside the individual's control.

A4) A national economy consists of individuals (households) who supply labor and firms that employ the labor supplied by households to produce goods/services and seek to maximize profits from their products. The firms' outputs are then returned to households as wages and dividend income.

A5) All income is consumed. In other words, consumption utility may be equated with income utility.

Utility Function $V=V(Y,S,L)$ $V_Y, V_S, V_L>0,$ $V_{YY}, V_{SS}, V_{LL}<0,$

Production Function $Y=F(N)$ $F_N>0,$ $F_{NN}<0,$

Social Stability Function $S=S(U)$ $S_U<0,$ $S_{UU}<0$[12],

12) The form of the $S(U)$ function can be easily understood if social stability is considered as a function of the employment rate $E(\equiv 1-U)$ and then converted into a function of the unemployment rate. The $S(U)$ function is obtained when the function $S=S(E)$, $S_E>0$, $S_{EE}<0$, (where social stability is an

Average Unemployment Rate $U=U(N)$ $U_N<0$, $U_{NN}>0$,

V=utility function; Y=consumption (income); S=social stability; L=leisure; N=labor inputs; U=average unemployment rate (for a set period including the time under examination)

(The average unemployment rate (U) is a decreasing function of labor inputs (N), where the effects of changes in N on U diminish as full employment is approached. The reasons for these diminishing effects are (i) the increased possibility that labor input changes will manifest as changes in working hours rather than unemployment changes as full employment is approached, and (ii) the decrease in the average duration of unemployment at situations close to full employment.)

(1) $L+N=1$ (That is, the combined total of leisure time and labor is fixed.)

(1) Social Optimization

Consider a situation in which a benevolent dictator administering a national economy decrees labor inputs so as to maximize household welfare.

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increasing function of the employment rate, with effects diminishing as full employment is approached) is transformed symmetrically with respect to the y-axis and translated by one along the x-axis. From this, we get the relations $S_U<0$, $S_{UU}<0$.

(2) $MAX_N V(Y, L, S)$ s.t. $L+N=1$

(3) First order condition: $V_Y F_N + V_L \frac{dL}{dN} + V_S S_U U_N = 0$

From (1), we get $\frac{dL}{dN} = -1$. Thus:

(4) $V_Y F_N = V_L - V_S S_U U_N$

(2) Maximizing Household Utility

A household receives wage income and dividend income in exchange for supplying labor and seeks to maximize utility from consumption (income) and leisure. It is incapable of influencing the rate of unemployment and therefore regards social stability as a given.

(5) $MAX_N V(Y, L, \bar{S})$ s.t. $L+N=1$

Where $Y=WN+P$, and W, P represent wages and dividend income (profits) respectively.

(6) First order condition: $V_Y W + V_L \frac{dL}{dN} = 0$

Since $\frac{dL}{dN} = -1$,

(7) $V_Y W = V_L$

The household's utility maximization results in labor supply decisions such that the marginal utility of wage income from a unit increase in labor inputs is equal to the loss of marginal utility from the decrease in leisure.

(3) Profits Maximization

A firm attempts to maximize the profits remaining from the products of labor after wages are subtracted.

(8) $MAX_N P$

(9) $P=F(N)-WN$

(10) First order condition: $F_N-W=0$

(11) $F_N=W$

A firm maximizing profit will determine labor demand in such a way that the marginal product of labor is equal to wages paid.

(4) Market Equilibrium

From the equilibrium between labor demand and supply, (7) and (11) produce:

(12) $V_Y F_N=V_L$

(5) Comparing Social Optimum and Market Determined Employment

Let N^* denote labor input satisfying the conditions for social optimization in (4), and N^{**} denote labor input satisfying the conditions for market maximization in (12).

(13) $$V_Y F_N|_{N=N^*} = V_L|_{N=N^*} - V_S S_U U_N|_{N=N^*}$$

(14) $$V_Y F_N|_{N=N^{**}} = V_L|_{N=N^{**}}$$

Since $V_S > 0$ and $S_U, U_N < 0$,

(15) $$V_S S_U U_N > 0$$

From (13) and (15), we arrive at:

(16) $$V_Y F_N|_{N=N^*} < V_L|_{N=N^*}$$

However, because V_{YY}, F_{NN} are less than zero and V_Y is greater than zero,

(17) $$\frac{d(V_Y F_N)}{dN} = V_{YY}(F_N)^2 + V_Y F_{NN} < 0$$

Also, because V_{LL}, $\frac{dL}{dN}$ are negative,

(18) $$\frac{dV_L}{dN} > 0$$

From (17) and (18), we see that the left-hand side of (16)

increases and the right-hand side decreases as N decreases. Thus, N^{**}, which satisfies the equation (14), is less than N^{*}, which satisfies the equation (13).

$N^{**} < N^{*}$

(6) Employment Externality and Its Counter-cyclical Property

(19) Social benefits of employment: $\frac{dV(Y,S,L)}{dN} = V_Y F_N - V_L + V_S S_U U_N$

(20) Private benefits of employment: $\frac{dV(Y,\bar{S},L)}{dN} = V_Y F_N - V_L$

(21) Employment externalities (X) = (19) - (20) = $V_S S_U U_N > 0$
($\because V_S > 0,\ S_U, U_N < 0$)

From (21), we find that hiring decisions ($dN > 0$) carry positive externalities, while laying-off decisions ($dN < 0$) carry negative externalities.

