Vol.31 No.2 / ISSN 1738-656x

韓國開發硏究 2010 I

KDI Journal of Economic Policy

KDI

韓國開發硏究
KDI Journal of Economic Policy

Contents

韓國開發硏究
제32권 제1호(통권 제106호)

Financial Intermediation and the Post-Crisis Financial System with Implications for Korea

Hyun Song Shin
(Hughes-Roger Professor of Economics, Princeton University)

위기 이후 금융중개와 금융제도 변천 및 한국에 대한 시사점

신 현 송
(미국 프린스턴 대학교 경제학과 교수)

* 신현송: (e-mail) hsshin@princeton.edu, (address) Princeton University, Department of Economics, Princeton, Nj 08544, USA

• Key Word: Financial Intermediation(금융중개), Securitization(증권화), Intermediation Chain (중개사슬), Bank Lending(은행대출)
• JEL code: G21, G28
• Received: 2009. 11. 10 • Referee Process Started: 2009. 11. 13
• Referee Reports Completed: 2010. 2. 19

ABSTRACT

Securitization was meant to disperse credit risk to those who were better able to bear it. In practice, securitization appears to have concentrated the risks in the financial intermediary sector itself. This paper outlines an accounting framework for the financial system for assessing the impact of securitization on financial stability. If securitization leads to the lengthening of intermediation chains, then risks become concentrated in the intermediary sector with damaging consequences for financial stability. Covered bonds are one form of securitization that do not fall foul of this principle. I discuss the role of countercyclial capital requirements and the Spanish-style statistical provisioning in mitigating the harmful effects of lengthening intermediation chains. For Korea, the stability of funding emerges as a key consideration. Covered bonds may play a role in stabilizing the funding arrangement for banks.

대출자산의 증권화는 자산부실위험을 분산시키려는 취지로 도입하였으나 실제로는 자산부실을 키우고 금융중개부문의 취약성을 키우는 결과를 낳았다. 본 논문은 증권화와 자산부실 문제를 다룰 수 있는 금융제도 전반의 위험을 분석할 수 있는 회계 프레임워크를 고려한다. 미국의 증권화제도는 긴 중개사슬을 낳았고, 위기 시에 취약한 구조가 되었다. 유럽에서 사용되는 커버드본드 제도는 짧은 중개제도와 부합하는 제도로서 금융제도의 안정성에 도움이 된다. 한국의 금융제도도 부채의 안정성을 감안할 때 커버드본드의 혜택을 볼 수 있을 것으로 예상된다.

I . Introduction

The recent financial crisis has the distinction of being the first post-securitization crisis in which banking and capital market developments have been closely intertwined. Historically, banks have always reacted to changes in the external environment, expanding and contracting lending in reaction to shifts in economic conditions. However, in a market-based financial system built on securitization, banking and capital market developments are inseparable, and the current crisis is a live illustration of the potency of the interaction between the two.

Securitization was meant to disperse credit risk to those who were better able to bear it, but in the financial crisis the risks appear to have been concentrated in the financial intermediary sector itself, rather than with the final investors. To understand the true role played by securitization in the financial crisis, we need to dispose of two pieces of received wisdom concerning securitization - one old and one new. The old view, now discredited, emphasized the positive role played by securitization in dispersing credit risk, thereby enhancing the resilience of the financial system to defaults by borrowers.

But having disposed of this old conventional wisdom, the fashion now is to replace it with a new one that emphasizes the chain of unscrupulous operators who passed on bad loans to the greater fool next in the chain. We could dub this new fashionable view the hot potato hypothesis, since the bad loan is like a hot potato passed down the chain. The idea is attractively simple, and there is a convenient villain to blame, and so has figured in countless speeches given by central bankers and politicians on the causes of the subprime crisis.

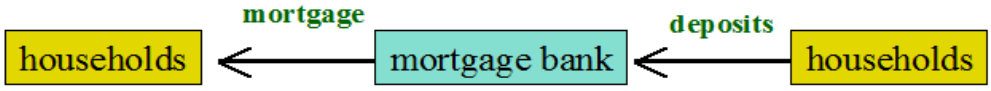
But the new conventional wisdom is just as flawed as the old one. Not only does it fall foul of the fact that securitization worked well for thirty years before the subprime crisis, it fails to distinguish between *selling* a bad loan down the chain and *issuing liabilities* backed by bad loans. By selling a bad loan, you get rid of the bad loan and it's someone else's problem. In this sense, the hot potato is passed down the chain to the greater fool next in the chain. However, the second action has a different consequence. By issuing liabilities against bad loans, you do not get rid of the bad loan. The hot potato is sitting on your balance sheet or on the books of the special purpose vehicles that you are sponsoring. Thus, far from passing the hot potato down the chain to the greater fool next in the chain, you end up keeping the hot potato. In effect, the large financial intermediaries are the last in the chain. While the investors who buy your securities will end up losing money, the financial intermediaries that have issued the securities are in danger of larger losses. Since the intermediaries are leveraged, they are in danger of having their equity wiped out, as some have found to their cost.

Indeed, Greenlaw, Hatzius, Kashyap and Shin (2008) report that of the approximately 1.4 trillion dollar total exposure to subprime mortgages, around half of the potential losses were borne by US leveraged financial institutions, such as commercial banks, securities firms and hedge funds. When foreign leveraged

[Figure 1] Subprime exposures by type of institution (source: Greenlaw, Hatzius, Kashyap and Shin (2008))

	Total reported sub-prime exposure (US$bn)	Percent of reported exposure
Investment Banks	75	5%
Commercial Banks	418	31%
GSEs	112	8%
Hedge Funds	291	21%
Insurance Companies	319	23%
Finance Companies	95	7%
Mutual and Pension Funds	57	4%
Leveraged Sector	896	66%
Unleveraged Sector	472	34%
Total	1,368	100%

[Figure 2] Short Intermediation Chain

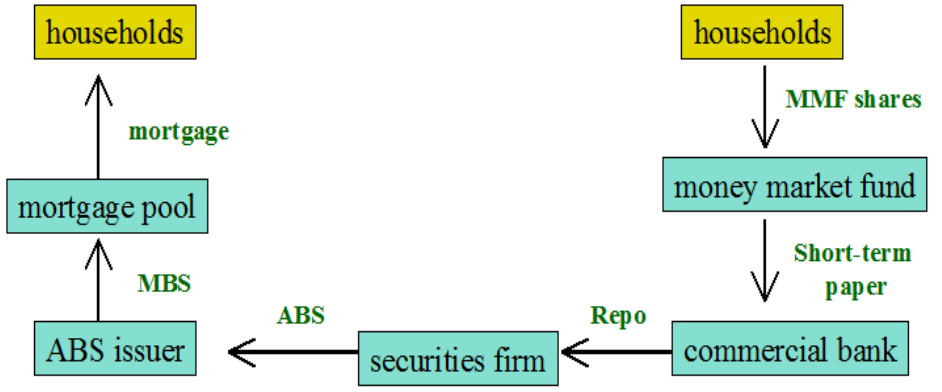


institutions are included, the total exposure of leveraged financial institutions rises to two thirds (see Figure 1). Far from passing on the bad loans to the greater fool next in the chain, the most sophisticated financial institutions amassed the largest exposures to the bad assets.

A characteristic feature of financial intermediation based on the US-style securitization system is the long chains financial intermediaries involved in channeling funds from the ultimate creditors to the ultimate borrowers. The difference can be illustrated in figures 2 and 3. Figure 2, depicts a traditional deposit-taking bank that collects deposits and holds mortgage assets against household borrowers. Until around 1990, the bulk of home mortgage assets in the United States were held by savings institutions and commercial banks (see Adrian and Shin (2008)).

In recent years, however, the proportion of home mortgages held in government sponsored enterprise (GSE) mortgage pools have become the dominant holders. The chain of financial intermediation has become correspondingly much longer and more heavily dependent on overall capital market conditions. Figure 3 illustrates one possible chain of lending relationships whereby credit flows from the ultimate creditors (household savers) to the ultimate debtors (households who obtain a mortgage to buy a house). In this illustration, the mortgage asset is held in a

[Figure 3] Long Intermediation Chain



mortgage pool - a passive firm whose sole role is to hold mortgage assets and issue liabilities (mortgage-backed securities, MBSs) against those assets. The mortgage-backed securities might then be owned by an asset-backed security (ABS) issuer who pools and tranches the MBSs into another layer of claims, such as collateralized debt obligations (CDOs). Then, a securities firm (a Wall Street investment bank, say) might hold CDOs on their own books for their yield, but finances such assets by collateralized borrowing through repurchase agreements (repos) with a larger commercial bank. In turn, the commercial bank would fund its lending to the securities firm by issuing short term liabilities, such as financial commercial paper. Money market mutual funds would be natural buyers of such short-term paper, and ultimately the money market fund would complete the circle, since household savers would own shares to these funds.

Of course, the illustration in Figure 3 is a simple example of potentially much more complex and intertwined relationships. For instance, the same security could be used several times in repo lending as the lender turns round and pledges the same security as collateral to another lender (the practice known as re-hypothecation). In that case, the chain would be much longer and more involved. Nor does the illustration take account of off-balance sheet vehicles such as structured investment vehicles (SIVs) or ABCP conduits that the commercial bank might set up in order to finance the direct holding of CDOs and other asset-backed securities.

What is noticeable from the institutions involved in Figure 3 is that they were precisely those institutions that were at the sharp end of the financial crisis of 2007 and 2008. Subprime mortgages cropped up in this chain, and the failure of Bear Stearns and Lehman Brothers owed to problems in the smooth function of this chain. This realization begs the question of what advantages can be gained by such long intermediation chains.

One possible argument might be that securitization enables the dispersion of credit risk to those who can best bear losses. We have already commented on the apparent failure of this particular mechanism, but we will return to examine it more closely below. Leaving that to one side, another possible justification for long

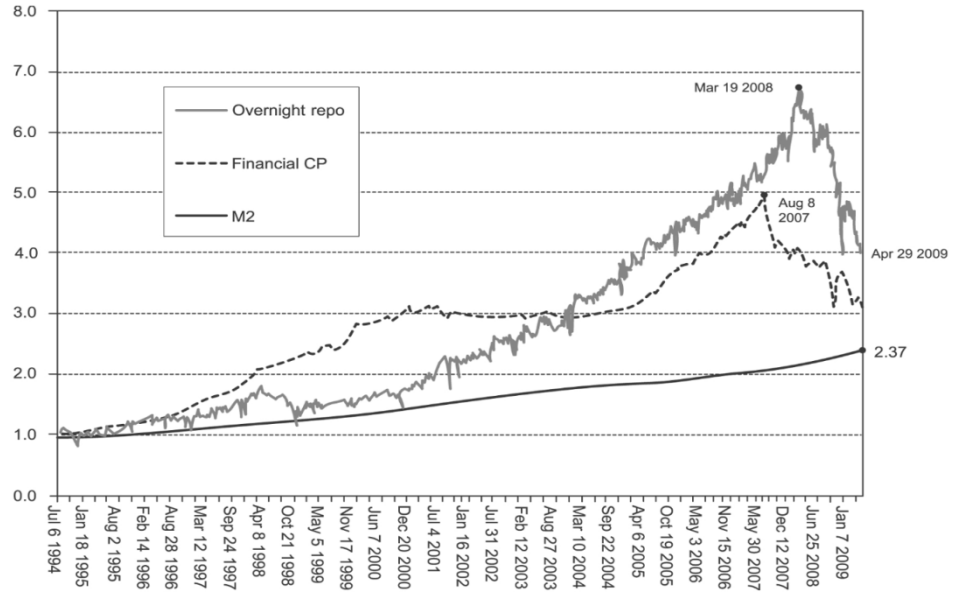
intermediation chains is that there is an inherent need for maturity transformation in the financial system because ultimate creditors demand short-term claims, and that the process of stringing together long lending relationships make it easier to perform the overall maturity transformation role.

There are well known arguments for the desirability of short-term debt for incentive reasons - in particular in disciplining managers. Calomiris and Kahn (1991) have argued that demand deposits for banking arose naturally as a response by the bank's owners and managers to commit not to engage in actions that dissipate the value of the assets, under pain of triggering a depositor run. Diamond and Rajan (2001) have developed this argument further, and have argued that the coordination problem inherent in a depositor run serves as a commitment device on the part of the depositors not to renegotiate in the face of opportunistic actions by the managers. When the bank has the right quantity of deposits outstanding, any attempt by the banker to extort a rent from depositors will be met by a run, which drives the banker's rents to zero. Foreseeing this, the banker will not attempt to extort rents. In a world of certainty, the bank maximizes the amount of credit it can offer by financing with a rigid and fragile deposit-only capital structure.

However, in both Calomiris and Kahn (1991) and Diamond and Rajan (2001), the focus is on traditional bank deposits, where the creditors are not financial intermediaries themselves. However, what is notable about the financial boom and bust cycle witnessed recently is that the largest fluctuations in ultra short-term debt has not been associated with the liabilities to retail depositors, but rather with the liabilities to other financial intermediaries. Adrian and Shin (2009) compare the stock of repurchase agreements of US primary dealers plus the stock of financial commercial paper expressed as a proportion of the M2 stock. M2 includes the bulk of retail deposits and holdings in money market mutual funds, and so is a good proxy for the total stock of liquid claims held by ultimate creditors against the financial intermediary sector as a whole. As recently as the early 1990s, repos and financial CP were only a quarter of the size of M2. However, the total rose rapidly reaching over 80% of M2 by the eve of the financial crisis in August 2007, only to collapse with the onset of the crisis.

The ultra-short nature of the financial intermediary obligations to each other can be better seen when plotting the overnight repos component of the overall repo series. Figure 4 plots the size of the overnight repo stock, financial commercial paper and M2, normalized to be equal to 1 on July 6th, 1994 (the data on overnight repos are not available before that date). The stock of M2 has grown by a factor of around 2.4 since 1994, but the stock of overnight repos grew almost seven-fold up to March 2008. Brunnermeier (2009) has noted that the use of overnight repos became so prevalent that, at its peak, the Wall Street investment banks were rolling over a quarter of their balance sheets every night. What is evident from Figure 4 is that the rapid growth and subsequent collapse of the overnight repos cannot be easily explained by the demand for short-term liquid claims of retail depositors.

[Figure 4] Overnight repos, financial commercial paper and M2 (normalized to 1 on 6 July 1994)



Ⅱ. An Accounting Framework

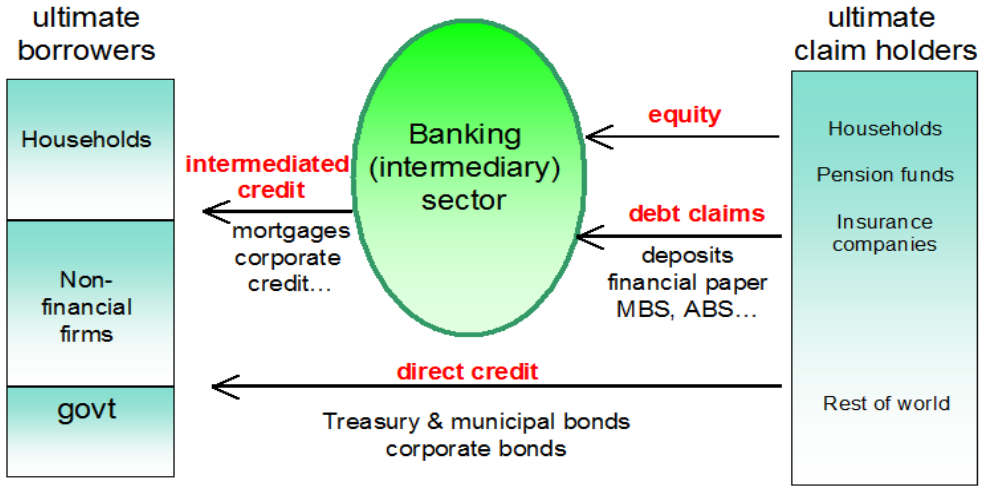
Consider a stylized financial system for the allocation of credit in the economy depicted in Figure 5. The financial system channels savings from the lenders to ultimate borrowers. The ultimate lenders are households, either directly or indirectly through institutions such as pension funds, mutual funds and life insurance companies.

Some credit will be directly provided from the lender to the borrower. Treasury bonds or municipal bonds are a good example of such direct credit where the lender holds a direct claim on the borrower. However, the sizeable borrowing of the household sector - either mortgages or consumer debt - is almost always intermediated through the banking system, broadly defined. At the end of 2008, US household sector mortgage liabilities amounted to around $10.6 trillion, and consumer debt accounts for another $2.5 trillion.

The accounting framework presented here is based on the picture of credit flow given in Figure 5, and is drawn from Shin (2009). There are n financial intermediaries standing between the ultimate borrowers and the ultimate creditors. For convenience, we denote these intermediaries simply as banks.

Denote by y_i the claim held by bank i on the ultimate borrowers, such as household mortgages or consumer loans. For our purposes in this paper, it does not matter much whether y_i is in face values or market values, since the purpose of this paper is to outline the underlying accounting relationships within the financial

[Figure 5] Stylized Financial System for Credit



system. However, in what follows, it is useful to interpret all quantities as being in market values, since the comparative statics take on additional richness due to valuation effects.[1]

As well as claims on the ultimate borrowers, the banks hold claims against each other. Denote by x_i the total value of the liabilities of bank i, by x_{ij} the value of bank i's liabilities held by bank j and by π_{ij} the share of bank i's liabilities that are held by bank j. Denoting by e_i the value of equity of bank i, the balance sheet identity of bank i is:

$$y_i + \sum_j x_j \pi_{ji} = e_i + x_i \tag{2.2}$$

The left hand side is the value of assets and the right hand side is the sum of debt (x_i) and equity (e_i). The matrix of claims and obligations between banks can then be depicted as below. The (i,j)th entry in the table is the debt owed by bank i to bank j. Then, the ith row of the matrix can be summed to give the total value of debt of bank i, while the ith column of the matrix can be summed to give the total assets of bank i. We can give the index $i+1$ to the outside creditor sector (households, pension funds, mutual funds etc.), so that $x_{i,n+1}$ denotes bank i's liabilities to the outside claimholders. Deposits would be the prime example of a liability that a bank has directly to outside creditors.

[1]See Shin (2009) for more details on the relationship between book values and market values in an interconnected balance sheet network.

	bank 1	bank 2	⋯	bank n	outside	debt
bank 1	0	x_{12}	⋯	x_{1n}	$x_{1,n+1}$	x_1
bank 2	x_{21}	0		x_{2n}	$x_{2,n+1}$	x_2
⋮	⋮	⋮	⋱	⋮	⋮	
bank n	x_{n1}	x_{n2}	⋯	0	$x_{n,n+1}$	x_n
end-user loans	y_1	y_2	⋯	y_n		
total assets	a_1	a_2		a_n		

From the balance sheet identity (2.2), we can express the vector of debt values across the banks as follows, where Π is the $n \times n$ matrix where the (i, j)th entry is π_{ij}.

$$[x_1, \cdots, x_n] = [x_1, \cdots, x_n] \begin{bmatrix} & \Pi & \\ & & \end{bmatrix} + [y_1, \cdots, y_n] - [e_1, \cdots, e_n] \tag{2.3}$$

or more succinctly as

$$x = x\Pi + y - e \tag{2.4}$$

Solving for y,

$$y = e + x(I - \Pi)$$

Define the leverage of bank i as the ratio of the total value of assets to the value of its equity. Denote leverage by λ_i. That is,

$$\lambda_i = \frac{a_i}{e_i} \tag{2.5}$$

Since $x_i / e_i = \lambda_i - 1$, we have $x = e(\Lambda - I)$, where Λ is the diagonal matrix whose ith diagonal entry is λ_i. Thus

$$y = e + e(\Lambda - I)(I - \Pi) \tag{2.6}$$

Thus, the profile of total lending by the n banks to the end-user borrowers depends on the interaction of three features of the financial system - the distribution of equity e in the banking system, the profile of leverage Λ and the structure of the financial system given by Π. Total lending to end users is increasing in equity and in leverage, as one would expect. More subtle is the role of the financial system, as given by the matrix Π. Define the vector z as

$$z \equiv (I - \Pi)u \tag{2.7}$$

Where

$$u \equiv \begin{bmatrix} 1 \\ \mathsf{M} \\ 1 \end{bmatrix}$$

so that $z_i = 1 - \sum_{j=1}^{n} \pi_{ij}$. In other words, z_i is the proportion of bank i's debt held by the outside claimholders - the sector $n+1$. Then, total lending to end-user borrowers $\sum_i y_i$ can be obtained by post-multiplying equation (2.6) by u so that

$$\sum_{i=1}^{n} y_i = \sum_{i=1}^{n} e_i z_i (\lambda_i - 1) + \sum_{i=1}^{n} e_i \tag{2.8}$$

Equation (2.8) is the key balance sheet identity for the financial sector as a whole, where all the claims and obligations between banks have been netted out. The left hand side is the total lending to the end-user borrowers. The second term on the right hand side of (2.8) is the total equity of the banking system, and the first term is the total funding to the banking sector provided by the *outside* claimholders (note that the second term can be written as $\sum_{i=1}^{n} x_i z_i$). Thus, from equation (2.8) we see the importance of the structure of the financial system for the supply of credit. Ultimately, credit supply to end-users must come either from the equity of the banking system, or the funding provided by non-banks. Greenlaw, Hatzius, Kashyap and Shin (2008) uses this framework to calibrate the aggregate consequences of banking sector lending contraction that results from the combination of capital losses and deleveraging from subprime losses.

The aggregate balance sheet identity of the financial intermediary sector given by (2.8) can be explained more informally as follows. Take the balance sheet of an individual bank, given by Figure 6. The bank has assets against ultimate borrowers (loans to firms and households), but it also has assets that are claims against other banks. On the liabilities side, the bank has obligations to outside creditors (such as retail depositors), but it also has obligations to other banks.

[Figure 6] Balance Sheet of Individual Bank

Assets	Liabilities
Loans to firms, households Claims on other banks	Liabilities to non-banks (e.g. deposits) Liabilities to other banks Equity

Individual bank

[Figure 7] Aggregate Balance Sheet of Bank Sector

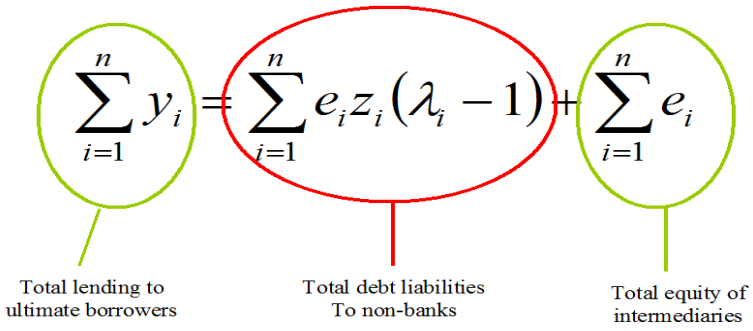
Assets	Liabilities
Total lending to ultimate borrowers (firms, households govt)	**Total debt liabilities to non-banks** Total equity

Banking sector

Now, consider the aggregate balance sheet of the banking sector as a whole, where the assets are summed across individual banks and the liabilities are summed across the banks, also. Every liability that a bank has to another bank is an asset when viewed from the point of view of the lending bank. One asset cancels out another equal and opposite liability. In aggregate, all the claims and obligations across banks cancel out. Thus, in aggregate, the assets of the banking sector as a whole against other sectors of the economy consists of the lending to non-bank borrowers. This lending must be met by two sources - the total equity of the banking system, and the liabilities that banks have to lenders *outside* the banking system. Figure 7 illustrates.

Equation 2.8 is a statement of the aggregate balance sheet identity. What is useful is the fact that equation 2.8 tells us how the leverage of the financial intermediary sector as a whole depends on the leverage of the individual institutions.

The total debt liabilities of the banking sector to the household creditors can be expected to be sticky, and would be related to total household assets. Thus, the expression in the central balloon above will be slow-moving, in line with shifts in the total household holding of debt claims on the banking sector. For the purposes of short-term comparative statics, we could approximate it as being roughly constant. If we treat the expression in the central balloon as a constant, we learn much about the impact of various shifts in the parameters on the configuration of the financial system. We now examine two scenarios.



1. Boom Scenario

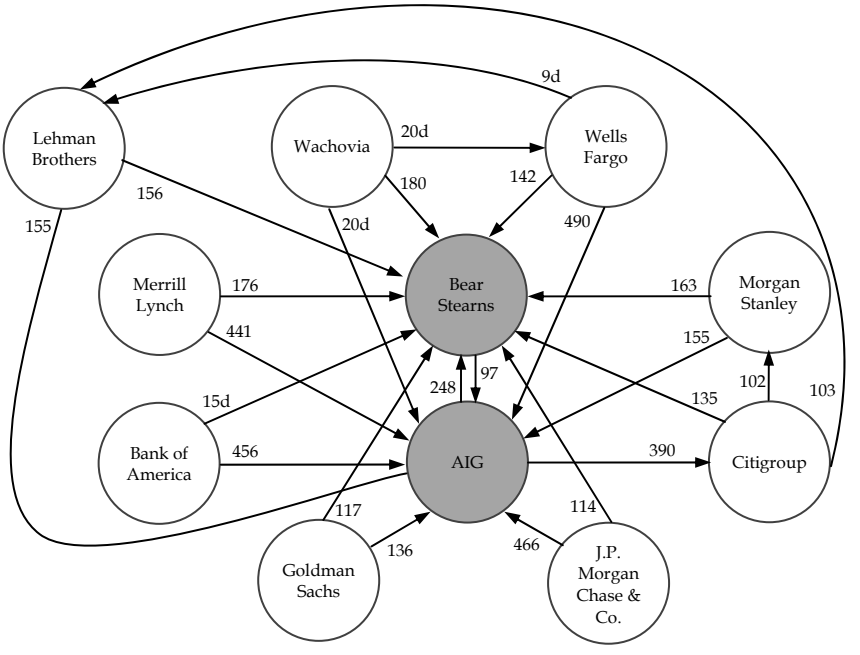
Consider a boom scenario where the marked-to-market equity of the banks are healthy (that the profile of equity $\{e_i\}$ is strong) and the decline in measured risks leads to an increase in leverage, $\{\lambda_i\}$. In order for the expression in the red balloon to remain constant, there must be an overall decline in $\{z_i\}$, the proportion of funding coming from outside claimholders. In other words, banks must lend more to each other in order to achieve their desired risk-taking profile and leverage, given their strong capital position. In such a scenario, banks take on more of each others' debts and the intertwining of claims and liabilities become more far-reaching. The image is of an increasingly elaborate edifice built on the same narrow foundation, so that the structure becomes more and more precarious. The systemic risks therefore increase during the boom scenario.

Figure 8 is the map of CoVaR measures for the conditional Value at Risk for US financial institutions (conditional on distress of another institution) (Adrian and Brunnermeier (2009), IMF (2009)). Andy Haldane (2009) has recently highlighted the highly interconnected nature of financial institutions in the run-up to the financial crisis.

Our accounting identity above shows why such closely interconnected balance sheets is a necessary feature of a boom scenario when banks have strong capital positions and measured risks are low. For any fixed pool of funding to be drawn from the household sector, any substantial increase in balance sheet size of the financial intermediaries can be achieved only by *borrowing and lending from each other*. The key variables are the $\{z_i\}$, which gives the proportion of funding obtained from outside the intermediary sector. In order to increase the profile of leverage $\{\lambda_i\}$ within the intermediary sector, the banks must lower the funding profile $\{z_i\}$, since they are competing for the same limited pool of outside funding. The banks can raise their risk exposure to their desired level only by borrowing and lending between themselves, since outside funding is inadequate to meet their growing needs.

An architectural analogy is appropriate. In order to build additional rooms into a house whose footprint is limited by shortage of land, the only way is to build upward - like a skyscraper in Manhattan. The lower is the funding profile $\{z_i\}$,

[Figure 8] US Financial Institutions' Co-Risk Measure (source: IMF Global Financial Stability Report, April 2009)



the taller is the skyscraper. However, even this analogy is somewhat misleading in that the Manhattan skyscraper would be planned in advance and built as a coherent whole. An interconnected financial system that builds upward is much less coordinated, and hence is liable to result in greater unintended spillover effects. It would be as if additional floors are built on top of existing ones, where the architects of lower floors did not anticipate further building on top.[2]

Shortening of maturities would be a natural counterpart to the lengthening intermediation chains. In order for each link in the chain to be a profitable leveraged transaction, the funding leg of the transaction must be at a lower interest rate. When the yield curve is upward-sloping, this would entail funding with shorter and shorter maturities at each step in the chain. The prevalence of the overnight repo as the dominant funding choice for securities firms before the current crisis can be understood in this context. The use of ultra-short term debt is part and parcel of long intermediation chains.

The importance of the short-term interest rate in determining the size and fragility

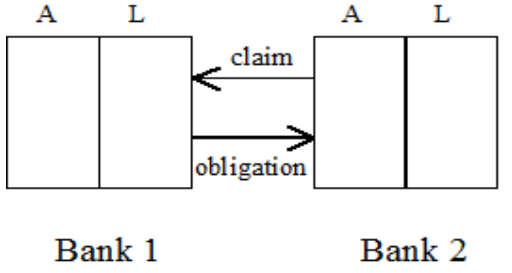
[2]Architecturally, the closest example would be the Sutyagin house in Archangel, Russia, reported in the Daily Telegraph of March 7th, 2007. The 13 floor 144 feet wooden structure is described as a jumble of planking and the eighth wonder of the world. A Google image search for Sutyagin House yields dozens of photos of the structure.

of the financial system can be seen from the above line of reasoning. A period of sustained short-term interest rates (with the assurance of continued low short rates by the central bank) is a highly favorable environment for the taking on of such short-term bets. Adrian and Shin (2008) shows that the Fed Funds rate is an important determinant of the growth of securities firms' balance sheets, which in turn has significant effects on the real economy. Thus, there is a monetary policy angle to the increasing length of intermediation chains.

2. Bust Scenario

Now consider the reversal of the boom scenario whereby perceptions of heightened risk raise Value at Risk and induce deleveraging of the financial system, leading to lower $\{\lambda_i\}$. In addition, falls in asset prices and possible credit losses eat into the marked-to-market equity levels $\{e_i\}$. This is a double whammy for the financial system as a whole, since in order for the expression in the red balloon to stay roughly constant, there has to be substantial *increases* in $\{z_i\}$. The increase in z_i means that a greater proportion of the funding comes from outside claimholders - that is, the funding that banks had granted to each other must now be withdrawn. This is a classic run scenario where banks run on other banks. The runs on Northern Rock, Bear Stearns and Lehman Brothers are all instances of such a run.

[Figure 9] Financial Intermediary Run in the Bust Scenario



The direct manifestation of a run of this type can be given a simpler depiction in the following two bank example, taken from Morris and Shin (2008). Bank 1 has borrowed from Bank 2. Bank 2 has other assets, as well as its loans to Bank 1. Suppose that Bank 2 suffers credit losses on these other loans, but that the creditworthiness of Bank 1 remains unchanged. The loss suffered by Bank 2 depletes its equity capital. In the face of such a shock, a prudent course of action by Bank 2 is to reduce its overall exposure, so that its asset book is trimmed to a size that can be carried comfortably with the smaller equity capital.

From the point of view of Bank 2, the imperative is to reduce its overall lending, including its lending to Bank 1. By reducing its lending, Bank 2 achieves its micro-prudential objective of reducing its risk exposure. However, from Bank 1's

perspective, the reduction of lending by Bank 2 is a withdrawal of funding. Unless Bank 1 can find alternative sources of funding, it will have to reduce its own asset holdings, either by curtailing its lending, or by selling marketable assets.

In the case where we have the combination of (i) Bank 1 not having alternative sources of funding, (ii) the reduction in Bank 2's lending being severe, and (iii) Bank 1's assets being so illiquid that they can only be sold at fire sale prices, then the withdrawal of lending by Bank 2 will feel like a run from the point of view of Bank 1. In other words, a prudent shedding of exposures from the point of view of Bank 2 is a run from the point of view of Bank 1. Arguably, this type of run is one element of what happened to Northern Rock, Bear Stearns and Lehman Brothers.

Ⅲ. Prescriptions

The prescriptions for moderating the fluctuations associated with the boom and busts scenarios can also be understood in terms of the aggregate balance sheet identity (2.8). We discuss three in particular - regulatory interventions, various forms of forward-looking provisioning, and the reform of the institutions involved in financial intermediation.

Approach 1. Regulatory Intervention.

The first approach is to moderate the fluctuations in leverage and balance sheet size through capital regulation with an explicit countercyclical element, such as the countercyclical capital targets advocated in the recent Geneva Report (Brunnermeier et al. (2009)) and the Squam Lake Working Group's memo on capital requirements (Squam Lake Working Group (2009)). The leverage cap introduced in Switzerland recently (Hildebrand (2008)) can also be understood in this connection.

$$\sum_{i=1}^{n} y_i = \sum_{i=1}^{n} e_i z_i (\lambda_i - 1) + \sum_{i=1}^{n} e_i$$

Leverage caps or countercyclical capital targets aim at restraining the growth of leverage $\{\lambda_i\}$ in boom times so that the corresponding bust phase of the financial cycle is less damaging, or can be avoided altogether. In the above expression, moderating the fluctuations in $\{\lambda_i\}$ implies that the marked-to-market equity values $\{e_i\}$ and the outside financing proportions $\{z_i\}$ can also be kept within moderate bounds, so as to prevent the rapid build-up of cross-exposures which are then subsequently unwound in a disorderly way as runs against other banks.

A closely related set of proposals are those that address the *composition* of assets, rather than the capital ratio. The idea is to impose liquidity requirements on the banks so as to limit the externalities in the bust phase of the cycle. Cifuentes, Ferrucci and Shin (2004) is an early statement of the proposal, subsequently incorporated in

the Bank of England's RAMSI framework for systemic risk.[3]

Morris and Shin (2008, 2009) describe the rationale for liquidity requirements and provides an analysis of the mechanisms invoked. The idea is to take those elements that are responsible for the vicious circle of distress and self-reinforcing runs and then harness them to create a *virtuous circle* of beliefs leading to a stable outcome. Liquidity requirements mandate a cushion of cash assets over some interval of time, such as requiring banks to maintain reserves at the central bank over some fixed maintenance period. Such liquidity requirements can moderate the externalities involved in a run by influencing the risks of spillovers across financial intermediaries. When a borrower bank has a high level of liquidity, then the withdrawal of funding by its creditor banks can be met (at least partly) by its liquid resources, which makes the debtor bank less likely to run on other banks. For creditor banks, there are two effects. First, knowing that the debtor bank is less vulnerable to runs reduces the incentive to run that arises purely from a coordination motive. In addition, when each creditor bank realizes that other creditor banks have higher liquidity levels, the coordination problem among the creditor banks becomes less sensitive to strategic risk - making them less jittery when faced with a run scenario. The more relaxed attitude of creditors and debtors are mutually reinforcing, just in the same way that distress and concerns about others' viability can be self-reinforcing. In this way, the same forces that lead to the vicious circle of run psychology can be harnessed and channeled to generate a *virtuous circle* of stability.

Approach 2. Forward-Looking Provisioning.

A second way to moderate fluctuations of the boom bust cycle is to operate directly on the equity $\{e_i\}$ of the banks. The forward-looking statistical provisioning scheme that has operated in Spain is a good example of such a method. By imposing a provisioning charge when new loans are made, there is a corresponding diminution of the equity level of the bank making the loan. For any given desired leverage of the bank, a lower equity level means lower total assets, hence restraining the rapid growth of balance sheets.

$$\sum_{i=1}^{n} y_i = \sum_{i=1}^{n} e_i z_i (\lambda_i - 1) + \sum_{i=1}^{n} e_i$$

The Spanish pre-provisioning scheme highlights one of the important lessons in a boom[4]. Under a boom scenario, the problem is that there is *too much equity* in the banking system. There is overcapacity in the sense that the level of aggregate capital is too high. Capital is higher than is consistent with only prudent loans being made.

[3]The Bank of England's RAMSI framework is described in the recent issue of the IMF's Global Financial Stability Report (2009, chapter 2).

[4]For a description of the Spanish pre-provisioning system, see the Bank of Spain working paper by Fernandez, Pages and Saurina (2000).

Overcapacity leads to the chasing of yields and the lowering of credit standards. Elsewhere (Shin (2009)), I have sketched a mechanism for the emergence of subprime lending based on this mechanism. Expanding balance sheets are like an expanding balloon. Just as an expanding balloon needs air to fill the balloon, expanding balance sheets need new asset creation. But when all prime mortgage borrowers are already catered for, lending standards must be lowered in order to generate new assets. Hence, subprime lending emerges as a result of the urge to expand balance sheets.

In the Geneva Report, we discuss the merits of a variant of the Spanish pre-provisioning scheme called the Pigovian Tax. The idea is that rather than reducing equity through a provision, equity can also be lowered in a boom through an explicit centralized tax. The tax has the potential to enhance efficiency of the overall financial system in the same way that a congestion charge would improve traffic in a city. By counteracting an existing inefficiency through a tax, one can counteract the harmful externality. Just as with a traffic congestion charge, the revenue raised in the tax is not an essential component of the scheme. However, if the revenue raised through the Pigovian Tax could be put into a separate bank resolution fund, then the scheme would not imply a net transfer away from the banking sector.

Approach 3. Structural Reform of Intermediation.

A third approach is more long term, and is aimed at influencing the market structure of the financial intermediary sector as a whole. The idea is to restrain the lengthening of intermediation chains, and encourage the formation of shorter intermediation chains.

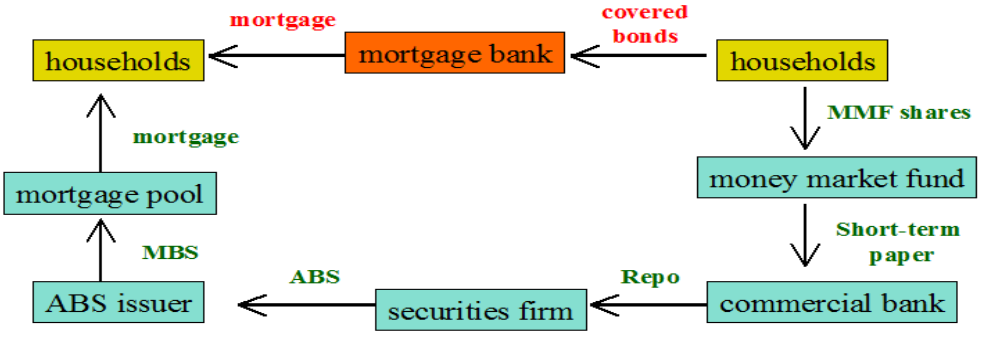
$$\sum_{i=1}^{n} y_i = \sum_{i=1}^{n} e_i z_i (\lambda_i - 1) + \sum_{i=1}^{n} e_i$$

In terms of the aggregate balance sheet identity, the objective is to operate directly on the mode of financial intermediation so that the funding profile $\{z_i\}$ is maintained at high levels, thereby limiting the number of intermediaries n and moderating the fluctuations in leverage and total assets. The idea is to induce a shortening of the financial intermediation chain by linking ultimate borrowers and ultimate lenders more directly.

One potential way to induce such shortening of the intermediation chain would be through the encouragement of the issuance of covered bonds -- bonds issued against segregated assets on a bank's balance sheet, with recourse against the issuing bank itself.

The intermediation chain associated with a covered bond is short, since the bank holds mortgage claims against ultimate borrowers, and issues covered bonds that could be sold directly to households or to long-only institutions such as mutual funds or pension funds. The bonds offer longer duration that match the duration of the assets. The longer duration of the liabilities have two advantages. First, the duration matching between assets and liabilities means that the issuing bank does

[Figure 10] Shortening the Intermediation Chain through Covered Bonds



not engage in maturity transformation in funding. Rigorous application of marking to market makes less sense when loans are segregated to back such liabilities. In the Geneva Report, we have argued that the accounting treatment of such assets can take account of what the banks are capable of holding, rather than simply appealing to their intentions, as is the rule under the current mark-to-market regime.

Second, the fact that liabilities have long duration means that the short-term funding that is prevalent in the long intermediation chains will be less likely to be employed provided that the covered bonds are held directly by households or by long-only institutions such as pension funds and mutual funds. The long duration of such securities would be a natural source of sought-after duration for pension funds who wish to match the long duration of their pension liabilities. Household savers would also find such products a good substitute for government bond funds. The shortening of the intermediation chain in this way will have important benefits in terms of mitigating the fluctuations in leverage and balance sheet size in the financial boom bust cycle.

Covered bonds have been a familiar feature of many European countries, especially in Denmark (with its mortgage bonds) and Germany (with its pfandbriefe). But to date, over twenty countries in Europe have some form of covered bonds backed by laws that underpin their role in the financial system. Packer, Stever and Upper (2007) is a recent overview of the covered bond system, who report that as of mid-2007 the outstanding amount of covered bonds reached €1.7 trillion.

As already discussed, covered bonds are securities issued by a bank and backed by a dedicated, segregated group of loans known as a cover pool. The bondholders have two safeguards in their holding of covered bonds. First, the bonds are backed by the cover pool over which the bondholders have senior claims in case of bankruptcy. Second, because the covered bonds are the obligations of the issuing bank, the bondholders have recourse to the bank if the cover pool is insufficient to meet the bond obligations. In this second sense, covered bonds differ from the U.S.-style mortgage backed security, which are obligations of the special purpose vehicle - a passive company whose sole purpose is to hold assets and issue liabilities against those assets. The loans backing the covered bonds stay on the balance sheet of the bank, eliminating one step in the intermediation chain, and also guarding against

potential incentive problems in the originate to distribute model of securitization in which the originating bank can sell the loan and take it off its balance sheet altogether.

The double protection offered by covered bonds distinguishes them both from senior unsecured debt and asset-backed securities (ABSs). In contrast to ABSs, the cover pool serves mainly as credit enhancement and not as a means to obtain exposure to the underlying assets. Also, cover pools tend to be dynamic in the sense that issuers are allowed to replace assets that have either lost some quality or have been repaid early. These features imply that covered bonds are seen not so much as an instrument to obtain exposure to credit risk, but rather as a higher-yielding alternative to government securities.

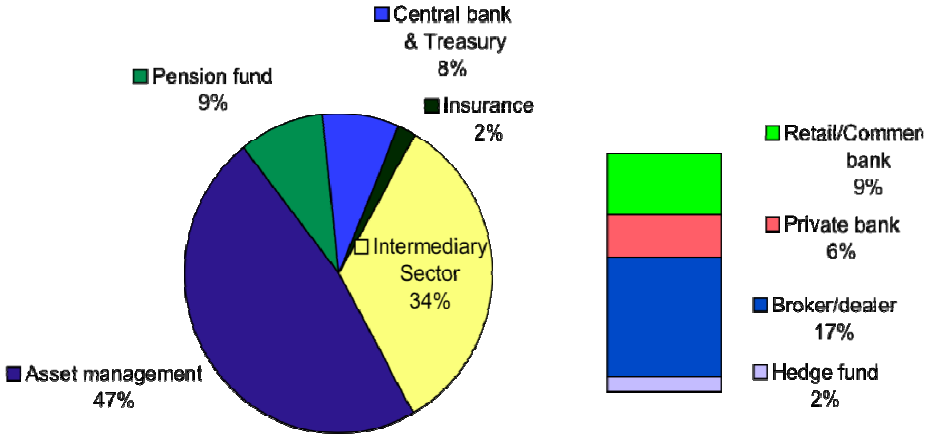
These payoff attributes of covered bonds are reflected in the identity of the investors who hold them. The identity of the investors is critical in determining the funding profile $\{z_i\}$ of the intermediation sector. The objective of achieving a higher funding profile is achieved if the investors are either household savers or non-bank institutions such as pension funds and mutual funds. A survey of the investors in covered bonds was released in May 2009 by the European Covered Bond Dealers Association (SIFMA (2009)), and is reproduced in Figure 11 We see that the bulk of the investors in covered bonds are non-banks, with the largest category being asset management firms. Leveraged institutions and intermediaries constitute only around one third of the total. Even within the intermediary sector, institutions such as private banks are closer to asset management firms in character than intermediaries such as broker dealers who lengthen the intermediation chain.

Even among covered bonds, the Danish system of mortgage bonds has attracted considerable attention recently as a resilient institutional framework for household mortgage finance due to the added feature that household mortgage borrowers can redeem their debt by purchasing the relevant issue of the mortgage bonds at the prevailing market price (see Boyce (2008)). By being able to extinguish debt obligations at market prices, household borrowers participate as purchasers in the market for mortgage debt, and prevent the type of collapse in mortgage-backed securities seen in the United States in the financial crisis of 2007 and 2008.

The legislation required to underpin the operation of a covered bond system is more developed in some regions than others. Europe leads the world in this respect. In the European Union, covered bonds are defined by the Capital Requirements Directive (CRD), which limits the range of accepted collateral maximum loan-to-value ratios. While the CRD only recognizes securities issued under special legislation as covered bonds, market participants tend to work with a more general definition that also includes bonds issued under private contractual arrangements using elements from structured finance. There have been a number of such structured covered bonds, primarily in countries without covered bond legislation (eg the United Kingdom, the Netherlands and the United States) (see Packer, Stever and Upper (2007)).

Indeed, one of the main hurdles against the widespread introduction of a covered bond system has been the legal hurdle of introducing a class of claimholders for the cover pool that are senior to the deposit insurance agency, and hence the general depositors of the bank. The larger is the cover pool for covered bonds, the smaller is

[Figure 11] Investors in covered bonds (source: SIFMA(2009))



the general pool of assets that are accessible to the deposit insurance agency. In the United States, the FDIC has issued a statement on the treatment of covered bonds, limiting the size of covered bonds to 4% of total liabilities after issuance.[5] Given the benefits associated with the shortening of the intermediation chain, there are legitimate questions on how much political will can be mustered in order to amend the relevant laws to allow the operation of the covered bond system.

A possible alternative legal approach would be to permit specialist narrow banks whose liabilities are restricted to covered bonds only, and hence whose liabilities are not insured by the deposit insurance agency. Such narrow banks would be akin to Danish mortgage banks whose liabilities match the duration of the assets perfectly and whose equity provides a cushion for bond holders.

Ⅳ. Implications for Korea

Korea has been vulnerable to twin crises in which a banking crisis and currency crisis reinforce each other. Such crises are particularly potent due to the mutually reinforcing nature of the two crises, and the rapid deterioration of economic fundamentals caused by the amplification of the crisis. Although twin crises show many different forms across countries and across time, the common thread that links all of them is the balance sheet mismatch at the aggregate country level arising from excessive short-term debt denominated in foreign currency.

There are three potential ways to address the vulnerability to twin crises:

[5]The FDIC's statement on covered bonds is at
http://www.fdic.gov/news/news/financial/2008/fil08073.html

- maintain larger holding of foreign exchange reserves
- curb the growth of banking sector assets
- diversify the funding sources for the banking sector.

However, the first two methods have many undesirable economic consequences and are unsuitable as a long-term strategy for financial sector resilience. The best way to improve the resilience of the Korean financial sector is through the third method -- to diversify the funding sources for the banking sector. US-style securitization has been shown to be flawed in the current crisis. Instead, the adoption of covered bonds (used in Europe for over two hundred years) is a more promising long-term strategy to diversify the funding of the banking sector while maintaining the stability of the system.

Foreign exchange reserves held by Korea rose to $227 billion in May, up substantially from last autumn in the midst of the liquidity crisis caused by the failure of Lehman Brothers. There is an active debate on the appropriate size of foreign exchange reserves, with some voices arguing for a continued accumulation of foreign exchange reserves. Although larger foreign exchange reserves may be desirable in the short-term, maintaining large foreign exchange reserves is not a feasible or desirable option for Korea in the long-term.

Maintaining large reserves is costly – it is tantamount to lending to foreigners at a very low interest rate. Given the large and growing US budget deficit and the potential for a rapid fall in the value of the US dollar, there is the potential for large capital losses on such holdings. Large reserves hinder the smooth functioning of domestic monetary policy pursued by the Bank of Korea, as capital inflows have to be sterilized by issuing domestic claims. Capital inflows present challenges for maintaining domestic liquid reserves at prudent levels. Finally, there are international political economy issues. Large foreign exchange reserves expose Korea to political pressures from US politicians who may misinterpret Korea's intentions, and accuse it of artificially maintaining a weak currency.

For these reasons, maintaining large foreign exchange reserves is not a desirable long-term strategy. Much better would be to reduce the vulnerability of the Korean financial sector, so that there is less need to hold large foreign exchange reserves.

One potential way to reduce the vulnerability of the Korean financial sector is by curbing the rapid growth of lending in booms. Restricting the rapid growth of assets would mitigate the building up of such vulnerabilities, but such a policy also carries large costs. By restricting the growth of assets, lending would be limited to the same rate as the growth of retail deposits. However, for a rapidly growing economy, such restrictions would impose inefficiently tight restrictions on loans.

There is also the danger that banks would focus excessively on the availability of collateral, so that lending is skewed toward residential real-estate based lending, at the expense of financing for firms. Although large companies can tap the capital markets, the same is not true of the small and medium sized enterprises (SMEs) who rely heavily on bank lending. Therefore, restricting the growth of assets will have potentially undesirable side-effects of choking off lending to SME firms.

These concerns are magnified by the institutional development in which banks have to compete to keep their retail deposits in the face of competition from other providers of deposit-like savings instruments, such as money market funds (MMFs)

provided by securities firms. Restricting the excessive growth of bank lending should form part of the overall strategy for the Korean financial sector, but relying on it exclusively will entail undesirable costs. Combining such a policy with a long-term policy for the diversification of bank funding is important. I turn to this issue now.

US-style securitization in which loans are sold off to special purpose vehicles has been shown to be flawed by the current crisis. Securitization was meant to disperse risks associated with bank lending so that deep-pocketed investors who were better able to absorb losses would share the risks. But as argued already, in reality, securitization had the perverse effect of concentrating all the risks in the banking system itself. The severity of the global financial crisis, especially in the United States, highlights the shortcomings of US-style securitization and the excessive growth of the securities industry relative to the real economy.

One promising alternative to US-style securitization is the institution of covered bonds. Covered bonds offer two main benefits. First, by providing a long-term domestic source of funding for the banking system, the liability structure of the banking sector is made more resilient. The funding becomes (i) long-term and (ii) denominated in the domestic currency. For both reasons, covered bonds guard against twin crises of liquidity crisis and currency crisis. Second, covered bonds provide a long-term savings vehicle for households that (in contrast to bank deposits) allow them to hedge against fluctuations in interest rates. The legislation required to underpin the operation of a covered bond system is most developed in the European Union. Outside Europe, the main hurdle against the widespread introduction of a covered bond system is the legal hurdle of introducing a class of claimholders for the cover pool that are senior to the deposit insurance agency, and hence the general depositors of the bank. However, given the large benefits from providing a stable source of domestic funding and providing a long-term savings vehicle, the development of the covered bond system deserves greater attention from policy makers.

A possible way to overcome the issue of seniority of depositors is to establish specialist "narrow" banks whose liabilities are restricted to covered bonds only, and hence whose liabilities are not insured by the deposit insurance agency. Danish mortgage banks operate in this way. Indeed, Denmark provides a good illustration of how resilience of the financial sector can be combined with active lending for domestic mortgage borrowers. Denmark's housing boom was almost as large as that of the United States. However, Denmark has not seen a similar financial crisis as in the United States. This contrast is largely due to the difference in the financial structure and the operation of the covered bond system.

For Korea, the covered bond system in Denmark (but also in Germany, France, Spain and others) would bring the twin advantages of providing a stable source of long-term domestic funding, and the provision of a long-term savings vehicle for households.

Ⅴ. Concluding Remarks

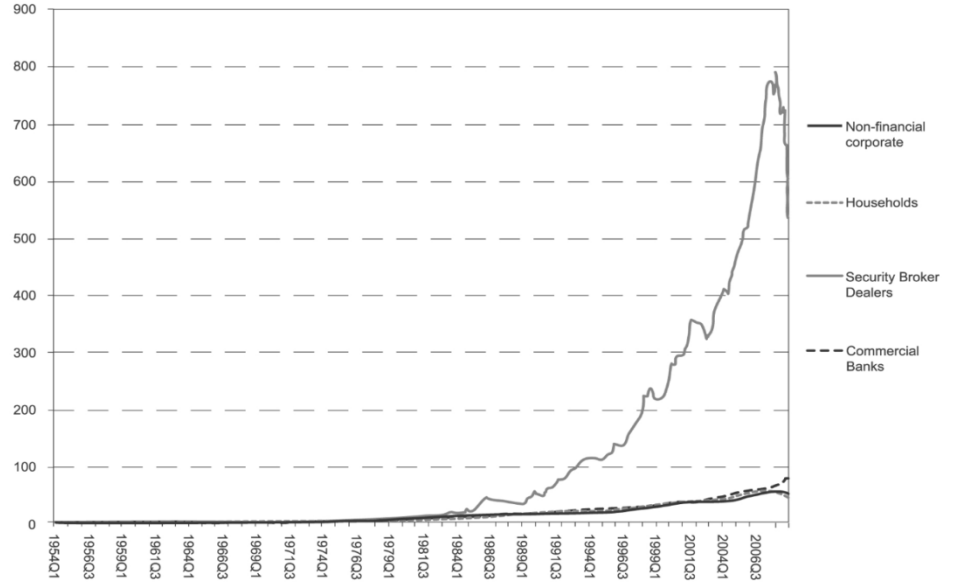
The organizing theme of this paper has been the overall systemic impact of long versus short intermediation chains. Long intermediation chains have been associated with the rapid development of the securitized, market-based financial system in the United States. I have argued that long intermediation chains carry costs in terms of greater amplitude of fluctuations in the boom bust cycle of leverage and balance sheet size. Shorter intermediation chains carry benefits for stability of the financial system.

For the financial industry, the key question is to what extent the rapid development of securitization and the market-based system can be regarded as the norm, or a long, but ultimately temporary stage in the development of a more sustainable financial system. Figures 12 and 13 show the growth of four sectors in the United States (non-financial corporate sector, household sector, commercial banking sector and the security broker-dealer sector) taken from the Federal Reserve's Flow of Funds accounts. The series are normalized so that the size in Q1 1954 is set equal to 1. Most sectors grew to roughly 80 times its size in 1954, but the broker dealer sector grew to around 800 times its 1954 level, before collapsing in the current crisis. Figure 13 is the same chart, but in log scale. The greater detail afforded by the chart in log scale reveals that the securities sector kept pace with the rest of the economy until around 1980, but then started a growth spurt that outstripped the other sectors. On the eve of the crisis, the securities sector had grown to around ten times its size relative to the other sectors in the economy. Clearly, such a pace of growth could not go on forever. Even on an optimistic scenario, the growth of the securities sector would have tapered off to a more sustainable pace to keep in step with the rest of the economy.

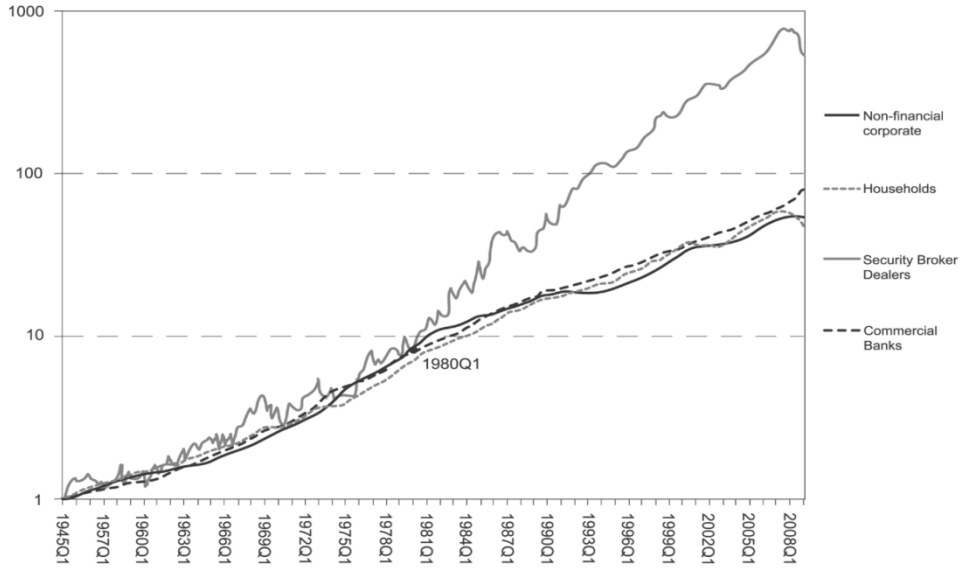
The relative size of the securities sector can be seen as a mirror of the lengthening intermediation chains in the market-based system of financial intermediation. One could reasonably conclude that some of the baroque flourishes that appeared in the Indian summer of the expansion of the securities sector (such as the growth of exotic asset-backed securities such as CDO-squared) have gone for good, and are unlikely to feature in a steady state of the securities sector.

Overall, it would be reasonable to speculate that the securities sector that emerges from the current crisis in sustainable form will be smaller, with shorter intermediation chains, perhaps less profitable in aggregate, and with less maturity transformation. The backdrop to this development will be the regulatory checks and balances that are aimed at moderating the fluctuations in leverage and balance sheet size that were instrumental in making the current financial crisis the most severe since the Great Depression.

[Figure 12] Growth of Four US Sectors (1954Q1 = 1) (source: Flow of Funds, Federal Reserve)



[Figure 13] Growth of Four US Sectors (1954Q1 = 1)(in log scale)



References

Adrian, Tobias and Markus Brunnermeier, "CoVaR," Working Paper, Federal Reserve Bank of New York and Princeton University, 2009.

Adrian, Tobias and Hyun Song Shin "Liquidity and Leverage" *Journal of Financial Intermediation,* 2007.

Adrian, Tobias and Hyun Song Shin, "Financial Intermediaries, Financial Stability and Monetary Policy," Proceedings of the Federal Reserve Bank of Kansas City Symposium at Jackson Hole, 2008.

Adrian, Tobias and Hyun Song Shin, "Money, Liquidity and Monetary Policy," *American Economic Review*, Papers and Proceedings, 2009.

Boyce, Alan, "Covered Bonds vs. Securitization Transparency vs. Opacity Which is the Right is the Right Question," Working Paper, Absalon, 2008.
https://www.ibm.com/developerworks/blogs/resources/adler/20090325_1.pdf

Brunnermeier, Markus, "De-Ciphering the Credit Crisis of 2007," *Journal of Economic Perspectives* 23(1), 2009, pp.77~100

Brunnermeier, Markus, Andrew Crockett, Charles Goodhart, Avi Persaud, and Hyun Song Shin, *The Fundamental Principles of Financial Regulation*, Geneva Report on the World Economy 11, 2009.

Calomiris, Charles and Charles Kahn, "The Role of Demandable Debt in Structuring Optimal Banking Arrangements," *American Economic Review* 81, 1991, pp.497~513

Cifuentes, Rodrigo, Gianluigi Ferrucci and Hyun Song Shin, "Liquidity Risk and Contagion Bank of England," Working Paper 264, 2004, short version published in *Journal of the European Economic Association*, 3, 2005, pp.556~566.
http://www.bankofengland.co.uk/publications/ Working Paper /wp264.pdf

Diamond, Douglas and Raghuram Rajan, "Liquidity Risk, Liquidity Creation, and Financial Fragility: A Theory of Banking," *Journal of Political Economy* 109, 2001, pp.287~327.

Fernandez, S., J. Pages, and J. Saurina, "Credit Growth, Problem Loans and Credit Risk Provisioning in Spain Bank of Spain," Working Paper 18, 2000.
http://www.bde.es/informes/be/docs/dt0018e.pdf

Greenlaw, D., J. Hatzius, A. Kashyap, and H. S. Shin, "Leveraged Losses: Lessons from the Mortgage Market," Meltdown US Monetary Policy Forum Report 2, 2008.
http://www.chicagogsb.edu/usmpf/docs/usmpf2008confdraft.pdf

Haldane, Andrew, "Rethinking Financial Networks," Speech Delivered at Financial Student Association in Amsterdam 28 April 2009.
http://www.bankofengland.co.uk/publications/speeches/2009/speech386.pdf

Hildebrand, Philipp, "Is Basel II Enough? The Benefits of a Leverage Ratio Financial Markets Group Lecture," 2008. www.bis.org/review/r081216d.pdf

International Monetary Fund, "Global Financial Stability Report," April, Washington DC, 2009.

Morris, Stephen and Hyun Song Shin, "Financial Regulation in a System Context," *Brookings Papers on Economic Activity*, Fall 2008, pp.229~274.

Morris, Stephen and Hyun Song Shin, "Illiquidity Component of Credit Risk" Working Paper, Princeton University, 2009.

Packer, F., R. Stever, and C. Upper, "The Covered Bond Market," *BIS Quarterly Review*, September 2007, pp.43~55.

Shin, Hyun Song, "Securitisation and Financial Stability," *Economic Journal* 119, 2009, pp.309~332.

SIFMA, *First European Covered Bond Investors' Survey*, European Covered Bond Dealers Association, May 2009. http://europe.sifma.org/ecbda.shtml

Squam Lake Working Group, "Reforming Capital Requirements for Financial Institutions," policy memo, 2009. http://www.squamlakeworkinggroup.org/

韓國開發硏究
제32권 제1호(통권 제106호)

Economic Crisis and Intergenerational Economy: Lessons from Korea's 1997~98 Economic Crisis

Chong-Bum An
(Professor, Department of Economics, Sungkyunkwan University)
Sang-Hyop Lee
(Professor, Department of Economics, University of Hawaii at Manoa)
Namhui Hwang
(Ph.D Candidate, Department of Economics, Sungkyunkwan University)

경제위기와 세대 간 경제: 1997~98년 경제위기의 교훈

안 종 범
(성균관대학교 경제학과 교수)
이 상 협
(하와이대학교 마노이 캠퍼스 경제학과 교수)
황 남 희
(성균관대학교 경제학과 대학원생)

* 본 논문은 BK21(Brain Korea 21) 사업의 일환으로 진행되는 성균관대학교 경제핵심인재 양성사업단의 지원으로 작성되었다.

** 안종범: (e-mail) cban@skku.edu, (address) 53 Myeongnyun-dong 3-ga, Jongno-gu, Seoul, 110-745, Korea
이상협: (e-mail) leesang@hawaii.edu, (address) 2500 Campus Road, Honolulu, HI 96822, U.S.A
황남희: (e-mail) nhui@naver.com, (address) 53, Myeongnyun-dong 3-ga, jongno-gu, Seoul, 110-745, Korea

• Key Word: Intergenerational Economy(세대 간 경제), Transfers(이전), Economic Crisis (경제위기), Population Aging(고령화)
• JEL code: J18, H53, I35
• Received: 2009. 10. 19 • Referee Process Started: 2009. 10. 22
• Referee Reports Completed: 2009. 12. 30

ABSTRACT

This paper provides insight into some important features of the intergenerational resource allocation in Korea, before and after the financial crisis in 1997-98. Data sets of three periods before and after the financial crisis (1996, 2000, and 2005) were used to compare the results. This research particularly addresses two related issues: i) the generational effects of economic crisis, and ii) the capacity of age reallocation systems to spread economic risks across generations. The results show tremendous consumption smoothing and resource reallocation by age, during and after the financial crisis. Private education and private health consumption decreased for children between 1996 and 2000. However, the decrease in private education and private health consumption was mitigated by the increase in public consumption. It appears that the public sector did not only mitigate the adverse impact of the economic crisis on consumption, but it also reduced the widening disparity amongst generations. Within transfers, the public transfers for the elderly increased substantially as the private transfers decreased rapidly. Finally, there was a big increase in the asset-based reallocation of the elderly. The increase in asset-based reallocation was mainly due to an increase in asset income between 1996 and 2000, but it was almost entirely due to a decrease in saving (i.e. an increase in dis-saving) between 2000 and 2005. This suggests that Korean elderly seemed to have some degree of supporting system during the crisis, even without sufficient pension benefits. The increased reliance on asset accumulation will be critical in the long-run in Korea, as public pension funds diminish due to population aging.

본 연구에서는 1996년과 2000년, 2005년의 국민이전계정(National Transfer Accounts)을 이용하여 1997년 말 외환위기와 2000년 이후의 급속한 인구구조 고령화가 세대 간 재배분에 미친 영향에 대해 분석하였다. 국민이전계정은 국민계정과 일관되게 거시적 수준에서 세대 간 이전(intergenerational transfers)을 측정하는 회계방식이다. 국민이전계정을 통해 외환위기와 인구고령화가 세대 간 재배분에 미친 영향을 살펴본 결과는 다음과 같이 요약된다. 1) 유년층(0~19세)의 민간소비(보건, 교육)는 크게 감소한 반면, 공공소비(보건, 교육)는 증가하였다. 2) 노년층(65세 이상)의 공적이전(public transfers)은 증가한 반면, 사적이전(private transfers)은 감소하였다. 3) 노년층의 자산재배분이 크게 증가하였다. 경제위기에도 불구하고 총소비는 크게 위축되지 않은 것으로 파악되는데, 이는 정부의 확대재정정책에 의한 공공소비의 증가가 총소비를 일정 수준으로 유지(consumption smoothing)시킬 수 있었기 때문이다. 한편, 노년층의 경우 우리나라의 국민연금제도가 아직 미성숙함에도 불구하고 자산축적을 통해 스스로 노후를 대비하고 있는 것으로 파악되었다. 자신의 노후소득을 마련하기 위해 자산축적이 지속적으로 활발하게 이루어질 경우 향후 급속한 인구고령화에 의한 공적연금의 재정부담을 경감시켜 줄 수 있을 것이다.

I . Introduction

Korea survived the brunt of the crisis in 1997-98, but it was faced with numerous socioeconomic problems that emerged during and following the crisis. The most serious problems included the rising numbers of disadvantaged people, employment instability, the widening gap between the rich and the poor, and rapid deterioration of familial support for the elderly. Even long after the affected economies recovered, social impacts continue to be felt.

During and after the crisis, there has been great change in the Korean economy and economic support system. There has been substantial fluctuation in the value of assets due to changes in the price of housing and equities. A lot of middle aged workers were forced to retire, and many of them were not able to re-enter the labor market even when the economic crisis was over. The reduction in new jobs made it difficult for young workers to find a regular job after graduating. On the other hand, there has been a great increase in social expenditure, mainly due to changes in the economic and social environments, as well as some political factors. Increasing social demands for welfare are recognized, especially since the economic crisis devastated the Korean economy. The expenditure is often age targeted, regardless of whether the Korean government intended this or not.

At the same time, a rapid decline in fertility during and after the crisis appeared to be a new threat to the economy that accelerates the aging process of the society. The unprecedentedly fast population aging imposed a burden of old age support. Traditionally, the burden was borne by the income transferred from their grown-up children living with the elderly. But as the traditional familial support system has deteriorated, the number of families living with their aged parents has been declining. During the crisis, lots of families suffered from the economic difficulties, and, as a result, private transfers substantially diminished. However, the Korean government has increased the welfare budget in order to settle the problems of unemployment and poverty since the financial crisis.

The origins of the Korean economic crisis in 1997-98 are complex. Many researchers pointed out several domestic, regional, and global elements, all of which contributed to generating it. The impact of the Korean economic crisis seems at least as complex as the origins are. In this paper, we focus on two related issues: Korea's intergenerational economy before and after the crisis and the capacity of age reallocation systems to spread economic and financial risks across generations. The analysis makes use of the National Transfer Accounts (NTA) which provides comprehensive estimates of intergenerational economic flows. The analysis emphasizes the effects of the crisis on consumption and key components of consumption by age. A second level of analysis focuses on the economic flows that fund consumption. Value of assets and labor income are directly affected. Transfers and savings are indirectly influenced and may serve to mitigate the effects of economic crises.

We use three periods of data, 1996, 2000, and 2005. The year 1996 is chosen

because it was soon before the financial crisis and it was also the year before entering the aging society. The year 2005 is the year after entering the aging society and it is the one showing the effect of the increased social policies. We try to compare them with the year 2000, which seems to be the year that unemployment rates began to recover and per capita income recovered to the level before the economic crisis. Thus, this study sets the years of 1996 and 2005 as comparison years to grasp the effect of population aging and the change of the intergenerational resource allocation due to the economic crisis.

It should be mentioned that the methodology of comparing outcomes before and after the crisis has its own limitation because it is very difficult to identify the pure effect of any time-series event on an economy. This is in large part because there is no counterfactual event, and, hence, it is difficult to net out the effect of other economic events, policies, and trends from that of the crisis. On the other hand, some of these events, policies, and trends are outcomes of the financial crisis, which might have affected the following changes in intergenerational economy. Thus, although it is difficult to identify the net effect of the economic crisis, the crisis might have played the broader role of a catalyst, which might have had an effect on intergenerational resource reallocation.

We also focus only on the short run impact of the economic crisis. The impact may have a persistent effect and the lifetime behavior of an individual at each generation might be governed by a lifetime budget constraint. The long run impact of a crisis can be analyzed by calculating the lifetime wealth effect of the economic crisis, for example by constructing a synthetic cohort measure.[1] The lifetime impact of the economic crisis on each age/cohort group, however, is discussed elsewhere, in collaboration with other project country teams. On the other hand, the Korean economic crisis has been marked by sharp declines of very short duration, which might distinguish it from a long lasting economic recession.

The paper is organized as follows. Section II briefly reviews the economic crisis and methodology. Section III discusses results. The last section concludes.

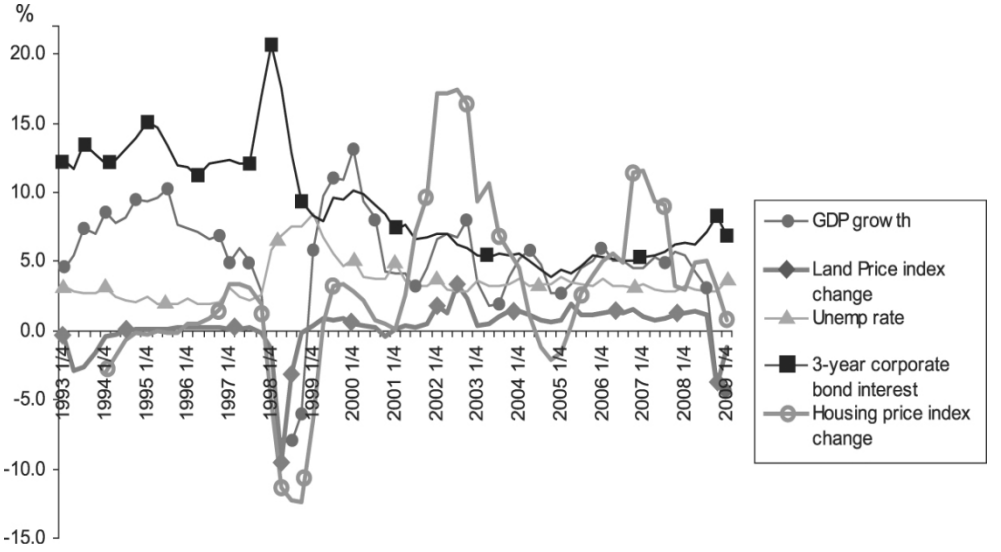
II. Background

1. Korea's 1997-98 Economic Crisis

Korea has had an extraordinary development experience until the mid 1990s. Between 1962 and 1996, real GDP per capita grew at an annual rate of 6.6 percent, and per capita income soared from only $87 in 1962 to $12,197 in 1996. During the process of economic development, the investment and saving rate remained over 30 percent. The rate of total savings in Korea increased continuously from 10 percent of GNP in the 1960s to 40.4 percent in 1988. Despite such high economic growth, inflation remained relatively low, at around 4 percent throughout the mid 1990s. However, late in 1997, shortly after Korea had become a member of the OECD, the

[1]We would like to thank John M. Kim for his valuable comment on this.

[Figure 1] Key Macroeconomic Indicators: Quarterly, 1993 ¼ to 2009 ¼



Korean economy experienced a severe economic crisis. Combined with a substantial depreciation in the exchange rate, per capita income plunged to US $7,355 in 1998.

The changes in key macroeconomic indicators between the first quarter of 1993 and the first quarter of 2009 are shown in Figure 1. The real per capita GDP growth rate ranged from 4.4 percent to 10.3 percent until the third quarter of 1997, but it decreased to 2.8 percent in the fourth quarter of 1997. The real growth rate fell to -5.3 percent in the first quarter of 1998, which was the lowest growth rate in Korea since the political turmoil of the early 1980's. The growth rated plunged to -8.1 percent in the third quarter of 1998. The GDP growth rate rebounded in 1999 and fully recovered to the pre-crisis level by the third quarter of 2000.

Market interest rates, measured as the nominal interest rate for the 3-year corporate bond, soared to over 20 percent during the crisis. The interest rates sharply declined to below 10 percent in 1999 and maintained a decreasing trend until 2004. The decline in asset prices was also substantial during the crisis. The nominal value of land and housing respectively decreased by 9.5 percent and 11.4 percent in the second quarter of 1998, compared with the second quarter of 1997. For only one year in 1998, the average price of land and housing declined 14 percent and 12.4 percent respectively. Land and housing prices began to rise again in 1999. Interestingly, the housing price rose very rapidly after the crisis, much faster than the land prices. Between 2000-2003, the housing price increased over 35 percent, or 10 percent per annum. It rose again by 20 percent between 2004 and 2007. Unemployment rates increased from 2.2 percent in the third quarter of 1997 to 7.5 percent in the same quarter of 1998. Unemployment rates began to recover later; they started to recover in the second quarter of 2000, almost three years after the crisis.

[Figure 2] Other Socio-Economic Indicators: Annually, 1994-2008

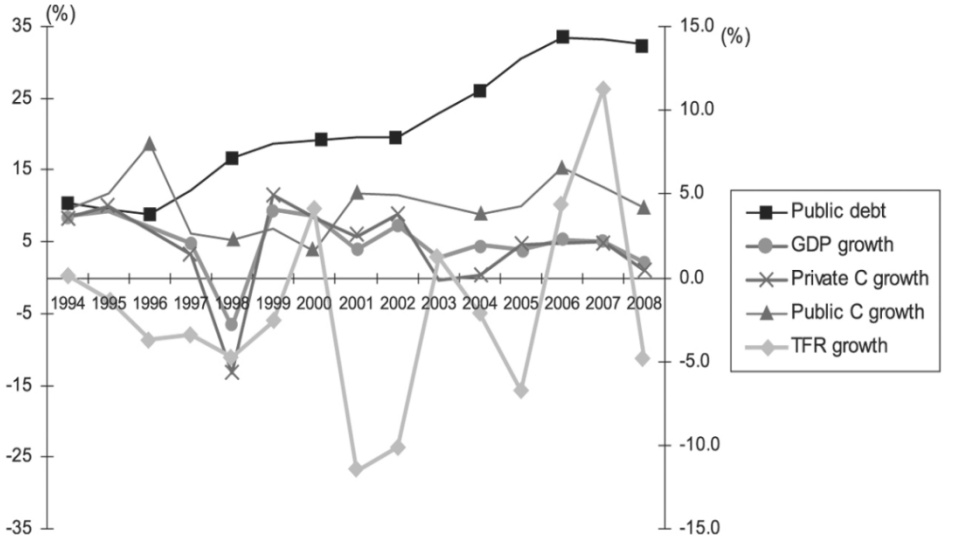
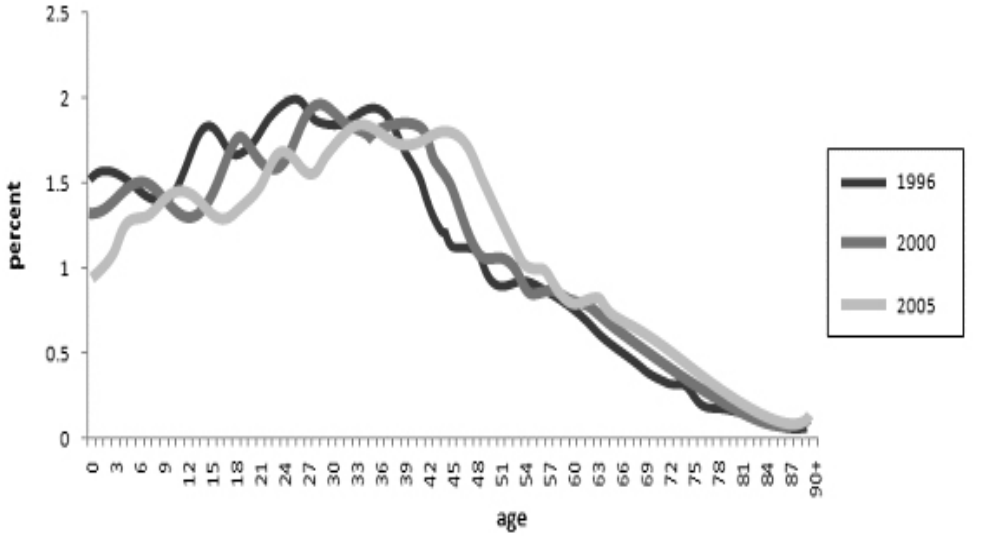


Figure 2 shows the changes in more key socio-economic indicators, by year, which bear direct or indirect implications for the intergenerational economy. Most of all, the government debt has increased very rapidly since 1997. The government debt as a percentage of GDP increased from 8.8 percent in 1996 to 16.6 percent in 1998. It further increased to 22.9 percent in 2003 and reached to 33.4 percent of GDP in 2006. The rise in government debt during the crisis may not be surprising because public debt increases as governments attempt to maintain public spending in the face of declining revenues, and to employ fiscal policy in response to the economic crisis. In Korea, the government debt kept increasing after the crisis, especially between 2002 and 2005, mainly due to the large increase in the exchange stabilization fund (ESF). ESF accounted for only 15 percent of all government debts in 2002, but the share increased to 40 percent as of 2005. Interestingly, public consumption has not declined, while private consumption sharply declined during the crisis, making a marked contrast. Again, this might suggest that the Korean government played a role in smoothing consumption during the crisis. The total fertility ratio (TFR) went down slightly from 1.58 in 1996 to 1.47 in 2000, but it plunged further, to 1.08, in 2005. The life expectancy (not shown in the figure) increased from 74.0 in 1996 to 76.0 in 2000, and it further increased to 78.6 in 2005.

There were also substantial changes in population age structure before and after the crisis. Figure 3 shows the population distribution by age in Korea between 1996 and 2005. The youth dependency ratio decreased from 22.9 percent in 1996 to 21.1 percent in 2000, and dropped to 19.1 percent in 2005. On the other hand, the old age dependency ratio increased from 6.1 percent in 1996 to 7.2 percent in 2000, and increased again to 9.1 percent in 2005, entering the aging society. As a result, the

[Figure 3] Population Age Structure: 1996, 2000, and 2005



population age structure in Korea has changed substantially during a short period of time.

2. Application of National Transfers Accounts (NTA) in Korea

The purpose of National Transfer Accounts (NTA) is to measure at the aggregate level, in a manner consistent with National Income and Product Accounts (NIPA), the reallocations across age of economic resources. The methodological details are not discussed here, but some important aspects for constructing estimates are as follows.

The young and the old have a lifecycle deficit because they produce less through their labor than they consume. Working-age adults have a lifecycle surplus because they produce far more through their labor than they consume. Age reallocations occur because of this; at some ages individuals consume more than they produce, while at other ages individuals produce more than they consume. The reallocation system consists of a set of complex institutions and practices by which the young and the old, those with lifecycle deficits, draw on the surplus resources generated during the prime working ages (Lee 1994a, 1994b).

The economic mechanisms used for age reallocations fall into two broad categories: transfers and asset-based reallocations. A defining feature of transfers is that they involve no explicit quid pro quo, or exchange of money for goods or services. Resources flow from one party to another either voluntarily, in the case of private transfers, or as public transfers. Asset-based reallocations realize inter-age

flows through inter-temporal exchange. For example, an asset such as gold can be acquired in one period generating an outflow at that age, and disposed of in a subsequent period generating an inflow at an older age. More generally asset-based reallocations involve two kinds of flows – asset income and saving. When individuals accumulate pension funds or personal saving during their working years and rely on asset income and dis-saving of those assets during their non-working years, they are relying on asset-based reallocations. Or when individuals borrow to finance their education, they are relying on asset-based reallocations to shift resources to young ages, when they are in need, from older ages. Readers interested in methodological details might benefit by reading Lee, Lee, and Mason (2008), Mason et al. (2009), http://www.ntaccounts.org/. Readers interested in Korea's public sector generational accounting may also benefit by reading Chun (forthcoming).

A variety of micro data sets are required to construct the age profiles of NTA. To construct the age profiles for our study, income and expenditure surveys, such as the National Survey of Household Income and Expenditure (NSHIE), Household Income and Expenditure Survey (HIES), Korean Household Panel Study (KHPS) and Korean Labor and Income Panel Study (KLIPS) are used. It is important to understand that the numbers estimated from the micro data sets are used to construct the age profiles, but the numbers are adjusted by aggregate macro controls. For this purpose, we use NIPA and the records of public institutions, including but not limited to National Pension Statistical Yearbook, National Health Insurance Statistical Yearbook, National Tax Statistical Yearbook, Yearly Statistics of Employment Insurance, Statistical Yearbook of Health and Welfare, and Statistical Yearbook of Teachers Pension.

A brief explanation for primary micro data sets is as follows. NSHIE started in 1991 and has been released every five years. This survey provides information on yearly income and expenditures, durable goods, assets, and liabilities of households in detail from the nationally representative household sample. The sample size is about 27,000 households. The Household Income and Expenditure Survey (HIES) has been conducted with non-farm households excluding one person households in cities during the past sixty or so years, and in 2003 it was expanded to include rural non-farm households. Beginning in 2005, one person households are also included. Hence, it should be mentioned that the changing consumption pattern between 2000 and 2005 could be due to the changing coverage of households between the two surveys. The purpose of HIES is to collect up-to-date information on household income and expenditures and to analyze variations in the levels of living and the disparities among different socio-economic groups, and to obtain weights for the consumer price index.

KHPS is the first panel data in Korea. The sixth wave has been released from the first study in 1993. It covers minutely the income and expenditures of the whole household, and the income and taxes of all over 18 years of age, except for the residents of Cheju Island. KLIPS, started in 1998, is the longitudinal survey of households and individuals residing in urban areas, on their labor market and income activities. The KLIPS sample had been selected from households that lived in the 7 metropolitan cities as well as urban areas in 8 provinces, again excluding Cheju

<Table 1> Estimation Methods and Data Sources

NTA	Estimation methods	Data Sources
Education, private	Regress on enrollment and age	NSHIE, HIES
Health, private	Regress on age	NSHIE, HIES
Imputed-rent, Others, private	Equivalence scale	NSHIE, HIES
Education, public	Age- & education level- specific enrollment rate	OECD
Health, public	Age distribution of benefits	NHISY
Others, public	Per capita basis	NIPA
Compensation of employees	Wage of wage workers	KLIPS, KHPS
Entrepreneurial income	Income of non-wage workers	KLIPS, KHPS
Asset income, private	Net property income of households	NSHIE, HIES
Savings, private	Residuals	Calculation
Asset income & financial asset Accumulation, public	Age distribution of tax burden	NIPA
Capital and land accumulation, public	Age distribution of population	NIPA
Social insurance & tax	Generational accounting	NIPA
Inter-household transfers	Private subsidy and remittance of households	NSHIE, HIES
Intra-household transfers	Net transfers=consumption - disposable income	KHPS

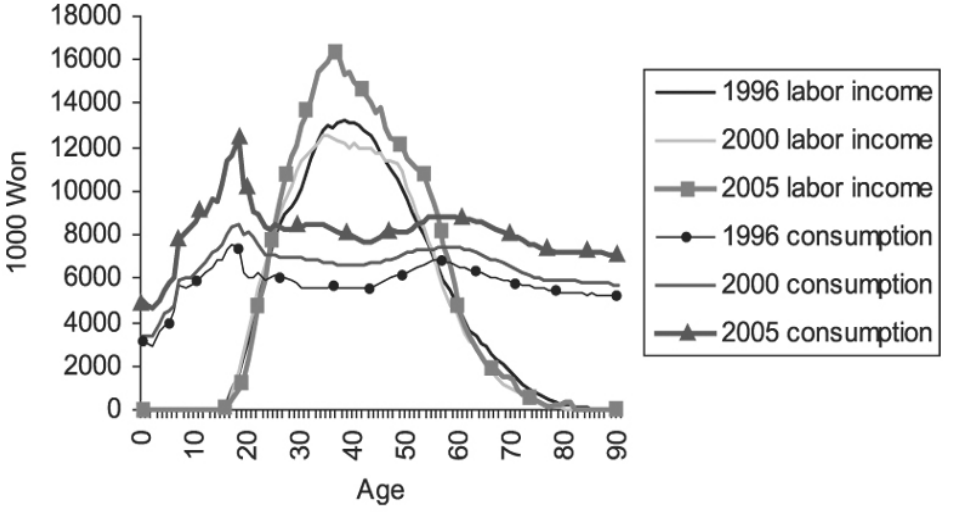
Island. The sample size was originally 5,000 households and 13,321 individuals, and has diminished since then. The primary data sets and methods used by items of NTA are summarized in Table 1.

III. Results

1. Economic Lifecycle

The age profiles of consumption and labor income – the economic lifecycle – reflect many factors (Lee, Lee, and Mason 2008). One of the most important factors is population age structure. Reallocations to children are much more important than

[Figure 4] Lifecycle Profiles of Per Capita Labor Income and Consumption: 1996, 2000, and 2005



reallocations to the elderly in current-day Korea because there are many more children than elderly. But Korea is aging rapidly and therefore reallocations to the elderly, as compared with reallocations to children, will increase substantially over the coming decades. The economic lifecycle also reflects behavior and the factors that influence behavior – prices, taxes, tastes, etc. Consumption profiles, for example, are influenced by the importance of education as compared to health care – and the institutional framework that governs these important sectors. Labor income profiles vary with the wage system, the returns to education, educational attainment, the ages at which children leave school and adults retire, and the labor force decisions made by women – to mention a few obvious factors.

Figure 4 shows the lifecycle profile of per capita labor income and consumption in Korea for 1996, 2000, and 2005. The labor income peaked at age 38 in 1996, but it declined to 35 in 2000. It bounced back slightly, to 37, in 2005.[2] The mean age of labor income and median age of labor income showed a similar pattern. The mean age of labor income declined from 42.2 in 1996 to 41.3 in 2000. It increased slightly, back to 42.0, in 2005. The median age of labor income declined from 40 to 39 between 1996 and 2000, but recovered to the pre-crisis level, 40, in 2005. The share of labor income for elderly ages 65 and older declined substantially from 4.1 percent in 1996 to 2.3 percent in 2000, and slightly increased to 2.7 percent in 2005. This consistent pattern means that the share of labor income for the prime age adults or elderly

[2]Labor income peaks much earlier in Korea than in many other advanced countries, and it was excelled during the economic crisis. This in part reflects that the labor income peaks quite early for women in Korea. Note that the shape of the figure is dependent upon various components of labor income as well.

population must have declined compared with the share for young people. This is also consistent with the notion that the unique seniority-based wage system in Korea has been rapidly deteriorating during the 1990s, especially after the 1997 economic crisis.

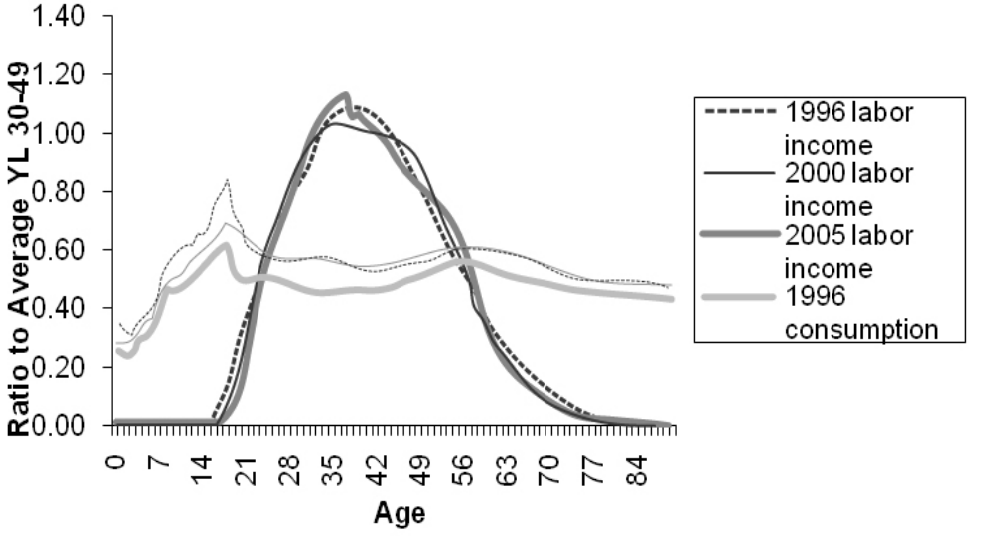
The figure also shows that consumption peaks in the late teens and decreases until the 40s. Such a decline in consumption was also found in other countries as a result of decreasing expenditure on education. However, the decline seems to come earlier in Korea, immediately after high school graduation. This result may be related to the extremely high level of private education consumption among high school students in Korea, which is supported by the data. The peak of consumption at senior high is much more prominent in 2005.

As is clear from the figure, while the labor income profile has shifted little between 1996 and 2000, it increased substantially between 2000 and 2005. However, consumption has modestly increased between 1996 and 2000, and again substantially between 2000 and 2005. Both results are interesting because this suggests that the impact of the economic crisis on consumption might have been mitigated. The combined effect of the change in age profiles of labor income and consumption changed the lifecycle deficit years. It indicates that the lifecycle surplus decreased from 33 years in 1996 (age 23 to 55) to 31 years in 2000 (age 24 to 54), and remained the same in 2005 (age 25 to 55).

Figure 5 charts the age profile of labor income and consumption relative to average labor income for adults aged 30-49 each year. That is, Figure 5 was drawn in a way that Figure 4 was rescaled by dividing by the simple average of per capita production between ages 30-49. This normalization makes the estimated profiles more easily comparable by age and also by time period. We divided each age schedule by the un-weighted average of per capita labor income of each age over the range 30 to 49. Thus, for example, a value of 0.5 at some age in consumption implies that a person at that age consumes half the annual amount of production averaged over the prime ages of her life. So it can present the changing pattern of age profiles or age targeting of government programs more clearly. The figure suggests that the labor income of elderly aged 65 and older declined substantially between 1996 and 2000, while it was stagnant between 2000 and 2005, compared to that of ages 30-49. In addition, the labor income of prime age adults appears to have declined between 1996 and 2000. The figure also shows that the normalized per capita consumption increased for almost all ages between 1996 and 2000, while it was stagnant between 2000 and 2005. The only notable difference between 2000 and 2005 is that the consumption of children under 20 years , normalized by the average labor income ages 30 to 49, has increased substantially. On the other hand, the normalized consumption increased for all ages between 1996 and 2000, suggesting a potential consumption smoothing during the period.

A further investigation of the consumption by component shows some interesting features. Table 2 presents real annual growth rates of each consumption component and labor income by broad age group. While per capita labor income increased by only 0.7 percent per annum between 1996 and 2000, per capita labor income for ages 65 and older decreased by 10.7 percent per annum during the same period. On the other hand, total consumption rose by 3.7 percent per annum,

[Figure 5] Lifecycle Profiles of Per Capita Labor Income and Consumption: Ratio to the Average Labor Income Ages 30-49, 1996, 2000, and 2005



exceeding the increase in labor income. Interestingly, the private consumption for ages 0-24 and ages 65 and older increased much less than the average, by 3 percent and 1.6 percent per annum, respectively. As a result, the consumption gap between prime age adults and the older people and between prime age adults and the younger people in Korea has been widened after the financial crisis. The results for private education and private health consumption are most striking because both of them respectively decreased by 3.8 percent and 2.9 percent per annum for ages 0-19.[3] However, the decrease in private education and private health consumption was mitigated by the increase in public consumption. The public health consumption, in particular, grew very rapidly for all age groups, recording 10.6 percent per annum. Thus, it appears that the public sector did not only mitigate the adverse impact of the economic crisis on consumption, but it reduced the widening disparity amongst generations due to changing patterns of private consumption.

Public consumption further increased between 2000 and 2005, especially for public education consumption. Public education consumption for ages 0-19 increased by 12.2 percent per annum during the period, which is in stark contrast with the substantial decrease in the labor income for the same age group. Public health consumption also kept growing during the period. Private education consumption and health consumption increased very rapidly during the recovery,

[3]Another interesting result is that, while private consumption for ages 0-19 declined, that for 0-24 increased for the same period, suggesting that the education expenditure for college students increased substantially. It might be because of the substantial increase in college tuition during the period.

<Table 2> Annual Growth Rate of Consumption and Labor Income: By Broad Age Groups

(unit: %)

	Annual growth between 1996-2000				Annual growth between 2000-2005			
	0~19	20~64	65+	per capita	0~19	20~64	65+	per capita
Total Consumption	2.6	4.2	2.7	3.7	6.4	3.6	4.0	4.4
Public Consumption	3.7	4.4	6.6	4.0	9.0	6.9	7.1	7.4
Public Education	3.4				12.2			
Public Health	9.4	9.1	14.5	10.6	8.2	10.6	8.9	10.6
Public Others	3.2	3.2	3.2	3.2	6.0	6.0	6.0	6.0
Private Consumption	2.1	4.1	1.6	3.6	5.0	2.8	3.0	3.4
Private Education	-3.8	..	..	..	10.6	..	..	..
Private Health	-2.9	-1.2	1.4	-0.3	22.5	6.3	8.3	9.2
Housing	-1.4	1.6	5.6	1.9	4.1	1.3	-1.0	2.0
Private Others	5.1	4.0	0.9	4.3	2.2	2.7	2.9	2.9
Labor Income	2.7	0.3	-10.7	0.7	-13.4	3.3	3.2	3.7
Compensation	2.6	0.0	-14.1	0.4	-13.5	4.6	6.9	5.0
Self-Employed Income	46.2	2.1	-2.8	2.5	4.8	-6.0	-4.9	-5.4

too. The private health consumption for children ages 0-19 grew 22.5 percent per annum during the period. For ages 0-24, it increased by 20.2 percent per annum.

2. Reallocation System

Reallocation systems, which is the way of funding to fill the gap between consumption and labor income, vary along two important dimensions: the governing or mediating institution and the economic form of the reallocation (Lee, 1994a; 1994b). The public sector reallocates resources relying on social mandates embodied in law and regulation and implemented by local, regional, and national governments. Education, public pensions, and health care programs are important examples of public reallocation programs. Private sector reallocations are governed by voluntary contracts, social conventions, etc. that are mediated by households, families, charitable organizations, and other private institutions. Important examples of private reallocations are private saving and credit transactions and familial support to children and the elderly. The results are explained in turn using the following figures.

It is not surprising that transfers dominate the reallocation of wealth to children in any economy, because asset reallocation is not the usual mechanism for

supporting consumption by young children. Although Korea is no exception, familial transfer to children in Korea is particularly prominent, given the high level of private education consumption by high school students. Public transfers to children are getting more important, especially since the recovery from economic crisis, due to the rapid increase in public education consumption. Familial transfers for the elderly trend upward with age too, but net familial transfers for the elderly decreased dramatically between 2000 and 2005 (figures 6 and 7). The drastic decrease in familial transfers during the period is largely due to the difference in growth rate between inflows and outflows. That is, the outflows grew much faster than inflows for elderly, which might be also related with the change in asset-based reallocation for the elderly, as described below.

The most striking feature of the change in transfers was the rapid increase in social welfare expenditure (Not shown in the figure). In addition to public health expenditure, social assistance benefits increased for all age groups, amounting to 18.9 percent per annum between 1996 and 2000, and 13.3 percent per annum between 2000 and 2005, in real terms. It might be because of the expansion of the National Basic Livelihood Security System (NBLSS) benefits system in 2000, which consists of cash and in-kind benefits to households with incomes below the poverty line. Social security related expenditure also grew rapidly, especially for the elderly. Social security inflows grew by 7 percent per annum between 1996 and 2000, and it further increased by 16.3 percent per annum between 2000 and 2005.

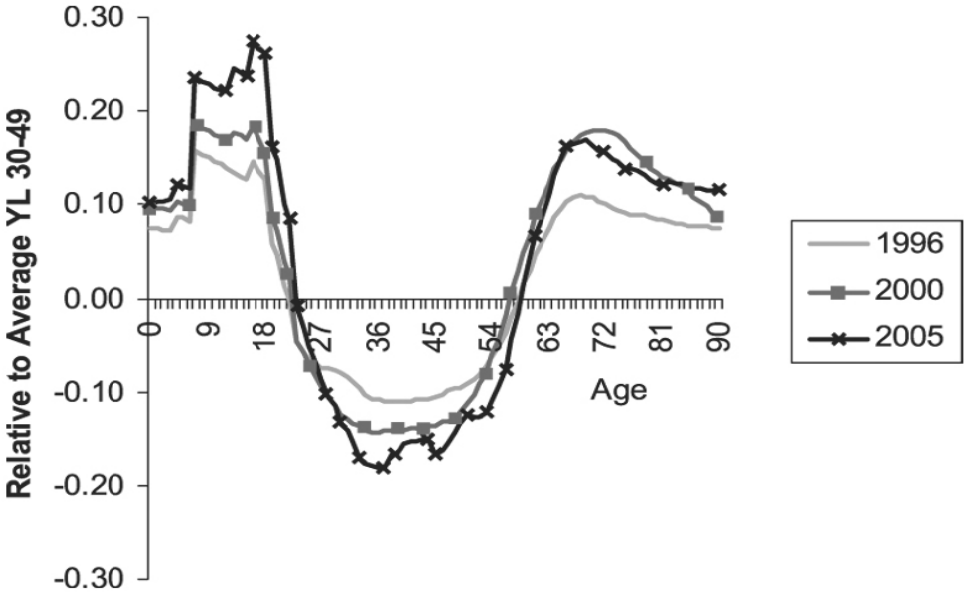
Private asset-based reallocations were positive at most ages, except for ages in the 20s and 30s in Korea over the period (Figure 8). At those ages, asset income was equal to or smaller than saving. Younger people, those aged 15–20, were dis-saving, but at a trivial level. Private asset income was rising steeply among people in their 40s and 50s. But their private savings were always quite low compared with their asset income. Perhaps the reason for their low savings is that people in this age group were financing much of the consumption of children and the elderly.[4]

A striking result is the huge increase in asset-based reallocation (asset income minus saving) for the elderly between 1996 and 2000, and again between 2000 and 2005. Quite surprisingly, the increase in asset-based reallocation is mainly due to an increase in asset income between 1996 and 2000, while it was entirely due to a decrease in saving (an increase in dis-saving) between 2000 and 2005 (figures 9 and 10). The increase in asset income among older people between 1996 and 2000 was largely due to an increase in net inflow of interest and other property income for those age groups, while capital income was still a most important source of asset income for Koreans of all age groups.