Also:

(22) $\frac{dX}{dN} = V_{SS}(S_U)^2(U_N)^2 + V_S S_{UU}(U_N)^2 + V_S S_U U_{NN} < 0$
($\because V_{SS}, S_{UU}, S_U < 0,\ V_S, U_{NN} > 0$)

In other words, employment externalities vary counter-cyclically. In particular, we find that employment externality X is close to zero in full employment or a classical labor market where $U_N, U_{NN} \approx 0$.

Ⅳ. Further Discussion on Employment Externalities

1. The Scope of Employment Externalities and Social Value in the Broad Sense

Chapters Ⅱ and Ⅲ focused on explaining the social value of employment based on its social functions, and on developing a principle of employment externalities from this. But the type of social value of employment discussed in the previous section – that is, the one stemming from the social function of employment – is not indispensible to derive such externalities. In other words, the scope of externalities is greater than those for which the social value of employment applies.

This section takes a simple look at instances of employment externalities that arise irrespective of employment's social functions. If the externalities that apply when such social functions are recognized represent the "strong principle", as they generally apply, then the instances discussed in this section may be said to represent the "weak principle", since they apply only under certain conditions.

First, there are the externalities that apply in the most limited instances, which we may term the "weak principle". These include externalities that arise in terms of fiscal burden associated with unemployment. Many modern economies have

a number of policies in place that use government funds to assist the unemployed or reduce unemployment. The amount of such expenditure is generally proportional to the scale of unemployment. In such cases, a business's employment decisions cause variations in unemployment and accordingly changes in public expenditures related to unemployment, which reflects changes to the tax burden of the individuals who make up the national economy. Corporate layoffs, for example, would lead to rising unemployment, which would result in a higher tax burden on the public as unemployment-related spending increases. In short, the business's employment decision may be viewed as carrying externalities, since the changes in unemployment spending lead to a change in the tax burden on economic participants who are not responsible for the decision.

Defined in this narrow sense, the size of the externalities may be equated with that of unemployment spending per unemployed individual. In this case, the size obviously varies depending on whether spending is defined narrowly – i.e., as ongoing unemployment benefits – or is extended to include expenditures related to policies to reduce unemployment. If the scope is set at its broadest, and this is taken to represent the society's financial appraisal of the social value of employment , then it may be linked to the principle of employment externalities based on the social value of employment, as described in the previous chapter. Conversely, if the scope is restricted solely to unemployment insurance payouts, it may be connected to programs such as experience rating systems in the employment insurance, used in certain countries.

The second principle can be described as that of "intermediate externalities". An example of this would be an instance where an employment decision aimed at maximizing profits conflicts with financial optimization of the national economy – that is, the maximizing of income. Suppose that a firm finds that it can increase profits by moving production facilities overseas and cutting its domestic workforce, while the economy is in stagnant condition, and the laid-off workers cannot find new jobs. In this case, if the total increase in profits from this decision falls short of the total reduction in wages for the fired workers, the firm's decision results in a decrease in total income for the national economy. In other words, the decision is profitable to the firm, but creates a loss of income for the national economy. If the loss of utility from this decreased income exceeds the increase in utility from the increased leisure for the fired workers, then the employment cuts, while profitable for the firm, cause losses for the general welfare of the national economy. Such situations can often occur when firms cut jobs in an economy with downward rigidity of wages and involuntary unemployment. If aggregate demand externalities exist under insufficient effective demand conditions, firms' employment decisions in such cases may result in externalities without the assumption of the social value of employment.[13] While it is disputable as to whether this situation would count as an externality in the strict sense if aggregate demand externalities are ignored, it certainly is the case at least

13) For more on aggregate demand externalities, see Chung (2001), pp. 475-477.

that the employment decision conflicts with social optimization for the national economy. And, the basic argument of policies to correct employment externalities also applies in this instance.

In sum, the concept and basic policy rationale of employment externalities does not necessarily require employment to have a social value, and may be applicable in a broader range of situations. Obviously, the policy arguments and effects described in the sections that follow may apply equally to other situations where employment externalities are present, regardless of whether they are founded in a social value of employment. It also may be possible to conceive of a social value of employment in a "broad sense", one that responds to the entire gamut of employment externalities, since such externalities do cover a wider scope of instances than those related to a social value rooted in the social functions of employment. This "broad" value would encompass not only the previously described social value originating in employment's social functions, but also all pecuniary externalities arising from firms' employment decisions. The broader concept is also what is meant by the "social value of employment" referred to in this paper's title.

2. Previous Discussions on Employment Externalities

The term "employment externality" was adopted here for the sake of convenience. While there are few instances of the concept of externalities being applied to the issue of employment, some previous discussions do exist in the literature.

The use of experience ratings in employment insurance may be one of the most representative cases of the externality concept being applied to employment issues. This system, which was introduced in the U.S. in the early 20th century, adjusts the amount of employment insurance premiums paid by a business according to the amount of unemployment produced. The aim is to control employment by having the firm internalize the social costs of unemployment in its own cost function, which may be viewed as following the same principle of offsetting employment externalities that was outlined above (Rector, 1951; Tirole, 2008). The externalities that form the underpinning for this system may also be seen as falling under the "weak principle" in the previous section.

In addition to the discussions of experience rating systems, Blanchard & Tirole (2008) and Kang (2008) also provide examples of research that recognize a concept of employment externalities. Blanchard and Tirole argue the need for a layoff tax in the interests of social optimization, with a level equivalent to unemployment benefits paid. Their concept of externalities may be viewed as slightly broader in scope than in the case of experience rating, but would still fall under the "weak principle" described in the previous section. Because their discussion of the issue is confined in the perspective of employment protection policy, it does not proceed as far as a comprehensive concept of employment policy that includes job creation. Their focus is only on the idea of a layoff tax founded in negative externalities, without any mention of Pigouvian subsidies based on a dual understanding of employment externalities. They also

unfortunately fail to acknowledge the counter-cyclical variation of employment externalities. However, this variation applies equally to instances based on a "weak argument" like Blanchard and Tirole's, as it does to those that suppose a social function of employment. It may be no easy task to actually calculate a layoff tax in such a way that its amount varies with economic conditions, but a reflection of this counter-cyclical variation in the layoff tax is, at least theoretically, necessary to achieve social optimization.

As noted in the introduction, this paper follows two previous studies by the author in 2008 and 2010. The 2008 paper applies a concept of employment externalities that is fundamentally similar in scope to the one discussed here. The difference from the two previous studies is that the concept has been fleshed out further, and a policy discussion has been developed.

3. Employment Externalities and the Globalization of Corporate Activity

As examined above, situations in which businesses' employment decisions aimed at maximizing profits depart significantly from social optimization, may arise both in cases where employment has a social function and in those where involuntary unemployment exists or significant public expenditures are made in response to employment conditions. In that sense, the principle of policies based on employment externalities holds under a comparatively broad range of situations in a market capitalist economy. Moreover, some changes in the modern

economy appear to strengthen the aptness of such an argument. Two cases are worth mentioned in that regard: globalization of corporate activity and the corporate maximization of short-term market value under shareholder capitalism. This section offers a brief discussion of the implications of the former on the principle of employment externalities and the policies derived from it.

The term "globalization of corporate activities" refers to cases where a firm's decisions and actions are made at the geographic scale of the global economy rather than the national level. When the global economy is the geographic scope of a firm's profit maximization activities, this raises the possibility that its decisions will conflict with the goals of social optimization, which is based on another geographic category, namely the national economy. And, this discord is likely to be manifested particularly in the area related to employment.

The reason is explained as follows. It can be said that other things being equal, national economies want to maximize incomes created by firms, and income is composed of profit and wage. If firms' activities are confined to a national economy, then firms' profit maximization will not depart much from national economy's income maximization. However, if firms globalize their businesses and can move productions abroad, then there is no longer any reason that the two maximizations coincide. And, the discrepancy between the two will be manifested mainly through wages and employment since income is the sum of profit and wages. In this sense, globalization is likely to increase the frequency and extent of deviations between corporate employment decisions and so-

cial optimization. In short, the progress of globalization seems to raise the significance of employment externalities.

Ⅴ. Policy Ideas

So far, I have offered a theoretical discussion on the concept of employment externalities based on the social value of employment and the principle of employment policies to correct these externalities. In the remaining chapters, I will discuss specific policies derived from this theoretical approach and their effects. This chapter presents policy ideas based on the existence and properties of employment externalities, while the following chapters will examine their effects and their functional strengths and weaknesses compared to current employment policies.

Externalities can be addressed by a corresponding tax or subsidy – the "Pigouvian tax" or "Pigouvian subsidy". In light of the aforementioned characteristics of employment externalities, – their dual nature and counter-cyclical variation – any policies aimed at correcting employment externalities should adopt the following structure: first, based on the dual nature of employment externalities, the response should be symmetrical, offering Pigouvian subsidies for corporate hiring decisions while assessing Pigouvian taxes (negative subsidies) for firing decisions, and second, the amount of unit subsidies or taxes should also vary counter-cyclically.

Theoretically, the size of unit subsidies and taxes should be equal to the size of marginal social benefit or costs incurred by the

externalities. In practice, however, estimations of their sizes are very difficult. As a result, a realistic policy approach to addressing externalities includes 'standards and prices' system proposed by Baumol and Oates (1971). Under the system, a socially agreeable quantitative target (standard) is established with respect to the externalities, and a subsidy or charge (price) is imposed to attain the standard.

This system seems to be particularly appropriate to our case since there is a clear and socially agreeable target with regard to employment: full employment. Under this system, policy to address employment externalities will be to assess a hiring subsidy or layoff tax to attain full employment or a predetermined job creation target. The size of a hiring subsidy should be equal to that of a layoff tax, and the unit size of subsidy or tax would be greater as unemployment rate rises, which is consistent with counter-cyclical variation of employment externality. Specifically, in this case, there are two types of policies available: carbon tax type and emission trading type. If the first approach – carbon tax type policy – can be characterized as a price-setting method, then the second – emission trading type – is a quantity-setting-flexible-price method.

Both responses represent options for addressing the employment externalities discussed in this paper. For several reasons, however, the emission trading type approach appears likely to be comparatively better-suited to employment externality policies. Before investigating the reasons in detail, I will explain the specific policy ideas based on two approaches in subsequent sections.