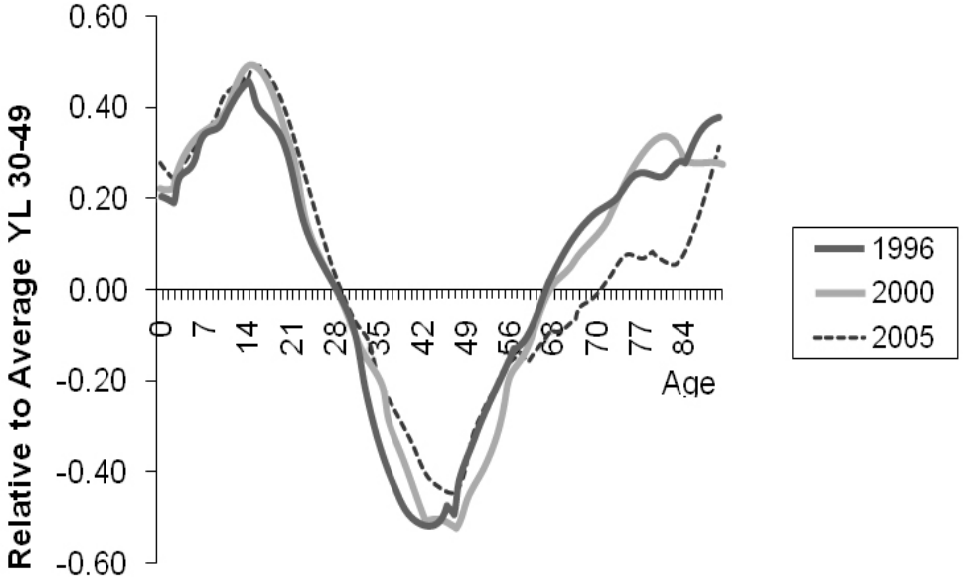
What are the major sources of the large swings in asset income and saving during the financial crisis and after the recovery? It is premature to speculate at this moment, and it is well beyond the scope of this paper. However, it is worthwhile to mention that it must be related to the speculation in real estate which became a serious social issue in Korea right after the financial crisis. The lowering interest rate between 2000 and 2005 may have affected the huge decline in saving behavior for the elderly

[4]Or it could be simply due to the fact that our results are based on cross-sectional rather than longitudinal data. See Mason et al. (2009) regarding this issue.

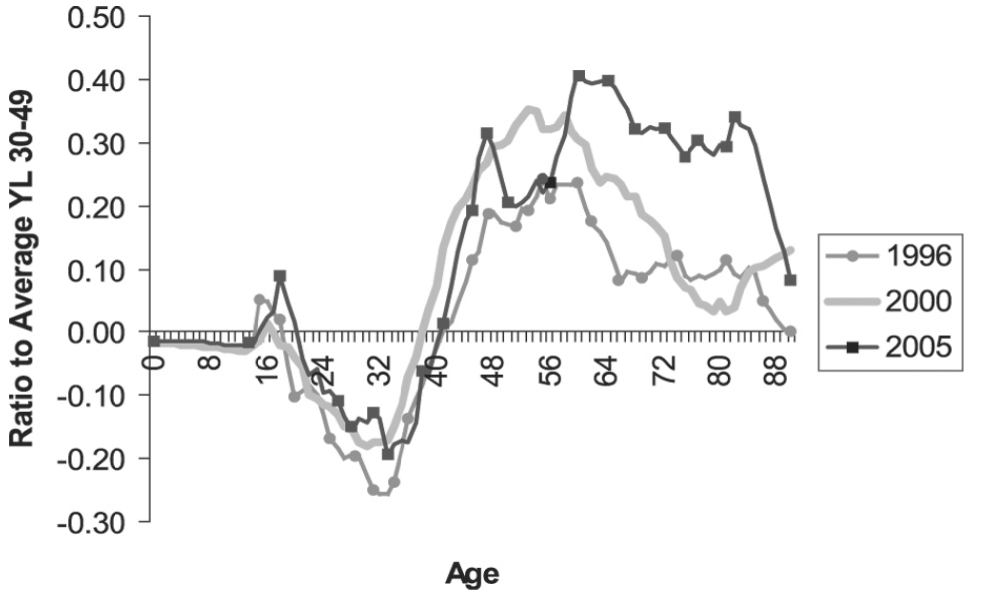
[Figure 6] Per Capita Net Public Transfers Profiles: 1996, 2000, and 2005



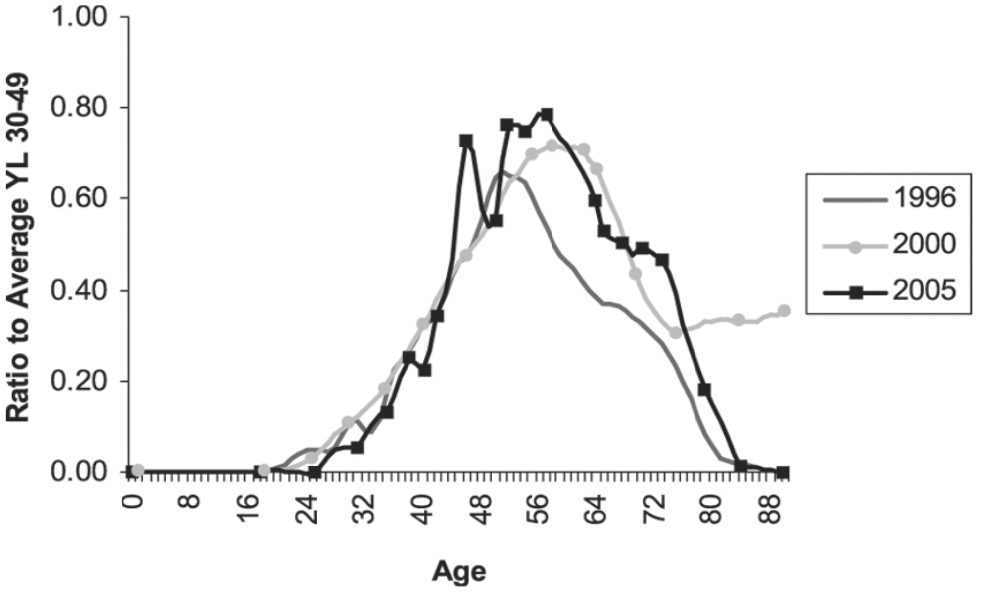
[Figure 7] Per Capita Net Private Transfers Profiles: 1996, 2000, and 2005



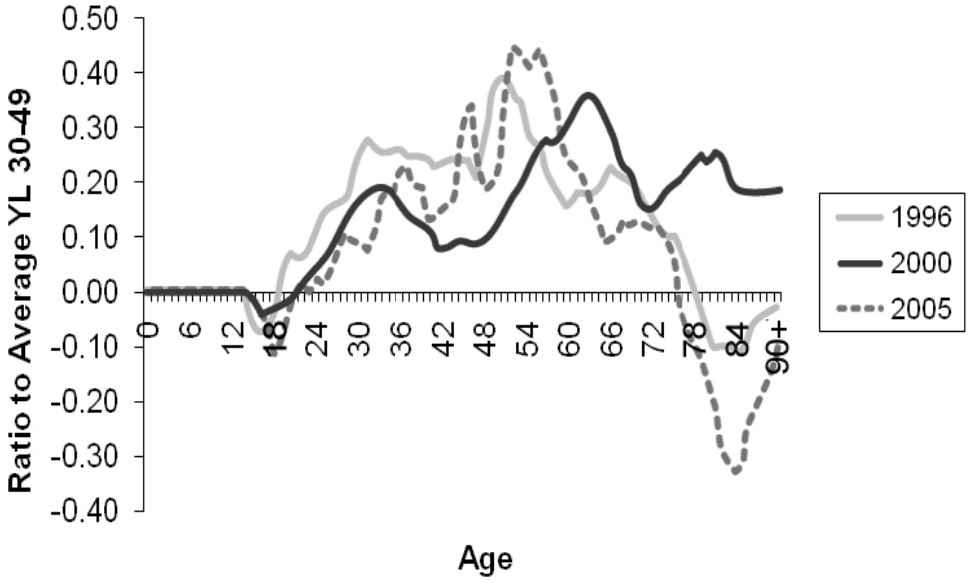
[Figure 8] Per Capita Asset-based Reallocation Profiles: 1996, 2000, and 2005



[Figure 9] Per Capita Private Asset Income Profiles: 1996, 2000, and 2005



[Figure 10] Per Capita Private Saving Profiles: 1996, 2000, and 2005



during the period, which in turn might have affected the asset-based reallocation. Also the asset-based reallocation system in Korea after the crisis should be understood in conjunction with several unusual features of Korea, such as the *chonse* (key-money) housing system, that may have had a significant effect on the private sector through private transfers and private asset-based reallocations.

3. Sources of Financing Consumption

Table 3 presents the national transfer flow account for Korea in a highly summarized form, reporting aggregate lifecycle deficits and aggregate age reallocations by age in billions of won. Total age reallocations and their major components are shown in the bottom panel, with positive values representing net inflows and negative values representing net outflows. The lifecycle deficit for people ages 65 and older, for example, was 12 trillion won in 1996. The lifecycle deficit for this age group was substantially increased, to 19 trillion won, in 2000. The lifecycle deficit further increased to 30 trillion won in 2005 for this age group. Clearly, the lifecycle deficit has become large as the population ages and labor income decreases for this age group.

Table 3 enables us to measure the source of financing consumption for each age group. Figure 11 shows how consumption by children and the elderly was funded for the three periods. In the case of children, earnings were a negligible source for all years; virtually all their consumption was financed by transfers in all three periods.

<Table 3> National Transfer Accounts, Aggregate Values by Broad Age Groups: 1996, 2000, and 2005

<1996>

(unit: Billion won)

	Total	0~19	20~64	65+
Life Cycle Deficit	(12,590)	74,873	(99,717)	12,254
Total Consumption	263,878	78,979	168,848	16,050
Public Consumption	58,089	24,914	29,902	3,273
Private Consumption	205,789	54,066	138,946	12,777
Labor Income (Less)	276,467	4,106	268,565	3,796
Age Reallocations	(12,590)	74,873	(99,717)	12,254
Transfers	(161)	76,174	(85,453)	9,118
Net Public Transfers	0	19,671	(22,917)	3,246
Public Transfer Inflows	78,261	28,273	43,202	6,787
Public Transfer Outflows	(78,261)	(8,602)	(66,119)	(3,541)
Private Transfers, net	(161)	56,503	(62,537)	5,872
Asset-Based Reallocations	(12,428)	(1,301)	(14,263)	3,136
Public Asset Based Reallocation	(36,379)	(3,998)	(30,735)	(1,646)
Public asset income	4,832	531	4,082	219
Less: Public Saving	41,210	4,529	34,817	1,865
Private Asset Based Reallocation	23,951	2,697	16,472	4,782
Private asset income	96,256	54	87,572	8,631
Less: Private Saving	72,306	(2,644)	71,100	3,849

<Table 3> Continue

<2000>

(unit: Billion won)

	Total	0~19	20~64	65+
Life Cycle Deficit	21,299	79,505	(76,930)	18,725
Total Consumption	314,706	83,887	209,161	21,658
Public Consumption	70,098	27,608	37,358	5,133
Private Consumption	244,609	56,280	171,804	16,525
Labor Income (Less)	293,407	4,382	286,092	2,933
		-	-	-
Age Reallocations	21,299	79,505	(76,930)	18,725
Transfers	644	82,629	(94,698)	12,713
Net Public Transfers	-	23,326	(29,746)	6,420
Public Transfer Inflows	102,278	33,052	57,915	11,310
Public Transfer Outflows	(102,278)	(9,726)	(87,661)	(4,891)
Private Transfers, net	644	59,303	(64,952)	6,294
Asset-Based Reallocation	20,655	(3,124)	17,768	6,012
Public Asset Based Reallocation	(49,731)	(4,729)	(42,624)	(2,378)
Public asset income	9,047	860	7,754	433
Less: Public Saving	58,777	5,589	50,378	2,810
Private Asset Based Reallocation	70,386	1,605	60,392	8,389
Private asset income	125,337	30	108,075	17,231
Less: Private Saving	54,951	(1,575)	47,684	8,842

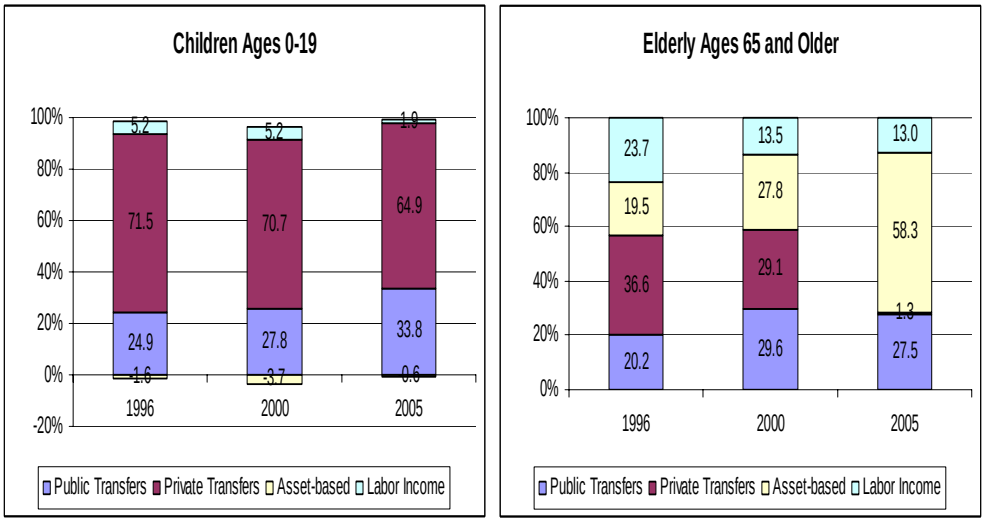
<Table 3> Continue

<2005>

(unit: Billion won)

	Total	0~19	20~64	65+
Life Cycle Deficit	38,405	101,112	(92,255)	29,549
Total Consumption	399,109	103,036	262,116	33,958
Public Consumption	102,452	38,315	54,843	9,294
Private Consumption	296,657	64,720	207,273	24,664
Labor Income (Less)	360,704	1,924	354,371	4,409
		-	-	-
Age Reallocations	38,405	101,112	(92,255)	29,549
Transfers	(2,267)	101,684	(113,699)	9,747
Net Public Transfers	(0)	34,795	(44,116)	9,321
Public Transfer Inflows	157,144	46,036	93,729	17,379
Public Transfer Outflows	(157,144)	(11,242)	(137,845)	(8,057)
Private Transfers, net	(2,267)	66,890	(69,583)	426
Asset-Based Reallocation	40,672	(573)	21,444	19,801
Public Asset Based Reallocation	(50,380)	(3,604)	(44,192)	(2,583)
Public asset income	8,661	620	7,597	444
Less: Public Saving	59,040	4,224	51,790	3,027
Private Asset Based Reallocation	91,051	3,031	65,636	22,384
Private asset income	171,600	69	147,179	24,352
Less: Private Saving	80,549	(2,963)	81,543	1,968

[Figure 11] Sources of Financing Consumption: 1996, 2000, and 2005



Private transfers dominated, accounting for more than 70 percent for 1996 and 2000. Private transfers decreased to about 65 percent, as a source of consumption for this group, in 2005. The remainder consisted of public transfers, and its importance has been substantially increased over the periods.

For the elderly, work contributed about 24 percent of consumption in 1996, but it declined to about 13 percent in 2000 and 2005. Public transfers accounted for only 20 percent of consumption by the elderly in 1996, but jumped to about 30 percent in 2000 and decreased slightly until 2005. Private transfers were the most important source of consumption for the elderly in 1996, accounting for about 37 percent. But these decreased to 29 percent in 2000, and further decreased, dramatically, to 1.3 percent in 2005. The results should be interpreted with caution, however, because, as we pointed out above, the 2000 and 2005 data sets are not exactly comparable due to the changing coverage of households between two surveys, NSHIE and HIES. However, the results are still quite informative in terms of the direction of changes. For the elderly, only the importance of asset-based reallocation rose consistently.

IV. Conclusion

The challenges resulting from the rapid aging and extremely low fertility level are of great concern to Korea, simply because no other society has faced so dramatic a demographic transition. This paper provides insight into some important features of the intergenerational resource allocation in the nation before and after the financial crisis in 1997-98.

The summary and implications of the study are as follows. The results show a tremendous consumption smoothing and resource reallocation by age during and after the financial crisis. Although labor income was sluggish between 1996 and 2000, consumption showed a modest increase, mostly due to the increase in public consumption. Private education and private health consumption decreased for ages 0-19 between 1996 and 2000. However, the decrease in private education and private health consumption was mitigated by the increase in the public sector consumption. It appears that the public sector did not only mitigate the adverse impact of economic crisis on consumption, but it also reduced the widening disparity amongst generations. Within transfers, the results suggest the public transfers increased substantially, while the private transfers substantially decreased for the elderly during and after the crisis. It also appears that social assistance benefits increased rapidly for all age groups.

Perhaps the most important and striking result is that the asset-based reallocation of the elderly increased remarkably after the financial crisis. The increase in asset-based reallocation was mainly due to an increase in asset income between 1996 and 2000, but it was almost entirely due to a decrease in saving (an increase in dis-saving) between 2000 and 2005. It means that the elderly in Korea have some degree of autonomy in spite of the economic crisis, rapid population aging, and the deterioration of the familial support system. This is good news for Korea, because it means that less public resources will be required by the elderly, and that in turn will mitigate the financial burden caused by rapid population aging or economic downturn. However, the increased reliance on dis-saving will lead to a decrease in saving rates, which could be an obstacle for economic growth in the future. The sharp increase in the reliance on asset-based reallocation could be diminished for a while, as the old-age pension of the National Pension Scheme has begun to be fully implemented, starting in 2008. However, without further reforms, public pension funds will be exhausted around 2035. Thus, increased reliance on asset accumulation will be critical in the future. Exactly how all these changes will play out remains to be seen.

References

Chun, Y., "Population Aging, Fiscal Policies, and National Saving: Prediction for Korean Economy," in T. Ito and A. Rose (eds.), *Fiscal Policy and Management: East Asia Seminar on Economics,* Vol. 16, Chicago: University of Chicago Press, Also NBER Working Paper 12265, forthcoming.

Lee, R., "The Formal Demography of Population Aging, Transfers, and the Economic Life Cycle," in L. G. Martin and S. H. Preston (eds.), *Demography of Aging,* Washington, D.C.: National Academy Press, 1994a, pp. 8~49.

_____, "Population, Age Structure, Intergenerational Transfers, and Wealth: A New Approach, with Applications to the US" in P. Gertler (ed.), *The Family and Intergenerational Relations,* special issue of *Journal of Human Resources* 24, 1994b, pp.1027~1063.

Lee, R., S.-H. Lee, and A. Mason, "Charting the Economic Life Cycle," in A. Prskawetz, D. Bloom, and W. Lutz (eds.), *Population Aging, Human Capital Accumulation, and Productivity Growth*, Supplement to *Population and Development Review* 33, Also NBER Working Paper 12379, 2008.

Mason, A., R. Lee, A.-C. Tung, M.-S. Lai, and T. Miller, "Population Aging and Intergenerational Transfers: Introducing Age into National Accounts," in David Wise (ed.), *Economics of Aging Series*, Chicago: National Bureau of Economic Research and University of Chicago Press, 2009.

http://www.ntaccounts.org/

韓國開發硏究
제32권 제1호(통권 제106호)

Economic Resources and Child Health: An Assessment of Certain Mechanisms

Wankyo Chung
(Associate Research Fellow, Korea Development Institute)

가계 내 경제적 자원이 자녀의 건강에 미치는 영향에 대한 실증분석

정 완 교
(한국개발연구원 부연구위원)

* 정완교: (e-mail) wankyo@kdi.re.kr, (address) 49 Hoegiro, Dongdaemun-gu Seoul 130-740, Korea

• Key Word: Economic Resources(경제적 자원), Health(건강), Sanitation(위생)
• JEL code: I12, I11
• Received: 2009. 10. 14 • Referee Process Started: 2009. 10. 19
• Referee Reports Completed: 2009. 10. 30

ABSTRACT

We use data from the Indonesian Family Life Survey (IFLS) to examine the relationship between child health and household economic resources, and find that economic resources as measured by equivalized expenditure have a statistically significant positive effect on child health and protect children from acute health conditions. We make additional use of the data (where extensive data on children's nutrition, household sanitation, the utilization of medical care, and family health status are available) to assess the mechanisms through which economic resources may affect child health. We find evidence that economic resources have a sizable and significant effect on these potential intermediary factors, and that they, particularly household sanitation, partly explain the protective role of economic resources in child health.

본 연구는 가계 내 경제적 자원이 자녀의 건강에 미치는 영향을 분석한다. 경제적 자원과 건강 간의 관계는 두 변수 상호 간의 영향으로 인해 분석이 용이하지 않다. 그러나 성인의 건강이 노동공급 등을 통해 경제적 자원에 영향을 미치는 것과는 달리, 자녀의 건강은 경제적 자원에 미치는 영향이 적으므로 가계의 경제적 자원이 자녀의 건강에 미치는 영향은 분석이 상대적으로 용이하다. 인도네시아 자료(Indonesian Family Life Survey)를 이용하여 분석한 결과, 가계의 경제적 자원이 자녀의 건강에 통계적으로 유의한 수준에서 긍정적인 영향을 끼치는 것으로 나타났다. 또한 경제적 자원이 자녀의 건강에 영향을 끼치는 경로는 영양상태, 의료서비스의 이용, 가계의 위생상태 등인 것으로 나타났다. 따라서 저소득 가구 자녀의 건강증진을 위해서는 의료서비스의 이용 증대뿐만 아니라 가구의 위생상태 등을 개선하는 정책 또한 중요한 것으로 판단된다.

I . Introduction

The positive association between economic resources and health has been extensively reported in the literature. However, the direction of causation remains unclear, particularly as to whether it is economic resources that affect health or vice versa (Smith 2004). Pritchett and Summers (1996) and Ettner (1996) used instrumental variables estimation and found the positive income effect on health to be causal and structural. However, Smith (1998, 1999), Meer et al. (2003), and Adams et al. (2003) cast considerable doubt on the robustness of these results.

Driven by the assumption that children's health is less likely to affect their socioeconomic status because they do not contribute to family income,[1] Case et al. (2002) and Currie and Stabile (2003) used data from the U.S. and Canada, respectively, to show that the relationship between income and adult health status has antecedents in childhood. Case et al. examined insurance, health at birth, the genetic tie between parents and children, and a number of types of health behavior, such as whether a child has a regular bedtime, to identify the mechanisms that underlie the relationship between income and child health. Currie and Stabile found that the health of children with low socioeconomic status worsens with age, because they are subject to more health shocks, and argued that it is important to understand the reasons that there are more health shocks among children who live in low-income families.

We use data from the Indonesian Family Life Survey (IFLS) to examine the relationship between economic resources and child health in Indonesia, and find that economic resources as measured by equivalized expenditure have a statistically significant positive effect on child health and protect children from acute health conditions. We make additional use of the data (where extensive data on children's nutrition, household sanitation, the utilization of medical care, and family health status are available) to assess the mechanisms through which economic resources affect child health. We find evidence that economic resources have a sizable and significant effect on these potential intermediary factors, and that they, particularly household sanitation, partly explain the protective role of economic resources in child health. It is important to understand the mechanisms that underlie the relationship between economic resources and child health, because poor health is likely to affect the future socioeconomic status of children through its effect on their future health and educational attainment (Case et al. 2002; Case et al. 2003; Currie and Stabile 2003).

The remainder of this paper is organized as follows. Section II describes in detail the data that is used in the study. Section III presents the empirical results, which show a positive association between economic resources and child health, and examines the mechanisms that underlie this relationship. Section IV concludes the paper.

---

[1]Children's health, however, may reduce the parental labor supply and thus family income, but Case et al. (2002) found no supporting evidence that children's health at birth affects the maternal labor supply.

Ⅱ. Data and Descriptive Statistics

Data from the third wave of the Indonesian Family Life Survey (IFLS3) (collected from June to November in 2000) is used in the empirical analysis.[2] More than 30,000 individuals in 7,224 households, representing about 83% of the Indonesian population living in 13 of the nation's 26 provinces, were originally sampled and then followed up in a large-scale socioeconomic and health survey (Strauss et al. 2004a; Strauss et al. 2004b).[3]

One of the key variables for the empirical analysis is household expenditure as a measure of economic status. Household expenditure is less prone to measurement error than is wealth or income, and it is more likely to provide an accurate picture of economic well-being (Frankenberg et al. 1999; Strauss et al. 2004a). Household expenditure for 37 food and 19 non-food items, including housing expenses, was cumulated and converted to a monthly equivalent, as in Frankenberg et al. (1999). It was then divided by the square root of the total number of people in the household to equivalize household expenditure. This equivalized expenditure captures the amount of economic resources that are available to each household member, taking into account the fact that people in a larger household are worse off than those in a smaller household, conditional on the same level of household economic resources (Deaton 2001).[4]

Another key variable in the analysis is that which measures child health status. The IFLS3 contains a rich array of data on child health. Self-reported child health, either self-rated by older children or rated by a household member (most likely, at 72.2%, the child's parent), are measured on a four-point scale from "unhealthy" (1), "somewhat unhealthy" (2) and "somewhat healthy" (3) to "healthy" (4). We also use the number of days of activities that are missed due to poor health in the past four weeks, and the child's health change in the past year,[5] transformed into a five-point scale from "much worse" (-2), "somewhat worse" (-1), "about the same" (0) and "somewhat better" (1) to "much better" (2).

---

[2]Although the IFLS is longitudinal, the current analysis relies solely on the 2000 data because some of the key variables for this study - for example, parental information and nurse-assessed child health - are not available for 1993 and 1997. On the other hand, Gertler and Zeitlin (2002) used the 1993 data to study the relationship between education and adult health.

[3]The provinces are four from Sumatra (North Sumatra, West Sumatra, South Sumatra, and Lampung), all five of the Javanese provinces (DKI Jakarta, West Java, Central Java, DI Yogyakarta, and East Java), and four from the remaining major island groups (Bali, West Nusa Tenggara, South Kalimantan, and South Sulawesi).

[4]Thus, equivalized expenditure is household expenditure/(household size)$^{1/2}$. Note that the standard per capita household expenditure divides household expenditure by household size itself, not the number of equivalent adults as calculated in this paper by the square root of household size. Non-parametric kernel density estimates of log of equivalized expenditure appear to support the normality assumption.

[5]Children less than one year old are excluded from the health change measure.

As the drawbacks of all self-reported measure of health status have been well explained (Strauss and Thomas 1998; Baker et al 2001), our primary measure is nurse-assessed health status, which is measured on a nine-point scale from "the most unhealthy" (1) to "the most healthy" (9). Therefore, the use of a more objective health measure, such as nurse-assessed individual health status, will provide us with assured and robust empirical evidence.[6]

Table 1 presents the descriptive statistics for the estimation sample. The sample used in the analysis comprises 10,411 children aged 14 and below, with non-missing data on key covariates. In the sample, 10.4% reported poor health, which is either "somewhat unhealthy" or "unhealthy," with a mean self-reported heath status of 3.35, whereas 38.2% were assessed by a nurse to be unhealthy (the evaluation scale <=5), with a mean value of 6.432.[7] The average household monthly expenditure was 1,179.15 (in thousands of Rupiahs), and the average equivalized expenditure was 519.18 (in thousands of Rupiahs).

Of the sample, 54% are female, and 46.9% live in urban areas. In terms of household sanitation, 25% live in households that drink either bottled or piped water, 47.3% in households that use their own toilet with a septic tank, and more than half (55.1%) live in households that use a flowing drainage ditch. Only 22.8% live in households that dispose of garbage in trash cans that are collected by a sanitation service, and 13.8% live in households that store perishable food in a refrigerator. Finally, 9.3% live in households that participate in the Dana Sehat (health fund) program, which is a unique, community-managed health insurance scheme in Indonesia.[8]

Ⅲ. Economic Resources and Health

1. Evidence on the Relationship between Economic Resources and Child Health

Figure 1 first looks at the relationship between economic resources as measured

[6]The use of child height and weight can be another solution to the drawbacks of all self-reported measures of child health. However, it will require strafying the sample more finely by age groups with different growth pattern and hinder the results from being compared with those in studies by Case et al. (2002) and Currie and Stabile (2003), which all used self-reported measures of child health. The specific question for our nurse-assessed child health measure was, "How does the health of this person compare, in general, to the health status of other people of the same age and sex?"

[7]Looking more closely into the distribution shows that, whereas about 91% of the sample reported that they were either "somewhat healthy" or "healthy," about 92% were assessed to be 5, 6, or 7 on the scale by a nurse.

[8]This program is "in fact a framework within which the community, community leaders and health staff can work together" to "develop a pre-paid health care scheme, to raise income, to improve living conditions and to increase community's understanding about health and its relation to nutrition and environment" (www.healthdevelopment.org).

<Table 1> Descriptive Statistics

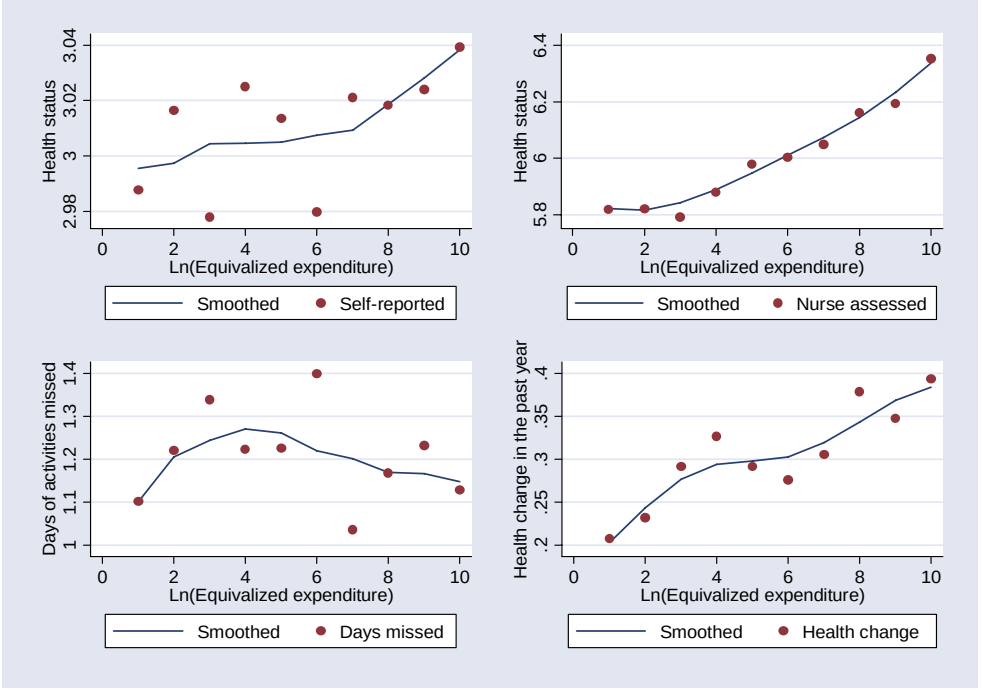
Variable	Description	Mean	Std. Dev.
Self-reported health status (1-4)	The scale is from 1 (unhealthy) to 4 (healthy)	3.350	1.601
Self-reported poor health	=1 if somewhat unhealthy or unhealthy	0.104	0.356
Nurse-assessed health status (1-9)	The scale is from 1 (the most unhealthy) to 9 (the most healthy)	6.432	2.983
Nurse-assessed poor health (<=5)	=1 if evaluation <=5	0.382	0.606
Household expenditure (in thousands of Rupiahs)		1179.15	1572.40
Equivalized expenditure (in thousands of Rupiahs)	=household expenditure/(household size)$^{1/2}$	519.18	731.71
Age		7.84	6.56
Female	=1 if female	0.540	0.645
Urban	=1 if living in urban area	0.469	0.639
Drinking water	=1 if living in household drinking bottled or piped water	0.250	0.494
Own toilet	=1 if living in household using own toilet with a septic tank	0.473	0.638
Sewage	=1 if living in household using a flowing drainage ditch	0.551	0.661
Garbage disposal	=1 if living in household disposing garbage in trash cans, collected by a sanitation service	0.228	0.501
Store perishable food in a refrigerator	=1 if living in household storing perishable food in a refrigerator	0.138	0.403
Health fund	=1 if living in household participating in the health fund (Dana Sehat program)	0.093	0.351
No. of Obs. (10,411)			

Notes: Nurse assessment of child health is reported by a nurse who collects physical assessments. Estimates are weighted using individual sampling weights.

Source: Third wave of Indonesian Family Life Survey, 2000.

by equivalized expenditure and child health. The upper half of Figure 1 shows the relationship between child health, as measured by both self-reported (the left panel) and nurse-assessed general health status (the right panel), and log of equivalized expenditure. The bottom half uses the number of days of activities that were missed due to poor health in the past four weeks (the left panel) and the child's health change in the past year (the right panel) for other health measures. The mean values of each health measure for each 10 equidistant intervals of the log of equivalized expenditure are overlaid with conditional expectations of them as a function of the log of equivalized expenditure, using a locally weighted regression smoother. The positive relationship between log of equivalized expenditure and child health is

[Figure 1] Equivalized Expenditure and Child Health



evident from the figure. Children were reported to be (or reported themselves to be) healthier, were assessed to be healthier by a nurse, missed fewer days of activities due to poor health, and experienced improvement in their health when they lived in a family with more economic resources.

Table 2 presents ordered probit estimates to examine the relationship between child health and log of equivalized expenditure while controlling for other confounding individual and parental health risk factors.[9] A mother's educational level of junior high school or high school or higher and a dummy variable for having two parents are used for child-specific parental characteristics. The other variables included in the regressions are dummy variables for the child's age, sex, urban location, and the relationship between the survey respondent and the child and

[9]See Currie (2000) for the economic model of the child health production function. Child health as measured by self-reported health status and nurse-assessed health status is an ordinal measure. Thus, the relationship between child health and log of equivalized expenditure is estimated using ordered probits. In ordered probit, the probability of observing health outcome (y=) i is the probability that the estimated linear function, plus random error, is within the range of the cutpoints estimated for the outcome: $\Pr(y = i \mid x) = \Pr(k_{i-1} < x\beta + e \leq k_i)$ where e is assumed to be normally distributed. β together with a set of cutpoints k are estimated while k_0 is taken as $-\infty$ and k_I as ∞ where I is the number of possible outcomes. x is a set of individual and parental health risk factors.

<Table 2> Economic Resources and Child Health

	Ordered Probits			OLS	Ordered Probits			OLS
	Self-reported health status	Nurse-assessed health status	Change in general health	Days of activities missed	Self-reported health status	Nurse-assessed health status	Change in general health	Days of activities missed
Ln(Equivalized expenditure)	0.071 (2.77)**	0.2 (6.08)**	0.076 (3.55)**	-0.099 (2.00)*	0.044 (1.65)	0.136 (4.09)**	0.049 (2.10)*	-0.066 (1.27)
Mother's education								
Junior high school					0.003 (0.06)	0.25 (4.87)**	0.104 (2.36)*	-0.037 (0.29)
High school or more					0.107 (2.35)*	0.275 (4.57)**	0.097 (2.25)*	-0.152 (1.58)
Two parent family					0.052 (1.06)	0.041 (0.81)	-0.016 (0.37)	-0.032 (0.34)
Constant				2.894 (8.26)**				2.756 (7.53)**
No. of Obs.	10,411	10,411	9,772	10,411	10,108	10,108	9,473	10,108

Notes: Other variables included in the regressions are: dummy variables for age, sex, living in urban area, and the relationship between the survey respondent and the child and thirteen provincial dummies, with Jakarta as the omitted category. A dummy variable for missing maternal education is also included in the regressions when child-specific parental characteristics are added to the estimation model. Estimates are weighted using individual sampling weights. Absolute values of robust t-statistics (OLS) and z-statistics (Ordered Probits) are reported, taking into account the clustering of observations by community area. * significant at 5%; ** significant at 1%.

Source: Third wave of Indonesian Family Life Survey, 2000.

thirteen provincial dummies, with Jakarta as the omitted category. Throughout this paper, unless otherwise specified, all of the estimation models include all of the variables above. They also correct for the clustering (not-independent sampling) of observations at the community area for more conservative standard errors than are corrected for clustering within households. Furthermore, estimates are weighted using individual sampling weights to handle random samples where the probability of being sampled varies.

The first two columns of Table 2 show that a doubling of equivalized expenditure is associated with 0.071 points (self-reported) and 0.2 points (nurse-assessed) of improvement in child health.[10] Similarly, we find significant effects of log of

[10]Although not directly comparable, it is worthwhile to note that the estimates of log of equivalized expenditure in the model of nurse-assessed health status are comparable in size to those in Case et al. (2002). Note also that the direction of the effect in the ordered probit model is unambiguously determined by the sign of the coefficient estimates for the first and last outcomes but not always for the intermediate outcomes (Wooldridge 2002). Furthermore, "the magnitude of the ordered probit coefficient does not have

equivalized expenditure on the child's health change in the past year and the number of days of activities missed due to poor health in the past four weeks. When variables for child-specific parental characteristics are additionally controlled for, the estimated coefficients for log of equivalized expenditure decline, but are still statistically significant at less than 10% significance levels, except for the number of days of activities missed due to poor health.[11] The coefficients on mother's education are large and statistically significant, either because education may serve as a proxy for the longer-run measure of economic status or because education makes mothers more adept at protecting their children's health (Case et al. 2002; Currie and Moretti 2003).

Case et al. (2002) argue that the positive relationship between household income and children's health can be explained by the arrival and impact of chronic health conditions in childhood.[12] Currie and Stabile (2003) argue that a new chronic health condition has a much greater effect on child health than does an older condition and that income mitigates the effect of the new chronic health condition. Table 3 examines this using the child's acute health conditions (these include headache, runny nose, cough, difficulty in breathing, fever, stomach ache, nausea/vomiting, diarrhea, skin infection, eye infection, and toothache) in the past four weeks for which the IFLS had collected information. These acute health conditions appear not to be rare and chronic in the sense that the fraction of children who have them increases with age; thus, these acute conditions are different from such chronic conditions as asthma, heart disease, bronchitis, epilepsy, kidney troubles, mental troubles, etc., that were used in the previous studies mentioned above. For example, about 72.5% of the children in the IFLS3 have at least one of these conditions, and the fraction of children with any one of them declines up to age nine and increases

---

a simple interpretation, but its sign and statistical significance agree with the linear regression results."

[11]These estimates are certainly biased downward to the extent that equivalized expenditure has a measurement error. However, this downward bias will be counterbalanced by the potential reverse causality that runs from health to economic resources. If anything, when the log of average equivalized expenditure, using data from the 1997 and 2000 IFLS, is used instead to reduce its measurement error, ordered probit estimations of nurse-assessed health status show that the coefficient estimates increase from 0.2 to 0.224 when variables for child-specific parental characteristics are not controlled for and from 0.136 to 0.172 when they are controlled for. On the other hand, when the log of equivalized expenditure using data from the 1997 IFLS alone is used, the coefficient estimates are 0.170 (std. err. 0.035) and 0.128 (std. err. 0.036), respectively.

[12]They also showed that the relationship between household income and children's health becomes more pronounced as children grow older. When our sample is divided into two age groups, one aged 0 to 6 (4,944 observations) and the other aged 7 to 14 (5,467 observations), the coefficient for log of equivalized expenditure increases similarly from 0.168 to 0.231 for older children, and both are statistically significant (1%) in the estimation model of nurse-assessed health status. When variables for child-specific parental characteristics are added to the estimation model, the coefficient still increases from 0.091 (4,884 observations) and 0.176 (5,224 observations) for older children. Furthermore, the main results in Table 5 remains the same when the sample is divided into two age groups. For example, as for younger children, the coefficient for log of equivalized expenditure declines the most from 0.091 to 0.066 when the variables on household sanitation are controlled for and, as for older children, from 0.176 to 0.131.

<Table 3> Economic Resources and Acute Health Conditions Ordered Probits

	Nurse-assessed health status	
Ln(Equivalized expenditure)	0.136 (4.09)**	0.068 (1.38)
Has condition	0.024 (0.65)	-0.512 (1.76)
Ln(Equivalized expenditure)*has condition		0.092 (1.85)
Mother's education		
Junior high school	0.25 (4.87)**	0.251 (4.90)**
High school or more	0.275 (4.57)**	0.274 (4.57)**
No. of Obs.	10,108	10,108

Notes: "Has condition" equals 1 if the child has at least one of the following conditions: headache, runny nose, cough, difficulty in breathing, fever, stomach ache, nausea/vomiting, diarrhea, skin infection, eye infection, and toothache. Other variables included in the regressions are: dummy variables for age, sex, living in urban area, whether the child has two parents in the household, missing maternal education, and the relationship between the survey respondent and the child and thirteen provincial dummies, with Jakarta as the omitted category. Estimates are weighted using individual sampling weights. Absolute values of robust z-statistics are reported, taking into account the clustering of observations by community area. * significant at 5%; ** significant at 1%.

Source: Third wave of Indonesian Family Life Survey, 2000.

thereafter.[13] Nonetheless, they are transformed into a binary indicator of having at least one of the 11 acute health conditions and used to examine whether they have any impact on children's health, and, if they do, whether household economic resources protect children from them. Due to the drawbacks of all of the reported measures of health status, hereafter we focus on results that are based on children's nurse-assessed health status.

First of all, the binary indicator for having at least one of the acute health conditions shows an unexpected positive sign and is not statistically significant, as shown in the first column of Table 3. Also, its inclusion in the model has no effect on the other coefficients of interest. However, when the acute health conditions are limited to serious ones that require a visit to a hospital, health center, clinic, or doctor's practice, the indicator shows a statistically significant negative effect on children's health with the coefficient of (-0.08). Unfortunately, however, these limited serious conditions as defined above have to be highly correlated (r = 0.992) with their

[13]The most common acute health condition is runny nose (51.2%), followed by cough (38.8%) and fever (34.3%), whereas the rarest condition is difficulty in breathing (4%), followed by eye infection (4.6%) and nausea/vomiting (8.3%). In Currie and Stabile (2003), 19% of the children reported suffering from asthma, and 26 percent reported having some chronic condition in 1994.

interaction variable with log of equivalized expenditure, because they entail more household expenditure. Thus, when the original binary indicator for having at least one of the 11 acute health conditions is added to the model, together with its interaction variable with log of equivalized expenditure, the binary indicator shows a negative sign and the interaction variable a positive sign (both are statistically significant at the 10% significance level), as shown in the second column of Table 3. This conforms to the results in Currie and Stabile (2003). Therefore, household economic resources appear to protect children from acute health conditions

2. Explanation on the Relationship between Economic Resources and Child Health

This protective income effect may reflect better nutrition, better household sanitation, and/or more utilization of medical care among the children who live in a family with more economic resources. Case (2001) provides supporting evidence for the argument that better nutrition and sanitation are important mechanisms through which income affects adult health. Barker (1997) emphasizes that a limited supply of nutrients in the prenatal period may be the origin of a number of diseases in later life. Currie and Gruber (1996) show that Medicaid (public health insurance in the U.S. for poor women and children) expansion to low-income children increases the utilization of medical care and is associated with a significant reduction in child mortality.

Econometric estimates that quantify the impact of economic resources, as measured by equivalized expenditure, on nutrition are provided in the first column of Table 4. A negative answer to the question - "Did the child eat the listed item last week?" - is coded "1" and then summed over all of the food items (these include sweet potatoes, eggs, fish, meat/poultry, milk, vegetables, bananas, papayas, carrots, and mangoes). The OLS results show that log of equivalized expenditure reduces the number of food items that were missed in the past week by 0.74, which is a 16.7% decline relative to the mean value of 4.42.[14]

Another way by which economic resources may influence child health is household sanitation. We take advantage of the extensive IFLS3 data on household sanitation. In previous studies, the health effect of household sanitation was captured using the household income variable when variables for household sanitation were not available. The second and third columns of Table 4 show that a doubling of equivalized expenditure increases the probability of living in a household that drinks bottled or piped water by 6.5 percentage points and the probability of living in a household that uses its own toilet with a septic tank by 19.9 percentage points, which are increases of 26% and 42.1%, respectively, relative to the baseline probabilities. The fourth and fifth columns of Table 4 show that a doubling of equivalized expenditure increases the probability of living in a household that uses a flowing drainage ditch by 7.2 percentage points and the probability of living

[14]About 18% of the children had missed four food items in the past week, and 16.5% and 16% had missed three and five food items, respectively.

<Table 4> Economic Resources, Nutrition, Household Sanitation, and the Utilization of Medical Care

	OLS	Probits				
	No. of food items missed	Drinking water	Own toilet	Sewage	Garbage disposal	Store perishable food in a refrigerator
Ln(Equivalized expenditure)	-0.74 (14.59)**	0.065 (5.50)**	0.199 (11.39)**	0.072 (4.64)**	0.059 (6.99)**	0.086 (14.58)**
Mother's education						
Junior high school	-0.28 (3.65)**	0.032 (1.48)	0.166 (6.29)**	0.065 (2.32)*	0.095 (5.45)**	0.059 (4.22)**
High school or more	-0.374 (5.11)**	0.086 (3.71)**	0.307 (12.19)**	0.119 (4.84)**	0.125 (7.26)**	0.138 (10.66)**
Constant	12.845 (39.26)**					
No. of Obs.	10,108	10,108	10,108	10,108	10,108	10,108

	Probits		
	Outpatient (4 weeks)	Inpatient (1 year)	Health fund
Ln(Equivalized expenditure)	0.038 (4.78)**	0.004 (4.44)**	0.019 (3.65)**
Mother's education			
Junior high school	0.025 (1.98)*	0.001 (0.45)	0.009 (0.88)
High school or more	0.035 (2.56)*	0.004 (2.16)*	0.001 (0.11)
Constant			
No. of Obs.	10,107	10,049	10,108

Notes: Food items include sweet potatoes, eggs, fish, meat/poultry, milk, vegetables, bananas, papayas, carrots, and mangoes. Other variables included in the regressions are: dummy variables for age, sex, living in urban area, whether the child has two parents in the household, missing maternal education, and the relationship between the survey respondent and the child and thirteen provincial dummies, with Jakarta as the omitted category. Estimates are weighted using individual sampling weights. Absolute values of robust t-statistics (OLS) and z-statistics (Probits) are reported, taking into account the clustering of observations by community area. Marginal effects are calculated by multiplying the probit coefficient by the value of the standard normal probability density function evaluated at the mean of all explanatory variables. * significant at 5%; ** significant at 1%.

Source: Third wave of Indonesian Family Life Survey, 2000.

in a household that disposes of its garbage in a trash can by 5.9 percentage points, which are increases of 13.1% and 25.9%, respectively, relative to the baseline probabilities. The last column shows that a doubling of equivalized expenditure increases the probability of living in a household that stores perishable food in a refrigerator by 8.6 percentage points, which is a significant 62.3% increase relative to the baseline probability.

The bottom panel of Table 4 examines the impact of economic resources, as measured by equivalized expenditure, on the utilization of medical care. Answers to the two questions - "In the past four weeks, did the child visit a hospital, health center, clinic, or doctor's practice, or was the child visited by a health worker?" and "In the past twelve months, did the child receive inpatient care (hospitalization)?" - are used to measure the probability of having had a doctor's visit in the past four weeks and the probability of having had hospitalization in the past year, respectively. If anything, a doubling of equivalized expenditure increases the former by 3.8 percentage points and the latter by 0.4 percentage points, which are increases of 21.1% and 30.8%, respectively, relative to the baseline probabilities of 18% and 1.3%.

To the extent that these measures of medical care utilization are affected by morbidity, their uses as a measure of access to medical care are vulnerable to the potential confounding problem of morbidity (Currie and Gruber 1996).[15] Therefore, to surmount this problem, this paper uses another measure of access to medical care that is less likely to be affected by morbidity. This is the health fund (the *Dana Seha* program). The uninsured are known to receive less health care than the insured, and, in Indonesia, the health fund is a unique community-managed health insurance scheme. The last column in the bottom panel of Table 4 shows that a doubling of equivalized expenditure is associated with a 1.9 percentage point increase in health fund coverage, which is a sizable 25.7% increase relative to the baseline probability. Thus, economic resources, as measured by equivalized expenditure, have a sizable positive effect on children's nutrition, household sanitation, and the utilization of medical care.