1. Employment Credit Trading System

This is an approach where the unit size of subsidy or tax (the 'price' for the 'standard') is determined in the artificial market as the price of 'tradable employment credit', a concept borrowed from 'carbon credit' in the carbon emissions trading system. This approach might be called the "employment credit trading system". It works as follows.

First, the government would run and administer a market for trading employment credits. Under this system, it would give firms that hire workers the right to issue a corresponding quantity of employment credits, which they could then sell on the market. Firms that lay off their employment would be required to purchase the corresponding credits. In order to prevent speculation, purchases and sales would be required to take place within a certain period (say one month) around the time of the employment activity (hiring or layoff). The government would participate in the market as a credit consumer by setting job creation targets, and the price of credits would be decided by market supply and demand.[14)]

This would obviate the need for the government to make a decision on the appropriate amount of subsidies or taxes. The government has only to set an employment target and participate in the credit trading market. Then the appropriate amount of subsidies to attain the employment target will be determined in

14) If a government seeks to control the rate of variability in credit prices, it may set upper and lower price limits.

the trading market.

2. The Dual Employment Subsidy

In this policy, unit subsidy or tax is set by the government. Firms are subsidized for their hiring activities and taxed for layoff. Or, it may be possible to apply these subsidies / taxes to firms in proportion to their employment net gains or losses over a certain period of time (Following the discussion in Section V-4, retiring or voluntarily departing workers are not included in counting net gains or losses of employment). This approach may be described as a combination of the layoff tax with a hiring subsidy; for convenience, it will henceforth be referred to as a "dual employment subsidy".

One problem with this policy is, according to the above discussion, that the government should adjust the size of unit subsidy or tax as economic situations change. For example, we can think of a system in which the size of unit subsidies / taxes is tied to the unemployment rate. However, it does not seem easy to operate such a system in practice. A more realistic approach would be to operate the system only for a limited time during a period of stagnant employment, when the scale of employment externalities grows significant.

3. Comparison of Two Approaches

Considering the nature of the employment issue or the afore-

mentioned properties of employment externalities, a credit trading system seems to be the more appropriate approach for addressing employment externalities than dual subsidies.

First of all, the counter-cyclical property of employment externalities may lead to problems with a price-setting approach, particularly the difficulty attendant on estimating the appropriate scale of subsidy and/or tax. Second, as economic conditions vary with business cycles, then the unit subsidies/taxes would have to change accordingly, but such a variable subsidy/tax system could lead to legal or administrative difficulties. Third, a credit trading system could also function as something of an automatic stabilizer for employment and aggregate demand. For starters, demand for credits would increase and supply would decrease under recession as layoff increases and hiring decreases, resulting in a rise in the price of credits. In an economic boom, the opposite situation would apply and credit prices would drop. In this case, rising credit prices mean an increased scale of intervention and job creation effect. In short, even without active governmental adjustments, the scope of intervention increases in a recession and decreases in a boom as credit prices fluctuate. Finally, most important is the relative ease of quantity-setting, given the nature of employment issues. As mentioned above, in most cases of employment policies, the target is set at full employment, which is not difficult to quantify. For instance, a target can be derived with relative ease from the difference between the natural and actual unemployment rates. These reasons suggest that emission trading type approach may be better suited to employment externalities than the carbon tax type.

4. The Pigouvian Problem: Who Bears What Burden?

In theoretical terms, externality correction should be designed so that the parties that generate externalities pay the taxes or receive the subsidies. Realistically, however, a number of other factors need to be considered in developing such policies, including the ease of administering subsidies/taxes and their feasibility, especially in terms of the ability of actors to shoulder the burden.

The parties involved in an employment decision are the firm and the worker; which party is viewed as an externality producer varies from one situation to the next. In the case of involuntary unemployment, as with layoffs, the firm may be seen as the externality producer. When a worker leaves voluntarily, in contrast, that worker is more of a producer. But a Pigouvian tax cannot realistically be assessed on a worker leaving his or her job. Moreover, given our presumptions about the social value of employment, the scale of the employment externality from a worker leaving voluntarily is far smaller than it would be in a case of involuntary unemployment; the effect of voluntary unemployment on employment security or social stability is smaller than that of involuntary unemployment. Conversely, in light of the dual or symmetrical nature of employment externalities, if a firm bears the burden of the Pigouvian tax, then it should also be the beneficiary of any Pigouvian subsidy.

In view of this, an appropriate policy approach may be to administer the aforementioned dual employment subsidy and

employment adjustment credit trading system with businesses, using the standard of net employment of gains and losses minus any voluntary departures or retirements.

Another issue that should also be considered here is the situation of firms that are unable to pay a Pigouvian tax or would be left vulnerable by one. Firms under court receivership or in workout would fall into this category. Not only would a Pigouvian tax be realistically difficult to administer in such cases, but even if it were possible, the socially optimal choice would probably be an exemption instead. For this reason, exceptions to the layoff tax or obligation to purchase employment credits might be granted to firms that are under court receivership or in workout. Such an exemption could also encourage restructuring at marginal businesses by providing an incentive to accept the terms of a workout.

Ⅵ. Job Creation Effects

There are two channels through which the proposed policies lead to increased employment. The first is the effect of labor cost reduction. Because the policies basically subsidize employment, they lower the relative cost of labor and incentivize methods of production using more labor. Second, aggregate demand can be created through net subsidies and bring about increased employment. If the policies increase employment through labor cost reduction effect, government expenditure for net subsidy (or credit purchase) arises and accordingly aggregate demand may increase. This rise in aggregate demand provides an additional employment increase effect to that of labor cost reduction.

In this section, I will attempt to estimate the scale of the job creation effect from the two aspects. First, start with the job creation effect from labor cost reduction (the relative factor price changes). The job creation derived from this principle depends upon how much a firm's labor costs are lowered by the policy. Therefore, in order to find out the size of the job creation effect, it is necessary to estimate the size of the decrease in a firm's labor costs that the policy would cause.

Taking the case of the dual employment subsidy for the sake of convenience, consider a case where a subsidy of T is paid for a unit hiring (or a tax of T for a unit laying-off). Subtract any voluntary departures and retirements from the count of employ-

ment change, following the argument in Section Ⅴ-4.

Assume that average ratio of departing or retiring worker to total employee is α. That is, α of employees of the firm are expected to depart or retire from the job every year. Implementing the policy will generate a subsidy revenue (or tax burden) for the firm proportional to the difference between the number of employees newly hired and the number of persons laid-off (that is, the sum of the net increase in employment and the supplementary hiring for the vacancies generated by voluntary departures or retirements).

Consider a situation where the total employment of the firm in year 0 is L_0 and the dual employment subsidy with unit subsidy size T is being implemented. In response to the change in business environment, the firm wants to change its employment level to L at the beginning of year 1 which brings about maximized profit.

In this case, the firm will earn $(L-L_0+\alpha L)T$ as subsidy revenues in year 1, and from year 2 on, it will earn αLT as subsidy every year. The present value of the expected benefits (costs) of the dual employment subsidy – offering T as a subsidy / tax for every hiring / lay-off to a firm – can be expressed as follows.

$$(23) \qquad \prod(L)=\sum_{t=1}^{\infty}\left[\int_0^L MRPL_t\,dL-W_tL\right](1+r)^{1-t}+(L-L_0)T+\sum_{t=1}^{\infty}\alpha LT\,(1+r)^{1-t}$$

Equation (23) represents the present value of profits ($\prod$) for a firm setting its employment level at L, where $MRPL_t$ is the expected value of the marginal revenue product of labor for year t, W_t is the expected value for the wage level at year t, and r is the discount rate.

From the firm's profit maximization, we find its first order condition as equation (24).

(24) First order condition:

$$\frac{d\prod}{dN}=\sum_{t}^{\infty}(MRPL_t-W_t)(1+r)^{1-t}+T+\sum_{t=1}^{\infty}\alpha T(1+r)^{1-t}=0$$

can be rewritten as

(25) $$\sum_{t}^{\infty}[MRPL_t-(W_t-(\alpha+\frac{r}{1+r})T)](1+r)^{1-t}=0$$

In other words, the policy has the effect of lowering the firm's annual labor costs by the amount of $(\alpha+\frac{r}{1+r})T$. Alternatively, it can be said that the dual employment subsidy of T per hiring is equivalent to conventional wage subsidy of $(\alpha+\frac{r}{1+r})T$ per employee.

Thus, once the scale of the labor cost reduction effect is estimated, the job creation effect can be calculated using the same methods as with conventional wage subsidies.

Labor demand and supply functions with a policy (wage subsidy) that reduces a firm's labor costs by ω are represented as follows:

(26) $$L^D=F(W[1-\omega])$$

(27) $$L^S=G(W)$$

Then the equilibrium results in

(28) $F(W^*[1-\omega])=G(W^*)$ (Asterisk represents equilibrium level)

If $\eta \equiv -\frac{\partial F}{\partial W}$ and $\epsilon \equiv \frac{\partial G}{\partial W}$ (η, ϵ are the absolute value of elasticity for labor demand and labor supply respectively), then from (26) through (28), the following changes in wages and employment are observed as a result of policy implementation.

(29) $(\frac{\Delta W}{W})^* = \frac{\eta}{\epsilon+\eta}\omega$

(30) $(\frac{\Delta L}{L})^* = \frac{\eta\epsilon}{\epsilon+\eta}\omega$

From (25), we find that

(31) $\omega=(\alpha+\frac{r}{1+r})\frac{T}{W}$

where W represents wage level at base year.

If we denote $(\alpha+\frac{r}{1+r})$ by $\emptyset$, then

(32) $(\frac{\Delta L}{L})^* = \frac{\epsilon\eta}{\epsilon+\eta}\frac{\emptyset T}{W}$

When a hiring subsidy / layoff tax of T per unit hiring / layoff is implemented, the change in employment from labor cost reduction effect is determined by (32).

Next let us investigate job creation effect through aggregate demand increase. This effect depends primarily on the scale of government expenditure, that is, the change in total net subsidies: once that level has been set, the size of the job creation effect would be determined by the expenditure multiplier and

the Okun coefficient (if Okun's rule holds). If the multiplier for unit expenditures is equal, the job creation effects of proposed policies in terms of aggregate demand change will equal the effects of an equivalent expansion in conventional fiscal stimulus.