Table 5 directly examines how much of the protective role of economics resources can be explained by nutrition, household sanitation, and the utilization of medical care, and which one of these plays the most important role. The first column of Table 5 is the result shown in Table 2. In the second column of Table 5, the coefficient of log of equivalized expenditure declines slightly from 0.136 to 0.134 when the number of food items that were missed in the past week is additionally controlled for. The coefficient on the number of food items that were missed in the past week is negative, but not statistically significant. The third column of Table 5 shows the corresponding decline from 0.136 to 0.133 in the coefficient of log of equivalized expenditure when the variable for the health fund program is additionally controlled for. Note that the

[15]When expenditure on medical costs is deducted from household expenditure, and an equivalized expenditure based on this is instead used to reduce the above mentioned confounding problem of utilization of medical care with morbidity, a slightly smaller, but still positive (statistically significant), effect on the utilization of medical care is shown (the respective coefficients are 0.036 and 0.0036), even though the results are not presented in the table. This may be partly due to quite a small medical cost, which is less than two percent of household expenditure on average.

<Table 5> Economic Resources and Child Health Taking into Account Some Mechanisms Ordered Probits

	Nurse-assessed health status					
Ln(Equivalized expenditure)	0.136 (4.09)**	0.134 (4.30)**	0.133 (4.02)**	0.1 (2.87)**	0.096 (2.88)**	0.096 (2.87)**
Mother's education						
Junior high school	0.25 (4.87)**	0.25 (4.87)**	0.249 (4.87)**	0.221 (4.52)**	0.219 (4.49)**	0.219 (4.49)**
High school or more	0.275 (4.57)**	0.274 (4.52)**	0.275 (4.58)**	0.206 (3.72)**	0.206 (3.66)**	0.206 (3.67)**
No. of food items missed		-0.003 (0.30)			-0.002 (0.16)	-0.002 (0.15)
Health fund			0.141 (2.31)*		0.14 (2.27)*	0.137 (2.23)*
Household sanitation						
Drinking water				-0.029 (0.40)	-0.029 (0.41)	-0.029 (0.40)
Own toilet				0.061 (1.18)	0.062 (1.20)	0.063 (1.22)
Sewage				-0.119 (2.34)*	-0.118 (2.32)*	-0.119 (2.33)*
Garbage disposal				0.302 (3.39)**	0.302 (3.39)**	0.303 (3.40)**
Store perishable food in a refrigerator				0.117 (1.41)	0.118 (1.42)	0.118 (1.43)
Family death						0.07 (0.96)
No. of Obs.	10,108	10,108	10,108	10,108	10,108	10,108

Notes: Food items include sweet potatoes, eggs, fish, meat/poultry, milk, vegetables, bananas, papayas, carrots, and mangoes. "Family death" equals 1 if a householder or other family member died over the past five years. Other variables included in the regressions are: dummy variables for age, sex, living in urban area, whether the child has two parents in the household, missing maternal education, and the relationship between the survey respondent and the child and thirteen provincial dummies, with Jakarta as the omitted category. Estimates are weighted using individual sampling weights. Absolute values of robust z-statistics are reported, taking into account the clustering of observations by community area. * significant at 5%; ** significant at 1%.

Source: Third wave of Indonesian Family Life Survey, 2000.

protective effect of health fund coverage is statistically significant at the 5% level.[16]

[16]To the extent that morbidity increases the demand for the health fund, its coefficient is downward biased. The positive and significant health fund coverage impact is consistent with the results of Currie

Likewise, controlling for the variables on household sanitation reduces the coefficient of log of equivalized expenditure from 0.136 to 0.1. They are, taken as a whole, statistically significant at less than the 1% level.[17] Finally, when all of the variables for children's nutrition, household sanitation, and the utilization of medical care are controlled for, the coefficient on the log of equivalized expenditure declines from 0.136 to 0.096 in the fifth column of Table 5. Therefore, although both nutrition and the utilization of medical care help to explain the protective role of economic resources, it is household sanitation that explains the greater part.

Nevertheless, a still positive and statistically significant coefficient of log of equivalized expenditure when all of the variables above are controlled for indicates that there still remain other unmeasured factors.[18] The last column of Table 5 examines another potential intermediary factor, which is family health status. Children's health may be affected by family health due to shared living environmental factors and/or a genetic tie between parents and children (Case et al. 2002). We use answers to the IFLS3 question on the death of a householder or other family member over the past five years. The variable of family death equals 1 if a householder or a family member died over the past five years and 0 otherwise.[19] However, the coefficient on the family death shows a positive sign and is not statistically significant. Also, its inclusion in the model has no effect on other coefficients of interest.

Ⅳ. Conclusions

Case et al. (2002) showed with U.S. data that the relationship between income and adult health has antecedents in childhood. Currie and Stabile (2003) showed with Canadian data that the health of children with a low socioeconomic status worsens with age because they are subject to more health shocks. We used data from the Indonesian Family Life Survey to show that economic resources as measured by equivalized expenditure have a statistically significant positive effect on child health and protect children from acute health conditions in Indonesia.

Case et al. examined insurance, health at birth, the genetic tie between parents and children, and a number of health behaviors to identify the mechanisms that underlie the relationship between income and child health. Currie and Stabile

---

and Gruber (1996), but not with those of Newhouse (1993).

[17]Note that the coefficient on sewage shows an unexpected (statistically significant) negative sign. This may be due to the plausible correlation among the household sanitation variables, because it seems unlikely that living in a household that uses a flowing drainage ditch has a negative effect on children's health. When the sewage variable alone is included in the estimation, apart from all other household sanitation variables, its coefficient still keeps its negative sign but becomes statistically insignificant.

[18]Note that provincial dummies are included in all of the estimations. Mellor and Milyo (2002) argue that these dummies control for regional variations in access to health services, practice patterns of health care suppliers, environmental and behavioral risk factors, or social norms regarding diet and exercise.

[19]About 6.5% of the children live in a household in which the householder died over the past five years.

argued that it is important to understand the reasons that there are more health shocks among children who live in low-income families. We examined children's nutrition, household sanitation, the utilization of medical care, and family health status to this purpose. Consequently, economic resources are found to have a sizable and significant effect on these potential intermediary factors, and that they, particularly household sanitation, partly explain the protective role of economic resources in child health. Therefore, the results indicate that health policy for children in poor households should focus on improving household sanitation as well as on increasing access to medical care. Nonetheless, it remains important to investigate other unexamined factors that underlie the relationship between income and child health, as there still remains a positive and statistically significant (although smaller) effect of economic resources on child health even when all of the factors above are controlled for.

References

Adams, Peter, Michael D. Hurd, Daniel McFadden, Angela Merrill, and Tiago Robeiro, "Healthy, Wealthy, and Wise? Tests for Direct Causal Paths between Health and Socioeconomic Status," *Journal of Econometrics* 112, January 2003, pp.3~56.

Baker, Michael, Mark Stabile, and Catherine Deri, "What Do Self-Reported, Objective, Measures of Health Measure?" NBER Working Paper No. 8419, National Bureau of Economic Research, 2001.

Barker, David J. P., "Maternal Nutrition, Fetal Nutrition, and Disease in Later Life," *Nutrition* 13, September 1997, pp.807~813.

Case, Anne, "Does Money Protect Health Status? Evidence from South African Pensions," NBER Working Paper No. 8495, National Bureau of Economic Research, 2001.

Case, Anne, Darren Lutotsky, and Christina Paxson, "Economic Status and Health in Childhood: The Origins of the Gradient," *American Economic Review* 92, December 2002, pp.1308~1334.

Case, Anne, Angela Fertig, and Christina Paxson, "From Cradle to Grave? The Lasting Impact of Childhood Health and Circumstance," NBER Working Paper No. 9788, National Bureau of Economic Research, 2003.

Currie, Janet, "Child Health in Developed Countries," in Anthony J. Culyer and Joseph P. Newhouse (eds.), *Handbook of Health Economics,* Amsterdam: Elsevier Science Publishing, 2000, pp.1053~1090.

Currie, Janet and Jonathan Gruber, "Health Insurance Eligibility, Utilization of Medical Care, and Child Health," *Quarterly Journal of Economics* 111, May 1996, pp.431~466.

Currie, Janet and Enrico Moretti, "Mother's Education and the Intergenerational Transmission of Human Capital: Evidence from College Openings," *Quarterly Journal of Economics* 118, December 2003, pp.1495~1532.

Currie, Janet and Mark Stabile, "Socioeconomic Status and Child Health: Why is the Relationship Stronger for Older Children?" *American Economic Review* 93, December 2003, pp.1813~1823.

Deaton, Angus, "Health, Inequality, and Economic Development," NBER Working Paper No. 8318, National Bureau of Economic Research, 2001.

Ettner, Susan L., "New Evidence on the Relationship between Income and Health," *Journal of Health Economics* 15, February 1996, pp.67~85.

Frankenberg, Elizabeth, Duncan Thomas, and Kathleen Beegle, "The Real Costs of Indonesia's Economic Crisis: Preliminary Findings from the Indonesian Family Life Surveys," RAND Labor and Population Program Working Paper Series 99-04, DRU-2064-NIA/NICHD, RAND, 1999.

Gertler, Paul, and Jennifer Zeitlin, "Do Investments in Child Education and Nutrition Improve Adult Health? Evidence from Indonesia," in Teh-Wei Hu and Chee-Ruey Hsieh (eds.), *The Economics of Health Care in Asia-Pacific Countries*, Cheltenham, UK: Northampton, Mass.: Edward Elgar, 2002, pp.111~140.

Meer, Jonathan, Douglas L. Miller, and Harvey S. Rosen, "Exploring the Health-Wealth Nexus," *Journal of Health Economics* 22, September 2003, pp.713~730.

Mellor, Jennifer M. and Jeffrey Milyo, "Income Inequality and Health Status in the United States," *Journal of Human Resources* 37, Summer 2002, pp.510~539.

Newhouse, Joseph P., *Free for All? Lessons from the RAND Health Insurance Experiment*, RAND, Santa Monica, 1993.

Pritchett, Lant and Lawrence H. Summer, "Wealthier is Healthier," *Journal of Human Resources* 31, Autumn 1996, pp.841~868.

Smith, James P., "Socioeconomic Status and Health," *American Economic Review* 88, May 1998, pp.192~196.

Smith, James P., "Healthy Bodies and Thick Wallets: The Dual Relation between Health and Economic Status," *Journal of Economic Perspectives* 13, Spring 1999, pp.145~166.

Smith, James P., "Unraveling the SES-Health Connection," in Waite Linda J. (ed.), *Aging, Health, and Public Policy: Demographic and Economic Perspectives*, Supplement to *Population and Development Review*, Population Council, New York, 2004.

Strauss, John, Kathleen Beegle, Agus Dwiyanto, Yulia Herawati, Daan Pattinasarany, Elan Satriawan, Bondan Sikoki, Sukamdi, and Firman Witoelar, *Indonesian Living Standards – Before and After the Financial Crisis*, RAND Corporation and Institute of Southeast Asian Studies (ISEAS), 2004a.

Strauss, John, Kathleen Beegle, Bondan Sikoki, Agus Dwiyanto, Yulia Herawati, and Firman Witoelar, "*The Third Wave of the Indonesian Family Life Survey (IFLS3): Overview and Field Report,*" WR-144/1-NIA/NICHD, RAND, 2004b.

Strauss, John and Duncan Thomas, "Health, Nutrition, and Economic Development," *Journal of Economic Literature* 36, June 1998, pp.766~817.

Wooldridge, J. M., "Econometric Analysis of Cross Section and Panel Data," Cambridge, Massachusetts: The MIT Press, 2002.

韓國開發硏究
제32권 제1호(통권 제106호)

Reconsidering the Goal and Strategy of Regional Development Policy in Korea

Kwang-ho Kim
(Assistant Professor, Division of Economics and Finance, Hanyang University)

우리나라 지역개발정책에 대한 재고찰

김 광 호
(한양대학교 경제금융학부 조교수)

* A Previous Version of This Paper was presented at 2008 KDI International Conference under the Title "Redefining the Goal and Strategy of Regional Development Policy in Korea"

** 김광호: (e-mail) kwanghokim@hanyang.ac.kr, (address) Hanyang University, 17 Haengdang-dong, Seongdong-gu, Seoul 133-791, Korea

• Key Word: Regional Development Policy(지역개발정책), Balanced Regional Development (지역균형발전), Regional Disparity(지역 간 격차)
• JEL code: R11, R12, R58
• Received: 2009. 4. 9 • Referee Process Started: 2009. 4. 10
• Referee Reports Completed: 2009. 10. 15

ABSTRACT

This paper aims to put forward some policy suggestions regarding the goal and strategies of the regional development policy in Korea. We first survey past regional policies and examine the regional disparity in Korea. It is found using the OECD data that although population and income are highly concentrated, inequalities of income and other living standards do not seem as problematic as to call for strong government intervention. Moreover, recent development in the new economic geography implies that the 'capital vs. non-capital area' framework that has been shaping the Korean regional development policy should be reconsidered. The main message of this paper is that it is not desirable for the central government to disperse agglomeration to enhance regional equity and that local governments should be responsible for regional development. Therefore enhancing the autonomy and accountability of the regional government is essential.

본 연구는 지금까지의 우리나라의 지역개발정책을 평가하고, 현황 파악과 이론적 검토를 통해 향후 지역개발정책의 목표와 전략에 대한 정책적 함의를 도출하는 것을 목적으로 한다. 우리나라의 지역정책은 일관되게 지역 간 균형을 추구하는 측면이 강했는데, 경제학적 관점에서 보았을 때 인위적인 지역 간 격차 완화, 특히 수도권과 비수도권 간 격차의 완화는 효율성뿐만 아니라 공평성을 저해할 가능성이 있다. 또한 우리나라의 지역 간 격차를 파악하고 OECD 주요국들과 비교한 결과, 우리나라의 인구 및 소득 집중도가 높은 것은 사실이나 지역 간 소득수준이나 여타 생활여건의 격차가 크다고 보기는 어려운 것으로 나타난다. 따라서 향후 지역정책은 인위적으로 경제활동을 재배치하여 지역 간 균형을 추구하기보다는 각 지역의 자생적 성장능력을 키워주는 데 주력할 필요가 있다. 이를 위해서 지역개발에 대해 현재 중앙정부가 가지고 있는 각종 권한을 대폭 지방으로 이전하여 지방의 자율성을 강화하는 한편, 지역의 성장은 궁극적으로 지방정부가 책임지도록 책임성을 부과할 필요가 있으며, 중앙정부는 지역발전을 위한 정보와 인력을 제공하는 등 건설적인 조력자로서의 역할을 담당해야 할 것이다.

I . Introduction

Since the 1970's when Korea began to accelerate its unprecedented economic growth, regional development policies have been carried out in various forms and names. They reflected the development stage, socioeconomic environment and the priority set by the government of the time. On one hand, it is quite natural and to some extent desirable for regional policy to reflect such social, economic, and political factors. On the other hand, however, it is hard to deny that Korean regional development policy has been somewhat ad hoc; it has been set up and changed arbitrarily lacking established goal and consistent strategy.

Most of all, the goal of regional policy itself has been vague. Should it be to disperse the concentration of population and economic activity in the capital area? Should it be to reduce the disparity across regions? What is the rationale for the goal, if any, of regional policy? No such fundamental questions have been seriously asked and answered. Also, discussion about how to attain such a goal has been scarce. Therefore, it is very important to establish the meaning and goal of regional policy and find an optimal strategy. This is the more important at this point in time when Korea is going through a downturn of economy coupled with worsened income distribution.

One characteristic feature of Korean regional policy is that it virtually means balanced regional development policy. That is, regional development policy in Korea usually refers to a policy aimed at reducing inequality among regions. This seems to cause many confusions and inefficiency, and undermine the efficacy of policy. In particular, the framework of 'capital vs. non-capital area' seems to capture people's recognition of regional policy. The typical argument from this perspective goes as follows. Most material and human resources, public institutions, top universities and big companies are concentrated in the Seoul National Capital Area (SNCA)[1] and this impoverishes non-capital areas. Moreover, people in the SNCA also suffer from congestion. Therefore, government should control further expansion of the SNCA and instead relocate various facilities to non-capital areas. Although this argument may seem very persuasive, it does not survive a careful scrutiny. Detailed discussion will follow later, but a brief counterargument is as follows. According to the recent development in economics, agglomeration arises naturally as the economy develops and it is in itself not something to be fixed; it is only when agglomeration generates bad externalities or when regional disparity is very severe that the government needs to take action. Also, examining relevant data suggests that the current regional disparity in Korea is not as serious as to call for equalization across regions. Therefore, current policy focus on regional equity should be reconsidered.

Incidentally, what is often ignored when regional development policy pursues regional equity is that balanced development is in general not compatible with growth or national competitiveness. Development in the research on spatial

[1]This consists of Seoul, Incheon, and Gyeonggi-province.

structure of economic activities such as the new economic geography and the recent experience in many countries together suggest that balanced regional development by means of relocating resources of the core area to peripheral areas is a policy objective that is not compatible with economic growth. Pursuing balanced regional development without understanding this point may result in an unintended policy outcome.

Moreover, if the policy goal of balanced development policy is to improve income distribution across regions, not only it is an ineffective means but also it may actually worsen income distribution. In the discussion of inter-regional transfer, a region is usually treated as a unity. But in fact a region is a collection of many heterogeneous individuals and households, and a poor person may live in a wealthy region and vice versa. Therefore, transferring income from a rich region to a poor one may cause a poor person in a wealthy region to subsidize a rich person in a poor region. If the improvement of income distribution is the policy goal, the right target of income transfer should be individuals or households, not regions; balanced regional development policy is not a good tool to tackle income distribution.

From this perspective, the goal and strategy of regional development policy in Korea should be redefined. Specifically, regional policy should be designed to induce autonomous regional growth so that each regional government is held responsible for its own growth. That is, regional governments should be endowed with both autonomy and accountability. The role of the central government should be limited to monitoring and coordinating regional projects.

The remaining of the paper is organized as follows. Section 2 briefly overviews the regional development polices in Korea. Section 3 examines the current status of regional disparity. Section 4 introduces the new economic geography and draws implications for Korean regional policy. Section 5 evaluates past policies and proposes a new policy goal and strategy. Section 6 concludes.

II. A Brief Overview of Korean Regional Development Policy

In this section, we divide the economic development stage of Korea into three periods,[2] and briefly overview the regional policy in each period focusing on the industry location policy, the SNCA regulation, and poor region support policy. Evaluating these policies and getting implications for future policy will be done in Section 5 after we examine the current regional disparity and overview related researches.

[2]This is based on Choi et al. (2007), who divided the economic development stage into i) 1970~1980's, ii) 1990~foreign exchange crisis, and iii) post-crisis period according to economic growth, industrial stage, regional migration, regional income disparity and so on. Different view focusing on other aspects of development may exist.

1. 1970 ~ 1980's: Industrialization, Growth and Population Concentration

This period observed an unprecedented economic growth and a huge inflow of population into Seoul. Notwithstanding the crises due to the oil shocks and political turmoil, Korea accomplished a tremendous economic growth through industrialization and export in this period.[3]

The characterizing feature of regional policy in this period is that it was used as an auxiliary tool for economic growth instead of having an independent role of its own. The policy that took the highest priority was industry location policy; the government determined industry location by efficiency standard. The Korean economy in the 1960's was mostly light industry-centered but as the less developed countries began to catch up in the 1970's, Korea began to lose its comparative advantage in light industry. In order to overcome such difficulties and advance the industry structure, the Korean government concentrated on fostering heavy industry such as steel, automobile, electronic, shipbuilding, and petrochemical industries. These industries were mostly located in Gyeongsang-province, the southeastern part of the Korean Peninsula, such as Changwon, Gumi, Pohang and Ulsan. This was mainly because these areas had a good access to the Pacific Ocean, but it is true that political factors also worked.

At the same time, efforts were also made to induce manufacturing industry to locate in non-capital areas. Benefits and incentives were given to firms that moved out of the metropolitan area to mitigate the congestion in the SNCA.

The policy direction that takes regional disparity into account was strengthened in the 1980's. Under the recognition that the strategic concentration of industry on some key bases generated regional disparity and many other problems, the government sought to disperse small- and middle-sized industrial complexes all across the country. This was intended to serve various purposes such as facilitating regional growth, dispersing concentrated population, and fostering small and medium enterprises. Measures were also taken and laws enacted to create income basis for rural and less developed areas by attracting manufacturing and service industries to those areas.

In the mean while, as the inflow of population into Seoul that had started in the 1960's accelerated in the 1970's, concentration and congestion in the SNCA began to be recognized as an important social issue. The government enacted various laws and regulations to deter concentration and disperse industry.

In the same vein, serious consideration was given to deal with underdeveloped poor regions. The Comprehensive National Development Plan in 1982 explicitly declared balanced regional development as one of the policy goals, and various projects were executed to sponsor rural and back regions and special regions such as small islands that lagged far behind.

[3]The nominal per capita GDP jumped from US$254 in 1970 to US$5,418 in 1989.

2. 1990 ~ Economic Crisis in 1997: Open Economy, Deindustrialization, and Regional Disparity

In the worldwide tide of globalization and open market economy, Korea began to substantially open up the market by abolishing preferential tariffs and lowering import duties on many items. The need to enhance competitiveness led the government to boost up the independence and autonomy of the private sector. The favorable economic conditions in the late 1980's such as low oil price, low interest rate, and weak US dollar, accelerated this trend. Domestic market expanded considerably in this period due to the economic boom and wage increase, and deindustrialization started as the share of the telecommunication, finance, and service industries increased. Regional disparity gradually increased in this period, which is ascribable to the development of transportation and communication and the expansion of knowledge-based economic activities. At the same time, however, the population concentration in the SNCA showed a slowdown; the population share of the SNCA increased from 42.1% in 1989 to only 45.7% in 1997. This was mainly because less people migrated to the SNCA.

As for the industry location policy in this period, more stress was put on expanding the industrial base of the underdeveloped regions. As the disparity between the capital and non-capital areas and the gap between urban and rural areas deepened as a result of fast economic growth and became an important social issue, the third Comprehensive National Development Plan in 1992 put emphasis on building the basis for balanced regional development. The plan specifically promoted fostering the development of non-capital areas, controlling the expansion of the capital area, and constructing new industry areas in underdeveloped regions.

The capital area regulation in this period continued to seek for mitigating the overcrowding of this area, and various measures were taken for this purpose in the form of regulating firm location or economic activities, setting a ceiling on the number of firms in an area, levying a congestion charge, and introducing differential tax, charge, and subsidy.

Efforts were also made to improve the living standard of underdeveloped regions. Various plans and laws were promoted and enacted to develop poor coastal and island areas and interior back regions. New laws were also enacted to support small and medium enterprises in the non-capital areas. All these policies targeted on improving the living standard of the underdeveloped areas and supplying SOC.

3. Post-Crisis Period: Knowledge-Based Economy and Aggressive Regional Policy

The Korean economy went through a thorough restructuring in various aspects after the economic crisis in 1997 that left a deep scar on the overall society. The remarkable growth rate slowed down considerably and the share of the knowledge-based industry in the national economy rose substantially. The distribution of the knowledge-based industry shows a significant regional disparity; about 60% of the work force in the industry is located in the SNCA. In the process of

knowledge-based industrialization, R&D investment, which is essential to innovation capability, also increased substantially. The distribution of R&D investment also shows regional disparity.

The number of people migrating into the SNCA, which slowed down in the 1990's, started to increase again from 1999, but this trend then reversed in 2003 and the inflow into the SNCA has been decreasing since then. However, the economic condition of the underdeveloped regions is still inferior in spite of various development plans and projects, and population is still decreasing there.

Regional policy was driven forward aggressively in this period in the form of balanced regional development policy. The Kim Dae-jung administration that kicked off in 1998 right after the economic crisis placed strong emphasis on reducing the inter-class and inter-regional gap. It established the Balanced Regional Development Committee to design, coordinate, and promote various regional policies. Several government offices and institutions such as the Office of Supply, Custom Service and the National Statistical Office were relocated to Daejeon which is about 140km south of Seoul. Promotion of regional industry to build up basis for regional development continued to be carried out. Regulations on the SNCA also continued, but in the process of restructuring after the crisis some exceptions were also made such as relaxing location regulation to induce foreign investment or loosening greenbelt regulation. In the reconciliatory mood of the Korean peninsula, development projects were also driven forward for the borderland near the DMZ.

Regional policy underwent an epochal change as Roh Moo-hyun administration took off in 2003. Setting balanced development as one of the national agendas of the highest priority and elevating the status of balanced regional development policy to 'Balanced National Development Policy (BNDP),' the Roh administration put a strong drive on balanced regional development. Various institutional apparatuses such as Balanced National Development Plan, Special Law for Balanced National Development and Special Accounting for Balanced National Development were made to support the policy systematically. The Second Stage Plan for Balanced National Development announced in 2007 introduced various measures to support non-capital areas such as reducing corporate tax for the firms relocating to non-capital areas, reducing the medical care contribution share of the employers in underdeveloped regions, and subsidizing universities in non-capital areas.

The three principle of BNDP is as follows. The first principle is a 'comprehensive approach,' which means that the plan seeks for balanced development not by fragmented support but by comprehensive means such as decentralization and constructing a new administrative city. The second one is the 'construction of regional innovation system,' which means that departing from the traditional input-driven growth, the new system aims at autonomous localization by building up regional innovation system and transform the regional economy into an innovation-driven one. The third one is 'developing non-capital regions first and then managing the SNCA systematically,' which is intended to develop both the capital and non-capital areas.

The projects of BNDP can be classified into three categories. The first is to relocate government ministries and agencies out of Seoul by constructing the administrative city, 'innovation city,' and 'enterprise city.' The second is to foster regional

innovation by promoting regional industry, strengthening the ties between industry and academia, fostering the innovation capability of local universities, building regional industrial clusters, and so on. The third is to support underdeveloped regions through promoting regional industry and designating districts for specialized development.

BNDP is also distinguished from the past policies in many respects. Past regional policies were usually planned and executed by ministries and offices in the central government without proper coordination, which caused lack of consistency and inefficiency due to overlapping investment. To fix these problems, the Roh administration changed the execution system completely so that each regional policy can be planned and enforced for each region. That is, each region became the unit of planning and execution of regional policy. Also, the Presidential Committee on Balanced National Development was founded as a control tower, and Special Accounting for Balanced National Development was established to manage balanced development policy independently and systematically.

III. Regional Disparity in Korea

1. Regional Disparity in Korea

Ever since the overpopulation and agglomeration of the capital area became an important social issue, there have been many studies on regional disparity in many respects. (E.g. Hwang [1982], Huh [1989], Kim et al [1991], Byun [1999], Kim [2003], Moon [2003], Choi et al. [2007]) In spite of the different approach and methodology adopted, theses studies show similar results on the time trend of regional disparity. Meanwhile, what is often stressed and talked of in the discussion of regional disparity in Korea is the gap between the capital and non-capital areas. Although the gap between the two is recognized as a malignant phenomenon, systematic studies on this issue seem rare. In this subsection, we will first examine the regional disparity in Korea, and then critically evaluate the argument that stresses the gap between the capital and non-capital areas.

Most studies on regional disparity use regional Gini index or coefficient of variation of per capita GRDP to measure regional disparity. According to the analyses, regional disparity in Korea was decreasing from 1970 until the mid 1990's, but then the trend reversed and has been increasing ever since. See <Table 1>. Regional disparity is getting bigger especially after the economic crisis in 1997 and this seems to be related to the knowledge-based industrialization which is occurring geographically unevenly.

Meanwhile, Moon (2003) examines the regional disparity in other countries and finds that regional disparity in Korea is close to those in developed countries. According to this study, disparity in Korea is actually smaller than some other centralized countries such as France and Italy. This shows that although regional disparity in Korea has been worsening recently, it is not that high in the international standard. This study also shows that the disparity measured by consumption

<Table 1> Regional Disparity in Korea (1970~2005)

	Gini Coefficient	Coefficient of Variation
1970	0.1147	0.2228
1975	0.0917	0.1708
1980	0.1097	0.2197
1985	0.0843	0.1670
1990	0.0734	0.1442
1995	0.0582	0.1119
2000	0.0877	0.1626
2005	0.0910	0.1686

Source: Choi et al. (2007).

<Table 2> Regional Disparity in Korea: Income vs. Consumption

	Regional Income Per Capita		Regional Consumption Per Capita	
	Gini	CV	Gini	CV
1995	0.0988	0.1875	0.0427	0.0897
1996	0.1070	0.1993	0.0462	0.1008
1997	0.1163	0.2152	0.0459	0.1000
1998	0.1254	0.2320	0.0424	0.0933
1999	0.1306	0.2406	0.0411	0.0876
2000	0.1363	0.2507	0.0379	0.0740
2001	0.1379	0.2543	0.0369	0.0756

Source: Moon (2003).

expenditure, which may represent the economic power of a region better than GRDP, is significantly smaller than that measured by GRDP. Moreover, in contrast to the movement of the disparity measured by GRDP, the disparity measured by consumption expenditure is improving. See <Table-2>. This suggests that the degree of regional disparity in Korea may not be as serious as it looks.

Now let's consider the argument that highlights the gap between the capital and non-capital areas, which occupies an important place in the discussion of regional disparity. The argument that emphasizes the gap between the two is as follows. The SNCA is holding too much of everything for its relative size, such as population, firms, public offices and institutions, universities, financial institutions, and so on. More specifically, the SNCA, which accounts for only 11.8% of Korean territory,

holds about 50% of total population, employees, hospitals, and economic power, about 70% of total financial transactions and about 85% of government offices and public institutions. Hence, the SNCA suffers from congestion and inefficiency and at the same time other regions are impoverished. Moreover, the argument goes, such concentration is hard to be found in other countries; the population share of the capital area is 47.6% in Korea, 32.6% in Japan, 18.7% in France, and 12.2% in the UK. Such arguments that regard the concentration of population and resources in the SNCA as the main source of regional disparity have been widely accepted and have had big influence on various regional policies. However, this argument seems faulty in many respects and policies based on it may be problematic. We will examine this argument closely below.

Let's first think about the concentration of population and economic power in the SNCA. It is true that the SNCA holds a lot for its area share, but in fact the same phenomenon is true of all the other big cities in Korea. <Table 3> shows the share of area, population, and income of major cities in Korea with respect to the surrounding regions. It turns out that the high proportion of core city is a nationwide phenomenon; the core city of a region has a very high share of population and income. <Table 4>, which shows the ratio of population and income share to the area share for each region, indicates that concentration index measured this way is actually lower for the SNCA than for most of the other big cities. Therefore, if the concentration in the SNCA is a big problem, then the same issue should be raised to the concentration elsewhere as well, which is not the case. It is not clear why only the concentration in the SNCA matters. This shows that the typical SNCA-non SNCA argument is not well-balanced and may be resorted frequently as such an argument can easily politicize the issue.[4]

Moreover, according the new economic geography that we will discuss in detail

<Table 3> Share of Major Cities

(unit: %)

	Area Share			Population Share			Income Share		
	1995	2000	2005	1995	2000	2005	1995	2000	2005
SNCA/Korea	11.8	11.8	11.8	45.2	46.2	48.1	47.7	47.8	47.3
Daejeon/Chungchung	3.3	3.3	3.3	28.7	29.3	30.1	23.4	21.9	20.3
Gwangju/Jeolla	2.4	2.4	2.4	24.1	25.8	28.2	21.3	21.6	21.4
Daegu/Gyeongbuk	4.4	4.4	4.4	47.8	47.7	48.6	37.8	35.1	31.6
(Busan+Ulsan)/Gyeongnam	6.1	14.7	14.8	49.8	61.1	60.0	36.8	62.2	61.6

Data: Korea National Statistical Office Portal (http://www.kosis.go.kr).

[4]Of course, these are no evidence that the current concentration in SNCA is not a problem, and that is not the purpose of the analysis, either. The discussion above is meant to suggest that the typical argument that highlights the concentration in the SNCA is problematic and not well-founded.

<Table 4> Ratio of Income and Population Share to Area Share (2005)

	Population Share / Area Share	Income Share / Area Share
SNCA/Korea	4.08	4.01
Daejeon/Chungchung	9.12	6.15
Gwangju/Jeolla	11.75	8.92
Daegu/Gyeongbuk	10.84	7.18
(Busan+Ulsan)/Gyeongnam	4.05	4.16

Data: Korea National Statistical Office Portal (http://www.kosis.go.kr).

later, concentration or agglomeration arises naturally as a result of the development of transportation and market activity, and it is in itself not a pathology to fix. It is when agglomeration generates externalities or when the regional disparity is so high that it generates social problems that the government may need to intervene. However, the usual dichotomy argument seems to miss these points and lack scrupulous study on how to judge whether the current concentration is excessive or how to measure negative externalities.

The argument that the degree of concentration in Korea is higher than those in other countries also seems faulty. The usual argument that compares the degree of concentration across countries does not mention the area share of the capital area of other countries. Recall that the population share of the capital area is 47.6% in Korea, 32.6% in Japan, 18.7% in France, and 12.2% in the UK, which seemingly shows that concentration is very high in Korea. However, it should be noted that the capital area in Korea, Japan, France, and the UK respectively account for 11.8%, 3.5%, 2.2% and 8.5% of the territory of each country. Therefore, one could argue that actually the degree of concentration is higher in Japan and France than in Korea. Anyhow, what is clear is that mere comparison of the population share without considering other factors may be quite misleading.[5]

It should be also noted that the dichotomous framework of capital vs. non-capital area may miss the heterogeneity within the non-capital regions, and hence may result in unintended policy outcomes. Each non-capital region has different population and income, and treating all the non-capital regions as one unity is not reasonable; the disparity among the non-capital areas may be a more important issue. Also, the argument in the framework of capital vs. non-capital areas implicitly assumes that the SNCA enjoys a stronger economic power than other regions, but this is not supported by the data. Some industrialized regions like Ulsan and

[5]Again, the purpose of this discussion is not to argue that concentration in the SNCA is not severe but rather to point out that the typical argument is problematic. Of course, different interpretations of the numbers above are possible. One could, for example, argue that the degree of concentration is much higher in Korea as the capital area accounts for almost half of the whole territory.

<Table 5> Decomposition of Gini Coefficient

Region	Gini index
Korea	0.3954
SNCA	0.3975
Non-capital Area	0.3954
Intra-Regional (SNCA – Non-capital)	0.3941

Data: KLIPS(2006).

Note: Gross household income was adjusted by the square-root of the number of family members.

Gyeongnam-province actually have higher per capital GRDP than Seoul. This fact can be also seen by decomposing Gini coefficient and comparing the inter-regional (capital – noncapital area) Gini coefficient with national or regional Gini coefficients. As is evident from <Table 5>, which shows the decomposition of Gini coefficient of Korea, all the Gini coefficients are almost identical; if it were the case that SNCA is much richer than other regions, we should observe a very high intra-regional Gini coefficient.

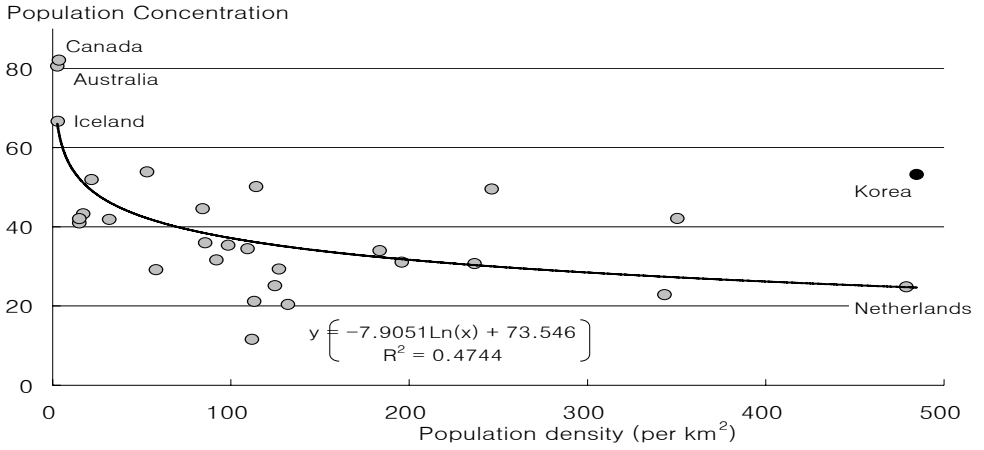
There are also arguments that assert that the overpopulation of the SNCA undermines national productivity and competitiveness. (PCBND [2004]) This claim, however, is not well-founded. It is only based on the mere observation that population of the SNCA and the national productivity moved in the same direction recently, and does not show any evidence that the latter is actually caused by the former. In fact, according to the analysis of Hahn and Shin (2007), the recent slowdown of the Korean economy is ascribable to diminishing inputs rather than to declining productivity. Choi et al. (2007) also find no relation between national competitiveness and regional disparity. Therefore, the claim that the overpopulation of the SNCA undermines the national productivity and competitiveness seems to lack theoretical and empirical basis at least at this stage.

Most importantly, what the capital vs. non-capital areas argument seems to be missing fundamentally is the consideration about the right policy goal. The final goal of regional policy should address the individual or household welfare. However, how regional disparity or the gap between the capital and non-capital areas is related to the individual or household welfare is not clear. To begin with, non-capital areas cannot be treated as a unity due to heterogeneity. Also, poor people may reside in wealthy region and vice versa. Transferring income from a wealthy region to a poor region may end up making a poor person in a wealthy region subsidize a rich person in a poor region. If the income disparity is a problem, then the redistribution policy should target each individual or household, not region.

2. Comparisons with the OECD Countries

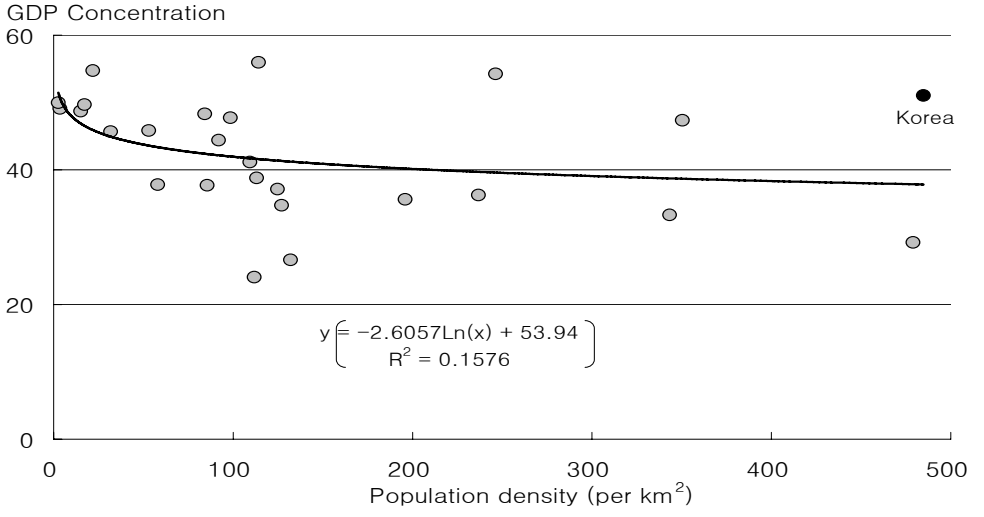
Comparisons of regional disparity across countries usually use as a measure the regional Gini index or variation coefficient. The OECD (2007) data enable us to go

[Figure 1] Population Concentration and Population Density (2003)



Source: Koh et al. (2008).

[Figure 2] GDP Concentration and Population Density (2003)

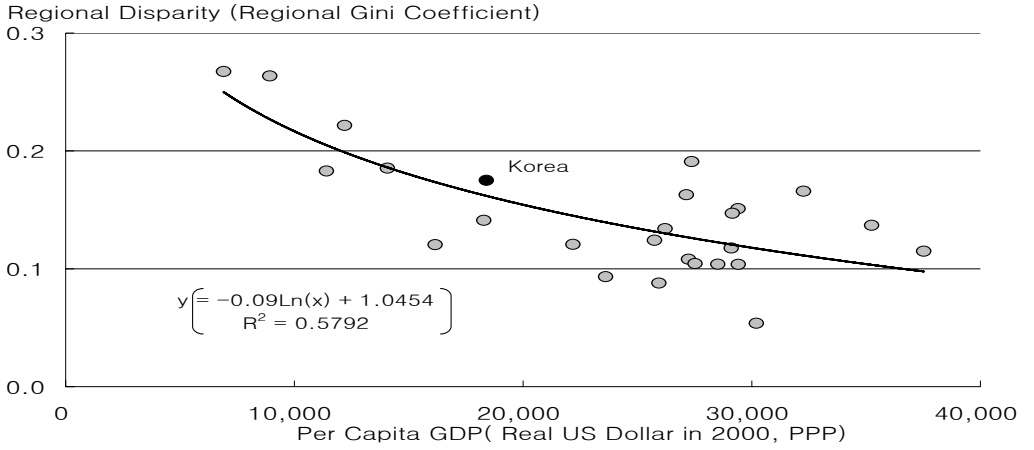


Source: Koh et al. (2008).

further. In this subsection, we present some of the analyses in Koh et al. (2008) based on the OECD (2007) and add a few more comparisons.

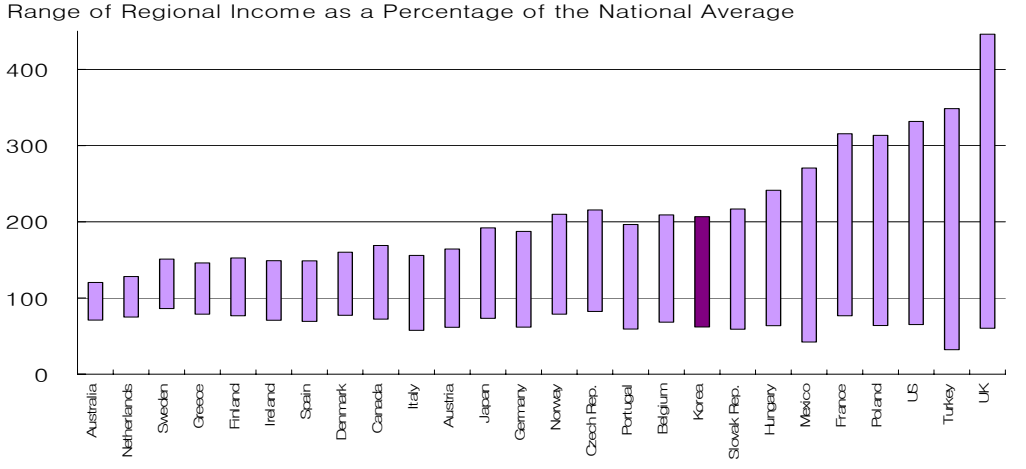
To begin with, the concentration index of population and income in Korea is very high even after controlling for population density as [Figure 1] and [Figure 2] show.

[Figure 3] Regional Disparity and Per Capita GDP (2003)



Source: Koh et al. (2008).

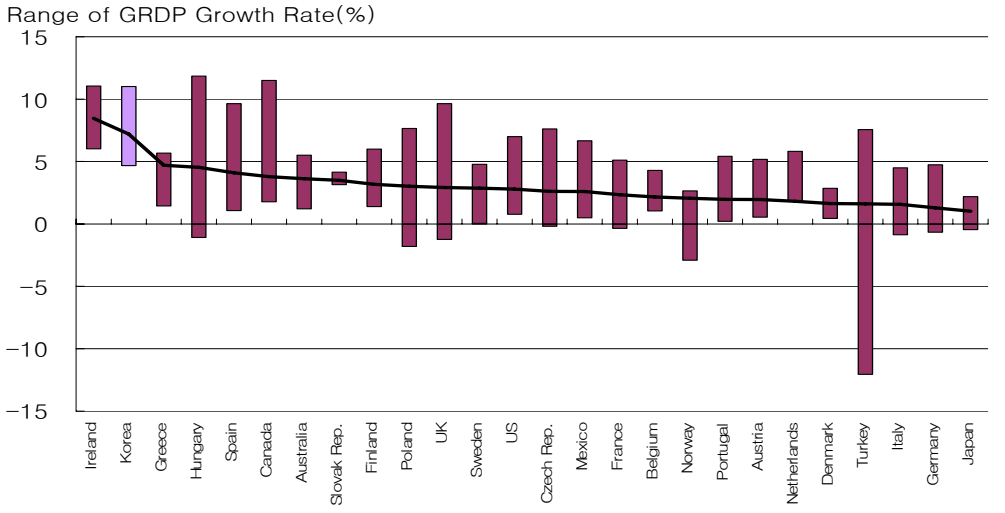
[Figure 4] Distribution of Regional Income (2003)



Source: Koh et al. (2008).

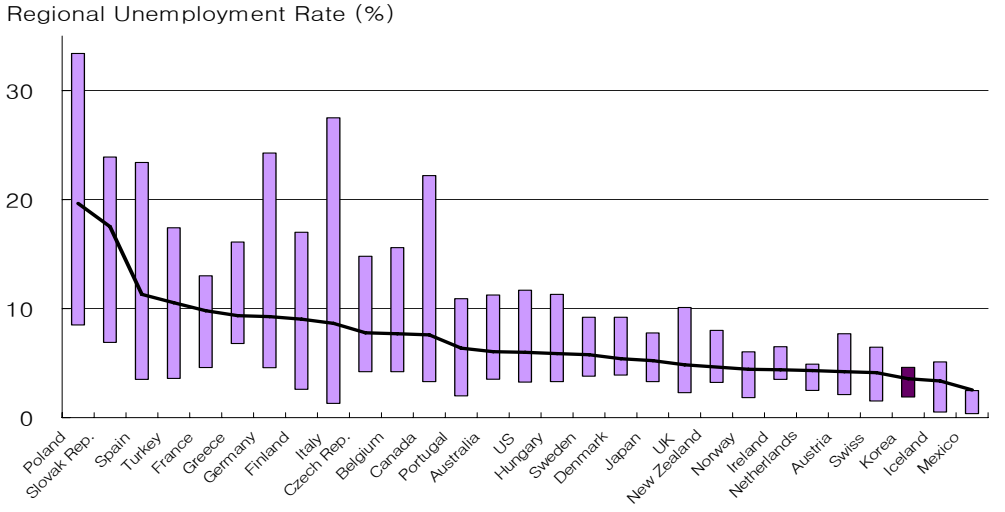
In spite of the high concentration, however, disparity in income and other living standards do not seem very high. [Figure 3] shows the regional Gini index of each OECD country and finds that after controlling for population density the regional Gini index of Korea is only slightly higher than the average. In [Figure 4] which shows the income gap between the richest and the poorest region, Korea ranks just about the middle.

[Figure 5] Growth Rate of GRDP (1998~2003)



Source: Koh et al. (2008).

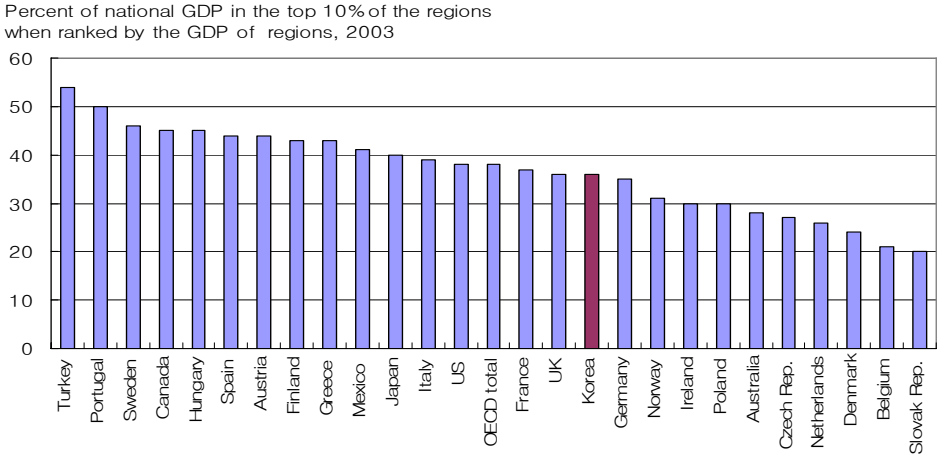
[Figure 6] Distribution of Regional Unemployment Rate (2003)



Source: Koh et al. (2008).