If we denote the change in total net subsidies and multiplier by B and m respectively, aggregate demand creation from the policy is Bm. And if Okun coefficient (percentage change in employment / percentage change in GDP) is k, job creation effect through aggregate demand increase is

$$(33) \quad (\frac{\Delta L}{L})^{**} = \frac{B}{Y_0} mk$$

where Y_0 represents GDP at base year.

If we assume for simplicity that aggregate demand effect is realized without time lag, then total employment change in year 1 is the sum of (32) and (33).

$$(34) \quad g = g_1 + g_2 \equiv (\frac{\Delta L}{L})^{*} + (\frac{\Delta L}{L})^{**}$$

$$(35) \quad g_1 = \frac{\epsilon\eta}{\epsilon+\eta}\frac{\emptyset T}{W}, \quad g_2 = \frac{B}{Y_0} mk$$

where g, g_1 and g_2 represent total effect, labor cost reduction effect, and aggregate demand creation effect respectively.

And the budget requirement for the policy to increase employment by the rate of g is determined as equation (36) in present value.

$$(36) \quad B = (\Delta L + \alpha \Delta L \sum_{t=1}^{\infty} \frac{1}{(1+r)^{t-1}}) T = (1 + \frac{1+r}{r}\alpha) g\, L_0\, T$$

where L_0 denotes employment level at year 0.

B in equation (36) is equal to the budget requirement for conventional wage subsidy of $(\alpha+\frac{r}{1+r})T$ per employee.[15] Thus equivalence between dual subsidy with unit subsidy T and conventional wage subsidy of $(\alpha+\frac{r}{1+r})T$ per employee holds in terms of aggregate demand effect as well.

From (34), (35), and (36)

$$g=\frac{\epsilon\eta}{\epsilon+\eta}(\alpha+\frac{r}{1+r})\frac{T}{W}+(1+\frac{1+r}{r}\alpha)g\frac{L_0T}{Y_0}mk \tag{37}$$

$$g=\frac{\frac{\epsilon\eta}{\epsilon+\eta}(\alpha+\frac{r}{1+r})\frac{Y_0}{W}T}{Y_0-(\frac{1+r}{r}\alpha+1)L_0Tmk} \tag{38}$$

15) The present-value budget requirement for conventional wage subsidy of $(\alpha+\frac{r}{1+r})T$ per employee is determined as follows.
$B=\Delta L(\alpha+\frac{r}{1+r})\sum_{t=1}^{\infty}\frac{1}{(1+r)^{t-1}}T=(1+\frac{1+r}{r}\alpha)gL_0T$

Ⅶ. Functional Characteristics in Comparison with Existing Policies

1. Social-Cost-Minimizing Employment Targeting

Baumol & Oates (1971) and Montgomery (1972) have shown that emission trading can achieve a specified reduction in pollution at minimum cost to the economy. In a similar way, it can be shown that employment credit trading can attain a specified job creation target with least social cost under certain conditions.

Consider the case where an omniscient administrative authority attempts to achieve a certain employment target with minimum social cost.

Let

x_{ij} represent the quantity of input i used by plant j

p_i be the price of input i

p_j be the price of the product of plant j

f_j $(x_{1j}, x_{2j}, \cdots x_{nj}, l_j)$ be its production function

l_j be the quantity of labor input for plant j

p_l be the price of labor, and

L^* be the employment target

Assume that p_i and p_j are given (We can assume that x_{ij} and y_j are

internationally traded goods and the country is small).

In this case, the administrative authority's problem is that of determining x's and l's that satisfy the following maximization.

(39) $max_{x_{ij}\,l_j}[\sum_j p_j f_j(x_{ij}\,l_j)-\sum_i\sum_j p_i x_{ij}-\sum_j p_l l_j]$

subject to the employment constraint $\sum_j l_j = L^*$
First order conditions are

(40) $p_j f_{ji}-p_i=0$

(41) $p_j f_{ji}-p_l+\lambda=0$ where λ is Lagrange multiplier.

(42) $\sum_j l_j=L^*$

Now let us consider the case where all the plants are run by independent managements who maximize profits and, instead of the imposition of a fixed aggregate employment constraint, employment is subsidized at a fixed rate Z.

Then independent managements' profit maximizations are

(43) $max_{x_{ij}\,l_j}[p_j f_j(x_{ij}\,l_j)-\sum_i p_i x_{ij}-(p_l-Z)l_j]$

First order conditions are

(44) $p_j f_{ji}-p_i=0$

(45) $p_j f_{jl}-p_l+Z=0$

If $Z = \lambda$, then the two maximizations coincide. In other words, if wage subsidy is set at such a level under which aggregate employment becomes L^*, the subsidy achieves the employment target with minimum social cost.

Intuitively, it is not difficult to see that such subsidy can produce the least-cost assignment of labor input the sum of which is equal to specified target. In response to a subsidy on employment, a profit-maximizing firm will increase employment until the gap between the price of labor (wage level) and the marginal product of labor is equal to the subsidy. Since all firms are subject to the same subsidy, it follows that the marginal product of labor will be equalized across all firms. This implies that it is impossible to reduce the aggregate cost (or increase the aggregate profit) of the specified employment by re-arranging labor input among firms: any alteration in that pattern of labor input would involve an increase in labor input by one firm the value of which to the firm would be less than the cost of the corresponding reduction in labor input by some other firm.

Then the remaining problem is that of finding out the value of wage subsidy (Z) satisfying the above condition. In reality, all the prices and even production functions vary with time. So, finding out and readjusting such value of Z at every moment will be extremely difficult. At this point, employment credit trading proves its worth. As we saw in the previous chapter, employment credit trading system with credit price T is equivalent to wage subsidy with unit subsidy of $(\alpha+\frac{r}{1+r})T$. Under the employment credit trading system, the government does not have to find out the correct value of Z. It has only to adjust its bidding price

of employment credit so that the supply of credit in the market matches the specified target. In that sense, employment credit trading makes a social-cost-minimizing employment targeting feasible

2. Fiscal Efficiency

As explained previously, the job creation effects of the policy suggested in this paper are based on two routes: labor cost reduction (changes in relative factor prices) due to subsidies/taxes, and increased aggregate demand due to net subsidies.

From this, we can expect that if the expenditure multiplier is equal, the proposed policy's job creation effects are greater than that of a conventional fiscal stimulus with the same size as total net subsidy by the extent of labor cost reduction effect. In this section, I will compare the cost efficiency of the policies introduced here and the conventional fiscal stimulus in terms of budget requirements for job creation. This kind of cost efficiency, or fiscal efficiency is conceptually different from the social cost minimization discussed in previous section as fiscal input for subsidy was regarded not as a cost but as a transfer payment from government to private sector in previous section.

Assume that the government wants to increase employment level by the rate of g with the policy. Let B' be the budget requirements to attain the target by fiscal stimulus. Then

$$B'=\frac{gY_0}{mk} \tag{46}$$

where m, k, and Y_0 are fiscal multiplier, Okun coefficient, and year 0's GDP respectively.

Meanwhile the budget requirement for the dual subsidy is the same as the change in total net subsidies. The budget requirements for the dual subsidy (B) in year 1 will be determined as equation (36).

Rewriting equation (37), we obtain

$$(47) \qquad T=\frac{g}{\frac{\epsilon\eta}{(\epsilon+\eta)W}(\alpha+\frac{r}{1+r})+(1+\frac{1+r}{r}\alpha)g\frac{L_0}{Y_0}mk}$$

From (36) and (47), we obtain

$$(48) \qquad B=(1+\frac{1+r}{r}\alpha)gL_0T=\frac{(1+\frac{1+r}{r}\alpha)g^2L_0}{\frac{\epsilon\eta}{(\epsilon+\eta)W}(\alpha+\frac{r}{1+r})+(1+\frac{1+r}{r}\alpha)\frac{gL_0}{Y_0}mk}$$

Since $B'=\frac{gY_0}{mk}$

$$(49) \qquad \frac{B'}{B}=1+\frac{(\frac{\epsilon\eta}{\epsilon+\eta})(\alpha+\frac{r}{1+r})}{(1+\frac{1+r}{r}\alpha)gmk}\frac{Y_0}{WL_0}$$

If we assign specific and plausible values to parameters in equation (49), we can calculate the value of $\frac{B'}{B}$. According to IMF's estimation, fiscal multiplier m is in the 0.9 to 1.7 range during recession.[16] Assume that m is 1.3, median of IMF estimation.

16) IMF Global Prospects and Policies Report 2012, p. 43.

Also assume that k is 0.5, following Okun(1962) and Abel & Bernanke(2005). According to Hammermesh, ϵ is around 1 in most cases. Supposing that the economy is in recession and there exists involuntary unemployment, assume that η is infinite. Additionally, if we assume that labor share $\frac{WL_0}{Y_0}$ is 0.7, α is 0.1[17], r is 4%, and g is 2%, then $\frac{B'}{B}$ is approximately 5.2.

In other words, when the above parameter values are assumed, the policy proposed in this paper is roughly five times more fiscally efficient than conventional fiscal stimulus. When the same values as the above example are assumed except g, if $g < 8.4\%$, then $\frac{B'}{B} > 2$. In short, unless employment target is very ambitious, the policy proposed in this paper seems to be much more fiscally efficient than conventional fiscal stimulus.

3. Precision Employment-Targeting: The Possibility of 'Smart' Employment Policy

Another important issue in the assessment of any policy's effectiveness is the matter of uncertainty of the effects and the costs associated with policy failure. In most economic policies that involve financial inputs, the inputs are made first, and the effects appear with somewhat of a lag. Moreover, considerable uncertainty exists around the size of the actual effects. Should the effects relative to inputs fall short of expectations, the result is a fiscal squander. This risk becomes even salient amid recent

17) 'α' will be same as the inverse of worker's average service period until departure or retirement.

economic conditions, where public debt is a serious issue among many of the world's advanced economies.

Related to these uncertainties and risks is the difficulty in determining the appropriate scale of policy (or fiscal inputs) even when the target of the policy is quantitatively set. For instance, even if job creation target is already set, fiscal stimulus needs additional decisions on how much and on what to spend. As for conventional wage subsidy, an additional decision on the size of unit subsidy is needed as well. And as we see in recent experiences after the global financial crisis, it is not easy to find a consensus regarding such decisions at all. More often than not, uncertainties related to the appropriate scale and effect of policy and a consequent lack of consensus seem to be significant obstacles to implementing the policy.