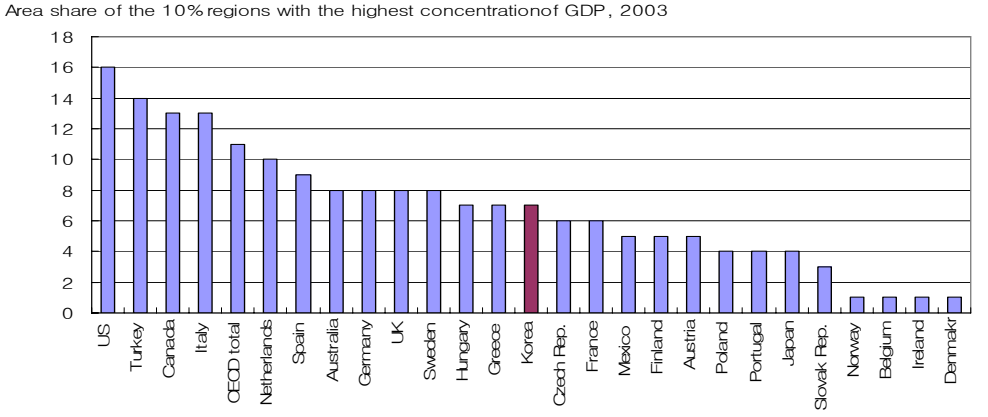
Korea also enjoys a high regional growth rate with small disparity as [Figure 5] shows, and the unemployment rate in Korea, which is fairly low in absolute value, also shows small regional disparity as shown in [Figure 6].

[Figure 7] Income Share of the Top 10% Regions



Data: OECD (2007).

[Figure 8] Area Share of the Top 10% Regions in Income Concentration

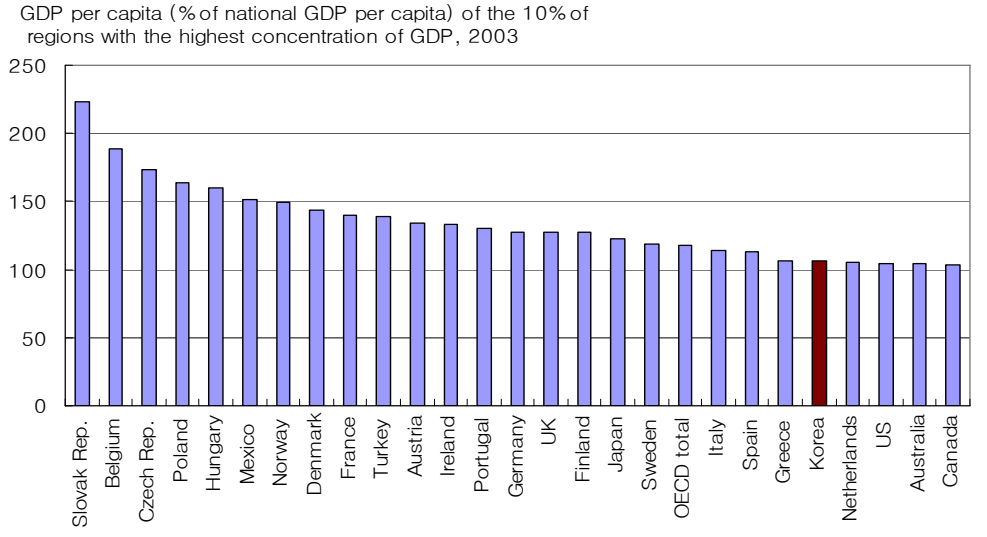


Data: OECD (2007).

[Figure 7] shows the percent of national GDP in the top 10% regions when ranked by GRDP; it is found that the value in Korea, 36%, is almost the same as the OECD average, 36.7%.

[Figure 8] shows the area share of the 10% regions with the highest concentration of GDP, and according to it this share is 7% in Korea and is just about the same as the OECD average, 6.85%.

[Figure 9] Income Level of the Top 10% Regions in Income Concentration



Data: OECD (2007).

Finally, [Figure 9] shows the GDP per capita of the 10% of regions with the highest concentration of GDP in percentage of national GDP per capita. Korea records 106%, which is significantly smaller than the OECD average, 134%; this ranks fifth from the bottom.

These comparisons suggest that in spite of the high concentration of population and income, [6] regional disparity in Korea is not very severe in various respects such as income, growth rate and unemployment compared with other OECD countries.[7]

IV. Theoretical Studies on Regional Disparity

There have been numerous economic studies on the pattern of regional disparity in a country as economy develops. Roughly, these studies can be broken down into

[6]See PCBND (1994) for a more thorough account of the concentration in the SNCA. Kim (2008) analyzes the disparity between SNCA-non SNCA in various respects.

[7]It should be made clear that the discussion in this section is not aimed at proposing that the concentration in the SNCA is not a problem. What the discussion tries to suggest instead is that i) concentration typically arises by market force and is in itself not something to cure unless it generates large scale externalities, that ii) it is hard to judge whether the current concentration is excessive or not, and that iii) in spite of the high concentration of population and income, the degree of regional disparity in Korea seems moderate in many respects among the OECD countries.

two distinct groups: one that suggests that regional disparity ultimately declines as economic development progresses and the other that suggests that regional disparity can be maintained and even expanded as economy develops. Neoclassical economics belongs to the former while cumulative causation model, core-periphery model, endogenous growth theory and new economic geography belong to the latter. In this section, we will briefly overview these theories to get insight into the regional policy in Korea. In particular, the new economic geography, the most recent development in spatial economics, has many theoretical advantages over previous models and merits detailed discussion.

1. Convergence vs. Divergence

Neoclassical growth theory assumes decreasing returns to scale and perfect mobility of inputs. These assumptions naturally lead to the conclusion that regional disparity gradually shrinks as economy develops and that eventually all the regional incomes are equalized (Borts and Stein (1964)). The marginal productivity of capital, for example, of a developed area declines and therefore capital moves to a less developed area where marginal productivity is higher. Similarly, labor moves to a less developed country where marginal productivity of labor and hence wage is higher. Through this process, all areas end up being equipped with the same level of inputs, and regional disparity disappears. In the neoclassical perspective, therefore, regional disparity is just an adjustment process toward equilibrium, and any prevailing disparity just suggests that there exist obstacles to perfect mobility of inputs. Barro (1991) shows that the growth rate of countries with lower per capita GDP is higher than those of higher per capita GDP countries. Barro and Sala-i-Martin (1991) also show using the US data that the same pattern holds within a country. However, there are other studies that report that income convergence is not well observed or occurs very slowly or that regional disparity actually widens (Dunford([1994], Armstrong (1994), and Magrini (1999)).

Myrdal (1957) and Friedmann (1966) suggest, contrary to the neoclassical growth theory, that income convergence cannot occur due to structural reasons and that regional disparity may actually widen. Myrdal (1957) models the economic growth of a region as a process of cumulative causation. An event such as the discovery of a mineral resource triggers the development of a region. Then the marginal productivity of capital and wage rises due to the increasing returns to scale. Moreover, the government may assign more resources to the developed region to take advantage of its efficiency when allocating resources across regions to maximize national growth. Overall, initial factors, market force, and government policy cumulatively work toward income divergence. Friedmann (1966) goes one step further and argues in his core-periphery model that not only economic but also political and institutional factors cause and consolidate regional gap.

Endogenous growth theory, put forward by Romer (1986) and Lucas (1988), notes the importance of technological development and human capital and also suggests that regional disparity is likely to be maintained and expanded as economy develops. According to this theory, technological development and human capital, which are

essential to economic growth, exhibit increasing returns to scale through externalities. More human capital flows into a region where there already exist enough human capital to take advantage of the positive externality, and this inflow accelerates the creation of knowledge, which in turn draws more human capital and so on. This process of cumulative causality implies that regional disparity is likely to expand as economy develops since economic development typically occurs centering around a region where knowledge and technology are actively created with high stock of human capital.

2. New Economic Geography

The new economic geography (NEG), which was initiated by Krugman (1991), is a branch of spatial economics that aims to explain the formation of economic agglomeration in geographical space.[8] NEG improves on the past research on the spatial distribution of economic activity in many respects. It adopts micro-founded mechanism and general equilibrium framework to analyze the geographical agglomeration of economic activity. It also formally models such important factors as pecuniary externality, self-reinforcing mechanism and forward/backward linkages. It also takes an evolutionary approach to the creation and buildup of core areas. In short, NEG can be regarded as the state-of-the-art economic research that is actively producing convincing results. Taking the importance of NEG into account, we briefly overview its key idea and seek to draw implications for the regional development policy.

2.1. Key Idea of the New Economic Geography

According to the analysis of NEG, agglomeration occurs through pecuniary externality, and regional disparity may deepen further because of increasing returns to scale. This is in contrast with the prediction of neoclassical economics, according to which regional disparity will eventually dissolve due to the adjustment of input prices. In addition, NEG asserts, agglomeration of economic activity occurs and maintains itself through self-reinforcing mechanism rather than by comparative advantage. Overall, the discussion of NEG takes a pessimistic view of balanced regional development. To see this in more detail, we briefly overview the development in NEG.

The basic framework of NEG is well illustrated in the core-periphery model in Krugman (1991), which shows how the interactions among transport costs, factor mobility and increasing returns can result in agglomeration. The main idea is as follows. When the transport costs are very high, firms will locate near the market to save transport costs. As the transport costs go down, the incentive to locate near the market gets smaller and the incentive for firms to gather and enjoy increasing returns to scale gets bigger. This agglomeration of firms boosts the demand for labor and hence the wage rate will rise. This will attract workers, which in turn will attract

[8]See Fujita and Mori (2005) for a detailed survey of NEG.

more firms. That is, agglomeration is strengthened by self-reinforcing process.

Agglomeration effect occurs through many channels. In the labor market, firms can easily find workers and workers can easily find a job as the labor market expands. In the production sector, producers of final goods and intermediate goods gather together, which facilitates specialization. Also, firms can enjoy economies of scale by producing in bulk. The SOC utilized jointly by the firms contributes to reducing production cost. Exchange of knowledge due to agglomeration also facilitates the creation and accumulation of knowledge. As for consumption, agglomeration creates various markets that meet consumers' demand, and this attracts more people to the core. Hence the population inflow from the periphery into the core occurs.

According to the above argument, regional disparity may deepen as agglomeration progresses. This phenomenon is mostly market-driven, and it is not necessarily undesirable even from the perspective of equity as will be discussed later.

NEG also implies that government's effort to disperse agglomeration may result in an unintended outcome. Venables (1996) in particular shows that weakening a location's industrial base makes the location less attractive and beyond some critical point may lead to complete deindustrialization of the location unless the disadvantage of a small industrial base is offset by a sufficiently low wage.

NEG also studies the effect of agglomeration on growth. Noting that the disparity in growth rate across countries is diminishing but at the same time the intra-national regional disparity is widening in Europe, Martin (1998) shows theoretically and empirically that regional policy may generate unintended outcomes. He shows that supporting low income areas can be hardly effective and investment in infrastructure that reduces transport cost may induce firms in poor areas to relocate to high income areas, which will impoverish underdeveloped regions even further. He analyzes the European data and finds that investment in infrastructure hardly benefits poor areas although it often benefits developed areas. This study hence shows that regional policy of this fashion may be problematic not only from the viewpoint of efficiency but also from the viewpoint of equity. This study also shows that there may exist a tradeoff between growth rate and regional convergence.

Martin and Ottaviano (1999, 2001) combine endogenous growth with endogenous industry location, and study their interaction. They show that the reduction in transaction cost due to economic integration induces firms to locate where R&D takes place, and this increases the growth rate there. Importantly, this study shows that increase in technological innovation through spatial agglomeration may benefit the periphery area as well; if the transaction cost is low enough and the effect of innovation through agglomeration is big enough, poor regions may benefit. Fujita and Thisse (2003) also come to a similar conclusion with respect to welfare. They show that if the technological innovation through agglomeration brings in high growth, agglomeration can benefit every region even without any inter-regional income transfer. However, this may widen inter-regional gap in absolute income if the core region grows by more. In this sense, growth through agglomeration may be regressive, and the effect of growth on equity crucially depends on the objective function or social welfare function.

2.2. Implications for Regional Policy[9]

One of the main messages of NEG is that spatial agglomeration is a natural phenomenon that arises through the interaction of many economic activities; agglomeration arises and reinforces itself through self-reinforcing mechanism when factors of production is mobile and there exist transport cost and increasing returns.

The first implication from this is that any effort to disperse agglomeration is unlikely to be very successful. It is the natural functioning of market that generates agglomeration and, regardless of whether to regard it as a 'market failure' or an efficient outcome by the 'invisible hand,' it is obvious that it will be hard to work against the market forces.

More specifically, suppose the government intends to relocate firms from the core to peripheries using a policy that affects firms' location decision. For such a policy to succeed, firms should be provided with incentives that exceed the current advantage of staying in the core. This means that a policy limited in magnitude can hardly be effective and that the cost of executing an effective policy will be high. If the final goal of the government is the autonomous development of peripheries and not the dispersion of agglomeration itself, significant number of firms should relocate, and this means that the cost will be huge. This will naturally give rise to questioning the effect of such a policy for the cost; if cost exceeds benefit, the policy will not be validated.

What is more important in this regard is that even if the policy somehow disperses agglomeration of the core successfully, the intended policy goal may not be achieved. If the benefit from agglomeration and resultant growth occur only above a certain level and magnitude of agglomeration, decentralization may fail to bring about the development of peripheries if it ends up with two agglomerations below the critical level. Moreover, even when the peripheries benefit from decentralization, decentralization may harm national growth if the benefit of peripheries is smaller than the loss the core incurs. The study of Venables (1996) which shows that decentralization may result in complete decentralization of the core shows an extreme possibility of such a case.

Incidentally, this argument also suggests that the government's effort to induce an industry to be concentrated in a specific region doesn't seem promising (Kim [2003]); firms will not relocate unless the government's intervention generates enough linkage effects for agglomeration to form. Taking advantage of the spillover effect from agglomeration may be more effective for the development of underdeveloped areas.

However, the argument of NEG is not necessarily in conflict with the government's effort to seek for balanced regional development. On the contrary, NEG may provide a rationale for balanced development if it is the case that agglomeration, which arises by the market forces, generates externality and the socially optimal level of agglomeration is actually much smaller. According to this

[9]The discussion below is based on the author's judgement that NEG well captures the economic realityl and hence is useful in drawing policy implications. Disagreement may well exist on the choice and judgement.

view, agglomeration causes overpopulation, increases pollution and transport cost and impoverishes peripheries. In short, agglomeration is a market failure and the government should come in to fix it. Theoretically, this argument makes sense as well and hence a close examination is necessary to evaluate it.

To begin with, it is very hard at least theoretically to judge whether the current level of agglomeration is socially excessive or not. (Kim [2003]) The opposite assertion can be also made that the current agglomeration is actually too small because firms do not take into account the social benefit of agglomeration.

The argument that agglomeration impoverishes other regions also needs to be checked closely. The absolute income level of peripheries may decrease in the beginning stage of concentration, but eventually the growth of the core may benefit peripheries as suggested by Martin and Ottaviano (1999, 2001) and Fujita and Thisse (2003). The absolute gap between the core and peripheries may widen even when the income of the core and peripheries both increase; this will be the case when the increase in income is higher in the core than in the peripheries. The effect of core-driven growth on regional inequality in terms of the Gini index is not clear; it depends on the specific pattern of growth. If, for example, the core-driven growth raises the income share of the peripheries, the Gini index will go down, suggesting an improvement of regional disparity. If it raises the income share of the core, which is more realistic, then the Gini index will go up. Even in this case, however, it is not obvious whether it should be interpreted as an indication of worsening inequality; it is true that the Gini index is higher, but now the peripheries are better off than before. We actually need a criterion for judgement, or social welfare function, to be able to answer such a question. To summarize, the statement that agglomeration deepens regional disparity can hold only limitedly, and we really need to establish an agreed criterion for judgement to reach a definite conclusion.

V. Directions for Future Policies

1. Evaluation of the Past Policies

There have been many regional development polices since the 1970's, an era of fast growth. One important aspect that is found consistently in these policies is that they all aimed at regional equity; regional development policy implicitly or explicitly meant balanced regional development policy in Korea. Regional disparity was discussed in the framework of capital vs. non-capital area, and many measures were taken to reduce the gap. Such measures include constructing SOC in underdeveloped regions, providing incentives for firms in the SNCA to relocate to non-capital regions, building up and subsidizing industry bases in underdeveloped regions, controlling the expansion of the SNCA, and so on.

It is hard to evaluate the efficacy of such policies, but judging from the fact that questions are still being raised about the gap between the capital and non-capital areas, it seems hard to conclude that such policies were successful.

More importantly, recent development in spatial economics and experiences in

other countries suggest in common that regional equity may be a wrong target. As discussed in the previous section, NEG shows that agglomeration is market-driven and dissolving it will be hard. Moreover, as the growth through agglomeration may eventually benefit peripheries, seeking for regional equity by dispersing agglomeration may be harmful. The turn in the direction of regional policies in other countries also give similar implications. Countries like France sought for regional equity by decentralizing and transferring income to ease off concentration in Paris in the past. However, in the changing environment of industry restructuring, globalization, knowledge-based economy and competition, they changed the direction of regional policy and began to focus on the competitiveness of the capital area, growth potential of the nation and international competitiveness. They also turn to decentralization for regional autonomous growth. Such a trend implies much for the direction of regional polices in Korea that is in the similar environment.

The Balanced National Development Policy (BNDP) in Roh administration which explicitly pursued regional equity merits a more thorough discussion. As discussed in Section 2, BNDP stands out among various regional policies in many respects. It took a comprehensive approach and used many systematic apparatuses, streamlined the process of regional projects and emphasized the autonomous development of regions.

Some critics of BNDP point out that in practice the role of local governments was subsidiary contrary to the spirit of BNDP and little progress was made to foster regional autonomy. Such criticism may be relevant, but problems of those kinds seem to be inevitable to some extent since BNDP was only at the beginning stage and the capability of local government is still weak. A more fundamental question has to do with the viewpoint and approach taken by BNDP.

First of all, BNDP regards the gap between the capital and non-capital area as a pathology that should be cured to strengthen national competitiveness. However, as discussed in detail in Section 3, the framework of capital vs. non-capital area is problematic and may cause distributional unfairness as well as loss of economic efficiency.

Moreover, some of goals of BNDP seem incompatible with each other. BNDP defines balanced regional development as "improving the quality of life, pursuing sustainable growth and reinforcing national competitiveness by facilitating regional equity and promoting regional development capability." However, it is generally agreed that balanced development is in conflict with national competitiveness; balanced development usually comes at a cost of efficiency loss.

Besides, one may question the feasibility of balanced development itself. BNDP seeks to promote the potential of all the regions and hence maximize national competitiveness. However, promoting the potential of all the regions may be infeasible. It is international competitiveness, not domestic competitiveness, that is necessary in the globalized world, and promoting the potential of all the regions seems to ignore comparative advantage argument or cost-benefit analysis-type of consideration.

BNDP may also overlap with other existing policies. The core of BNDP is to raise the income of underdeveloped regions. However, there already exist policies that support poor individuals or households, and how BNDP relates to those policies is

not established well.

Finally and very importantly, one may question whether BNDP is a timely policy at this point of time. Koh et al. (2008) argue that the national agenda that should be given priority to is to boost up growth and improve income distribution. As balanced development is likely to conflict with both of the two, they argue, it is not desirable for balanced development to take priority. Considering the recent slowdown in growth and aggravating income distribution, this assertion seems quite persuasive.

To sum up, BNDP has many aspects that improve on the past polices but at the same time still suffer from some problems shared by the past policies. It is of utmost importance that we learn our lesson from the past policies and use it constructively in designing future policy.

2. Goal and Strategy of the Future Regional Development Policy

As is evident from the discussion so far, regional development is a very complex subject in which various factors are entangled with each other. Thus, it would be too ambitious to try to establish the goal and strategy of regional development policy from the general and somewhat abstract discussion so far. Nonetheless, it will be still meaningful to put the discussion so far together and attempt to seek for the goal and strategy of regional policy, be it somewhat vague and abstract.

The first thing to point out is that the paradigm of regional development policy should depart from focusing on promoting regional disparity. Attempts to raise regional equity is likely to come into conflict with growth or national competitiveness, and may also have a negative effect on distribution contrary to the intended plan. The negative effect on distribution may occur because raising regional equity may ignore intra-regional heterogeneity and hence violate vertical and horizontal equity. If, for example, the government transfers income from SNCA to a rural area with a lower regional income, this may result in having the poor in SNCA assist the rich in the poor region, which violates vertical equity. Moreover, under such an income transfer scheme, a person in a poor region may fare better than a person in a rich region although the two persons have the same income; this violates horizontal equity. In this sense, regional disparity cannot be treated as individual income inequality, as a region is a collection of heterogeneous residents and regional income only reflects the average of individual income.

As for methodology, recent studies and experiences in other countries imply that raising regional equity by relocating the resources in the core region to peripheries is not only hard to succeed but may result in unintended outcome. Of course, support for underdeveloped regions should be maintained. But the purpose of such a policy should be to guarantee a certain level of living conditions or national minimum everywhere, not to reduce the absolute gap among regions.

In this regard, regional development plan should be carried out in two directions. One is to provide public goods or merit goods to guarantee a certain level of living conditions everywhere. Of course such a policy need not belong to the category of regional development policy. For example, the existing inter-governmental grant

system is already playing a role in inter-regional redistribution in part, and hence the above policy may be included in this category.

The other is to focus on maximizing the growth potential of each region and promote regional innovation capacity for autonomous growth. This seems to be the most crucial element in designing future regional development policy. The current system in which the central government takes the lead in carrying out regional projects is bound to result in negative side effects; local demand is not represented well and local governments are preoccupied in getting grants from the central government instead of working on reinforcing autonomous capability. To solve these problems, local governments should be eventually responsible for regional development so that they hold accountability and the sense of ownership. That is, each region should reinforce its capacity and find an engine for autonomous growth to build up its own income base. The role of the central government should be limited to coordinating and monitoring regional projects ex ante, and evaluating the result ex post. Of course, the central government should provide necessary assistance when local governments lack initial resources or impetus. Such division of roles between the central and local governments is essential and should be established firmly.

However, reinforcing the accountability of regions by such division of roles presupposes an important change. Local governments should be endowed with sufficient autonomy, in particular funds to finance regional projects. Without this, solid regional capacity is hard to achieve since local governments will spend most of the time and resources to attract grants from the central government.

To sum up, local governments should be held responsible for regional development, and at the same time be given necessary autonomy and means. The central government should coordinate, evaluate and foster regional projects instead of taking initiatives.

VI. Concluding Remark

This paper puts forward some policy suggestions regarding the goal and strategies of the regional development policy in Korea. We first find that although population and income are highly concentrated, inequalities of income and other living standards do not seem as problematic as to call for strong government intervention. Moreover, recent development in economics suggests that the 'capital vs. non-capital area' framework that has been shaping the Korean regional development policy should be reconsidered. The main message of this paper is that it is not desirable for the central government to disperse agglomeration to enhance regional equity, and that the regional government should be responsible for regional development; therefore enhancing the autonomy and accountability of the regional government is essential.

Finding the growth engine for autonomous regional development by raising autonomy and accountability of the local governments seems essential for sustainable growth and national competitiveness in a globalized world where the

share of knowledge-based industry is increasing. Efforts should be made to find the specific strategies to achieve this goal in the long term view, and it should be avoided that a premature policy is enacted or policy direction frequently changes regime by regime.

Admittedly, the policy suggestion made in this paper is somewhat too general and abstract, lacking specific and concrete strategies. Still, it is very important to view the big picture and try to get a perspective, be it abstract or vague. This paper should be regarded as one of such attempts. More studies on this important subject should follow in the future.

References

Armstrong, Harvey, "Convergence among Regions of the European Union, 1950-1990," *Papers in Regional Science*, Vol. 74, No. 2, 1995, pp.143~152.

Barro, Robert J., "Economic Growth in a Cross Section of Countries," *Quarterly Journal of Economics*, Vol. 106, No. 2, 1991, pp.407~443.

Barro, Robert J. and Xavier Sala-i-Martin, "Convergence across States and Regions," *Brookings Papers on Economic Activity*, Vol. 22, 1991, pp.107~182.

Borts, George H. and Jerome L. Stein, *Economic Growth in a Free Market*, New York: Columbia University Press, 1964.

Byun, Byoungseol, "Comparison of Regional Disparity Patterns between Korea and the US," Korea Planners Association, 1999. *(In Korean)*

Choi, Young-Chool, Duk-Soon Yang, and Oe-Chool Choi, "Analysing Major Issues Regarding Regional Disparity: Results and Policy Implications," *Korea Urban Management Association Journal*, Vol. 20, No. 2, 2007, pp.3~27. *(In Korean)*

Choi, Yunki, Jaehong Jang, Mungu Heo, Gidon An, and Chang-uk Byeon, *The Development Path of Korean Economy and the Regional Policy*, Korea Institute for Industrial Economics & Trade, 2007. *(In Korean)*

Dunford, Mick, "Winners and Losers: The New Map of Economic Inequality in the European Union," *European Urban and Regional Studies*, Vol. 1, No. 2, 1994, pp.95~114.

Friedmann, John, *Regional Development Policy: A Case Study of Venezuela*, Cambridge, Massachusetts: MIT Press, 1966.

Fujita, Masahisa and Jacques Francois Thisse, "Does Geographical Agglomeration Foster Economic Growth? And Who Gains and Who Loses from It?" *Japanese Economic Review*, Vol. 54, 2003, pp.121~145.

Hahn, Chin Hee and Seok-ha Shin, "Empirical Assessment of the Post-crisis Growth Performance of the Korean Economy," paper presented at the 2007 KDE-EWC Conference, Reforms for Korea's Sustained Growth, Honolulu, Hawaii, 2007.

Huh, Jaewan, "The Dynamic Pattern of Regional Disparity and Hypothesis Tests," Korea Planners Association, 1989. *(In Korean)*

Hwang, Myeongchan, "Disparity in Korea and Regional Policy," Korea Research Institute for Human Settlements, 1982. *(In Korean)*

Kim, Jongil, "A Study on the Regional Disparity of Economic Power," Youngsun Koh (ed.), *The Direction and Strategy of Regional Development Policy*, Korea Development Institute, 2008. *(In Korean)*

Kim, Sungbae, "Regional Development Policy for the Mutual Benefit of the Capital and Non-capital Areas," *Korean Association for Public Administration Papers and Proceedings*, 2003, pp.31~66. *(In Korean)*

Kim, Sungtae, Choshi Chung, and Keunho Roh, "Regional Disparity in Korea," *Economic Studies*, Vol. 39, No. 2, 1991, pp.363~389. *(In Korean)*

Koh, Young-Sun, Kwang-ho Kim, and Hee Suk Yun, *Improving the Special Accounting for Balanced National Development*, Korea Development Institute, 2008. *(In Korean)*

Krugman, Paul, "Increasing Returns and Economic Geography," *Journal of Political Economy*,

Vol. 99, No. 3, 1991, pp.483~499.
Krugman, Paul, "On the Number and Location of Cities," *European Economic Review*, Vol. 37, 1993, pp.293~298.
Krugman, Paul and Anthony J. Venables, "Globalization and the Inequality of Nations," *Quarterly Journal of Economics*, Vol. 110, No. 4, 1995, pp.857~880.
Lucas, George W. Jr., "On the Mechanics of Economic Development," *Journal of Monetary Economics*, Vol. 22, 1988, pp.3~42.
Magrini, Stefano, "The Evolution of Income Disparities among the Regions of the European Union," *Regional Science and Urban Economics*, Vol. 29, No. 2, 1999, pp.257~282.
Martin, Philippe, "Can Regional Policies Affect Growth and Geography in Europe?" *The World Economy*, Vol. 21, No. 6, 1998, pp.757~774.
Martin, Philippe and Gianmarco I. P. Ottaviano, "Growth and Agglomeration," *International Economic Review*, Vol. 42, No. 4, pp.947~968.
Moon, Hyung-Pyo, "Regional Equity and Financial Decentralization," Korea Development Institute, 2003. *(In Korean)*
Myrdal, Gunnar, *Economic Theory and Underdeveloped Regions*, London: Duckworth, 1957.
OECD, *Regions at a Glance*, 2007.
Presidential Committee for Balanced National Development (PCBND), *Vision and Strategy for Balanced National Development*, 2004.
Roemer, Paul M., "Increasing Returns and Long-Run Growth," *Journal of Political Economy*, Vol. 94, No. 5, 1986, pp.1002~1037.
Venables, Anthony J., "Equilibrium Locations of Vertically Linked Industries," *International Economic Review*, Vol. 37, No. 2, 1996, pp.341~359.

韓國開發硏究
제32권 제1호(통권 제106호)

우리나라 주식형 펀드의 투자성과 평가

신 인 석
(중앙대학교 경영학부 부교수)
조 성 빈
(한국개발연구원 부연구위원)

Performance Evaluation of Equity Funds in Korea

Inseok Shin
(Assistant Professor, College of Business Administration, Chung-Ang University)
Sungbin Cho
(Research Fellow, Korea Development Institute)

* 신인석: (e-mail) ishin@cau.ac.kr, (address) Chung-Ang University, 211 Heukseok-dong Dongjak-gu, Seoul, Korea
조성빈: (e-mail) scho@kdi.re.kr, (address) Korea Development Institute, 49 Hoegiro, Dongdaemun-gu, Seoul 136-701, Korea

• Key Word: 펀드성과(Fund Performance), 효율적 시장가설(Efficient Market Hypothesis), 마켓타이밍(Market Timing)
• JEL code: G23, G29
• Received: 2009. 8. 17 • Referee Process Started: 2009. 8. 20
• Referee Reports Completed: 2009. 12. 30

ABSTRACT

We examine performance of actively managed equity funds in Korea for the period from 2002 to 2008 and investigate if fund managers have market timing abilities. We obtain the following findings: (1) average performance of funds evaluated at net return basis(net of expenses) is statistically indistinguishable from zero; (2) average performance of funds evaluated at gross return basis(before netting expenses) exceeds benchmark market returns significantly. More importantly, when funds are grouped by their size of expenses, higher performance is matched with larger expense; (3) the regression results for decomposing positive excessive returns of large-expense funds between market timing and stock selection ability are mixed. The first two findings of the paper are consistent with the Efficient Market Hypothesis a lá Grossman and Stiglitz(1980). Concluding remarks, however, need to be reserved since sources of excessive performance of funds with large expenses are yet to be clarified.

본고에서는 2002년 1월에서 2008년 12월까지 존재한 국내 주식형 펀드를 대상으로 하여 투자성과를 평가하고 마켓타이밍 능력의 존재 여부를 검토하였다. 주요 분석 결과는 다음과 같다. 첫째, 모든 투자비용을 공제한 순수익률 기준 펀드의 초과성과는 0과 다르지 않았다. 둘째, 투자비용이 공제되기 이전 총수익률 기준 펀드의 초과성과는 통계적으로 유의하게 0을 상회하였다. 특히, 보수수준과 초과성과 간에는 양의 상관관계가 있는 것으로 나타났다. 셋째, 보수수준이 높은 그룹에서 발견된 양의 초과성과를 마켓타이밍 능력과 주식선별능력으로 구분하는 추정을 실시하였으나, 추정 결과는 일의적인 해석이 곤란하였다. 분석 결과는 일단 Grossman and Stiglitz(1980)가 상정한 정보비용이 존재하는 효율적 시장가설과 일치한다. 그러나 보수가 높은 펀드의 초과성과 창출요인이 밝혀지지 않았으므로 이 해석의 타당성에 대한 결론적 언명은 추가 연구를 필요로 한다.

Ⅰ. 서 론

최근 국내 펀드산업은 주식형 펀드를 중심으로 급속한 성장을 경험하였다. 펀드의 양적 성장은 펀드산업의 경제적 기능에 대한 근본적인 질문을 제기하게 한다. "펀드의 투자성과가 벤치마크수익률을 초과하는가?" 이 질문에는 두 가지 이론적 배경이 있다. 먼저 효율적 시장가설(Efficient Market Hypothesis)이다. Grossman(1976)과 Grossman and Stiglitz (1980)에 의하면, 정보생산비용이 존재하는 효율적 시장에서 정보우위를 얻기 위해 비용을 지불한 투자자는 그 비용만큼의 투자이익을 얻게 된다. 다음으로는 대리인 문제(agency problem)이다. 펀드산업은 투자자와 펀드매니저 사이에 존재하는 전형적인 '주인-대리인' 관계를 기반으로 한다. 만일 펀드산업에서 대리인 문제가 심각하다면 투자자에게 귀착되는 펀드의 투자성과는 그만큼 하락할 것이다. 펀드산업에서 효율적 시장가설이 성립한다면 펀드투자자에게 귀착되는 펀드투자의 순수익률(총수익률에서 비용을 제외한 투자수익률)은 벤치마크수익률과 같아야 한다. 또 비용을 공제하기 이전인 총수익률은 비용에 비례하여 벤치마크수익률을 상회하여야 한다. 반면, 대리인 문제가 심각하다면 펀드투자의 순수익률은 벤치마크수익률에도 미치지 못할 수 있다.

효율적 시장가설과 금융산업에서 대리인 문제의 중요성에 대한 시사점을 얻을 수 있다는 연구의의로 인하여, 펀드의 역사가 장기인 미국에서 펀드 투자성과에 대한 연구는 꾸준히 진행되어 왔다. 최초 연구자인 Jensen(1968)은 1945년에서 1964년까지의 자료를 사용하여 펀드투자의 순수익률이 벤치마크수익률에 미치지 못한다는 것을 발견하였다. 반면, 1970년대 자료를 사용한 Henriksson(1984), Chang and Lewellen(1984)은 벤치마크 대비 펀드의 초과성과가 0과 다르지 않다고 보고하였다. 또 Ippolito(1989)는 1965년에서 1984년까지의 자료를 사용하여 펀드투자의 순수익률이 벤치마크를 다소 상회한다는 분석 결과를 내놓았다. 이때까지의 연구는 모두 표본기간 동안 지속된 펀드만을 대상으로 하였으며, 따라서 생존편의(survivorship bias)에 노출된 것들이었다. 또한 벤치마크수익률 설정(평가모형 설정)에 있어 오류가 있다는 문제제기도 있었다(Elton et al.[1993]; Ferson and Schadt[1996]; Carhart[1997]). 이후 좀 더 포괄적인 펀드성과 자료가 입수 가능해지고 평가모형이 정교해지면서, 1990년대 중반 이후의 연구들은 공통되게 펀드 투자의 순수익률이 벤치마크수익률 수준 또는 그에 미치지 못한다는 결과를 보고하였다(Malkiel[1995]; Gruber[1996];

Carhart[1997]; Pastor and Stambaugh [2002]). 점차 펀드투자 순수익률의 벤치마크 대비 초과성과가 0이거나 음이라는 점에 대해 합의가 이루어지면서, 최근 미국 학계의 연구는 비용과 현금 등 기타 자산 보유를 감안한 펀드의 총수익률에 집중되는 모습이다. Chen, Jegadeesh, and Wermers(2000)와 Jiang, Yao, and Yu (2007)는 펀드매니저의 주식선별능력이 존재하고 주식보유 기준 펀드의 총수익률은 양의 초과성과를 보이지만, 비용과 주식 이외 보유자산의 저성과로 인해 최종 순수익률 기준 펀드성과는 벤치마크에 미치지 못한다고 보고하였다. 이는 Grossman and Stiglitz(1980)의 정보생산비용을 감안한 효율적 시장가설이 펀드산업의 행태를 설명할 수 있다는 것으로 해석되고 있다.[1)]

펀드산업의 역사가 일천한 우리나라에서 펀드의 투자성과에 대한 연구는 아직 초기단계이다. 박영규・장욱(2001)은 1998년 12월 이후 설정되고 2001년 3월 현재 존재하는 주식형 펀드를 대상으로 한 연구에서 펀드의 순투자성과가 벤치마크수익률을 상회하지 못한다고 보고하였다. 박영규(2005)도 1999년에서 2003년 말까지의 기간 중 2년 이상 지속된 주식형 펀드 표본을 대상으로 한 연구에서 펀드 순수익률에서 양의 초과성과가 없다고 보고하였다. 반면, 최종범・박영규・이종달・최영목(2005)은 2000년 7월에서 2003년 말까지의 기간 중 2년 이상 지속된 표본을 대상으로 한 연구에서 주식형 펀드들이 순수익률 기준 평균 연 3~4%의 초과성과를 달성하였다는 반대되는 결과를 보고하였다. 그러므로 우리나라의 경우 펀드 투자의 초과성과 존재 여부는 기존 연구에서 아직 해결하지 못한 연구주제이다. 또한 기존 연구는 자료와 방법론상에서 보완될 여지가 있다. 먼저 자료의 포괄성이다. 기존 연구는 표본기간이 대부분 3년 내외이고 생존편의(survivorship bias)에 노출되어 있다는 약점이 있다. 다음으로 펀드 초과성과 계산의 기초자료 문제이다. 기존 연구는 모두 펀드성과 평가에 있어 투자자에게 귀착되는 순수익률을 기준으로 하였다. 그러나 Grossman and Stiglitz(1980)의 효율적 시장가설을 평가하기 위해서는 비용이 포함된 총수익률 기준의 평가가 병행되어야 한다.

본 논문의 1차적인 목적은 기존 연구의 자료와 방법론상의 한계를 보완하면서 국내 주식형 펀드의 투자성과를 평가하는 데 있다. 분석기간은 초과성과 관련

1) 다른 한편으로는 펀드산업에서 대리인 문제가 중요한 역할을 한다는 연구 결과도 계속 발표되고 있다 (Lakonishok et al.[1991]; Chevalier and Ellison[1997, 1999]; Carhart et al.[2002]; Gaspar et al.[2006]). 그러므로 대리인 문제의 존재가 평균적인 펀드 투자성과에 어느 정도의 영향을 주는지의 문제는 여전히 논란이 되고 있는 독립된 연구주제라고 하겠다.

국내 연구 중 최장 기간인 2002년 1월에서 2008년 12월까지이며,[2] 분석기간 중 존재한 모든 펀드를 표본에 포함함으로써 생존편의 문제를 해소한다. 더불어 펀드의 투자성과로서 순수익과 총수익을 동시에 사용하여 보다 정교하게 효율적 시장가설에 대한 시사점을 검증한다.

이에 대한 주요 분석 결과는 다음과 같다. 순수익을 기준으로 펀드의 초과성과 존재 여부를 실증분석한 결과 펀드의 평균 투자성과는 일반적인 통계적 유의수준에서 0과 다르지 않았다. 이 결과는 CAPM에 기반을 둔 젠센(Jensen)의 알파, Fama and French(1993)에 의해 일반화된 3요인 모형, Ferson and Schadt(1996)가 우월성을 주장한 조건부 CAPM(Conditional CAPM) 등을 사용한 초과성과 추정에서 모두 일관되게 나타났다. 또한 펀드의 존속기간, 기타 펀드특성 등을 감안하여도 결과는 달라지지 않았다. 그러나 총수익을 기준으로 측정한 펀드 투자성과에서는 펀드보수에 비례하여 양의 초과성과가 발견되었다. 특히, 전체 펀드를 보수수준에 따라 4그룹으로 구분할 때, 상위 두 그룹 펀드의 평균 투자성과는 통계적으로 유의하게 기준수익률을 초과하였다. 이상의 분석 결과는 Grossman(1976), Grossman and Stiglitz(1980)가 이론화한 효율적 시장가설에서 정보생산자의 기능과 일치하는 것으로 해석된다. 즉, 펀드산업은 경제적 가치가 있는 정보를 생산하며 양의 초과성과를 거둔다. 그러나 양의 초과성과에 해당하는 만큼을 보수로 징구함으로써 투자자는 양의 초과성과를 누리지 못한다.

본 논문의 두 번째 목적은 이 해석의 타당성을 추가 조사하기 위하여 과연 펀드매니저가 정보우위를 지니고 있는지를 분석하는 데 있다. 먼저 Treynor and Mazuy (1966), Henriksson and Merton(1981) 등의 방법을 따라 펀드의 양의 초과성과를 펀드매니저의 마켓타이밍(market timing) 능력에 따른 부분과 주식선별능력(security selection)에 따른 부분으로 구분하는 추정을 실시한다. 추정 결과, 펀드매니저의 마켓타이밍 능력에 대한 뚜렷한 증거는 발견되지 않았다. 또한 일부 모형의 계수 추정치가 이론적 예상과 어긋났다. 수익률에 기반을 둔 모형을 사용한 마켓타이밍 추정이 해석이 곤란한 결과를 보이는 것은 미국의 관련 연구에서도 나타났던 이례현상이다(Chang and Lewellen[1984]; Ferson and Schadt[1996]; Ferson and Warther [1996]; Edelen[1999]). 이를 설명하는 것은

2) 최근 유시용・황승규(2009)의 연구는 2001년 1월에서 2008년 5월까지의 자료를 사용하고 있어, 본 연구에 비하여 보다 긴 표본기간에 근거하고 있다. 그러나 이들이 사용한 표본은 주식편입비중 80% 이상의 공모펀드와 사모펀드를 대상으로 하고 있어 표본구성에 있어서 본 논문과 차이가 있고, 논문의 초점이 초과성과 추정이 아니라 투자주체별 펀드선별능력이어서 본 논문과의 평행 비교가 어렵다.

추후 연구과제로 남는다.

이하 본 논문의 구성은 다음과 같다. 제Ⅱ장에서는 분석 자료와 방법론을 소개한다. 제Ⅲ장에서는 펀드투자의 성과를 분석한다. 즉, 순수익률과 총수익률을 기준으로 각각 벤치마크 대비 초과성과가 존재하는지를 검증한다. 제Ⅳ장에서는 Ⅲ장의 결과를 바탕으로 펀드매니저의 운용능력을 분석한다. 즉, 마켓타이밍 능력의 존재 여부, 주식선별능력의 존재 여부를 추정한다. 제Ⅳ장에서는 분석 결과를 요약하고 시사점을 논의한다.

Ⅱ. 자료 및 방법론

1. 자 료

가. 펀드 자료

펀드 자료는 제로인 자료를 기본자료로 하여 자산운용협회 공시자료를 통해 보완하였다. 분석 대상 펀드는 자산운용협회 분류 기준 투자신탁 중 위탁판매되는 개방형 일반 공모펀드 중에서 주식형 펀드로 한정한다.[3] 주식형 펀드 외에 주식혼합형, 채권혼합형 및 채권형 등 다른 유형의 펀드들도 주식을 일정 비율 편입하지만 주식편입비중이 주식형 펀드와 다르고 이로 인해 성과 측정의 차이가 유발될 수 있으므로 분석에서 제외하였다. 또한 주식형 펀드 중 모신탁 및 자신탁은 제외하였으며, 세제 혜택으로 인해 투자기간 등에 제한이 존재하는 펀드의 경우 제도의 변경 등에 따라 설정액이 급격하게 변동하는 효과가 있고 그 결과 수익률의 변화가 유발될 수 있으므로 분석에서 제외하였다.[4] 또한 수동적 투자를 하는 인덱스 펀드(index fund)를 제외하여 능동적 투자(active investment)를 추구하는 펀드만을 분석 대상으로 하였다.

자료는 월별 자료이며, 분석 대상 기간은 2002년 1월부터 2008년 12월까지이다. 생존기간과 관계없이 동 기간에 존재한 모든 펀드가 분석 대상이다. <Table 1>은 연도별 평균 펀드 수, 평균 잔액, 평균 펀드연령을 정리한 것이다. 연도별 펀드 수는 2004년까지 정체되어 있었으나 2005・2006년간 급증하여 두 해에 펀드신설이

3) 주식형 펀드는 약관 또는 정관상 자산총액의 100분의 60 이상(또는 연평균 60% 이상)을 주식으로 운용하는 상품이며, 사모펀드를 제외한 이유는 보수 체계 및 수준이 상이하여 운용방식이 공모펀드와 다를 수 있기 때문이다.

4) 우리나라의 경우 과거 증권시장의 안정 및 성장과 장기투자 유도, 무주택자 등에 대한 지원 등을 위해 여러 가지 세제혜택을 한시적으로 부여하였다. 이 같은 세제혜택을 부여한 상품들로는 세금우대형, 장기보유세금우대형, 장기증권투자신탁, 장기주택마련, 장기주식형, 퇴직신탁, 개인연금 등이 존재하는데, 세제상의 유인과 펀드 유출입에 대해서는 박창균・임경묵(2004)을 참조하라.

〈Table 1〉 Summary Information on Fund[1)]

Year	Number of Funds	Average Outstanding Balance[2)]	Average Fund Age[3)]
2002	183	208.83	28.33
2003	180	147.19	38.14
2004	212	151.04	40.47
2005	288	606.11	35.60
2006	371	935.44	34.96
2007	458	1378.42	36.43
2008	530	1482.99	42.20

Notes: 1) As of the end of each year.
2) In 100 million KRWON.
3) In months.

많았음을 시사한다. 이를 반영하여 펀드의 평균 연령도 두 해 동안 하락하였다.

나. 펀드 수익률 자료

펀드의 월별 순수익률은 기준가격 산정방식과 동일하게 결산이익분배율을 고려한 시간가중 성과측정방식을 적용하여 다음과 같이 계산한다.

$$R_{i,t} = \Pi_{j=1}^{n_t} R_i^j \ where \ R_i^j = \frac{P_i^j \times (1 + D_i^j)}{P_i^{j-1}}$$

$R_{i,t}$: 펀드 i의 t월 수익률,
n_t: t월 일수,
R_i^j: 펀드 i의 j일 수익률,
P_i^j: j일 기준가,
D_i^j: j일 분배율

펀드투자를 위하여 투자자가 지불해야 하는 비용은 운용보수, 판매보수, 기타보수, 유가증권매매비용 등으로 구성된다. 이 중 유가증권매매비용에 대한 정확한 정보를 구하는 것은 시기와 펀드가 현재에도 존속되는지의 여부에 따라 어려운 경우가 많았다. 이에 본 논문에서 고려하는 펀드투자비용은 유가증권매매비용을 제외한 운용보수, 판매보수, 기타보수로 구성되는 총보수에 한정한다. 보수 자료의 정확한 구축을 위해 자산운용협회와 제로인 자료를 비교하였고, 또 각 펀드의 약관 또는 투자설명서 등을 통해 보수가 확인 가능한 자료만을 분석의 대상으로 하였다. 한편, 최근 신설된 펀드 중에는 판매보수 대신 또는 판매보수에 더하여 선취수수료를 징구하는 펀드가 없지 않다. 이들 펀드의 경우 평균 투자기간을 1년으로 가정하여 선취수수료를 연간 판매보수로 환산하였다. 참고로 미국의 경우

<Table 2> Trend in Fee Structure

(Unit: %)

Year[1)]	Management Fee	Sales Fee[2)]	Other Fees	Total Fees
2002	0.647	1.641	0.050	2.338
2003	0.641	1.726	0.050	2.417
2004	0.653	1.671	0.111	2.435
2005	0.658	1.619	0.050	2.327
2006	0.665	1.563	0.050	2.278
2007	0.679	1.454	0.050	2.183
2008	0.681	1.426	0.050	2.157

Notes: 1) As of the end of each year.
2) Front-end load and Back-end load included.

Sirri and Tufano(1998), Huang et al.(2007) 등에서 평균 투자기간을 7년으로 가정하고 선취수수료의 1/7을 연간 비용으로 반영한 바 있다. <Table 2>는 총보수의 추이와 구성을 정리한 것이다. 총보수의 수준은 표본기간 중에 2.3% 내외에서 안정적이었으며, 판매보수와 운용보수의 비중도 별다른 변화가 없었다.

제로인이 제공하는 펀드 기준가는 보수가 이미 제외된 가격이다. 그러므로 총수익률은 총보수율을 이용하여 기준가로부터 계산된 순수익률에서 환산하여야 한다. 순수익률에서 총수익률의 환산은 다음의 식에 의한다.

순수익률 = 총수익률 × (1 - 총보수율)

다. 기타 자료 및 기초통계량

무위험수익률은 1년 만기 국고채수익률을 월별 수익률 자료로 환산하여 사용하였다.[5)] 시장포트폴리오의 대용치로는 KOSPI를 기본추정에서 사용한다. 강건성(robustness) 검증에서는 각 펀드별로 사전에 설정한 벤치마크를 사용한다. 펀드별 벤치마크 정보는 제로인에서 제공받았다. 3요인 모형 추정에 필요한 기업별 주가자료 및 회계자료는 WiseFN에서 추출하였다.[6)] 기업규모요인을 반영하는 SMB와 장부가치와 시장가치의 상대적

5) 상장폐지 및 시장이전 기업들에 대하여 상장폐지 시점과 시장이전 시점을 고려하여 자료에 포함하였다.
6) 3년만기 국고채수익률 및 10년만기 국고채수익률을 사용하여 분석하였으나 정성적으로 결과가 변화하지 않는다. CD수익률의 경우 2007년 하반기 이후 전 세계적인 금융위기 등으로 인해 국고채수익률과 상관관계가 낮은 모습을 보이고, 위험이 국고채에 비해 큰 이유 등으로 인해 무위험수익률로 상정하지 않았다.

<Table 3> Summary Statistics of Factors

(Unit: %)

Variables	Mean	Standard Deviation	Min	Max
$R_{m,t}$(KOSPI)	0.8142	6.8443	-23.1344	12.7090
$R_{F,t}$(Risk-Free Rate)	0.3786	0.0476	0.2701	0.4605
SMB	1.4331	5.0867	-15.2178	14.7776
HML	0.2480	4.9528	-14.1843	13.1940
Term Spread	0.0549	0.0371	0.0016	0.1618
Credit Spread	0.2716	0.0527	0.1764	0.3494
Dividend Yield	0.1567	0.0312	0.1061	0.2336
Short-term Yield	0.3378	0.0455	0.2661	0.4273

크기를 반영하는 HML을 구하기 위하여 Fama and French(1993)와 같이 다음의 과정을 거쳤다. 먼저 우선주를 제외하고 거래소에 상장되어 있는 비금융기업을 대상으로 매년 6월 말 시가총액의 중위값을 기준으로 하여 대형주와 소형주를 구분하였다. 그리고 장부가치는 보통주의 전년도 말 장부가 총액으로, 시장가치도 보통주의 전년도 말 기준 시장가치로 평가하였고, 두 가치의 비율을 기준으로 상위 30%, 중위 40%, 하위 30%의 포트폴리오를 구성하였다. 이렇게 6개의 포트폴리오를 구성한 후 해당되는 포트폴리오들의 평균을 취하여 각각 SMB와 HML을 구하였다.

분석에 사용된 주요 변수들의 기초통계량은 <Table 3>에 정리하였다.

2. 방법론

가. 평균 펀드 투자성과 추정방법

본 논문의 분석초점은 일반투자자가 무작위로 펀드에 투자할 경우 기대할 수 있는 투자성과가 벤치마크수익률을 초과하는가에 있다. 이 질문에 답하기 위해서는 펀드산업의 평균 투자성과 추정이 필요하다. 주어진 자료가 패널자료이므로 평균 투자성과의 추정방법으로는, 즉 펀드산업의 평균 투자성과 추정방법으로는 전체 자료를 동질적으로 취급하여 풀링(pooling) 추정하는 방법, 개별 펀드별로 초과성과를 추정한 뒤 펀드별 추정치에서 평균 초과성과를 다시 추정하는 방법, 각 시점별로 펀드포트폴리오를 구축하고 펀드포트폴리오의 시계열 자료에서 초과

성과를 추정하는 방법 등 세 가지를 생각할 수 있다. 주가수익률에서 일반적으로 발견되는 높은 횡단면 상관관계(cross section correlation)를 감안할 때 일단 첫 번째 방법은 배제된다. 두 번째와 세 번째 방법은 균형 패널자료인 경우 추정치가 동일하고, 통계량도 유사하다(Ferson and Schadt[1996]). 그러나 본 논문에서처럼 펀드별 존속기간이 다르고(즉, 불균형 패널자료), 존속기간에 관계없이 각 시점에 존재한 모든 펀드를 추정에 포함시키려 할 경우 유일한 추정방법은 세 번째 방법이다.[7] 세 번째 방법의 실행을 위해서는 포트폴리오 구성에 있어 사용할 가중치가 선택되어야 한다. 본 논문에서는 기본추정에서는 동일가중치 포트폴리오를 기준으로 하여 분석을 실시하고, 펀드 자산을 가중치로 사용한 포트폴리오를 강건성(robustness) 검증에서 사용하도록 한다.

나. 초과성과 추정방법

펀드투자의 초과성과는 아래의 세 식에 따라 CAPM모형의 알파(α), 3요인 모형의 알파, Ferson and Schadt(1996)의 조건부 모형의 알파로 측정한다.

$$\left(\frac{1}{N_t}\sum_{i=1}^{N_t} R_{i,t}\right) = \alpha + \beta r_{m,t} + \epsilon_t \quad (1)$$

$$\left(\frac{1}{N_t}\sum_{i=1}^{N_t} R_{i,t}\right) = \alpha + \beta_1 r_{m,t} + \beta_2 SMB_t + \beta_3 HML_t + \eta_t \quad (2)$$

$$\left(\frac{1}{N_t}\sum_{i=1}^{N_t} R_{i,t}\right) = \alpha + \beta_0 r_{m,t} + B'(z_t r_{m,t}) + \xi_t \quad (3)$$

$$\left(\frac{1}{N_t}\sum_{i=1}^{N_t} R_{i,t}\right) = \alpha + \beta_1 r_{m,t} + B'(z_t r_{m,t}) + \beta_2 SMB_t + \beta_3 HML_t + \xi_t \quad (3\text{-}1)$$

N_t: t월 펀드 수,
$R_{i,t}$: t월 펀드 i의 수익률,
$r_{m,t}$: t월 시장포트폴리오 프리미엄(Market Premium) 또는 $(R_{m,t} - R_{F,t})$. 단, $R_{m,t}$는 시장포트폴리오 수익률, $R_{F,t}$ 무위험금리,
SMB_t: t월 SMB수익률,
HML_t: t월 HML수익률,
z_t: $Z_t - E(Z)$,
ϵ, η, ξ: 교란항

조건부 모형을 추정하기 위해서는 조건변수(conditional variable) Z_t의 지정이 필요하다. 미국 연구에서 사용된 조건

7) 전체 펀드를 몇 개의 그룹으로 나누어 분석한 Carhart(1997)의 초과성과 추정방법이 본 논문과 유사하다.

〈Table 4〉 Definition of Conditioning Variables

Variable Name	Definition
Term Spread	10-year Treasury bond yield less 1-year Treasury bill yield
Credit Spread	BBB-rated corporate bond yield less AAA-rated corporate bond yield
Dividend Yield	the dividend yield of the KOSPI index
Short-term Yield	Call rate

〈Table 5〉 Explanatory Power of Lagged Conditioning Variables for the Current Market Return

	Dependent Variable: Market Rate of Return				
	(i)	(ii)	(iii)	(iv)	(v)
Constant	0.8142 (0.7512)	0.8142 (0.7467)	0.8142 (0.7266)	0.8142 (0.7253)	0.8142 (0.7170)
Term Spread(-1)	1.6971 (20.3847)				-4.7002 (28.0208)
Credit Spread(-1)		14.2919 (14.2632)			-41.1457 (28.9569)
Dividend Yield(-1)			55.7769** (23.4672)		31.0841 (29.2826)
Short-term Yield(-1)				-39.2529** (16.0428)	-70.2228** (30.7309)
R-squared	0.0001	0.012	0.065	0.068	0.1226

Note: Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

변수들은 미래 주가에 대한 예측력이 기존 연구에서 확인된 배당수익률, 단기이자율, 신용스프레드, 기간스프레드 등이다. 우리나라에서는 아직 미래 주가에 대해 예측력이 있는 변수들을 판별하는 연구가 충분히 축적되어 있지 않은 상황이므로, 본 논문에서는 Ferson and Schadt (1996)에서 사용된 조건변수들을 그대로 사용하기로 한다. 각 변수들의 정의는 <Table 4>에 정리하였다. 이들 변수들이 과연 미래 주가예측력이 있는지 추정해 보았는데, 그 결과를 <Table 5>에 정리하였다. 단기이자율이 미래 시장수익률과 음의 상관관계를 보이면서 통계적으로 유의한 수준에서 예측력을 지닌 것으로 나타났다. 배당수익률은 양의 부호를 지

니면서 미래 시장수익률을 예측하는 것으로 나타났으나 통계적 유의성은 단기 이자율에 비하여 약하였다. 기간스프레드는 유의성이 전혀 없었으며, 신용스프레드도 기간스프레드에 비해서는 p-값이 높았으나 유의한 수준의 예측력을 지닌 것은 아니었다.

식 (3), (3-1)은 각각 CAPM 모형인 식 (1), 3요인 모형인 식 (2)에 대한 조건부 모형이다. 그러나 엄격히 말해 식 (3-1)은 정확한 3요인 모형의 조건부 추정식은 아니다. 3요인 모형에서 SMB와 HML이 Fama and French(1993)가 주장하듯이 근본 위험요인을 대변한다고 하면, 3요인 모형의 조건부 추정에서는 시장프리미엄($r_{m,t}$)에 더하여 SMB와 HML에 대한 베타계수의 동태적인 변동이 감안되어야 한다. 반면, 식 (3-1)은 시장프리미엄 계수의 동태적 변동만이 허용되어 있다. 식 (3-1)은 형태 자체로만 놓고 보면 조건부 모형이 아니라 다요인 모형(multi-factor model)의 관점에서 해석되는 것이 적합하다. 즉, $r_{m,t}z_{m,t}$를 다요인 모형의 한 요인이라고 간주하면 식 (3-1)은 쉽게 해석된다.[8] 식 (3-1)의 현재의 형태로 표현되어 있는 것은 본 논문이 조건부 모형을 다요인 모형의 관점에서 해석하는 것을 선호하기 때문은 아니다. 단지 SMB와 HML 계수에도 동태적 변동을 허용하였을 경우의 추정 결과가 질적으로 다르지 않았으므로 지면을 절약하기 위하여 보다 간소한 형태의 (3-1)모형을 서술에 사용하기로 한다.[9]

다. 마켓타이밍 추정방법

펀드매니저의 마켓타이밍(market timing) 능력 존재 여부의 추정은 Treynor and Mazuy(1966)와 Henriksson and Merton (1981)의 모형에 의거한다. 두 모형은 초과성과 추정모형 (1), (2)에 각각 $r_{m,t}^2 = (R_{m,t} - R_{F,t})^2$과 $r_{m,t}^+ = (R_{m,t} - R_{F,t}) \times I\{(R_{m,t} - R_{F,t})>0\}$를 설명변수로 추가한다. $I\{(R_{m,t} - R_{F,t})>0\}$는 $(R_{m,t} - R_{F,t})$이 양수일 때 1을 취하는 지시함수(Indicator Function)이다. 마켓타이밍 능력의 존재는 추가된 설명변수 계수의 추정치가 양의 값을 갖는지의 여부로 평가한다. 이것은 펀드매니저의 마켓타이밍 능력을 미래 시장프리미엄에 대한 예측능력으로 평가한다는 것을 의미한다. 만일 펀드매니저가 미래 시장프리미엄에 대한 예측능력을 가지고 있다면, 펀드매니저는 양의 시장프리미엄이 예상될 때 베타를 높이는 펀드운용을 시도할 것으로 예측할 수 있다. 즉, $r_{m,t}^2 = (R_{m,t} - R_{F,t})^2$과 $r_{m,t}^+ = (R_{m,t} - R_{F,t}) \times I\{(R_{m,t} - R_{F,t})>0\}$항의 계수 추정치가 유의한 양의 값

8) 조건부 모형의 이 같은 다의적 해석은 Ferson and Schadt(1996), Ferson(2003)을 참조.
9) SMB, HML계수에 동태적 변동을 허용한 모형의 추정 결과는 부록으로 첨부하였다.

을 취할 것으로 기대할 수 있다.

마켓타이밍의 추정 역시 비조건부 모형의 추정뿐 아니라 조건부 모형에 의해서도 실시한다. Treynor and Mazuy(1966) 방식의 경우 조건부 모형 추정식은 앞의 식 (3), (3-1)에 $r_{m,t}^2 = (R_{m,t} - R_{F,t})^2$을 설명변수로 추가하는 것으로 얻어진다.

Henriksson and Merton(1981) 방식의 경우 조건부 모형인 (3)과 (3-1)의 추정식이 다소 복잡해지는데, Ferson and Schadt (1996)을 원용하여 추정식을 설정한다. 즉, Henriksson and Merton(1981) 방식에 의한 마켓타이밍 능력의 존재 여부 추정을 조건부 추정식인 (3)과 (3-1)에 추가할 때 추정식은 다음의 두 식이 된다. 마켓타이밍 능력의 존재는 추정식에서 계수 γ의 추정치가 양의 값을 갖는지의 여부로 평가한다.

$$\left(\frac{1}{N_t}\sum_{i=1}^{N_t} R_{i,t}\right) = \alpha + \beta r_{m,t} + B'(z_t r_{m,t}) + \gamma r_{m,t}^{*} + C'(z_t r_{m,t}^{*}) + \nu_t \qquad (4)$$

$$\left(\frac{1}{N_t}\sum_{i=1}^{N_t} R_{i,t}\right) = \alpha + \beta_1 r_{m,t} + B'(z_t r_{m,t}) + \gamma r_{m,t}^{*} + C'(z_t r_{m,t}^{*}) + \beta_2 SMB_t + \beta_3 HML_t + \upsilon_t \qquad (4\text{-}1)$$

$$r_{m,t}^{*} = r_{m,t} I\{(r_{m,t} - E(r_{m,t}|Z_t)) > 0\}$$

여기서 $I(\bullet)$는 지시함수,

Ⅲ. 분석 결과

1. 펀드투자의 성과

가. 순수익률(Net Return) 기준

<Table 6>은 펀드포트폴리오의 순수익률 기준 초과성과를 추정한 결과이다. 추정은 전체 표본뿐 아니라 6개월 이상, 12개월 이상, 36개월 이상 등 일정 기간 이상 생존한 펀드만을 대상으로 한 표본에 대해서도 실시하였다. 먼저 CAPM모형을 기준으로 추정한 결과를 살펴보면, 모든 존속기간별 추정에서 펀드포트폴리오의 초과성과는 0과 다르지 않은 것으로 나타났다. 이 결과는 3요인 모형을 이용한 추정에서도 달라지지 않았다. 사실 3요인 모형의 추정에서 SMB와 HML 등 두 요인에 대한 계수 추정치는 부호는 예상과 일치하지만, 모두 유의성이 없을 뿐 아니라 추정치의 크기도 0에 근사하였다. 한편, <Table 6>에서 존속기간별 알파의 추정치가 대동소이하게 나타난 것은 생존편의가 크지 않음을 시사한다. 이 결과는 미국의 연구(Malkiel[1995])와 다른 것으로서 특기할 만하다. 그 이유를 밝히는 것은 본 논문의 범위를 넘어서는 것이지만, 국내 펀드의 경우 미국에 비해 모두 연령이

<Table 6> Net Return Performance of Fund Portfolio

	Total Sample		(1) Sample of Funds survived longer than 6 months		(2) Sample of Funds survived longer than 12 months		(3) Sample of Funds survived longer than 24 months		(5) Sample of Funds survived longer than 36 months	
	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor
α	0.2548 (0.2359)	0.2820 (0.2485)	0.2459 (0.2361)	0.2742 (0.2488)	0.2299 (0.2363)	0.2586 (0.2491)	0.2491 (0.2388)	0.2867 (0.2517)	0.2469 (0.2410)	0.2866 (0.2540)
r_m	0.9030*** (0.0345)	0.9042*** (0.0351)	0.9042*** (0.0346)	0.9055*** (0.0351)	0.9053*** (0.0346)	0.9066*** (0.0351)	0.9121*** (0.0350)	0.9139*** (0.0355)	0.9182*** (0.0353)	0.9201*** (0.0358)
SMB		0.0178 (0.0492)		0.0150 (0.0493)		0.0147 (0.0493)		0.0039 (0.0499)		0.0021 (0.0503)
HML		-0.0224 (0.0482)		-0.0227 (0.0482)		-0.0229 (0.0483)		-0.0274 (0.0488)		-0.0287 (0.0492)
R-squared	0.893	0.893	0.893	0.894	0.893	0.894	0.892	0.893	0.892	0.893

Note: Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

낮은 편이라서 아직 생존편의가 부각되지 않았기 때문일 수도 있어 보인다.

조건부 모형의 추정 결과는 <Table 7>에 정리하였다. 배당률, 단기채권수익률 등의 부호는 각각 양과 음으로서 예상과 일치하게 추정되었지만 유의성은 없었다. 추가된 설명변수의 유의성이 없음에 따라 초과성과 추정치에도 별다른 변화가 없음을 확인할 수 있다. 이것은 미국의 연구 결과와는 차이가 있다. 미국의 연구들에서는 조건부 변수의 계수 부호가 예상과 반대인 가운데 유의하게 추정되었고, 이로 인해 알파 추정치가 비조건부 모형에 비하여 오히려 상승하는 현상이 나타난 바 있다(Ferson and Schadt[1996]; Ferson and Warther[1996]).

나. 총수익률(Gross Return) 기준

1) 전체 표본

<Table 8>은 총수익률 기준으로 펀드의 초과성과를 추정한 결과이다. 순수익률 기준 추정 결과와는 달리 양의 초과성과(10% 유의수준에서 유의)가 추정되었다. 초과성과의 크기는 월 0.42%로서 연율로 환산하면 5.2%에 달한다. 이 결과는 존속기간에 따라 펀드 표본을 달리할 때에도 달라지지 않았다. 조건부 모형을 사용한 추정 결과는 <Table 9>에 정리하였는데, 기본모형과 질적으로 동일한 결과가 얻어졌다. 굳이 차이를 찾는다면 12개월 이상 존속기간 표본에서 초과성과의 유의성이 낮아졌다는 점이다.

〈Table 7〉 Net Return Performance of Fund Portfolio: Conditional Models

	Total Sample		(1) Sample of Funds survived longer than 6 months		(2) Sample of Funds survived longer than 12 months		(3) Sample of Funds survived longer than 24 months		(4) Sample of Funds survived longer than 36 months	
	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor
α	0.2683 (0.2520)	0.2949 (0.2672)	0.2570 (0.2526)	0.2846 (0.2679)	0.2365 (0.2531)	0.2645 (0.2684)	0.2458 (0.2558)	0.2845 (0.2713)	0.2461 (0.2585)	0.2872 (0.2742)
r_m	0.8910*** (0.0375)	0.8929*** (0.0382)	0.8926*** (0.0376)	0.8945*** (0.0383)	0.8942*** (0.0377)	0.8961*** (0.0383)	0.9030*** (0.0381)	0.9054*** (0.0387)	0.9084*** (0.0385)	0.9109*** (0.0392)
SMB		0.0211 (0.0506)		0.0181 (0.0508)		0.0180 (0.0509)		0.0085 (0.0514)		0.0062 (0.0520)
HML		-0.0204 (0.0501)		-0.0205 (0.0502)		-0.0208 (0.0503)		-0.0262 (0.0509)		-0.0273 (0.0514)
$r_m\times$ Term Spread	1.4821 (1.6258)	1.5893 (1.6519)	1.4452 (1.6293)	1.5434 (1.6560)	1.4289 (1.6325)	1.5274 (1.6593)	1.4229 (1.6500)	1.5038 (1.6773)	1.4442 (1.6673)	1.5206 (1.6949)
$r_m\times$ Credit Spread	-2.5357 (1.7036)	-2.6104 (1.7286)	-2.4516 (1.7073)	-2.5167 (1.7330)	-2.4289 (1.7107)	-2.4938 (1.7364)	-2.5431 (1.7290)	-2.5802 (1.7553)	-2.4443 (1.7471)	-2.4747 (1.7737)
$r_m\times$ Dividend Yield	0.9877 (1.4694)	0.8130 (1.5140)	0.9933 (1.4726)	0.8266 (1.5178)	1.0089 (1.4755)	0.8411 (1.5208)	0.9469 (1.4913)	0.7762 (1.5373)	0.9755 (1.5070)	0.8050 (1.5534)
$r_m\times$ Short-term Yield	-0.4581 (1.1844)	-0.5655 (1.2102)	-0.4412 (1.1869)	-0.5386 (1.2132)	-0.4727 (1.1893)	-0.5703 (1.2156)	-0.6813 (1.2020)	-0.7569 (1.2288)	-0.5844 (1.2146)	-0.6546 (1.2417)
R-squared	0.897	0.897	0.897	0.897	0.896	0.897	0.896	0.896	0.895	0.896

Note: Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

〈Table 8〉 Gross Return Performance of Fund Portfolio

	Total Sample		(1) Sample of Funds survived longer than 6 months		(2) Sample of Funds survived longer than 12 months		(3) Sample of Funds survived longer than 24 months		(4) Sample of Funds survived longer than 36 months	
	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor
α	0.4473* (0.2365)	0.4742* (0.2491)	0.4388* (0.2366)	0.4669* (0.2494)	0.4239* (0.2369)	0.4524* (0.2496)	0.4497* (0.2394)	0.4872* (0.2523)	0.4519* (0.2416)	0.4916* (0.2546)
r_m	0.9051*** (0.0346)	0.9062*** (0.0351)	0.9063*** (0.0346)	0.9075*** (0.0352)	0.9073*** (0.0347)	0.9086*** (0.0352)	0.9140*** (0.0350)	0.9158*** (0.0356)	0.9201*** (0.0354)	0.9220*** (0.0359)
SMB		0.0180 (0.0494)		0.0152 (0.0494)		0.0149 (0.0495)		0.0038 (0.0500)		0.0019 (0.0504)
HML		-0.0222 (0.0483)		-0.0226 (0.0483)		-0.0228 (0.0484)		-0.0273 (0.0489)		-0.0286 (0.0494)
R-squared	0.893	0.893	0.893	0.894	0.893	0.894	0.892	0.893	0.892	0.892

Note: Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

<Table 9> Gross Return Performance of Fund Portfolio: Conditional Models

	Total Sample		(1) Sample of Funds survived longer than 6 months		(2) Sample of Funds survived longer than 12 months		(3) Sample of Funds survived longer than 24 months		(4) Sample of Funds survived longer than 36 months	
	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor
α	0.4608* (0.2526)	0.4871* (0.2679)	0.4499* (0.2532)	0.4772* (0.2685)	0.4305* (0.2537)	0.4582* (0.2690)	0.4461* (0.2564)	0.4847* (0.2720)	0.4509* (0.2591)	0.4918* (0.2749)
r_m	0.8929*** (0.0376)	0.8949*** (0.0383)	0.8945*** (0.0377)	0.8964*** (0.0383)	0.8961*** (0.0377)	0.8981*** (0.0384)	0.9048*** (0.0381)	0.9072*** (0.0388)	0.9102*** (0.0385)	0.9127*** (0.0392)
SMB		0.0213 (0.0508)		0.0183 (0.0509)		0.0181 (0.0510)		0.0084 (0.0516)		0.0060 (0.0521)
HML		-0.0202 (0.0502)		-0.0204 (0.0503)		-0.0206 (0.0504)		-0.0260 (0.0510)		-0.0271 (0.0515)
r_m× Term Spread	1.4942 (1.6297)	1.6016 (1.6559)	1.4574 (1.6332)	1.5559 (1.6600)	1.4412 (1.6362)	1.5399 (1.6631)	1.4418 (1.6539)	1.5221 (1.6813)	1.4648 (1.6714)	1.5402 (1.6991)
r_m× Credit Spread	-2.5396 (1.7077)	-2.6148 (1.7328)	-2.4557 (1.7114)	-2.5214 (1.7371)	-2.4343 (1.7146)	-2.4998 (1.7404)	-2.5561 (1.7331)	-2.5929 (1.7595)	-2.4592 (1.7514)	-2.4889 (1.7781)
r_m× Dividend Yield	0.9977 (1.4730)	0.8235 (1.5177)	1.0033 (1.4761)	0.8369 (1.5214)	1.0182 (1.4789)	0.8507 (1.5243)	0.9640 (1.4948)	0.7944 (1.5410)	0.9947 (1.5106)	0.8258 (1.5573)
r_m× Short-termYield	-0.4540 (1.1872)	-0.5617 (1.2131)	-0.4372 (1.1898)	-0.5350 (1.2161)	-0.4697 (1.1920)	-0.5677 (1.2184)	-0.6793 (1.2049)	-0.7543 (1.2317)	-0.5815 (1.2176)	-0.6507 (1.2448)
R-squared	0.897	0.897	0.897	0.897	0.896	0.897	0.896	0.896	0.895	0.896

Note: Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

2) 보수수준별 추정

순수익률 기준 추정에서 발견되지 않았던 양의 초과성과가 총수익률 기준 추정에서 나타난 현상을 Grossman and Stiglitz(1980)의 관점에서 보면, 펀드산업이 정보를 생산하고 이 정보에 기초하여 양의 초과성과를 거둔 뒤, 그만큼을 보수로 징구한다는 해석이 가능하다. 이 해석에 의한다면 총수익률 기준 초과성과는 보수수준에 비례하여야 한다. 이를 조사하기 위하여 전체 펀드를 보수수준에 따라 4그룹으로 나누고 각 그룹별로 초과성과를 재추정하였다. <Table 10>은 기본모형을 재추정한 결과이고, <Table 11>은 조건부 모형을 재추정한 결과이다. <Table 10>은 총수익률 기준 초과성과 추정치의 유의성이 보수가 높은 펀드그룹에 집중된 현상이라는 점을 보여준다. <Table 11>은 대체로 <Table 10>의 결과와 비슷하다. 단, CAPM모형의 조건부

〈Table 10〉 Gross Return Performance of Fund Portfolio: by Total Fee Level

	Total Fee ≤1.5		1.5< ≤2.0		2.0< ≤2.5		2.5<	
	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor
α	0.3507 (0.2314)	0.3308 (0.2408)	0.3904 (0.2502)	0.3525 (0.2605)	0.4541* (0.2347)	0.4744* (0.2470)	0.4817* (0.2490)	0.5322** (0.2623)
r_m	0.8637*** (0.0339)	0.8622*** (0.0340)	0.8988*** (0.0366)	0.8963*** (0.0367)	0.8863*** (0.0344)	0.8871*** (0.0348)	0.9275*** (0.0365)	0.9300*** (0.0370)
SMB		0.0739 (0.0477)		0.0794 (0.0516)		0.0277 (0.0489)		-0.0101 (0.0520)
HML		0.0016 (0.0467)		0.0135 (0.0505)		-0.0192 (0.0479)		-0.0342 (0.0508)
R-squared	0.888	0.891	0.880	0.884	0.890	0.891	0.888	0.888

Note: Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

〈Table 11〉 Gross Return Performance of Fund Portfolio: by Total Fee Level
– Conditional Models

	Total Fee ≤1.5		1.5< ≤2.0		2.0< ≤2.5		2.5<	
	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor
α	0.4087* (0.2419)	0.3736 (0.2537)	0.4248 (0.2687)	0.3859 (0.2810)	0.4705* (0.2503)	0.4905* (0.2650)	0.4809* (0.2665)	0.5343* (0.2826)
r_m	0.8443*** (0.0360)	0.8435*** (0.0362)	0.8852*** (0.0400)	0.8844*** (0.0401)	0.8738*** (0.0372)	0.8755*** (0.0378)	0.9182*** (0.0397)	0.9212*** (0.0404)
SMB		0.0692 (0.0481)		0.0849 (0.0533)		0.0318 (0.0502)		-0.0051 (0.0536)
HML		0.0116 (0.0476)		0.0116 (0.0527)		-0.0179 (0.0497)		-0.0334 (0.0530)
r_m× Term Spread	0.9828 (1.5601)	1.1690 (1.5680)	1.6252 (1.7334)	1.8592 (1.7370)	1.5615 (1.6144)	1.6958 (1.6380)	1.5177 (1.7194)	1.5725 (1.7470)
r_m× Credit Spread	-2.3852 (1.6348)	-2.5991 (1.6409)	-2.1828 (1.8164)	-2.4462 (1.8178)	-2.6386 (1.6917)	-2.7460 (1.7142)	-2.7201 (1.8017)	-2.7172 (1.8282)
r_m× Dividend Yield	1.1151 (1.4101)	0.9808 (1.4372)	0.7963 (1.5667)	0.6168 (1.5920)	0.9860 (1.4591)	0.7947 (1.5013)	0.9166 (1.5540)	0.7446 (1.6012)
r_m× Short-term Yield	0.1894 (1.1365)	-0.0206 (1.1487)	-0.1589 (1.2628)	-0.4212 (1.2725)	-0.4757 (1.1761)	-0.6141 (1.2000)	-0.7562 (1.2526)	-0.7997 (1.2798)
R-squared	0.897	0.899	0.883	0.887	0.895	0.896	0.891	0.892

Note: Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

추정에서 알파값이 오히려 상승한 점은 이례현상이다. 이론적으로 보아 조건부 추정에서 알파값은 비조건부 추정에 비해 하락하여야 한다.

3) 보수수준과 펀드별 총수익률 기준 초과성과의 관계 추정

<Table 11>이 시사하는 보수수준과 초과성과의 관계를 확인하는 방법으로서 펀드별 초과성과와 보수수준의 관계를 추정하고자 한다. 추정방법은 다음과 같다. 먼저 9개월 이상 존속 펀드를 대상으로 펀드별 CAPM과 3요인 모형을 추정하여 초과성과 알파를 추정한 후 초과성과 알파와 각 시점별 잔차를 합산하여 월별 초과성과를 펀드별로 계산한다. 그리고 펀드별 보수와 펀드규모, 펀드나이, 자금유출입 등 통제변수를 독립변수로 하고 펀드별 초과성과를 종속변수로 하여 월별 자료에 대하여 횡단면 회귀분석을 수행한 후 이를 시계열로 평균하여 추정치를 구한다.[10] 이렇게 구한 경우 표준오차는 이분산성(heteroskedasticity) 및 자기상관(autocorrelation)에 의해 과소 또는 과대 추정될 수 있으므로 이를 조정한 Newey-West 표준오차를 구하여 추정치의 유의성 여부를 확인하였다.

추정 결과는 <Table 12>에 제시되어 있는데, 총보수, 판매보수, 운용보수 모두 펀드의 초과성과와 통계적으로 유의한 관계를 갖고 있는 것으로 추정되었음을 알 수 있다.

2. 펀드매니저의 마켓타이밍 능력

펀드산업의 정보생산능력은 마켓타이밍(market timing) 능력과 주식선별능력으로 구분될 수 있다. Treynor and Mazuy (1966)와 Henriksson and Merton(1981)의 방법에 따라 두 능력의 존재 여부를 추정하여 그 결과를 <Table 13>의 Panel A와 B에 보고하였다. 마켓타이밍 계수 추정치는 부호가 음이고 대체로 유의성이 없었다. 다만, 보수수준이 낮은 그룹에서 마켓타이밍 계수 추정치의 p-값이 11~12% 수준으로서 통계적 유의성의 경계선에 있었다. 또 이들 그룹의 경우 주식선별력을 나타내는 알파값은 유의한 양의 값으로 추정되었다. 마켓타이밍 계수와 주식선별계수가 반대방향의 값을 취한다는 것은 논리적으로 설명되기 어려운 이례현상이다. 마켓타이밍 능력이 없는 펀드매니저일수록 주식선별능력은 있다는 의미가 되기 때문이다. 이 같은 이례현상은 미국의 연구 결과와 동일한 것이고(Chang and Lewellen[1984]) 또한 두 추정방법의 문제점으로 지적된 것인데

10) Chen et al.(2004), Ferris and Yan(2009), 그리고 Nanda et al.(2004) 등이 본문과 동일한 방법론을 적용하여 초과수익률을 추정하였다.

〈Table 12〉 Relationship between Gross Returns and Fee Level

	Dependent Variable: Gross Fund Return					
	CAPM Adjusted			3 Factor Adjusted		
Constant	0.1409 (0.3720)	0.1325 (0.3742)	0.1313 (0.3743)	0.0443 (0.3439)	0.0287 (0.3446)	0.0263 (0.3448)
ln(fundsize)	0.0032 (0.0149)	0.0035 (0.0149)	0.0035 (0.0149)	0.0063 (0.0137)	0.0068 (0.0138)	0.0068 (0.0138)
Fundage	-0.0003 (0.0010)	-0.0003 (0.0010)	-0.0003 (0.0010)	0.0000 (0.0009)	0.0001 (0.0009)	0.0001 (0.0009)
Flow	0.2828* (0.1620)	0.2860* (0.1620)	0.2864* (0.1618)	0.2587* (0.1372)	0.2632* (0.1370)	0.2635* (0.1367)
Total Fee	1.2272** (0.5406)			1.4054*** (0.5389)		
Sales Fee (including load)		1.1745** (0.5458)			1.2642** (0.5485)	
Sales Fee (excluding load)			1.1809** (0.5496)			1.2902** (0.5500)
Mgmt Fee		1.3687** (0.6284)	1.3702** (0.6306)		1.8228*** (0.6129)	1.8283*** (0.6143)
Load Dummy	0.0175 (0.0608)	0.0182 (0.0628)	0.0978 (0.0686)	0.0337 (0.0602)	0.0366 (0.0620)	0.1238* (0.0701)
No. of Obs	23957	23957	23957	23957	23957	23957
Average R-squared	0.101	0.105	0.105	0.104	0.108	0.108

Note: The t-statistics are adjusted for serial correlation using Newey-West (1987) lags of order two and are shown in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

(Jagannathan and Korajczyk[1986]; Glosten and Jagannathan[1994]), 같은 현상이 우리나라에서도 발견된다는 점이 흥미롭다.

Ferson and Schadt(1996)는 이 이례현상이 조건부 모형을 사용하면 사라진다고 주장한 바 있다. 이에 조건부 모형을 사용한 추정을 실시하여 그 결과를 <Table 14>와 <Table 15>에 정리하였다. 마켓타이밍 계수 추정치의 p-값은 한층 하락하였지만 음의 값을 갖는 현상은 여전하다. 한편, 조건부 모형 모두에서 마켓타이밍 변수를 추가하고 추정하자 보수수준이 높은 그룹의 알파가 유의성이 없어졌다. 조건부 모형에서 초과성과의 유의성이 사라진 것은 조건부 변수의 추가에 기인하였을 수 있다. 즉, 펀드매니저가 조건부 변수에 연동하여 투자전략을 체계적으로 변경하고 이 투자전략에 의해 초과성과를

<Table 13> Estimation of Market Timing Ability

Panel A: Treynor-Mazuy Model

	Total Fee ≤1.5		1.5< ≤2.0		2.0< ≤2.5		2.5<	
	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor
α	0.6131** (0.2783)	0.5496* (0.2847)	0.4528 (0.3057)	0.3751 (0.3119)	0.5112* (0.2867)	0.5022* (0.2957)	0.5106* (0.3044)	0.5450* (0.3141)
r_m	0.8463*** (0.0351)	0.8463*** (0.0355)	0.8946*** (0.0386)	0.8947*** (0.0389)	0.8825*** (0.0362)	0.8851*** (0.0369)	0.9256*** (0.0384)	0.9291*** (0.0392)
SMB		0.0639 (0.0479)		0.0784 (0.0525)		0.0264 (0.0498)		-0.0107 (0.0529)
HML		0.0120 (0.0470)		0.0146 (0.0514)		-0.0179 (0.0488)		-0.0336 (0.0518)
r_m^2	-0.0055 (0.0033)	-0.0048 (0.0034)	-0.0013 (0.0036)	-0.0005 (0.0037)	-0.0012 (0.0034)	-0.0006 (0.0035)	-0.0006 (0.0036)	-0.0003 (0.0037)
R-squared	0.892	0.894	0.880	0.884	0.890	0.891	0.888	0.888

Panel B: Henriksson-Merton Model

	Total Fee ≤1.5		1.5< ≤2.0		2.0< ≤2.5		2.5<	
	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor
α	0.7674* (0.4001)	0.7023* (0.4021)	0.4503 (0.4368)	0.3771 (0.4387)	0.5126 (0.4097)	0.4894 (0.4159)	0.4779 (0.4348)	0.4900 (0.4416)
r_m	0.9314*** (0.0629)	0.9239*** (0.0634)	0.9085*** (0.0687)	0.9004*** (0.0692)	0.8958*** (0.0645)	0.8896*** (0.0656)	0.9269*** (0.0684)	0.9230*** (0.0697)
SMB		0.0706 (0.0477)		0.0792 (0.0520)		0.0275 (0.0493)		-0.0097 (0.0524)
HML		0.0108 (0.0473)		0.0141 (0.0516)		-0.0188 (0.0489)		-0.0353 (0.0519)
r_m^+	-0.1491 (0.1170)	-0.1373 (0.1191)	-0.0214 (0.1277)	-0.0091 (0.1299)	-0.0210 (0.1198)	-0.0055 (0.1232)	0.0014 (0.1271)	0.0156 (0.1308)
R-squared	0.890	0.893	0.880	0.884	0.890	0.891	0.888	0.888

Note: Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

거두었을 경우, 해당 조건부 변수를 추정식에 포함하면 비조건부 모형에서 나타났던 초과성과는 사라지게 된다. 이 가능성을 점검하기 위해 <Table 14, 15>에서 조건부 변수 계수의 추정치를 조사하면 신용스프레드항의 계수가 보수가 높은 펀드에서 유의하게 음의 값을 갖는 것으로 추정되었다. 이 점은 보수가 높은

〈Table 14〉 Estimation of Market Timing Ability-Conditional, Treynor-Mazuy Model

	Total Fee ≤1.5		1.5< ≤2.0		2.0< ≤2.5		2.5<	
	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor
α	0.5557* (0.2960)	0.5031 (0.3025)	0.4384 (0.3305)	0.3814 (0.3365)	0.4863 (0.3078)	0.4895 (0.3173)	0.5051 (0.3278)	0.5444 (0.3384)
r_m	0.8398*** (0.0364)	0.8389*** (0.0368)	0.8848*** (0.0407)	0.8846*** (0.0409)	0.8733*** (0.0379)	0.8756*** (0.0386)	0.9174*** (0.0403)	0.9208*** (0.0411)
SMB		0.0669 (0.0483)		0.0849 (0.0537)		0.0318 (0.0506)		-0.0053 (0.0540)
HML		0.0160 (0.0480)		0.0115 (0.0534)		-0.0179 (0.0504)		-0.0331 (0.0537)
r_m^2	-0.0040 (0.0047)	-0.0037 (0.0047)	-0.0004 (0.0052)	0.0001 (0.0053)	-0.0004 (0.0049)	0.0000 (0.0050)	-0.0007 (0.0052)	-0.0003 (0.0053)
r_m× Term Spread	1.0382 (1.5639)	1.2041 (1.5725)	1.6303 (1.7460)	1.8580 (1.7493)	1.5675 (1.6261)	1.6956 (1.6496)	1.5268 (1.7318)	1.5752 (1.7592)
r_m× Credit Spread	-2.7678 (1.6963)	-2.9437* (1.7018)	-2.2181 (1.8938)	-2.4344 (1.8930)	-2.6799 (1.7637)	-2.7433 (1.7852)	-2.7831 (1.8783)	-2.7442 (1.9038)
r_m× Dividend Yield	0.9597 (1.4238)	0.8684 (1.4477)	0.7819 (1.5895)	0.6206 (1.6104)	0.9693 (1.4804)	0.7956 (1.5186)	0.8910 (1.5765)	0.7358 (1.6196)
r_m× Short-term Yield	-0.6340 (1.4848)	-0.7659 (1.4886)	-0.2348 (1.6576)	-0.3958 (1.6558)	-0.5645 (1.5438)	-0.6084 (1.5615)	-0.8918 (1.6441)	-0.8581 (1.6653)
R-squared	0.898	0.900	0.883	0.887	0.895	0.896	0.891	0.892

Note: Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

펀드의 운용에서 펀드매니저들이 보다 적극적으로 시장상황 변동을 반영하였고(이 경우 신용스프레드 상승에 의해 장세 약화가 예상될 경우 베타를 감소시키는 전략), 상대적으로 우수한 성과를 거두었다는 해석과 일치한다. 그러나 반면 'r_m^*× 배당수익률'의 계수 추정치가 유의하게 음의 값으로 추정되었다. 이는 배당수익률 상승으로 시장수익률의 상승이 예상될 때 펀드매니저들이 오히려 베타를 감소시켰다는 의미로서 직관과 어긋난다. 배당수익률의 계수 추정치가 이례적인 부호를 취하는 것은 미국의 연구 결과와 같다(Ferson and Warther[1996]; Edelen [1999]). 미국의 연구자들은 이 현상을 펀드의 투자자금 유출입이 펀드매니저의

〈Table 15〉 Estimation of Market Timing Ability-Conditional, Henriksson-Merton Model

	Total Fee ≤1.5		1.5< ≤2.0		2.0< ≤2.5		2.5<	
	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor
α	0.4934 (0.3750)	0.4782 (0.3791)	0.2941 (0.4097)	0.2810 (0.4132)	0.3514 (0.3876)	0.3640 (0.3936)	0.3269 (0.4142)	0.3565 (0.4195)
r_m	0.8606*** (0.0769)	0.8656*** (0.0776)	0.8756*** (0.0840)	0.8811*** (0.0846)	0.8649*** (0.0794)	0.8643*** (0.0806)	0.9004*** (0.0849)	0.8952*** (0.0859)
SMB		0.0481 (0.0490)		0.0609 (0.0534)		0.0122 (0.0509)		-0.0268 (0.0542)
HML		0.0108 (0.0482)		0.0041 (0.0525)		-0.0233 (0.0500)		-0.0394 (0.0533)
r_m*	-0.0425 (0.1253)	-0.0505 (0.1278)	0.0356 (0.1369)	0.0292 (0.1392)	0.0317 (0.1295)	0.0397 (0.1326)	0.0465 (0.1384)	0.0639 (0.1414)
r_m× Term Spread	0.9801 (2.6534)	0.8748 (2.6806)	1.6392 (2.8987)	1.5441 (2.9216)	1.2826 (2.7421)	1.3595 (2.7829)	1.1262 (2.9302)	1.3175 (2.9661)
r_m× Credit Spread	-4.0108 (2.6544)	-4.0115 (2.6734)	-4.8556* (2.8998)	-4.8557 (2.9136)	-4.9774* (2.7431)	-4.9753* (2.7753)	-5.1363* (2.9314)	-5.1332* (2.9580)
r_m× Dividend Yield	2.8006 (2.1466)	2.5829 (2.1783)	3.6907 (2.3451)	3.3882 (2.3741)	3.1688 (2.2183)	3.0406 (2.2614)	2.9649 (2.3706)	2.9925 (2.4103)
r_m× Short-term Yield	-0.2351 (1.6626)	-0.4750 (1.6924)	-1.0849 (1.8163)	-1.3907 (1.8445)	-1.4288 (1.7182)	-1.4954 (1.7569)	-1.6988 (1.8361)	-1.5725 (1.8726)
r_m*×Term Spread	-1.0478 (3.2887)	-0.5895 (3.3485)	-1.3399 (3.5928)	-0.7982 (3.6495)	-0.5397 (3.3987)	-0.5278 (3.4762)	-0.3617 (3.6319)	-0.7506 (3.7051)
r_m*× Credit Spread	1.4932 (3.4334)	1.3697 (3.4609)	3.3815 (3.7509)	3.2139 (3.7719)	3.3191 (3.5482)	3.2573 (3.5928)	3.6278 (3.7917)	3.6575 (3.8294)
r_m*× Dividend Yield	-5.8709* (3.2125)	-5.3189 (3.2977)	-8.3069** (3.5095)	-7.6774** (3.5941)	-6.0850* (3.3199)	-6.1326* (3.4235)	-5.7814 (3.5477)	-6.3291* (3.6488)
r_m* ×Short-term Yield	-3.5844 (2.9445)	-3.0625 (3.0145)	-2.8089 (3.2167)	-2.1779 (3.2855)	-1.4153 (3.0429)	-1.3632 (3.1295)	-1.1802 (3.2517)	-1.5736 (3.3355)
R-squared	0.907	0.908	0.898	0.900	0.905	0.906	0.901	0.902

Note: Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

운용에 가하는 제약이 있기 때문에 나타나는 왜곡으로 해석하였다. 그 이유가 무엇이든지 조건부 모형의 추정 결과는 깨끗한 해석이 곤란해 보인다.

Ⅳ. 강건성 검증

1. 설정액 기준 가중평균 포트폴리오 사용

기본모형에서 펀드포트폴리오는 펀드 규모와 관계없이 동일한 가중치를 적용하여 구축한 것이다. 이것은 매월 투자자가 펀드규모와 관계없이 동일한 금액을 모든 펀드에 투자한다는 가정이다. 그러나 투자자는 각 펀드의 규모에 비례하여 투자금액을 결정하는 '금액가중평균 포트폴리오(value-weighted portfolio)'를 구성할 수도 있다. 특히, 우수한 운용성과를 지닌 펀드로 자금이 유입되고(Sirri and Tufano[1998]), 그에 따라 우수 펀드의 규모가 상대적으로 큰 경향이 나타날 수 있다. 이 경우 동일가중치 펀드포트폴리오는 금액가중치 포트폴리오에 비하여 펀드투자의 초과성과를 낮게 추정하는 경향이 있게 된다. 과연 이 문제가 존재하는지를 보기 위하여 동일가중치 대신 설정액을 가중치로 하여 펀드포트폴리오를 구성한 뒤 펀드 투자의 초과성과를 재추정하였고, 그 결과를 <Table 16>에 정리하였다. 먼저 순수익률 기준 초과성과 추정치를 보면 동일가중평균에 비하여 다소 상승하였다. 그러나 여전히 CAPM과 3요인 모형의 알파 추정치가 통계적으로 0과 다르지 않았다. 총수익률 기준 초과성과 추정치의 경우에도 동일가중치 포트폴리오의 경우와 질적으로 동일하였다.

2. 펀드별 벤치마크 사용

벤치마크의 설정오류가 심각한 초과성과의 추정 오류로 연결될 수 있는지에 대한 논란은 오랜 기간 지속되어 왔다(Roll [1971]; Lehman and Modest[1987]; Admati et al.[1986]; Conner and Korajczyk[1991]; Grinblatt and Titman[1989]). 펀드의 초과성과 측정과 관련하여 Elton, Gruber, Das, and Hlavka(1993)는 벤치마크의 설정오류가 초과성과 추정에서 심각한 오류를 가져올 수 있다고 주장한 바 있다. 이론적으로는 만일 각 펀드가 지향하고 있는 벤치마크가 다르다면 이 정보를 무시하고 동일한 시장포트폴리오를 사용한 초과성과 추정은 분명히 추정오류를 낳을 수 있는 잠재적 소지가 있다. 그러므로 만일 개별 펀드별 벤치마크에 대한 구체적 정보가 있다면 이를 활용하여 초과성과를 추정하는 것이 타당하다는 논리가 가능하다. 이를 감안하여 추가적인 강건성 검증으로서 펀드별로 사전에 운용 계획서에서

〈Table 16〉 Reestimating Performance of Fund Portfolio: Value-weighted Portfolio

Panel A: Net Return Performance										
	Total Sample		(1) Sample of Funds survived longer than 6 months		(2) Sample of Funds survived longer than 12 months		(3) Sample of Funds survived longer than 24 months		(4) Sample of Funds survived longer than 36 months	
	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor
α	0.2988 (0.2594)	0.3613 (0.2729)	0.2988 (0.2594)	0.3613 (0.2729)	0.2990 (0.2595)	0.3615 (0.2730)	0.3116 (0.2589)	0.3736 (0.2724)	0.3197 (0.2615)	0.3866 (0.2750)
r_m	0.9304*** (0.0380)	0.9335*** (0.0385)	0.9304*** (0.0380)	0.9335*** (0.0385)	0.9302*** (0.0380)	0.9334*** (0.0385)	0.9293*** (0.0379)	0.9324*** (0.0384)	0.9293*** (0.0383)	0.9327*** (0.0388)
SMB		-0.0138 (0.0541)		-0.0138 (0.0541)		-0.0139 (0.0541)		-0.0147 (0.0540)		-0.0189 (0.0545)
HML		-0.0422 (0.0529)		-0.0422 (0.0529)		-0.0422 (0.0529)		-0.0417 (0.0528)		-0.0445 (0.0533)
R-squared	0.880	0.881	0.880	0.881	0.880	0.881	0.880	0.881	0.878	0.879
Panel B: Gross Return Performance										
	Total Sample		(1) Sample of Funds survived longer than 6 months		(2) Sample of Funds survived longer than 12 months		(3) Sample of Funds survived longer than 24 months		(4) Sample of Funds survived longer than 36 months	
	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor
α	0.5016* (0.2600)	0.5640** (0.2736)	0.5016* (0.2600)	0.5641** (0.2736)	0.5023* (0.2601)	0.5647** (0.2736)	0.5176** (0.2595)	0.5795** (0.2731)	0.5273** (0.2621)	0.5942** (0.2756)
r_m	0.9325*** (0.0381)	0.9356*** (0.0386)	0.9325*** (0.0381)	0.9356*** (0.0386)	0.9324*** (0.0381)	0.9355*** (0.0386)	0.9314*** (0.0380)	0.9345*** (0.0385)	0.9314*** (0.0384)	0.9348*** (0.0389)
SMB		-0.0139 (0.0542)		-0.0139 (0.0542)		-0.0140 (0.0542)		-0.0149 (0.0541)		-0.0191 (0.0546)
HML		-0.0421 (0.0530)		-0.0421 (0.0530)		-0.0420 (0.0530)		-0.0416 (0.0529)		-0.0444 (0.0534)
R-squared	0.880	0.881	0.880	0.881	0.880	0.881	0.880	0.881	0.878	0.879

Note: Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

선언한 벤치마크를 시장포트폴리오의 대용치로 하여 추정하였다.