In case of employment credit trading, however, these problems can be significantly reduced. The government can achieve employment target accurately with employment credit trading. It has only to adjust the bid price of credit so that its credit demand is met in the trading market. Since it is relatively easy to estimate the size of job creation necessary for attaining full employment, even fine-tuned full employment targeting will not be difficult with employment credit trading. In short, employment credit trading is expected to make precision employment-targeting possible. In that sense, employment credit trading can be a 'smart' employment policy. I think this aspect would be the greatest advantage of employment credit trading over existing policies.

4. Addressing Structural Unemployment

Another comparative advantage of the policy approaches suggested here is related to addressing unemployment issues stemming from (corporate activity induced) structural changes, such as globalization or automation. As these issues can be regarded as typical cases reflecting the discords between a national economy's interests and firms' pursuit of profit, they seem to be best addressed by the approach suggested in this paper: internalizing social benefits/costs of corporate activity. Theoretically, the policy based on this approach can control the speed of globalization or automation so that the social welfare may be enhanced.

At the practical level as well, the policies proposed in this paper are expected to be comparatively effective in addressing these issues. First, as an economy is globalized, existing policy such as fiscal stimulus becomes less effective. The Mundell-Fleming model shows that fiscal stimulus is impotent in a small open economy with floating exchange rate and free capital movement. The policy proposed in this paper is, at least in terms of labor cost reduction effect, free from such problems. Second, unlike macroeconomic shocks, globalization affects jobs differentially, specifically impacting ones that are "tradable" or "offshorable" as opposed to all jobs[18], and the degrees of influence on jobs with the same level of offshorability may differ depending on

18) See, for example, Jensen and Kletzer 2006; Blinder and Kruger 2009; Spence and Hlatshwayo 2011.

how actively a firm is pursuing globalization. Similar logic would hold for automation as well.[19] As the policies proposed here work differentially in proportion to the scale of change in a firm's employment, they are likely to be more efficient in addressing these kinds of employment issues than policies designed to impact all employment non-differentially.

5. Addressing Job Quality: Adjusting the Unit of Employment Credit

In the above discussion, I suppose that the unit of employment credit is a head: if a firm hires ten workers it can sell ten employment credits. But, in this case, firms may have incentives to pad its employment rolls while lowering the quality of the job. For example, a firm may respond to the policies by converting its full-time employees to part-time status and increasing the number of employees.

If the government wants to prevent this situation, it can change the unit of employment credit into a job with a certain amount of wages. For example, the unit of employment is set to be the minimum wage and a full time equivalent job. If a firm hires ten workers and their average monthly wage is two times of the minimum wage, then the firm is qualified to issue and sell twenty employment credits in this case.

19) Automation (computerization) also affects certain type of jobs differentially. See Autor et al. (2003); Frey and Osborne (2013); Brynjolfsson and McAfee (2011).

This method (setting the unit of employment credit as a job with a certain amount of wages instead of a head) has both pros and cons. The good news is that it enables the policy to address not only quantity but also quality of employment. Meanwhile, an obvious consequence of such a method would be that the policy becomes more complicated.[20)]

20) Job quality issue may be resolved without this method if full employment and a labor suppliers' market is achieved by policy. When it is workers rather than jobs that are in scarce supply, the cases where workers have no choice but to accept low-quality jobs will be much less likely to happen.

Ⅷ. Conclusion: Possibilities for Employment-Centered Economic Policy

This paper has presented some ideas for employment policies based on the principle of internalizing the social value of employment into firms' hiring and firing decisions. It has been shown that this principle does not only provide a new rationale for employment policy, but also leads to more efficient policy measures.

Of course, while this paper did focus on policy, its scope was limited principally to theoretical aspects of policy. If the policies are to proceed into actual implementation, additional examination of administrative and political aspects may be necessary. If policy proposals are viewed as possessing sufficient value, experts in the relevant areas may discuss them further.

If the policy proposed here is as practically feasible as examined theoretically above, then it may also lead to a broader notion of employment-centered economic policy. Employment is one of the key indicators in economic policies, but the dominance is still in those policies managing aggregate demand or the GDP growth rate more than the so called "employment policies". This may stem from either the belief that income is a more important indicator than employment, or one that policies focusing on aggregate demand or GDP growth are more effective or feasible than those focusing on employment. If the findings of this paper

are found to be sound, its argument may contribute to boosting the feasibility of employment-centered economic policy, at least in the second instance. Just as policy authorities manage inflation targets by adjusting interest rates or currency volumes, it may be possible to manage unemployment rate targets through, for instance, an employment credit trading system. By greatly lowering the costs and risks attendant on such an approach, the proposals included here may improve their practicability. In that case, we can have a macro stabilizing policy based on two pillars: one is inflation targeting by monetary policy and the other is employment targeting by employment credit trading.

As discussed previously, employment policy, in addition to its economic function, also has the social function of raising stability of the society. One important component of the social function of employment policy is its effect in controlling the biggest weaknesses of the capitalist economy, namely income inequality. Such a function cannot be expected from policies that focus on aggregate demand or GDP growth. In that sense, the adoption of employment-centered economic policy might be a better option, since it can ensure not only efficiency, but also some measure of equity.

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