추정 결과는 <Table 17>에 정리하였다. 추정 결과는 KOSPI를 벤치마크로 사용한 기본모형 추정 결과와 대동소이하였다. 모든 존속기간에서 펀드포트폴리오의 초과성과는 0과 다르지 않다는 결과가 얻어졌다. 베타의 추정치는 이전과 비교하여

〈Table 17〉 Reestimating Performance of Fund Portfolio: Against Preannounced Target Benchmark Portfolio

Panel A: Net Return Performance

	Total Sample		(1) Sample of Funds survived longer than 6 months		(2) Sample of Funds survived longer than 12 months		(3) Sample of Funds survived longer than 24 months		(4) Sample of Funds survived longer than 36 months	
	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor
α	0.2461 (0.2489)	0.2732 (0.2611)	0.2370 (0.2486)	0.2655 (0.2609)	0.2209 (0.2485)	0.2500 (0.2608)	0.2250 (0.2507)	0.2588 (0.2632)	0.2158 (0.2537)	0.2516 (0.2664)
r_m	0.9171*** (0.0373)	0.9189*** (0.0377)	0.9187*** (0.0372)	0.9205*** (0.0376)	0.9199*** (0.0372)	0.9218*** (0.0376)	0.9249*** (0.0374)	0.9271*** (0.0379)	0.9315*** (0.0379)	0.9337*** (0.0384)
SMB		0.0413 (0.0517)		0.0383 (0.0517)		0.0381 (0.0516)		0.0337 (0.0521)		0.0324 (0.0527)
HML		-0.0266 (0.0506)		-0.0271 (0.0506)		-0.0275 (0.0506)		-0.0301 (0.0510)		-0.0313 (0.0516)
R-squared	0.881	0.882	0.881	0.883	0.882	0.883	0.882	0.883	0.880	0.882

Panel B: Gross Return Performance

	Total Sample		(1) Sample of Funds survived longer than 6 months		(2) Sample of Funds survived longer than 12 months		(3) Sample of Funds survived longer than 24 months		(4) Sample of Funds survived longer than 36 months	
	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor	CAPM	3 Factor
α	0.4386* (0.2495)	0.4655* (0.2617)	0.4299* (0.2492)	0.4582* (0.2615)	0.4149* (0.2491)	0.4437* (0.2614)	0.4255* (0.2513)	0.4592* (0.2638)	0.4207 (0.2543)	0.4565* (0.2670)
r_m	0.9192*** (0.0373)	0.9210*** (0.0377)	0.9208*** (0.0373)	0.9226*** (0.0377)	0.9220*** (0.0373)	0.9238*** (0.0377)	0.9269*** (0.0375)	0.9291*** (0.0380)	0.9335*** (0.0380)	0.9358*** (0.0385)
SMB		0.0416 (0.0518)		0.0386 (0.0518)		0.0383 (0.0518)		0.0337 (0.0522)		0.0323 (0.0529)
HML		-0.0265 (0.0508)		-0.0269 (0.0507)		-0.0273 (0.0507)		-0.0300 (0.0512)		-0.0313 (0.0518)
R-squared	0.881	0.882	0.881	0.883	0.882	0.883	0.882	0.883	0.880	0.882

Note: Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

모든 표본에서 다소 상승하였지만 특기할 만한 정도는 아니다. 이 점은 과연 펀드들이 운용계획서에서 선언한 벤치마크를 충실히 지키고 있는지에 의문을 제기한다. Sensoy(2009)에 의하면, 미국 펀드의 경우 운용계획서에서 선언한 벤치마크를

실제로 따르지 않는 예가 적지 않은데, 우리나라도 이 가능성이 없지 않은 것으로 보인다.

3. 운용스타일별 추정

유사한 문제로서 운용스타일별로 펀드를 구분하여 성과를 추정하는 것이 보다 정확한 추정방법이라는 비판이 있을 수 있다. 이를 감안하여 전체 펀드그룹을 공격형 운용펀드(주식편입비중 80% 이상)와 성장형 운용펀드(주식편입비중 60~80%)로 구분하여 두 그룹의 초과성과를 각각 추정하였다. 추정 결과는 <Table 18>과 <Table 19>에 정리하였다. 순수익률을 기준으로 할 경우 유의한 양의 초과성과가 발견되지 않는 반면, 총수익률 기준 추정에서는 유의한 양의 초과성과가 나타나는 점은 전체 펀드를 대상으로 한 추정 결과와 다르지 않다. 다만, 성장형 펀드의 일부에서 순수익률 기준 추정에서도 양의 초과성과가 나타난다.

V. 결 론

본 논문은 2002년 1월에서 2008년 12월까지 존재한 국내 주식형 펀드를 대상으로 하여 투자성과를 평가하고 마켓타이밍 능력의 존재 여부를 검토하였다. 주요 분석 결과는 다음과 같다. 첫째, 모든 투자비용을 공제한 순수익률 기준 펀드의 초과성과는 0과 다르지 않았다. 둘째, 투자비용이 공제되기 이전 총수익률 기준 펀드의 초과성과는 통계적으로 유의하게 0을 상회하였다. 연율로 환산할 경우 국내 주식형 펀드는 평균적으로 연 5.2%의 초과성과를 거두는 것으로 추정되었다. 셋째, 보수수준별로 전체 펀드를 4그룹으로 나누고 총수익률 기준 펀드 투자성과를 평가한 결과, 양의 초과성과는 보수가 높은 두 그룹에 기인한 것으로 나타났다. 넷째, 보수수준이 높은 그룹에서 발견된 양의 초과성과를 Treynor and Mazuy(1966)와 Henriksson and Merton (1981)의 방법에 따라 마켓타이밍 능력과 주식선별능력으로 구분하는 추정을 실시하였으나, 추정 결과는 일의적인 해석이 곤란하였다.

이상의 분석 결과는 일단 Grossman and Stiglitz(1980)가 상정한 정보비용이 존재하는 효율적 시장가설과 일치한다. 보수를 펀드산업이 정보를 생산하기 위하여 지출하는 정보비용으로 해석할 때, 보수가 높은 펀드일수록 정보우위에 기인한 높은 초과성과(총수익률 기준 양의 초과성과)가 기대된다. 그러나 이 초과성과는 보수를 공제할 때 사라진다(순수익률 기준 0의 초과성과). 그러나 보수가 높은 펀드의 초과성과 창출요인이 밝혀지지 않았으므로 이 해석의 타당성에 대한

〈Table 18〉 Reestimating Performance of Fund Portfolio: by Investment Style
(Aggressive Type – Equity Holding 80% over)

Panel A: Net Return Performance

	Total Sample		(1) Sample of Funds survived longer than 6 months		(2) Sample of Funds survived longer than 12 months		(3) Sample of Funds survived longer than 24 months		(4) Sample of Funds survived longer than 36 months	
	CAPM	3Factor	CAPM	3Factor	CAPM	3Factor	CAPM	3Factor	CAPM	3Factor
α	0.2472 (0.2357)	0.2746 (0.2484)	0.2383 (0.2359)	0.2672 (0.2487)	0.2245 (0.2365)	0.2543 (0.2492)	0.2399 (0.2395)	0.2799 (0.2524)	0.2370 (0.2415)	0.2792 (0.2545)
r_m	0.9006*** (0.0345)	0.9018*** (0.0350)	0.9021*** (0.0345)	0.9034*** (0.0351)	0.9035*** (0.0346)	0.9048*** (0.0352)	0.9129*** (0.0351)	0.9148*** (0.0356)	0.9183*** (0.0354)	0.9203*** (0.0359)
SMB		0.0151 (0.0492)		0.0125 (0.0493)		0.0122 (0.0494)		0.0030 (0.0500)		0.0010 (0.0504)
HML		-0.0221 (0.0482)		-0.0227 (0.0482)		-0.0234 (0.0483)		-0.0290 (0.0489)		-0.0302 (0.0493)
R-squared	0.893	0.893	0.893	0.893	0.893	0.893	0.892	0.893	0.892	0.892

Panel B: Gross Return Performance

	Total Sample		(1) Sample of Funds survived longer than 6 months		(2) Sample of Funds survived longer than 12 months		(3) Sample of Funds survived longer than 24 months		(4) Sample of Funds survived longer than 36 months	
	CAPM	3Factor	CAPM	3Factor	CAPM	3Factor	CAPM	3Factor	CAPM	3Factor
α	0.4409* (0.2363)	0.4680* (0.2490)	0.4324* (0.2365)	0.4610* (0.2493)	0.4196* (0.2370)	0.4492* (0.2498)	0.4412* (0.2401)	0.4810* (0.2530)	0.4430* (0.2421)	0.4851* (0.2552)
r_m	0.9026*** (0.0346)	0.9038*** (0.0351)	0.9042*** (0.0346)	0.9054*** (0.0352)	0.9055*** (0.0347)	0.9068*** (0.0352)	0.9149*** (0.0351)	0.9168*** (0.0357)	0.9202*** (0.0354)	0.9223*** (0.0360)
SMB		0.0153 (0.0493)		0.0127 (0.0494)		0.0123 (0.0495)		0.0029 (0.0501)		0.0008 (0.0506)
HML		-0.0219 (0.0483)		-0.0225 (0.0483)		-0.0232 (0.0484)		-0.0289 (0.0490)		-0.0301 (0.0495)
R-squared	0.893	0.893	0.893	0.893	0.893	0.893	0.892	0.893	0.892	0.892

Note: Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

결론적 언명은 추가 연구를 필요로 한다. 미국의 연구 결과와 마찬가지로 전통적인 방법의 마켓타이밍과 주식선별능력 판별로는 이에 대한 만족스러운 실증 결과를 도출할 수 없었다. 이 점이 본 논문의 주요 한계이자 향후 연구방향이라고 하겠다.

〈Table 19〉 Reestimating Performance of Fund Portfolio: by Investment Style
(Growth Type – Equity Holding 60~80%)

Panel A: Net Return Performance

	Total Sample		(1) Sample of Funds survived longer than 6 months		(2) Sample of Funds survived longer than 12 months		(3) Sample of Funds survived longer than 24 months		(4) Sample of Funds survived longer than 36 months	
	CAPM	3Factor	CAPM	3Factor	CAPM	3Factor	CAPM	3Factor	CAPM	3Factor
α	0.3647 (0.2404)	0.3201 (0.2503)	0.3612 (0.2402)	0.3152 (0.2501)	0.3411 (0.2393)	0.2920 (0.2490)	0.4028* (0.2353)	0.3470 (0.2455)	0.4015* (0.2406)	0.3477 (0.2511)
r_m	0.9192*** (0.0352)	0.9170*** (0.0354)	0.9185*** (0.0352)	0.9162*** (0.0354)	0.9193*** (0.0351)	0.9169*** (0.0352)	0.8959*** (0.0345)	0.8934*** (0.0348)	0.9127*** (0.0353)	0.9103*** (0.0355)
SMB		0.0607 (0.0497)		0.0604 (0.0496)		0.0621 (0.0494)		0.0457 (0.0487)		0.0490 (0.0498)
HML		0.0240 (0.0507)		0.0251 (0.0506)		0.0272 (0.0504)		0.0357 (0.0497)		0.0334 (0.0508)
R-squared	0.894	0.896	0.894	0.896	0.895	0.897	0.893	0.894	0.892	0.894

Panel B: Gross Return Performance

	Total Sample		(1) Sample of Funds survived longer than 6 months		(2) Sample of Funds survived longer than 12 months		(3) Sample of Funds survived longer than 24 months		(4) Sample of Funds survived longer than 36 months	
	CAPM	3Factor	CAPM	3Factor	CAPM	3Factor	CAPM	3Factor	CAPM	3Factor
α	0.5382** (0.2409)	0.4935* (0.2507)	0.5347** (0.2407)	0.4886* (0.2505)	0.5147** (0.2398)	0.4656* (0.2494)	0.5818** (0.2357)	0.5263** (0.2459)	0.5788** (0.2411)	0.5253** (0.2515)
r_m	0.9210*** (0.0353)	0.9188*** (0.0355)	0.9202*** (0.0353)	0.9180*** (0.0355)	0.9211*** (0.0352)	0.9187*** (0.0353)	0.8973*** (0.0345)	0.8948*** (0.0348)	0.9142*** (0.0353)	0.9118*** (0.0356)
SMB		0.0616 (0.0498)		0.0614 (0.0497)		0.0631 (0.0495)		0.0464 (0.0488)		0.0497 (0.0499)
HML		0.0238 (0.0508)		0.0250 (0.0507)		0.0270 (0.0505)		0.0354 (0.0498)		0.0331 (0.0509)
R-squared	0.894	0.896	0.894	0.896	0.894	0.897	0.893	0.894	0.892	0.894

Note: Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

참 고 문 헌

박영규, 「펀드 투자자와 펀드매니저의 투자행태에 관한 연구」, 『재무연구』, 제18권 제1호, 2005, pp.31~67.

박영규 · 장욱, 「국내 주식형 펀드시장에 대한 성과평가연구」, 『증권학회지』, 제29권, 2001, pp.117~143.

박창균 · 임경묵, 『자본시장 발전을 위한 정책과제: 장기채권시장과 자산운용업을 중심으로』, 연구보고서 2004-16, 한국개발연구원, 2004.

유시용 · 황승규, 「국내 펀드시장에서 투자주체별 펀드선정능력에 관한 연구」, 재무금융 공동심포지엄 발표자료, 2009.

최종범 · 박영규 · 이종달 · 최영목, 「조건부 성과평가 모형을 이용한 국내 주식형 펀드의 성과 지속성 검증에 관한 연구」, 증권학회 정기학술발표회, 2005.

Admati, R. A., S. Bhattacharya, P. Pfleiderer, and S. A. Ross, "On Timing and Selectivity," *Journal of Finance*, Vol. 41, No. 3, 1986, pp.715~730.

Carhart, M., "On The Persistence of Mutual Fund Performance," *Journal of Finance*, Vol. 52, No. 1, 1997, pp.57~82.

Carhart, M., J. N. Carpenter, A. N. Lynch, and D. K. Musto, "Mutual Fund Survivorship," *Review of Financial Studies*, Vol. 15, No. 5, 2002, pp.1439~1463.

Chang, E. C. and W. G. Lewellen, "Market Timing and Mutual Fund Investment Performance," *Journal of Business*, Vol. 57, No. 1, 1984, pp.57~72.

Chen, H. L., N. Jegadeesh, and R. Wermers, "The Value of Active Mutual Fund Management: An Examination of The Stockholdings and Trades of Fund Managers," *Journal of Financial and Quantitative Analysis*, Vol. 35, No. 3, 2000, pp.343~368.

Chen, Joseph, Harrison Hong, Ming Huang, and Jeffrey Kubik, "Does Fund Size Erode Performance? The Role of Liquidity, Organization," *American Economic Review*, Vol. 94, No. 5, 2004, pp.1276~1302.

Chevalier, J. and G. Ellison, "Risk Taking by Mutual Funds as a Response to Incentives," *Journal of Political Economy*, Vol. 105, No. 6, 1997, pp.1167~1200.

Chevalier, J. and G. Ellison, "Career Concerns of Mutual Fund Managers," *Quarterly Journal of Economics*, Vol. 114, No. 2, 1999, pp.389~432.

Conner, G. and R. Korajczyk, "The Attributes Behavior and Performance of U.S. Mutual Funds," *Review of Quantitative Finance and Accounting,* Vol. 1, No. 1, 1991, pp.4~25.

Edelen, R. M., "Investor Flows and The Assessed Performance of Open-end Mutual Funds," *Journal of Financial Economics*, Vol. 53, Issue 3, 1999, pp.439~466.

Elton, E. J., M. J. Gruber, S. Das, and M. Hlavka, "Efficiency with Costly Information: A Reinterpretation of Evidence from Managed Portfolios," *Review of Financial Studies*, Vol. 6, No. 1, 1993, pp.1~22.

Fama, E. and K. French, "Common Risk Factors in The Returns on Bonds and Stocks," *Journal of financial Economics*, Vol. 33, No. 1, 1993, pp.3~56.

Ferson, W. E., "Tests of Multifactor Pricing Models, Volatility Bounds and Portfolio Performance," Ch. 12, in G. M. Constantinides, M. Harris, and R. M. Stulz (eds.), *Handbook of the Economics of Finance*, Elsevier, North Holland, 2003.

Ferson, W. E. and R. Schadt, "Measuring Fund Strategy and Performance in Changing Economic Conditions," *Journal of Finance*, Vol. 51, No. 2, 1996, pp.425~461.

Ferson, W. E. and V. A. Warther, "Evaluating Fund Performance in a Dynamic Market," *Financial Analysts Journal*, Vol. 52, No. 6, 1996, pp.20~28.

Ferris, S. P. and X. Yan, "Agency Costs, Governance, and Organizational Forms: Evidence from the Mutual Fund Industry," *Journal of Banking & Finance*, Vol. 33, 2009, pp.619~626.

Gaspar, J. M., M. Massa, and P. Matos, "Favoritism in Mutual Fund Families? Evidence on Strategic Cross-Fund Subsidization," *Journal of Finance*, Vol. 61, No. 1, 2006, pp.73~104.

Glosten, L. and R. Jagannathan, "A Contingent Claims Approach to Performance Evaluation," *Journal of Empirical Finance*, Vol. 1, 1994, pp.133~166.

Grinblatt, M. and S. Titman, "Portfolio Performance Evaluation: Old Issues and Insights," *Review of Financial Studies*, Vol. 2, No. 3, 1989, pp.393~421.

Grossman, S. J., "On the Efficiency of Competitive Stock Markets Where Traders Have Diverse Information," *Journal of Finance*, Vol. 31, No. 2, 1976, pp.573~585.

Grossman, S. J. and J. E. Stiglitz, "On the Impossibility of Informationally Efficient Markets," *American Economic Review*, Vol. 70, No. 3, 1980, pp.393~408.

Gruber, M. J., "Another Puzzle: The Growth in Actively Managed Mutual Funds," *Journal of Finance*, Vol. 51, No. 3, 1996, pp.783~810.

Henriksson, R. D., "Market Timing and Mutual Fund Performance: An Empirical Investigation," *Journal of Business*, Vol. 57, No. 1, Part 1, 1984, pp.73~96.

Henriksson, R. and R. Merton, "On Market Timing and Investment Performance II: Statistical Procedures for Evaluating Forecasting Skills," *Journal of Business*, Vol. 54, No. 4, 1981, pp.513~533.

Ippolito, R. A., "Efficiency with Costly Information: A Study of Mutual Fund Performance, 1965-1984," *Quarterly Journal of Economics*, Vol. 104, No. 1, 1989, pp.1~23.

Jagannathan, R. and R. Korajczyk, "Assessing the Market Timing Performance of Managed Portfolios," *Journal of Business*, Vol. 59, 1986, pp.217~236

Jensen, M. C., "The Performance of Mutual Funds in The Period 1945-1964," *Journal of Finance*, Vol. 23, No. 2, 1968, pp.389~416.

Jiang, G. J., T. Yao, and T. Yu, "Do Mutual Funds Time The Market? Evidence from Portfolio Holdings," *Journal of Financial Economics*, Vol. 86, Issue 3, 2007, pp.724~758.

Lakonishok, J., A. Shleifer, R. Thaler, and R. W. Vishny, "Window Dressing by Pension Fund Managers," *American Economic Review*, Vol. 81, No. 2, 1991, pp.227~231.

Lehman, B. and D. Modest, "Mutual Fund Performance Evaluation: A Comparison of Benchmarks and Benchmark Comparisons," *Journal of Finance*, Vol. 42, No. 2, 1987, pp.233~265.

Malkiel, B. G., "Returns from Investing in Equity Mutual Funds 1971 to 1991," *Journal of Finance*, Vol. 50, No. 2, 1995, pp.549~572.

Nanda, Z. Vikram, Jay Wang, and Lu Zheng, "Family Values and the Star Phenomenon: Strategies of Mutual Fund Families," *Review of Financial Studies*, Vol. 17, 2004, pp.667~698.

Pastor, L. and R. F. Stambaugh, "Mutual Fund Performance and Seemingly Unrelated Assets," *Journal of Financial Economics*, Vol. 63, Issue 3, 2002, pp.315~349.

Roll, R., "Sensitivity of Performance Measurement Index Choice Commonly Used Indices," Working Paper, University of California, 1971.

Sensoy, B., "Performance Evaluation and Self-designated Benchmark Indexes in the Mutual Fund Industry," *Journal of Financial Economics*, Vol. 92, 2009, pp.25~39.

Sirri, E. R. and P. Tufano, "Costly Search and Mutual Fund Flows," *Journal of Finance*, Vol. 53, No. 5, 1998, pp.1589~1622.

Treynor, J. L. and K. K. Mazuy, "Can Mutual Funds Outguess The Market," *Harvard Business Review*, Vol. 44, Issue 4, 1996, pp.131~136.

<Appendix>

〈Table A-1〉 Net Return Performance of Fund Portfolio: Conditional Models – Alternative Specification

	Total Sample	(1) Sample of Funds survived longer than 6 months	(2) Sample of Funds survived longer than 12 months	(3) Sample of Funds survived longer than 24 months	(4) Sample of Funds survived longer than 36 months
α	0.3108 (0.2895)	0.2973 (0.2904)	0.2758 (0.2911)	0.2871 (0.2944)	0.2869 (0.2974)
r_m	0.8838*** (0.0422)	0.8859*** (0.0423)	0.8877*** (0.0424)	0.8968*** (0.0429)	0.9019*** (0.0433)
SMB	0.0136 (0.0589)	0.0114 (0.0591)	0.0120 (0.0593)	0.0019 (0.0599)	-0.0005 (0.0605)
HML	-0.0193 (0.0542)	-0.0196 (0.0544)	-0.0198 (0.0545)	-0.0240 (0.0551)	-0.0244 (0.0557)
r_m× Term Spread	1.4446 (1.8869)	1.4008 (1.8928)	1.3849 (1.8972)	1.3387 (1.9183)	1.3482 (1.9383)
r_m× Credit Spread	-2.7044 (1.9050)	-2.6064 (1.9109)	-2.5841 (1.9153)	-2.6842 (1.9366)	-2.5967 (1.9568)
r_m× Dividend Yield	0.5304 (1.7649)	0.5772 (1.7704)	0.6061 (1.7745)	0.5935 (1.7942)	0.6302 (1.8129)
r_m× Short-term Yield	-0.8390 (1.4168)	-0.7856 (1.4212)	-0.7974 (1.4245)	-0.9756 (1.4403)	-0.8722 (1.4553)
SMB × Term Spread	-0.4771 (1.9708)	-0.5301 (1.9769)	-0.5557 (1.9815)	-0.7193 (2.0036)	-0.8039 (2.0244)
SMB × Credit Spread	0.7389 (2.2330)	0.6422 (2.2399)	0.5381 (2.2451)	0.3963 (2.2701)	0.2840 (2.2937)
SMB × Dividend Yield	0.1150 (2.3258)	-0.0049 (2.3330)	-0.1095 (2.3384)	-0.1398 (2.3644)	-0.2030 (2.3890)
SMB × Short-term Yield	0.6538 (2.4479)	0.5249 (2.4555)	0.3926 (2.4612)	0.1846 (2.4886)	0.0246 (2.5145)
HML × Term Spread	-0.6257 (2.2450)	-0.6145 (2.2519)	-0.5741 (2.2572)	-0.6047 (2.2823)	-0.6183 (2.3060)
HML× Credit Spread	0.1537 (2.2804)	0.1960 (2.2875)	0.1312 (2.2928)	0.1976 (2.3183)	0.0909 (2.3424)
HML × Dividend Yield	-1.0752 (2.5830)	-1.0231 (2.5911)	-1.0176 (2.5971)	-1.0994 (2.6259)	-1.2204 (2.6533)
HML× Short-term Yield	-1.4657 (2.7889)	-1.3801 (2.7976)	-1.4148 (2.8041)	-1.3422 (2.8352)	-1.4766 (2.8648)
R-squared	0.899	0.898	0.898	0.897	0.897

Note: Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

〈Table A-2〉 Gross Return Performance of Fund Portfolio: Conditional Models – Alternative Specification

	Total Sample	(1) Sample of Funds survived longer than 6 months	(2) Sample of Funds survived longer than 12 months	(3) Sample of Funds survived longer than 24 months	(4) Sample of Funds survived longer than 36 months
α	0.5029*	0.4898*	0.4695	0.4872	0.4915
	(0.2902)	(0.2911)	(0.2918)	(0.2950)	(0.2982)
r_m	0.8857***	0.8879***	0.8897***	0.8986***	0.9036***
	(0.0423)	(0.0424)	(0.0425)	(0.0430)	(0.0434)
SMB	0.0138	0.0116	0.0122	0.0018	-0.0007
	(0.0591)	(0.0593)	(0.0594)	(0.0601)	(0.0607)
HML	-0.0191	-0.0194	-0.0197	-0.0239	-0.0243
	(0.0544)	(0.0545)	(0.0547)	(0.0553)	(0.0558)
r_m× Term Spread	1.4547	1.4112	1.3952	1.3543	1.3649
	(1.8914)	(1.8972)	(1.9014)	(1.9228)	(1.9430)
r_m× Credit Spread	-2.7065	-2.6088	-2.5877	-2.6948	-2.6090
	(1.9095)	(1.9153)	(1.9196)	(1.9411)	(1.9616)
r_m× Dividend Yield	0.5420	0.5886	0.6165	0.6130	0.6517
	(1.7691)	(1.7745)	(1.7784)	(1.7984)	(1.8173)
r_m× Short-term Yield	-0.8332	-0.7801	-0.7930	-0.9713	-0.8671
	(1.4202)	(1.4245)	(1.4277)	(1.4437)	(1.4589)
SMB × Term Spread	-0.4823	-0.5347	-0.5602	-0.7191	-0.8031
	(1.9755)	(1.9816)	(1.9859)	(2.0083)	(2.0294)
SMB × Credit Spread	0.7433	0.6468	0.5435	0.4007	0.2869
	(2.2383)	(2.2451)	(2.2501)	(2.2754)	(2.2993)
SMB × Dividend Yield	0.1077	-0.0121	-0.1161	-0.1445	-0.2086
	(2.3313)	(2.3384)	(2.3436)	(2.3700)	(2.3949)
SMB × Short-term Yield	0.6519	0.5232	0.3918	0.1855	0.0260
	(2.4538)	(2.4613)	(2.4667)	(2.4944)	(2.5207)
HML × Term Spread	-0.6234	-0.6123	-0.5716	-0.5949	-0.6067
	(2.2503)	(2.2572)	(2.2622)	(2.2876)	(2.3117)
HML× Credit Spread	0.1617	0.2032	0.1385	0.2063	0.0984
	(2.2858)	(2.2928)	(2.2979)	(2.3237)	(2.3482)
HML × Dividend Yield	-1.0697	-1.0180	-1.0128	-1.0948	-1.2161
	(2.5892)	(2.5971)	(2.6028)	(2.6321)	(2.6598)
HML× Short-term Yield	-1.4658	-1.3813	-1.4155	-1.3366	-1.4710
	(2.7956)	(2.8041)	(2.8103)	(2.8419)	(2.8718)
R-squared	0.899	0.898	0.898	0.897	0.897

Note: Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

韓國開發研究
제32권 제1호(통권 제106호)

실업급여 지급기간 변화의 효과 분석

문 외 솔
(삼성경제연구소 수석연구원)

The Effect of the Extended Benefit Duration on the Aggregate Labor Market

Weh-Sol Moon
(Research Fellow, Samsung Economic Research Institute)

* 본 논문에 대해 유익하고 세밀한 논평을 해주신 두 분의 검토자께 깊은 감사를 드린다. 여타의 오류들이 있다면 이것은 필자의 책임이다. 본 연구내용은 필자의 개인 의견이며, 삼성경제연구소의 공식 견해와는 무관하다.

** 문외솔: (e-mail) slmn@seri.org, (address) Samsung Economic Research Institute, 1321-15 Seocho, Seochogu, Seoul, Korea

• Key Word: 매칭모형(Search and Matching), 실업급여(Unemployment Insurance Benefits), 실업(Unemployment), 비경제활동(Nonparticipation)
• JEL code: E24, J64, J65, J68
• Received: 2009. 9. 18 • Referee Process Started: 2009. 9. 19
• Referee Reports Completed: 2010. 2. 19

ABSTRACT

I develop a matching model in which risk-averse workers face borrowing constraints and make a labor force participation decision as well as a job search decision. A sharp distinction between unemployment and out of the labor force is made: those who look for work for a certain period but find no job are classified as the unemployed and those who do not look for work are classified as those out of the labor force. In the model, the job search decision consists of two steps. First, each individual who is not working obtains information about employment opportunities. Second, each individual who decides to search has to take costly actions to find a job. Since individuals differ with respect to asset holdings, they have different reservation job-finding probabilities at which an individual is indifferent between searching and not searching. Individuals, who have large asset holdings and thereby are less likely to participate in the labor market, have high reservation job-finding probability, and they are less likely to search if they have less quality of information. In other words, if individuals with large asset holdings search for job, they must have very high quality of information and face very high actual job-finding probability. On the other hand, individuals with small asset holdings have low reservation job-finding probability and they are likely to search for less quality of information. They face very low actual job-finding probability and seem to remain unemployed for a long time. Therefore, differences in the quality of information explain heterogeneous job search decisions among individuals as well as higher job finding probability for those who reenter the labor market than for those who remain in the labor force.

The effect of the extended maximum duration of unemployment insurance benefits on the aggregate labor market and the labor market flows is investigated. The benchmark benefit duration is set to three months. As maximum benefit duration is extended up to six months, the employment-population ratio decreases while the unemployment rate increases because individuals who are eligible for benefits have strong incentives to remain unemployed and decide to search even if they obtain less quality of information, which leads to low job-finding probability and then high unemployment rate. Then, the vacancy-unemployment ratio decreases and, in turn, the job-finding probability for both the unemployed and those out of the labor force decrease. Finally, the outflow from nonparticipation decreases with benefit duration because the equilibrium job-finding probability decreases. As the job-finding probability decreases, those who are out of the labor force are less likely to search for the same quality of information.

ABSTRACT

I also consider the matching model with two states of employment and unemployment. Compared to the results of the two-state model, the simulated effects of changes in benefit duration on the aggregate labor market and the labor market flows are quite large and significant.

본고에서는 노동자들이 위험 기피적이고 차입제약을 갖는 Mortensen-Pissarides (1994) 매칭모형에 경제활동참여 의사결정을 내생화하여 실업급여 지급기간 변화가 노동시장에 미치는 영향을 분석하였다. 모형의 실업은 구직활동을 하였으나 일자리를 찾지 못한 상태로 정의하고, 비경제활동은 비구직활동으로 정의한다. 경제활동참여 의사결정을 내생화하기 위하여 개별 노동자들이 노동시장으로부터 서로 다른 정확성을 갖는 정보를 관찰하고, 이러한 정보가 개별 구직확률에 영향을 준다고 가정한다. 개별 경제주체들의 자산보유규모가 서로 다르기 때문에 구직활동을 하는 것과 하지 않는 것을 무차별하게 만드는 의중구직확률 또한 서로 다르다. 따라서 자신이 관찰한 정보의 정확성이 충분히 높아서 실제 구직확률이 자신의 의중구직확률보다 높은 사람들은 구직활동을 선택하게 된다.

이러한 모형을 바탕으로 실업급여 지급기간 3개월을 벤치마크로 하여 지급기간을 각각 4개월부터 6개월까지 연장할 때 전체 노동시장 및 경제활동상태 간 노동자들의 이동비율에 미치는 효과는 다음과 같다. 첫째, 실업급여 지급기간의 연장은 취업자들의 근속기간을 늘리는데, 근속기간이 늘어나면 취업자들의 예비적 동기에 의한 저축이 늘어나고, 저축에 따른 자산보유규모의 증가는 노동의 한계비용을 증가시켜 노동시장에서 이탈할 유인을 제공한다. 따라서 경제활동참가율을 떨어뜨린다. 둘째, 실업급여 지급기간이 늘어날 때 실업급여 수급자격을 갖춘 경제주체들의 의중구직확률은 떨어지고 실업상태에 남을 확률은 높아져 실업자 수가 증가한다. 따라서 실업률이 상승한다. 셋째, 실업자 수의 증가는 균형 공석-실업비율을 감소시켜 경제 전체의 구직확률을 낮추게 되며, 이는 차례로 비경제활동상태에 있는 사람들의 경제활동참여를 저해하는 효과를 야기한다. 이러한 결과는 비경제활동을 고려하지 않았을 때에는 나타나지 않는 현상이다.

Ⅰ. 서 론

본 연구의 목적은 노동시장의 중요한 정책 가운데 하나인 실업급여 지급기간의 변화가 노동시장에 어떠한 효과를 미치는지 분석하는 것이다. 특정 경제정책의 효과를 예측하는 것은 정책 수립단계에서 매우 중요한 사안이지만, 경제정책의 특성상 기존에 수행된 유사한 정책이 없거나 있다고 하더라도 관련 자료가 미비할 경우 정책의 효과를 예측하는 것은 불가능하다. 물론 표본을 선정하여 특정 정책을 시험적으로 시행하여 그 효과를 살펴보는 것도 가능하지만 상당한 비용을 지불해야 하는 경우가 많다. 따라서 정책의 효과를 예측하기 위한 가장 용이한 방법은, 현실을 설명하는 모형을 수립하고 수립된 모형을 바탕으로 모의실험을 수행하여 정책의 효과를 간접적으로 살펴보는 것이다.

본 연구는 최근 몇몇 연구에서 제기되고 있는 고용조정의 유연성 제고와 고용안정성 확보 사이의 조화와 관련하여 주로 고용 안정성 문제에 초점을 맞추고 있다.[1] 노동시장이 경쟁적이고 고용조정에 대해 기업이 비용을 부담하지 않는 상황에서 고용 안정성 확보는 노동시장의 매우 중요한 문제가 될 수 있다. 따라서 본 연구는 Mortensen and Pissarides(1994) 매칭모형을 사용하여 실업급여 지급기간 연장과 같은 고용 안정성 확보정책이 노동시장에 미치는 영향을 분석한다. 노동자는 취업자, 실업자 또는 비경제활동인구로 구분할 수 있으며, 위험 기피적이고 차입제약을 갖는다. 노동시장정책이 경제활동과 비경제활동 사이의 유출입에 상당한 영향을 줄 수 있는 만큼 본 연구에서는 기본적인 Mortensen-Pissarides 매칭모형에 비경제활동을 도입하였다. 한편, 매칭을 이룬 기업과 노동자 사이의 생산성은 시간에 따라 변화한다고 가정하여 생산성이 일정 수준(임계값) 아래로 떨어지면 고용관계가 종료된다.

비경제활동은 다음과 같이 모형화된다. 비경제활동을 비구직활동으로 정의하고, 실업을 구직활동 결과 일자리를 얻지 못한 상태로 정의한다.[2] 따라서 노동자들은 매칭이 이루어진 이후 경제활동 상태가 결정된다. 한편, 고용기회를 얻지 못한 사람들은 노동시장으로부터 취업가능성에 대한 정보를 획득하게 되는데, 상대적으로 정확한 정보를 획득한 사람이 더 높은 구직확률을 갖는다고 가정한다. 이러한 정보 정확성의 이질성은 개별 노동자들의 구직확률 차이를 설명하려는

1) 최근의 연구로는 김용성(2008)이 있다.
2) 구직활동 결과 일자리를 얻은 사람은 취업자로 구분된다.

시도이다. 실업을 위와 같이 정의하고 정보의 정확성을 모형에 도입하면 비경제활동으로부터 고용으로 직접 이동하는 사람들을 관찰할 수 있다. 지난달 비경제활동상태에 있었던 노동자가 이번 달 노동시장으로부터 정보를 획득하고 구직활동을 선택하여 일자리를 얻은 경우가 바로 그 예라고 할 수 있다.[3)]

본 연구는 실업급여 지급기간 3개월을 벤치마크로 하여 지급기간이 각각 4개월부터 6개월까지 연장되는 경우를 분석하였다. 비경제활동이 모형에 도입되면 노동시장참여 의사결정이 자산보유규모에 의해 내생적으로 결정되는데, 이는 유보임금(의중임금)이 자산보유규모에 의해 결정되기 때문이다. 모형의 경제주체들은 노동시장 관련 정보를 관찰한 후 구직활동 여부를 결정한다. 상대적으로 정확하고 신뢰할 만한 정보를 관찰한 사람은 높은 구직확률로 일자리를 얻는다. 개별 경제주체는 자산보유규모에 따라 서로 다른 의중구직확률(reservation job-finding probability)을 갖고 있으므로 자신의 의중구직확률보다 높은 확률로 일자리를 얻을 수 있다고 예상할 때 구직활동을 선택하고 그렇지 못할 때 구직활동을 포기하게 된다. 따라서 개별 경제주체가 관찰하는 상이한 정보의 정확성은 이들의 구직활동 의사결정에 중요한 영향을 미치게 된다.

일반적으로 자산을 많이 보유한 사람의 의중구직확률은 높고, 자산을 적게 보유한 사람의 의중구직확률은 낮다. 자산을 많이 보유한 사람은 상대적으로 매우 정확한 정보를 관찰할 때에만 구직활동을 선택하고, 구직활동을 선택했다면 매우 높은 확률로 일자리를 얻게 된다. 한편, 자산을 적게 보유한 사람은 상대적으로 낮은 정도의 정확성을 갖는 정보를 관찰했을 때에도 구직활동을 선택하게 되는데, 그렇기 때문에 구직활동을 선택했을 때 일자리를 얻을 확률은 낮다. 이러한 모형은 노동시장에서 흔히 관찰되는 비경제활동으로부터 고용으로의 이동을 설명할 수 있다는 장점을 갖는다. 자산을 많이 보유하여 비경제활동을 선택한 사람이 매우 높은 정확성을 갖는 정보를 관찰했다면 구직활동을 선택하게 되고, 이는 높은 구직확률로 이어지기 때문에 비경제활동으로부터 고용으로의 이동이 가능해진다.[4)]

이러한 모형에서 실업급여 지급기간이 연장되면 취업자들은 실업급여 수급자격

3) 통계청『경제활동인구조사』의 실업자는 '현재 일자리를 갖고 있지 않으나 일할 의사가 있고 지난 4주간 적극적으로 구직활동을 한 사람'이다. 이는 지난 4주간 구직활동을 하였음에도 불구하고 현재 일자리를 얻지 못한 상태라고 볼 수 있다.

4) 비경제활동상태에서 구직활동을 선택하면 실업으로의 이동으로 볼 수도 있으나, 본 연구에서는 실업을 '구직활동 결과 일자리를 얻지 못한 상태'로 정의하였으므로 비경제활동으로부터 고용으로의 이동이 가능하다.

을 얻는 것에 대한 매력을 강하게 느끼게 되어 수급자격 획득을 위한 최소 근속기간을 유지하려고 한다. 근속기간이 늘어나게 되면 위험 기피적인 취업자들의 예비적 동기(precautionary motive)에 의한 저축이 늘어나게 되고, 저축에 따른 자산 보유규모의 증가는 노동의 한계비용을 증가시켜 노동시장에서 이탈할 유인을 제공한다. 따라서 경제활동참가율이 하락한다.

한편, 실업급여 지급기간이 연장되면 수급자들이 구직활동을 지속할 유인은 이전보다 높아진다. 그러면 이전에 구직활동을 포기했었을 낮은 수준의 정확성을 갖는 정보를 관찰하더라도 계속해서 구직활동을 하게 되는데, 이러한 낮은 수준의 정보 정확성은 낮은 구직확률로 이어져 실업상태에 남아 있을 확률을 높이게 되고, 결과적으로 경제 전체의 실업자 수를 증가시키는 효과를 낳는다. 이처럼 실업자 수가 증가하면 경제 전체의 공석-실업비율이 감소하여 평균 구직확률이 떨어지고 비경제활동인구에 있는 사람들은 이전과 동일한 정보의 정확성을 관찰했을 때 구직활동을 선택하지 않게 된다. 따라서 비경제활동으로부터 경제활동으로 유입되는 비율은 감소한다.

실업급여 지급기간 연장이 실업률에 미치는 효과는 비경제활동인구가 고려되지 않은 모형, 즉 의중임금 변화에 따른 경제활동참여 의사결정이 고려되지 않은 모형에서 관찰되는 효과보다 크다는 것을 본 연구는 분명히 보여준다. 우선 비경제활동인구가 포함될 때의 효과를 살펴보기 위해 비경제활동을 포함하지 않는 모형에서의 실업급여 지급기간 연장 효과를 분석한다. 비경제활동인구가 고려되지 않는 경우 실업급여 지급기간이 연장될 때 실업률은 소폭 상승한다. 실업급여 지급기간의 연장은 실업급여 수급자격을 갖춘 노동자들의 매칭에 따른 생산성 임계값을 높여서 실업으로 이동할 가능성을 증가시키지만 반대로 수급자격을 갖추지 못한 노동자들의 임계값을 낮추어 실업으로 이동할 가능성을 감소시키기 때문에 노동시장에 미치는 효과는 크지 않다.

일반적으로 실업급여 수준이 증가하거나 실업급여 지급기간이 늘어나면 실업급여를 수급하지 못하던 실업자들의 근로유인이 높아져 실업으로부터 고용으로 이동할 가능성이 높아지는 효과, 즉 자격효과(entitlement effects)가 나타난다.[5] 그러나 비경제활동이 존재하지 않는 모형에서는 이러한 자격효과가 나타나지 않는데, 그 이유는 비경제활동인구가 고려되지 않아서 구직활동의 선택이 내생적으로 결정되지 않기 때문이며, 모형의 가

5) 자격효과와 관련한 연구로는 Mortensen(1977)과 Hamermesh(1980)가 있다.

정에 따라 실업자들의 구직강도가 일정하게 주어지기 때문이다.

실업급여 지급기간을 확대하는 정책이 실업급여를 수급하는 실업자들의 실업기간과 실업으로부터의 이탈확률에 어떤 영향을 미치는가에 대한 연구는 주로 실증분석에 초점을 맞추어왔다.[6] 우선 탐색이론(search theory)을 바탕으로 실업급여의 효과를 분석한 연구는 Mortensen (1977), Burdett(1979), van den Berg(1990) 등과 기존 연구를 체계적으로 정리한 Pissarides(2000) 및 Cahuc and Zylberberg (2004) 등이 있다. 대표적인 실증분석 연구로는 Moffitt and Nicholson(1982), Moffitt (1985), Katz and Meyer(1990), Meyer (1990) 등이 있으며, 보다 최근의 연구로는 Card and Levine(2000), Puhani(2000), Lalive and Zweimüller(2004), Lalive et al. (2006) 등이 있다. 따라서 본 논문은 기존에 실증분석에만 국한되었던 실업급여 수급기간 변화효과를 보다 현실적인 모형을 사용하여 분석했다는 점에 그 의의가 있다 하겠다. 물론 기존 연구 가운데 일부는 정량분석을 통해 실업급여 수급기간 변화효과를 분석한 바 있다. 그러나 대부분 비경제활동을 포함하지 않았거나 노동자들의 유입, 유출을 고려하지 않았다는 한계를 지닌다.

본 논문은 다음과 같이 전개된다. 본 연구에 사용될 모형은 제Ⅱ장에서 소개되며, 모형의 모수 설정은 제Ⅲ장, 그리고 모의실험은 제Ⅳ장에서 다루어진다. 제Ⅴ장에서는 결론을 맺는다.

Ⅱ. 모 형

1. 환 경

여기서 다루는 모형은 Mortensen and Pissarides(1994)를 확장한 Bils, Chang, and Kim(2007)의 모형과 동일하지만 비경제활동인구가 포함되었다는 점에서 차이를 갖는다.[7] 따라서 모형의 노동자들은 위험 기피적이고 사전적으로 이질적이며 차입에 제약을 받는다. 노동자들의 t기 효용함수는 다음과 같이 정의한다.

$$\ln c_t + B_t \tag{1}$$

여기서 c_t는 소비를 나타내고, B_t는 여가로부터 얻는 효용을 나타낸다. B_t는 경제주체의 의사결정에 따라 다음과 같은 값을 갖는다.

6) 실업급여의 효과에 대한 대표적 문헌정리로는 Atkinson and Micklewright(1991)가 있으며, 보다 최근의 연구로는 Fredriksson and Holmlund(2006)가 있다.

7) 본 연구와 달리 실업을 적극적 구직활동으로, 비경제활동인구를 소극적 구직활동으로 구분한 연구가 있다. 대표적으로 Kim(2008)과 Pries and Rogerson(2009)이 있다.

$$B_t = \begin{cases} 0, & \text{일을 할 때} \\ B^s, & \text{구직활동을 할 때} \\ B^o, & \text{구직활동을 하지 않을 때} \end{cases} \quad (2)$$

t기의 자산보유규모가 a_t인 노동자가 일을 한다면 다음과 같은 예산제약을 갖는다.

$$c_t + a_{t+1} = (1+r)a_t + w_t \quad (3)$$

$$a_{t+1} \geq 0 \quad (4)$$

여기서 a_{t+1}은 t기의 저축, w_t는 t기의 임금이다. 노동자는 차입이 불가능하므로 식 (4)와 같이 t기의 저축 a_{t+1}은 반드시 0보다 커야 한다. 한편, t기의 자산보유액이 a_t인 노동자가 일을 하지 않는다면 다음과 같은 예산제약을 갖는다.

$$c_t + a_{t+1} = (1+r)a_t + h + b \quad (3')$$

여기서 h는 가계생산, b는 실업급여로서 실업급여 수급자격을 갖는 사람들만 수급하게 된다.

고용기회를 갖는 노동자는 일을 할 것인지 그렇지 않을 것인지를 결정하고 고용기회를 갖지 못하는 노동자는 구직활동을 할 것인지 그렇지 않을 것인지를 선택한다. 이러한 의사결정을 변수로 나타낼 수 있다. 먼저 I_t^w는 고용기회를 갖는 노동자의 선택변수로서 일을 하기로 선택할 때 1의 값을 갖고, 그렇지 않을 때 0의 값을 갖는다. I_t^s는 고용기회를 갖지 못한 노동자의 선택변수로서 구직활동을 할 때 1의 값을 갖고, 그렇지 않을 때 0의 값을 갖는다.

기업(또는 기업가)은 기대이윤의 현재가치를 극대화한다. 미래에 발생하는 기대이윤은 이자율 r로 할인된다. 소규모 개방경제를 가정하여 이자율 r은 외생적으로 주어진다. 경제 내에 두 종류의 기업들이 있다. 하나는 노동자와 매칭을 이루어 생산활동을 하는 기업이고, 다른 하나는 공석을 보유하고 구인활동을 하는 기업이다. 노동자와 매칭을 이루어 생산활동을 하는 기업은 z를 생산한다. 산출량 z는 기업의 고유 생산성을 나타내고 다음과 같은 확률과정을 따라 변화한다.

$$\ln z' = \rho \ln z + \varepsilon' \quad (5)$$

여기서 ε은 평균 0, 표준편차가 σ인 정규분포를 따른다. Tauchen(1986)을 따라서 연속적인 생산성의 분포를 이산화된 형태의 조건부 확률로 근사한다. 이산화된 z_i는 $[\underline{z}, \bar{z}]$에서 그 값을 갖는다. 이번 기의 생산성이 z_i일 때 다음 기의 생산성이 z_j일 조건부 확률 $\Pr(z' = z_j | z = z_i)$는 $\pi(z_j|z_i)$로 근사된다. 한편, 구인활동을 하는 기업은 구인광고를 위해 k의 비용을 지불해야 한다.

기업과 노동자는 다음의 함수에 의해

매칭이 결정된다.

$$m(u,v)=\omega u^{\alpha}v^{1-\alpha} \tag{6}$$

여기서 u는 효율단위로 나타낸 구직자의 수, v는 공석(구인자)의 수, α는 매칭함수의 구직자에 대한 탄력성, ω는 매칭함수 파라미터이다. 어떤 구직자의 구직강도 혹은 구직의 효율성이 s일 때 일자리를 찾을 확률 sp와 어떤 기업이 근로자를 만날 확률 q는 다음과 같이 표현된다.

$$sp= s\frac{m(u,v)}{u}=s\omega\theta^{1-\alpha} \tag{7}$$

$$q= \frac{m(u,v)}{v}=\omega\theta^{-\alpha} \tag{8}$$

여기서 θ는 공석-실업비율(v/u)을 나타낸다.

2. 고용 관련 정보의 획득

기존 연구들은 실업과 비경제활동 사이의 빈번한 이동현상을 설명하기 위하여 개별 경제주체의 생산성 혹은 여가에 대한 가치 변화가 단기간에 매우 크게 나타난다고 가정한다. 개별 경제주체의 생산성이 낮아지거나 여가에 대한 가치가 높아지면 노동시장에 있을 때의 상대적 비용이 높아져 노동시장을 떠나게 된다. 그러나 경제주체의 생산성의 변화나 여가에 대한 가치의 변화는 짧은 기간 발생하는 엄청난 규모의 노동시장 이동현상을 설명하기에는 한계가 있다.[8)]

본 절에서는 고용기회를 얻지 못한 사람들이 노동시장으로부터 자신에게 적합한 일자리가 있다는 정보를 얻게 되는 모형을 소개한다. 모형의 실업은 '구직활동을 하였으나 일자리를 얻지 못한 사람'으로 정의된다. 고용기회를 얻지 못한 사람들은 자신에게 적합한 일자리가 있는 곳에 대한 정보를 얻게 되는데, 그러한 정보는 s의 정확성을 갖는다. 그리고 이러한 정보는 매우 높은 정도의 지속성을 갖는다고 가정하였다. 따라서 본 논문에서 소개되는 모형을 고용-정보모형이라고 부른다.

정보 네트워크(Information Networks)와 관련한 문헌 가운데 대표적으로 Rees (1966)는 일자리와 관련한 정보의 출처를 공식출처(formal sources)와 비공식출처(informal sources)로 구분한 바 있다. 공식출처는 인터넷 혹은 신문 등의 구인광고, 정부나 관련 기관이 운영하는 구직알선단체 등을 포함하고, 비공식출처는 가족 혹은 친인척으로부터 얻게 되는 정보를 포함한다. Montgomery(1992)는 비공식출

8) Hæfke and Reiter(2006)는 개별 경제주체들의 이질적 충격을 가정한다. 집합적으로 표현한 정상상태에서의 노동시장 이동현상은 현실을 설명하기에는 충분치 못하다.

처의 중요성을 강조하면서 고용된 사람들 가운데 약 50%는 비공식출처를 통한 정보를 바탕으로 일자리를 얻었음을 보였다.

본 절에서 논의되는 일자리에 대한 정보는 이와 같은 비공식출처를 반영하는 것으로 해석될 수 있다. 모든 사람들이 공식출처로부터 정보를 획득한다면 동일한 능력과 동일한 기술을 보유한 사람들은 반드시 동일한 확률로 일자리를 얻어야 한다. 그러나 Montgomery(1992)의 결과와 같이 다수의 사람들은 비공식출처로부터 노동시장 관련 정보를 입수한다.

한편, 비공식출처로부터 얻게 되는 정보의 지속성은 정보 네트워크의 특성을 반영한 것이다. 광범위한 인간관계를 맺고 있는 사람은 지속적으로 좋은 정보를 얻을 수 있지만, 그렇지 않은 사람은 공식출처를 통해서만 정보를 얻게 된다. 이러한 네트워크(인간관계)는 단시간에 변하는 것이 아니므로 네트워크로부터 얻는 정보도 상당한 지속성을 갖는다고 가정하였다.

이번 기 s의 정확성을 갖는 정보를 획득하였다면 다음 기에 획득하게 되는 정보의 정확성 s'은 조건부 확률분포 $F(s'|s)$로부터 추출된다. 다만, 고용기회를 가졌던 근로자는 비조건부(unconditional) 확률분포 $G(s)$로부터 정보를 획득한다고 가정한다. 구체적으로 신호의 정확성 s는 확률변수 x로부터 다음과 같은 로지스틱 분포함수에 의해 주어진다고 가정하는데, 이는 단순히 신호 s가 0과 1 사이의 값을 갖도록 하기 위함이다.

$$s = \frac{e^x}{1+e^x} \tag{9}$$

확률변수 x는 다음의 AR(1) 과정을 따른다.

$$x' = \rho_x x + (1-\rho_x)\overline{x} + \eta' \tag{10}$$

여기서 $\overline{x}$는 확률변수 x의 비조건부 평균, ρ_x는 지속성을 나타내는 파라미터, η는 확률변수로 평균이 0이고 표준편차가 σ_η인 정규분포를 따른다.

3. 가치함수로 표현한 노동자와 기업의 의사결정

정확성 s를 내포한 정보를 획득한 사람은 구직활동을 할 것인지 하지 않을 것인지 결정한다. 구직활동을 하게 되면 $U(a,s)$의 가치를 얻게 되고, 그렇지 않으면 $O(a,s)$의 가치를 얻게 된다. 따라서 다음의 문제를 푼다.

$$N(a,s) = \max_{I^s(a,s)=\{0,1\}} \{U(a,s), O(a,s)\} \tag{11}$$

여기서 $I^s(a,s)$는 의사결정함수로서 구직활동을 하면 1의 값을 갖고, 구직활동을 하지 않으면 0의 값을 갖는다.

매기 고용기회를 갖는 노동자는 자신의 보유자산과 기업의 생산성을 관찰한 뒤 노동공급 여부를 결정한다. $W(a,z)$를 자산 a를 보유하고 생산성 z의 기업과 매칭을 이루어 일을 하는 사람의 가치함수라고 할 때, $W(a,z) \geq N^e(a)$이면 고용관계를 유지하고, 그렇지 않으면 고용관계를 종료한다. 여기서

$$N^e(a) = \int N(a,s')\mathrm{d}G(s') \tag{12}$$

이러한 의사결정을 함수 $I^w(a,z)$로 나타낸다. 따라서 고용관계를 유지할 때 $I^w(a,z)$는 1의 값을 갖고, 그렇지 않을 때 0의 값을 갖는다.

$$\max_{I^w(a,z)=\{0,1\}}\{W(a,s), N^e(a)\} \tag{13}$$

보유자산 a의 노동자가 생산성 z의 기업과 매칭을 이루어 일을 할 때의 가치함수를 $W(a,z)$로 나타내면 $W(a,z)$는 다음과 같다.

$$W(a,z) = \max_{\{c,a'\}}\left\{\begin{array}{l}\ln c + \beta\lambda N^e(a') \\ \quad + \beta(1-\lambda)E[\max\{W(a',z'), N^e(a')\}|z]\end{array}\right\} \tag{14}$$

제약식은

$c + a' = (1+r)a + w(a,z)$

$a' \geq 0$

여기서 λ는 외생적인 고용관계 분리를 나타내는 확률변수로서 일반적으로 노동자들의 자발적 이직을 나타낸다.[9] $w(a,z)$는 내쉬협상임금으로 노동자의 보유자산 a와 기업의 생산성 z에 의해 결정된다. 다음 기 고용기회를 유지하는 노동자는 자신의 보유자산 a'과 기업의 생산성 z'을 관찰한 뒤 노동공급 여부를 결정한다. 즉, $W(a,z) \geq N^e(a)$이면 고용관계를 유지하지만 그렇지 않으면 고용관계를 종료하는데, 이러한 의사결정은 기업에게도 동일하게 적용된다. 따라서 주어진 보유자산 a에서 기업의 생산성이 일정 수준 아래로 떨어지면 고용관계는 종료된다. 이러한 임계값의 함수를 $z^*(a)$로 나타낸다. 위의 문제로부터 노동자의 최적소비함수와 최적저축함수를 각각 $C^w(a,z)$와 $A^w(a,z)$라고 나타낸다.

자산 a를 보유하고 정확성 s의 신호를 획득한 사람이 구직활동을 할 때의 가치함수 $U(a,s)$는 다음과 같다.

9) 자세한 설명은 den Haan, Ramey, and Watson(2000)과 Bils, Chang, and Kim(2007)을 참조하라.

$$U(a,s)=\max_{\{c,a'\}}\left\{\begin{array}{l}\ln c+B^s+\beta(1-sp)E[N(a',s')|s] \\ \qquad\qquad +\beta sp\max\{W(a',\bar{z}),N^e(a')\}\end{array}\right\} \tag{15}$$

제약식은

$c+a'=(1+r)a+h+b$

$a'\geq 0$

구직활동은 하는 사람은 이번 기에 $\ln c+B^s$의 효용을 얻고 다음 기에 sp의 확률로 고용기회를 얻는다. 즉, 매우 정확한 정보를 획득한 사람은 확률 s로 자신에게 적합한 일자리가 있는 곳을 찾아가게 되는데, 그러한 일자리는 경쟁(p)을 통하여 얻게 된다. 새로운 매칭은 가장 높은 생산성 수준 $\bar{z}$에서 시작된다고 가정하여 sp의 확률로 고용기회를 얻은 노동자가 일을 할 때의 가치함수는 $W(a',\bar{z})$가 된다. 위의 문제로부터 구직활동을 선택한 노동자의 최적소비함수와 최적저축함수를 각각 $C^u(a,s)$와 $A^u(a,s)$로 나타낸다. 한편, 수급자격을 갖는 노동자에 한해 실업급여 b가 지급된다.

자산 a를 보유하고 정확성 s의 신호를 획득한 사람이 구직활동을 하지 않을 때의 가치함수 $O(a,s)$는 다음과 같다.

$$O(a,s)=\max_{\{c,a'\}}\{\ln c+B^o+\beta E[N(a',s')|s]\} \tag{16}$$

제약식은

$c+a'=(1+r)a+h$

$a'\geq 0$

구직활동을 하지 않는 사람들은 이번 기에 $\ln c+B^o$의 효용을 얻고 다음 기에 새롭게 실현되는 정보의 정확성에 따라 구직활동을 선택할 것인지 그렇지 않을 것인지를 결정한다. 여기서 B^o는 여가에 대한 효용의 상대적 가치로서 B^s보다 크다. 위의 문제로부터 노동자의 최적소비함수와 최적저축함수를 각각 $C^o(a,s)$와 $A^o(a,s)$라고 나타낸다.

기업의 가치함수도 축차적으로 표현된다. 보유자산 a의 노동자와 매칭을 이루어 생산활동을 하는 생산성 수준 z를 갖는 기업의 가치함수를 $J(a,z)$로 표현하고, 공석을 보유한 기업이 구인활동을 할 때의 가치함수를 V로 나타낸다.[10] 가치함수 $J(a,z)$는 다음과 같다.

$$J(a,z) = z - w(a,z) + \frac{1}{1+r}\lambda V + \frac{1}{1+r}(1-\lambda)E[\max\{J(A^w(a,z),z'), V\}|z] \quad (17)$$

여기서 $A^w(a,z)$는 매칭을 이룬 노동자의 최적저축함수를 나타낸다. 다음 기의 생산기회를 확보한 기업은 노동자의 보유자산 a와 자신의 생산성 z를 관찰한 뒤 생산활동의 지속 여부를 결정한다. 즉, $J(a,z) \geq V$이면 생산활동을 지속하지만 그렇지 않으면 생산활동을 중단한다. 따라서 근로자의 보유자산 a에서 기업은 자신의 생산성이 임계값 $z^*(a)$보다 낮아지면 생산활동을 중단한다.

구인활동을 하는 기업의 가치함수 V는 다음과 같다

$$V = -k + \frac{1}{1+r} q \sum_{a,s} \max\{J(A^u(a,s),\bar{z}), V\} \frac{\varphi^u(a,s)}{\sum_{a,s}\varphi^u(a,s)} \quad (18)$$

여기서 k는 구인비용, $A^u(a,s)$는 자산규모가 a이고 정보 정확성이 s인 구직자들의 최적저축함수, 그리고 $\varphi^u(a,s)$는 자신에게 적합한 일자리가 있는 곳에 성공적으로 도달한 유형-(a,s)를 갖는 사람들의 사전적 분포를 나타낸다. 신호 정확성 s를 관찰하여 구직활동을 선택한 사람들의 분포를 $\mu^u(a,s)$라고 할 때 $\varphi^u(a,s)$는 $s\mu^u(a,s)$가 된다. 기업들의 일자리 창출비용이 0이라고 가정하면 균형에서 자유진입조건이 만족되어 V는 0이 된다.

4. 균형임금의 결정

임금은 다음과 같은 일반적인 형태의 내쉬협상문제로부터 도출된다.

$$w(a,z) = \arg\max[W(a,z) - N^e(a)]^{\gamma}[J(a,z) - V]^{1-\gamma} \quad (19)$$

제약식은

$$S(a,z) = W(a,z) - N^e(a) + J(a,z) - V \quad (20)$$

10) 기업의 가치함수 $J(a,z)$에 매칭을 이룬 노동자의 자산보유규모 a에 의존하는 이유는 내쉬협상임금 때문이다. 내쉬협상임금을 결정하는 식 (19)에서 노동자의 가치함수 차이, 즉 $W(a,z) - N^e(a)$는 노동자의 보유자산에 영향을 받기 때문이다.

여기서 γ는 노동자의 협상력을 나타내고 $S(a,z)$는 매칭잉여(matching surplus)를 나타낸다.

5. 시간불변 측도(time-invariant measures)의 정의

시간에 따라 변화하지 않는 취업자, 구직자 및 비구직자의 분포 $\mu^e(a,z)$, $\mu^u(a,s)$, $\mu^o(a,s)$를 표현하기 위해 우선 고용기회를 갖는 사람들의 분포를 $\phi^m(a,z)$로 나타내고, 고용기회를 갖지 못한 사람들의 분포를 $\phi^n(a,s)$로 나타낸다. 그러면 $\phi^m(a,z)$와 $\phi^n(a,s)$가 주어졌을 때 취업자, 구직자 및 비구직자의 분포는 각각 다음과 같이 표현된다.

$$\mu^e(a,z)= I^w(a,z)\phi^m(a,z) \tag{21}$$

$$\mu^u(a,s)= I^s(a,s)\left\{\widetilde{\pi}_s(s)\sum_z\left[1-I^w(a,z)\right]\phi^m(a,z)+\phi^n(a,s)\right\} \tag{22}$$

$$\mu^o(a,s)= \left[1-I^s(a,s)\right]\left\{\widetilde{\pi}_s(s)\sum_z\left[1-I^w(a,z)\right]\phi^m(a,z)+\phi^n(a,s)\right\} \tag{23}$$

여기서 $\widetilde{\pi}_s(s)$는 비조건부 분포함수 $G(s)$의 이산화된 확률을 나타낸다. 우선 모든 (a',z')에 대해서 고용기회를 갖는 사람들의 분포 $\phi^m(a,z)$은 다음과 같다.

$$\phi^m(a',z')= \sum_{\Omega^w}\pi(z'|z)(1-\lambda)\mu^e(a,z)+1\{z'=\bar{z}\}\sum_{\Omega^u}sp\mu^u(a,s) \tag{24}$$

그리고 모든 (a',z')에 대해서 고용기회를 갖지 못한 사람들의 분포 $\phi^n(a,s)$은 다음과 같다.

$$\begin{aligned}\phi^n(a',s')= &\widetilde{\pi}_s(s)\sum_{\Omega^w}\lambda\mu^e(a,z)+\sum_{\Omega^u}\pi_s(s'|s)(1-sp)\mu^u(a,s)\\ &+\sum_{\Omega^o}\pi_s(s'|s)\mu^o(a,s)\end{aligned} \tag{25}$$

여기서 $\pi_s(s'|s)$는 F의 이산화된 조건부 확률로서 $\Pr(S=s'|S=s)$와 같다. 그리고 $\Omega^w=\{(a,z)|a'=A^w(a,z)\}$, $\Omega^u=\{(a,s)|a'=A^u(a,s)\}$, $\Omega^o=\{(a,s)|a'=A^o(a,s)\}$이다.

가. 균 형

균형은 노동자와 기업의 가치함수, 노동자의 최적소비 및 최적저축 함수, 노동자의 노동공급 및 구직에 대한 의사결정함수, 내쉬협상임금, 공석-실업비율 및 노동자의 분포로 구성된다. 노동자는 가치함수 식 (14)~(16)을 풀고, 기업은 가치함수 식 (17)~(18)을 풀며, 균형 내쉬협상임금은 식 (19)~(20)으로부터 도출된다. 노동자의 최적저축함수와 의사결정함수를 통해 식 (21)~(25)를 만족하는 시간불변 측도를 구할 수 있다.

나. 경제활동상태

앞서 언급한 바와 같이 실업은 '구직활동을 하였으나 일자리를 얻지 못한 상태'로 정의한다. 구직활동 결과 일자리를 얻은 사람들은 자연스럽게 취업자가 된다. 경제 전체의 취업자 수를 E로 나타낸다면 다음과 같다.

$$E=\sum_{a,z}(1-\lambda)\mu^{e}(a,z)+\sum_{a,s}sp\mu^{u}(a,s) \tag{26}$$

취업자의 수는 지난 한 달 동안 일을 해온 사람들 가운데 자발적 퇴직을 하지 않은 사람들과 구직활동 결과 일자리를 얻은 사람들의 합으로 이루어진다.

경제 전체의 실업자 수는 구직활동 결과 일자리를 얻지 못한 사람들로서 U로 나타내며, 다음과 같이 표현한다.

$$U=\sum_{a,s}(1-sp)\mu^{u}(a,s) \tag{27}$$

마지막으로 비경제활동인구는 O로 표현한다.

$$O=\sum_{a,z}\lambda\mu^{e}(a,z)+\sum_{a,s}\mu^{o}(a,s) \tag{28}$$

비경제활동인구는 지난 한 달 동안 일을 했으나 자발적 이유로 퇴직을 한 사람들과 지난 한 달 동안 구직활동을 하지 않은 사람들의 합으로 나타낸다.

6. Mortensen-Pissarides 기본모형

본 절에서는 경제활동인구의 규모가 고정되어 있다고 가정하여 고용과 실업만 존재하는 기본적인 Mortensen and Pissarides(1994) 모형(이하 MP 모형)을 소개한다. 이는 실업급여 지급기간 변화효과가 앞서 소개된 비경제활동인구를 갖는 모형과 어떤 차이점을 보이는지 비교하기 위함이다.

기본적인 MP 모형의 노동자는 취업자와 실업자로만 구분된다. 기업의 생산성이 일정 수준 아래로 떨어질 경우 매칭을 이루어 일을 하던 노동자는 고용관계를 종료하고 실업자가 된다. 모든 실업자는

구직활동을 하고 동일한 확률로 일자리를 얻는다. 모형의 자세한 설명과 균형의 정의는 부록에 서술하였다.

Ⅲ. 캘리브레이션

실업급여 수급자격을 갖춘 구직자는 최소 3개월에서 최대 8개월까지 실업급여를 지급받을 수 있다.[11] 물론 실업급여 자격기준과 수급기간은 <Table 1>과 같이 연령과 근무지, 그리고 근무기간에 따라 결정되지만, 본 연구에서는 분석을 단순화하여 6개월 이상 취업한 사람들에게 실업급여 자격이 부여된다고 가정하였다. 황덕순(2003)에 따르면, 임금대체율은 43%에서 45% 수준이므로 모형에서 실업급여 수준은 평균임금의 약 40% 수준이라고 가정하였다. 실업급여 수급기간 3개월을 벤치마크 모형으로 설정하여 수급기간이 4개월부터 6개월까지 연장될 때의 효과를 분석한다.

모형에서 외생적으로 이탈하는 경우 이를 자발적 이탈로 간주하여 실업급여를 수급하지 못하도록 하였다. 한편, 실업급여를 지급받고 있던 구직자가 고용기회를 얻었음에도 불구하고 이를 거절할 경우 실업급여 자격이 박탈된다고 가정하여 도덕적 해이 문제를 모형에서 배제하였다.

모형의 한 기간은 1개월과 같다. 매칭함수의 탄력성 α와 노동자의 협상력 γ는 매칭모형의 문헌을 따라 0.5로 두었다. 실업 및 비경제활동 상태에 있는 사람들의 가계생산을 나타내는 h는 0.1로 두었다. 이는 평균임금의 약 10% 수준에 해당한다. 외생적 이탈률 λ는 0.8%로 두어 정상상태에서 2/3 가량의 취업자들이 자발적 동기에 의해 이탈하도록 하였다.

〈Table 1〉 Durations of Unemployment Insurance (UI) Benefits

		Length of the Period Insured				
		less than 1 year	less than 3 years	less than 5 years	less than 10 years	more than 10 years
Age	less than 30	90 days	90 days	120 days	150 days	180 days
	less than 50	90 days	120 days	150 days	180 days	210 days
	more than 50	90 days	150 days	180 days	210 days	240 days

Source: Korea Employment Information Service.

11) 우리나라 실업급여제도는 부록에 간략하게 소개하였다.

<Table 2> Descriptive Statistics of the Korean Labor Market[1)]

Employment / Population	Unemployment / Population	Nonparticipants / Population	Unemployment Rate
63.00	2.56	34.45	3.67
Transition Rates(%)	Employment	Unemployment	Nonparticipation
Employment →	96.78	0.80	2.42
Unemployment →	26.24	62.64	11.12
Nonparticipation →	4.63	1.23	94.24

Note: 1) Seasonally unadjusted monthly average.
Source: Economically Active Population Survey 2000-2006, National Statistics Office.

den Haan, Ramey, and Watson(2000)과 Bils, Chang, and Kim(2007)과 같이 비경제활동인구를 포함하지 않는 고용・실업 매칭모형에서는 자발적 동기에 의한 이탈과 비자발적 동기에 의한 이탈이 각각 전체 이탈률의 1/2이 되도록 λ를 설정한다. 그러나 비경제활동인구가 포함될 경우 고용으로부터 비경제활동인구(고용→비경활)로의 이탈 또한 고려해야 한다. 그런데 '고용→비경활'의 상당 부분은 자발적 이탈이라고 해석할 수 있다. <Table 2>에 따르면, '고용→비경활' 전이확률(transition probability)은 2.4%로 '고용→실업' 전이확률 0.8%보다 3배 가량 크다. 만일 모든 '고용→비경활'을 자발적 이탈로 해석하고 모든 '고용→실업'을 비자발적 이탈로 해석한다면 전체 이탈 가운데 자발적 이탈이 차지하는 비중은 3/4이 된다. 따라서 본 연구에서는 1/2과 3/4의 중간값인 2/3을 전체 이탈 가운데 자발적 이탈이 차지하는 비중이라고 가정하였다.

한국고용정보원 워크넷 자료에 따르면, 2000년부터 2006년 사이의 월평균 구인확률은 약 0.5였다. 모형의 평균 구인확률 q를 0.5, 구직확률 p를 0.9로 가정하면 공석-실업비율 θ는 1.8이 되고 매칭함수 파라미터 ω는 0.6708이 된다. 월평균 실질이자율은 연평균 이자율이 6%가 되도록 설정하였으며, 기업의 이질적 생산성 z의 지속성 파라미터 ρ는 0.97, 충격의 표준편차 σ는 0.01로 두었다.

고용률과 실업률이 각각 63%와 4%에 근접하도록 효용함수 파라미터 B^s와 B^o를 각각 0.483과 1.0408로 설정하였으며, 모형이 <Table 2>와 같은 전이확률을 만들어낼 수 있도록 $\bar{x}$, σ_η 그리고 ρ_x를 각각 선택하였다. 노동자의 할인율 β는 0.994385로 맞추어 경제활동에 참여하고

〈Table 3〉 Model Parameters

Parameters	Description	Information Quality Model	MP Model
α	elasticity of matching function	0.5	0.5
γ	worker's bargaining power	0.5	0.5
h	home production	0.1	0.1
λ	exogenous separation rate	0.8%	0.8%
θ	vacancy-unemployment ratio	1.8	1.8
ω	matching function parameter	0.6708	0.6708
β	discount factor	0.994385	0.9950556
r	monthly interest rate	0.4868%	0.4868%
ρ	persistence parameter of productivity shock	0.97	0.97
σ	standard deviation of shock	0.01	0.01
b	unemployment insurance benefits	0.4	0.4
B^s	leisure value from searching	0.483	0.226
B^o	leisure value from nonparticipation	1.0408	-
s	search intensity	-	0.33
$\overline{x}$	mean of signal-quality-generating random variable	0	-
ρ_x	persistence parameter of signal-quality-generating random variable	0.98	-
σ_η	standard deviation of shock to the signal-quality-generating random variable	0.3	-

있는 경제주체의 평균 자산보유규모가 36 정도가 되도록 하였다.[12] 이상의 모수들은 <Table 3>에 요약되어 있다.[13]

12) 모형의 평균임금이 약 1이므로 평균 자산보유규모 36은 월평균 근로소득 대비 자산규모로 해석할 수 있다.

13) MP 모형의 경우, 2000년부터 2007년 사이의 평균 실업률이 3.67%이므로 효용함수의 파라미터 B^s를 0.226으로 선택하여 모형의 실업률이 4%가 되도록 하였다. 구직의 강도 s를 0.33으로 두었는데, 이는 <Table 2>에 나타나 있는 2000년부터 2006년까지의 『경제활동인구조사』의 월평균 구직확률 29.5%, 즉 26.2/(26.2+62.6)를 맞추기 위함이다. 노동자의 할인율 β는 0.9950556으로 맞추어 모형의 평균 자산보유규모가 36 정도가 되도록 하였다.

Ⅳ. 시뮬레이션

본 장에서는 앞서 소개한 모형들의 정량분석 결과를 차례로 보고한다. 먼저 비경제활동인구를 포함하지 않는 MP (Mortensen-Pissarides) 모형에서 실업급여 지급기간이 연장될 때의 효과를 살펴보고, 이어서 고용정보모형에서의 효과를 소개한다.

1. Mortensen-Pissarides (MP) 기본모형

실업급여 지급기간의 연장효과를 살펴보기 위해 실업급여 지급기간 3개월을 기준으로 모의실험을 수행하였다. 실업급여를 지급받기 위해서 근로자들은 6개월간 고용관계를 유지해야 한다.

MP 모형의 경우 실업급여를 지급받는 실업자들의 비율은 23.4%이다. 이유는 다음과 같다. 외생적(또는 자발적) 이탈률 λ가 0.8%이므로 이는 고용으로부터 실업으로 빠져나갈 전체 확률 1.25%의 2/3 수준이다. 외생적 이탈의 경우 실업급여 수급자격을 획득하지 못하므로 고용에서 실업으로 빠져나간 사람들 가운데 약 1/3 정도의 비자발적 이탈자들만 실업급여 수급자격을 얻을 수 있다. 그러나 모든 비자발적 이탈자들이 6개월 이상 근속한 것이 아니기 때문에 실제 실업급여 수급자의 비율은 1/3보다 낮은 수준을 보인다.

<Table 4>는 실업급여 지급기간의 연장에 따른 주요 변수들의 변화를 보여준다. 실업급여 지급기간이 연장되면 실업률은 상승하고 실업자들의 실업체류기간이 늘어나는 것이 일반적 현상이다. 실업급여 지급기간이 3개월에서 4개월로 1개월 연장될 때 실업률은 0.26% 상승하는데, 이는 이탈률(고용→실업)이 1.25%에서 1.33%로 0.08% 상승한 데 기인한다.

<Table 4>에 따르면, 실업급여 지급기간이 연장될 때 고용으로부터 실업으로의 이탈은 증가하고 실업률은 상승한다. 실업급여 지급기간을 3개월에서 6개월로 늘리더라도 공석-실업비율(Vacancy-Unemployment Ratio)에 영향을 주지 않기 때문에 MP 모형은 0.32%의 실업률 상승만을 예측한다. 그뿐 아니라 노동자들의 평균임금, 경제주체의 평균 자산보유규모에도 큰 영향을 주지 않는다.

실업급여 지급기간의 1개월 연장이 실업률 및 이탈률에 큰 영향을 주지 않지만 실업급여 수급비율에는 상당한 영향을 주는 것으로 나타난다.[14] 실업급여 지급

14) 수급비율은 전체 실업자들 가운데 실업급여를 지급받는 사람들의 비율을 나타낸다.

<Table 4> MP Model: Extending the Maximum Duration of UI Benefits

Maximum Duration	3 months	4 months	5 months	6 months
Employment/Labor Force (%)	96.02	95.76	95.73	95.70
Unemployment Rate (%)	3.98	4.24	4.27	4.30
E→U (%)	1.25	1.33	1.34	1.35
U→E (%)	30.00	29.99	30.00	30.00
Fraction of UI Recipients (%)	23.42	30.18	33.48	35.81
Average Wage	1.02	1.02	1.02	1.02
Average Asset Holdings	36.16	37.02	37.28	37.36
Vacancy-Unemployment Ratio	1.80	1.80	1.80	1.80

기간이 3개월일 때의 수급비율은 23.4% 였으나 1개월 연장된 4개월일 때의 수급비율은 30.2%로 6% 이상 상승한다.

이러한 현상을 이해하기 위해 두 종류의 노동자를 생각해 본다. 한 부류의 노동자는 6개월 이상 고용관계를 유지해 왔기 때문에 비자발적 이탈이 발생하면 실업급여를 수급할 자격이 발생하고 다른 한 부류의 노동자는 현재 근속기간이 6개월이 되지 못했기 때문에 비자발적 이탈이 발생하면 실업급여를 수급하지 못한다.

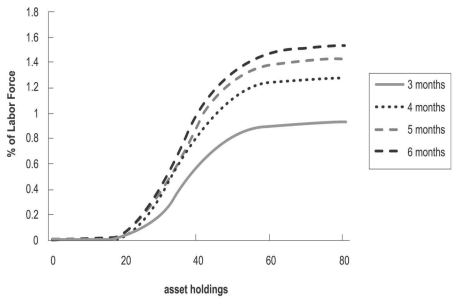
실업급여 수급자격을 갖춘 노동자의 경우 실업급여 지급기간이 연장되면 외부대안인 실업상태에서의 가치가 높아져 이전에 고용관계가 유지되었을 생산성 수준에서 더 이상 고용관계가 유지되지 못하기 때문에 고용에서 실업으로의 이탈이 증가한다.

실업급여 수급자격을 갖추지 못한 노동자의 경우 실업급여 지급기간의 연장은 이들의 외부대안인 실업상태에서의 가치에 영향을 주지 못한다. 그러나 고용관계를 지속적으로 유지하여 실업급여 수급자격을 얻게 될 때의 가치가 높아지기 때문에 고용을 지속하려고 하는 유인이 발생한다. 따라서 이전에 고용관계를 지속하지 않았을 생산성 수준에서도 고용관계를 유지한다.

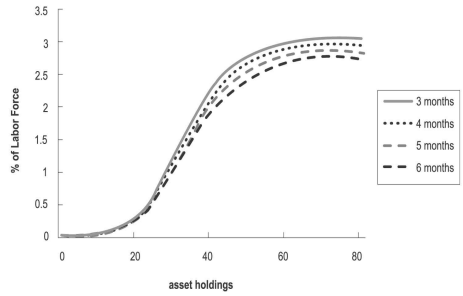
첫 번째 부류의 노동자들에 의해 주도되는 이탈이 실업률의 증가와 함께 실업급여 수급비율의 증가를 설명하지만 이것이 전부는 아니다. 실업급여 수급자격을 갖추지 못한 두 번째 부류의 노동자들의 이탈이 감소하여 실업급여 비수급자의 비율이 줄어들면 그 반대 효과로 실업

[Figure 1] Cumulative Distribution

(a) Recipients



(b) Nonrecipients



급여 수급비율이 상승하게 된다. 따라서 실업급여 지급기간이 6개월로 연장된다면 실업급여 수급비율은 35.8%로 상승한다. 실업급여 연장에 따른 실업급여 수혜자와 비수혜자의 분포는 [Figure 1]을 통해 확인할 수 있다.

2. 고용정보모형(Information Quality Model)

고용정보모형은 개개인들의 서로 다른 의중구직확률과 실제 구직확률을 설명하는 모형이다. 고용기회를 얻지 못한 사람들은 노동시장으로부터 정보를 획득하는데, 그러한 정보를 고려한 구직확률이 자신의 의중구직확률보다 큰 사람들은 구직활동을 시작하고, 그렇지 않은 사람은 구직활동을 포기한다. 자산을 적게 보유한 사람들의 의중구직확률은 낮고, 자산을 많이 보유한 사람들의 의중구직확률은 높다. 따라서 자산을 적게 보유한 사람들은 노동시장으로부터 상대적으로 정확하지 못한 정보를 획득할지라도 구직활동을 선택할 가능성이 높고 그로 인해 일자리를 얻지 못할 가능성도 높다. 한편, 자산을 많이 보유한 사람들은 노동시장으로부터 상대적으로 정확한 정보를 획득할 때 구직활동을 선택하게 되고 그로 인해 일자리를 얻을 가능성은 높아진다. 실업을 '구직활동을 했으나 일자리를 얻지 못한 사람들'로 정의한다면 실업자들이 구직활동을 했을 때 일자리를 얻을 확률은 비경제활동에 있던 사람들이 구직활동을 했을 때 일자리를 얻을 확률보다 작아질 수 있다.

Kim(2008)과 Pries and Rogerson(2009)은 실업을 적극적인 구직활동으로 정의하고, 비경제활동을 소극적 구직활동으로 정의한다.[15] 경제주체들이 위험 중립적이고 생산성 혹은 여가의 가치가 매

순간 변한다는 것이 이들 모형의 가정이다. 만일 이들 모형의 노동자들이 위험기피적이라면 실업과 비경제활동을 결정짓는 요인은 과연 무엇일까? 그것은 바로 자산보유규모이다. 고용기회를 얻지 못한 사람들 가운데 자산을 많이 보유하고 있는 사람들은 소극적 구직활동(비경제활동)을 선택하고 자산을 적게 보유하고 있는 사람들은 적극적 구직활동(실업)을 선택하게 된다. 따라서 실업과 비경제활동을 구분하는 자산보유규모의 임계값이 존재함을 직관적으로 알 수 있다.

이제 실업급여나 여타 비임금소득이 존재하지 않는 경우 Kim(2008)과 Pries and Rogerson(2009) 모형의 문제점을 지적하고자 한다. 비경제활동상태에 머무르는 사람들은 자신이 보유한 자산을 소비해야 하기 때문에 보유한 자산이 서서히 소진된다. 비경제활동상태에 장기간 머무를 경우 보유한 자산규모가 임계값 수준 이하로 떨어지게 되어 비경제활동상태로부터 실업으로 이동하게 된다. 그러나 실업상태에 있던 사람들은 비경제활동으로 이동하지 않는다. 실업급여나 여타 비임금소득이 존재하지 않는 경우 실업자들이 자산을 축적할 수 있는 별다른 수단이 없기 때문이다.

본 논문에서 소개하는 고용정보모형의 특징은 실업급여나 여타 비임금소득이 모형에 도입되지 않더라도 실업에서 비경제활동으로의 이동이 설명된다는 것이다. 실업급여가 없는 경우 실업으로부터 비경제활동으로의 이탈 및 비경제활동으로부터 실업으로의 유입은 [Figure 2]로부터 확인할 수 있는데, 이는 실업자와 비경제활동인구 분포가 서로 중첩되기 때문에 가능하다.

모형의 정의에 따라 실업자들은 구직활동 결과 일자리를 찾지 못한 사람들이다. [Figure 2]의 패널 (a)에서 볼 수 있듯이 자산을 많이 보유한 미취업자들 상당수가 비경제활동을 선택하고 자산을 적게 보유한 사람들이 구직활동을 선택한다. 실업자들의 분포가 비경제활동인구의 분포와 중첩되었다는 점은 실업과 비경제활동 사이에 이동이 발생한다는 것을 의미한다.

[Figure 2]의 패널 (b)는 자산보유규모에 따른 의중구직확률로서 구직활동의 선택이 어떻게 발생하는가를 보여준다.[16]

[Figure 2]의 패널 (b)에서 볼 수 있듯이 20 정도의 자산을 보유한 사람의 의중

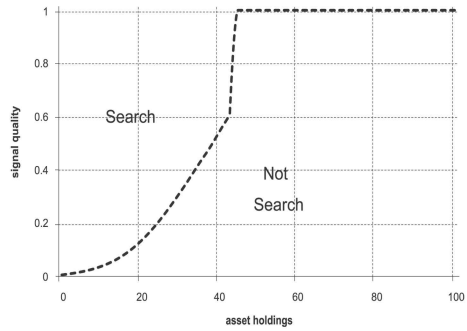
15) 적극적 구직과 소극적 구직의 경우 각각 구직의 강도(intensity)는 일정하다. 비경제활동을 소극적 구직활동으로 정의함으로써 구직의 가능성을 도입한 까닭은 비경제활동으로부터 고용으로의 직접적인 이동을 설명하기 위함이다.

16) 정확히 표현하면 의중정보 정확성(reservation threshold information quality)이라고 할 수 있다. 그러나 이러한 용어가 익숙하지 않고 모형에서 의중구직확률과 큰 차이를 보이지 않기 때문에 의중구직확률로 표현하였다.

[Figure 2] Distribution and Threshold

(a) Distribution of Workers

(b) Threshold Information Quality



Note: In the case with no unemployment insurance benefits, parameters are reset as follows. B^s is set to .692, B^o to 1.0509 and β to .99459 such that the employment-to-population ratio, the unemployment rate and the average asset holdings are 63%, 4%, and 36, respectively.

구직확률은 대략 0.1 정도이고, 40 정도의 자산을 보유한 사람의 의중구직확률은 0.5 정도가 된다. 이를 달리 표현하면, 자산을 20(40) 정도 보유한 미취업자의 경우 노동시장에서 0.1(0.5)보다 높은 확률로 일자리를 얻을 수 있다면 구직활동을 선택한다는 것이다. 한편, 50 이상의 자산을 보유한 사람은 의중구직확률이 1보다 크기 때문에 구직활동을 선택할 유인이 없다.

따라서 모형은 다음과 같은 두 가지 중요한 시사점을 제공한다. 자산을 많이 보유한 사람은 구직활동을 선택할 가능성(likelihood)이 낮은 반면 자산을 적게 보유한 사람은 구직활동을 선택할 가능성이 높다. 그러나 자산을 많이 보유한 사람들의 의중구직확률이 높기 때문에 구직활동을 선택한 경우 자산을 많이 보유한 사람들의 평균 구직확률이 자산을 적게 보유한 사람들의 평균 구직확률보다 높다.

이제 모형에 실업급여를 도입해 보자. 실업급여 지급기간 3개월을 기준(benchmark)으로 하여 지급기간을 6개월까지 연장한다. 실업급여 지급기간이 3개월에서 6개월로 연장되어 새로운 정상상태로 진입하면 일부는 비경제활동인구로 경제활동상태를 바꾼다는 점이 특징이다. 이것은 모든 취업자가 실업자가 되는 MP 모형과는 명확히 구분된다. 노동자들이 비경제활동을 또 다른 경제활동상태의 하나로 선택할 수 있다면 노동공급 의사결정이 자산보유규모와 그로 인한 의중임금에 의존하게 된다.

<Table 5> Extending the Maximum Duration of UI Benefits

Maximum Duration	3 months	4 months	5 months	6 months
Employment/Population (%)	63.00	62.73	62.54	62.41
Unemployment/Population (%)	2.62	2.77	2.87	2.96
Nonparticipation rate (%)	34.38	34.50	34.59	34.63
Unemployment rate (%)	3.99	4.23	4.39	4.53
E → U (%)	0.69	0.72	0.74	0.76
E → N (%)	0.21	0.22	0.24	0.24
U → E (%)	24.84	25.11	25.14	25.13
U → N (%)	13.38	11.23	9.76	8.82
N → E (%)	1.19	1.13	1.10	1.08
N → U (%)	1.66	1.61	1.56	1.53
Fraction of UI Recipients (%)	26.76	33.67	38.44	42.41
Average Wage	1.04	1.04	1.04	1.04
Labor Force Average Asset (Population Average Asset)	36.04 (38.85)	36.57 (39.46)	36.97 (39.93)	37.24 (40.24)
Vacancy-Unemployment Ratio	1.80	1.76	1.74	1.73

Note: E, U and N denote employment, unemployment and nonparticipation, respectively.

실업급여 지급기간 연장이 전체 노동시장에 미치는 효과를 모의실험한 결과는 <Table 5>와 같다. 실업급여 지급기간이 연장되면 고용률은 63%(3개월)에서 62.4%(6개월)로 0.6% 하락하고, 인구 대비 실업자 비율은 2.62%(3개월)에서 2.96%(6개월)로 0.34% 상승하여 실업률은 0.53%(3.99%→4.52%) 상승한다. 실업급여 지급기간 연장의 효과는 경제활동참가율의 하락과 실업의 증가로 요약될 수 있는데, 그 효과가 비경제활동인구를 고려하지 않은 MP 모형보다는 상당히 크게 나타난다.

경제활동참가율이 하락하는 것은 경제 전체의 자산보유규모가 증가하기 때문이다. 자산을 많이 보유한 사람일수록 노동으로 인한 효용의 감소를 싫어하기 때문에 노동시장을 떠나 비경제활동에 남으려 한다. 한편, 실업급여 지급기간이 늘어날수록 실업이 증가하는 이유는 실업으로 유입되는 인구가 증가하지만 그에 반해 실업으로부터 빠져나오는 인구는

감소하기 때문이다. 이하에서는 모형의 어떠한 특성들이 이와 같은 결과를 유도했는지 구체적으로 살펴본다.

가. 의중구직확률

의중구직확률은 구직활동을 하는 것과 하지 않는 것을 무차별하게 만드는 구직확률이라고 정의했다. 우선 실업급여 자격을 얻은 사람들과 그렇지 않은 사람들의 의중구직확률을 비교한다.

실업급여를 수급하는 사람의 경우 구직활동을 포기하면 실업급여 수급자격을 잃기 때문에 구직에 따른 비효용(B^s)에도 불구하고 구직상태에 남으려고 하는 유인이 있다. 따라서 이러한 유인은 실업급여 수급자들의 의중구직확률을 현저히 낮추는 효과를 만들어낸다. 다시 말하면 정보 정확성의 임계값을 낮춰서 동일한 s를 관찰하더라도 전에는 구직활동을 선택하지 않았지만 실업급여 수급자격을 얻게 되면 구직활동을 선택하게 된다.[17]

[Figure 3]은 실업급여를 수급하는 사람들과 그렇지 않은 사람들의 의중구직확률(정보 정확성의 임계값)을 보여준다. 자산보유규모가 20이고 실업급여를 수급하지 못하는 실업자를 생각해 보자. 실업급여의 최대 지급기간에 관계없이 이 사람은 대략 0.2의 의중구직확률을 갖는다. 따라서 0.2보다 정확한 정보를 관찰했을 때에만 구직활동을 선택하려 한다. 그런데 만일 실업급여를 수급할 수 있게 되었다면 어떻게 될까? 그때의 의중구직확률은 0이 되고 따라서 어떠한 정보가 관찰되더라도 구직활동을 선택한다. 동일한 이유로 보유자산의 규모가 40~60인 사람의 경우 실업급여를 지급받지 못할 때는 구직활동을 포기하고 비경제활동인구가 되지만 실업급여를 지급받을 경우 구직활동을 선택한다.

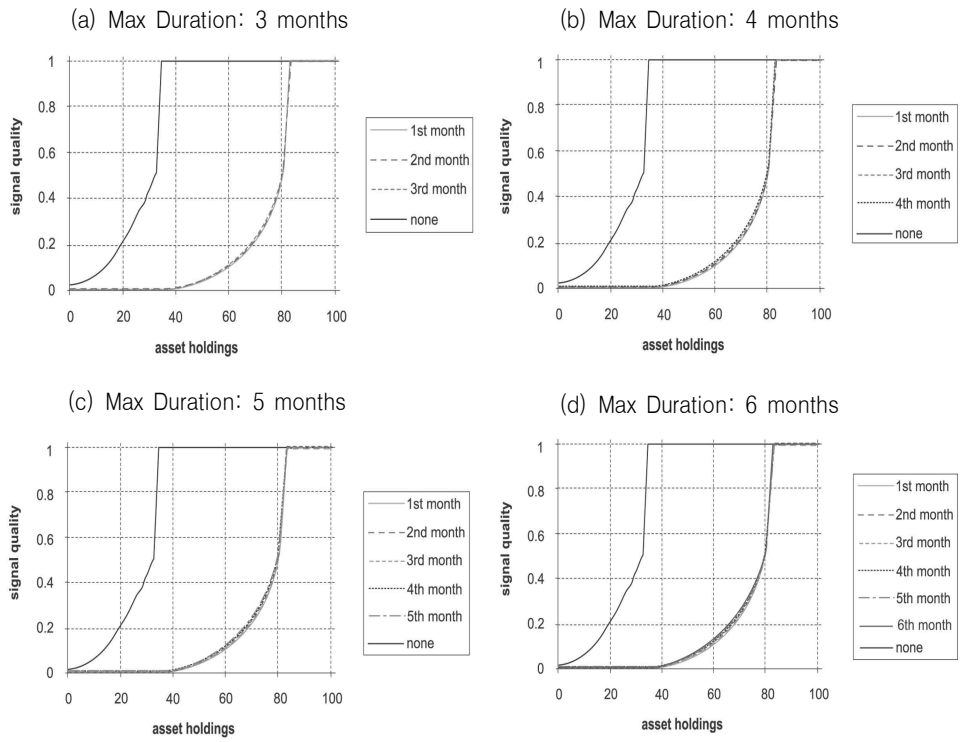
이어서 실업급여 수급자들과 비수급자들의 구직확률 및 노동시장에서의 전이확률(transition rates)을 분석하고자 한다. 그런데 실제 구직확률이나 전이확률은 의중구직확률을 중심으로 형성된 분포에 좌우되기 때문에 다음에서는 실업급여 수급자들과 비수급자들의 분포를 먼저 살펴본 후 의미 있는 논의를 이어가고자 한다.

나. 실업급여 수급자와 비수급자의 분포

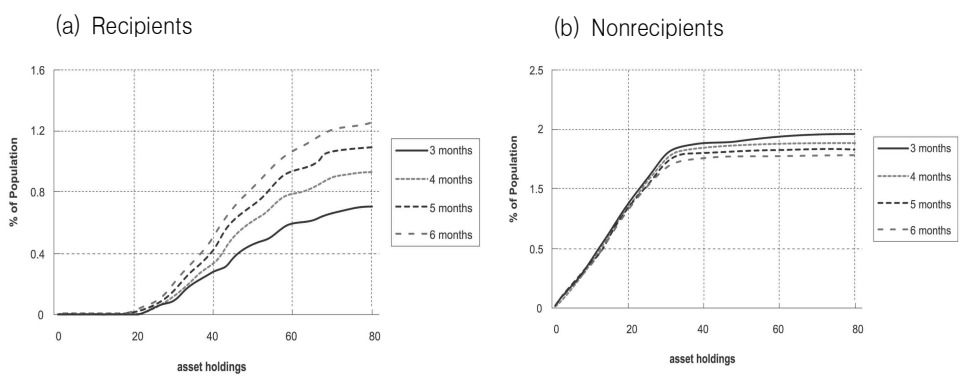
[Figure 4]는 각각 실업급여 지급기간이 연장됨에 따라 실업급여를 지급받는 사람들과 지급받지 못하는 사람들의 누적분포를 보여준다. 실업급여 지급기간이 3개월에서 6개월로 연장되면 지급받는 사람은 전체 노동자 가운데 0.70%에서

17) 모형에서 실업급여 수급자들의 도덕적 해이(moral hazard) 문제, 곧 적극적으로 구직활동을 하지 않으면서 실업급여를 지급받는 경우는 완전히 차단했다.

[Figure 3] Maximum Duration of UI Benefits and Threshold Information Quality



[Figure 4] Cumulative Distributions



1.26%로 0.56% 증가한다. 즉, 전체 실업자 1,000명 가운데 268명(3개월)에서 424명(6개월)으로 156명 증가한다.

[Figure 4]에서 주목할 점은 수급자들의 자산분포가 비수급자들의 자산분포보다 오른쪽으로 치우쳤다는 사실이다. 같은 실업자들이지만 실업급여를 수급하는 사람들의 평균 자산보유규모는 그렇지 않은 사람들보다 높다. 이것은 실업급여 수급자격을 얻기 위해서 일정 기간 고용관계를 유지해야 하는 제약 때문이다.

생산성에 따라 고용관계의 지속 여부가 결정되는 모형에서 그러한 유인은 생산성의 임계값을 떨어뜨리는 작용을 한다. 실업급여 지급기간이 연장되면 이전에 고용관계를 지속하지 않았을 생산성 수준에서 고용관계를 지속하려고 하기 때문이다. 이렇듯 근속기간이 늘어나게 되면 취업자들의 예비적 동기(precautionary motive)에 의한 저축이 늘어나게 되고 저축에 따른 자산보유규모의 증가는 노동의 한계비용을 증가시켜 노동시장에서 이탈할 유인을 제공한다. 따라서 실업급여 지급기간의 연장은 경제활동참가율을 떨어뜨리는 효과가 있다.

다. 실업으로부터 벗어날 확률

실업급여를 수급하고 있는 사람들과 그렇지 않은 사람들의 실업으로부터의 이탈확률은 매우 상이하게 나타난다. 그뿐 아니라 실업급여를 몇 개월 동안 수급해 왔는가에 따라 다르게 나타난다. 실업급여를 수급하고 있는 사람과 그렇지 않은 사람 사이의 이탈확률 차이는 앞서 언급했듯이 주로 자산보유규모의 차이에 기인하지만 동일한 수급자들 사이의 이탈확률의 차이는 주로 정보 정확성의 차이에 기인한다.

우선 수급자와 비수급자가 실업으로부터 벗어날 확률을 살펴본다. <Table 6>은 실업급여 지급기간이 최대 3개월에서 최대 6개월로 연장될 때 실업급여 수급자들과 비수급자들의 실업으로부터의 이탈확률을 보여준다.

<Table 6>은 다음 세 가지 특징을 보여준다. 첫째, 실업급여 수급자들의 구직확률(U→E)이 비수급자들의 구직확률보다 높다. 둘째, 실업상태에 잔류할 확률(U→U)이 수급자들의 경우 더 높다. 셋째, 실업상태에서 비경제활동으로 빠져나갈 확률(U→N)은 수급자들보다는 비수급자들이 훨씬 높다.

수급자들의 경우 실업급여를 포기하고 비경제활동을 선택할 유인이 거의 없기 때문에 세 번째 특징은 직관적으로 분명하다. 그리고 이러한 특징 때문에 수급자들의 실업상태 잔류확률도 상대적으로 높아져 두 번째 특징도 직관과 부합한다. 그렇다면 왜 실업급여 수급자들의 구직확률이 비수급자들의 구직확률보다 더 높을까? 이에 대한 설명은 [Figure 5]를

〈Table 6〉 Max Duration of UI Benefits and the Exit Rates from Unemployment

		3 months	4 months	5 months	6 months
U → E	Recipients	29.90	27.64	25.85	24.31
	Nonrecipients	23.87	23.71	23.64	23.77
U → U	Recipients	68.91	71.18	73.00	74.59
	Nonrecipients	66.82	67.01	67.10	66.81
U → N	Recipients	1.19	1.18	1.15	1.10
	Nonrecipients	9.31	9.28	9.26	9.41

통해 확인할 수 있다.

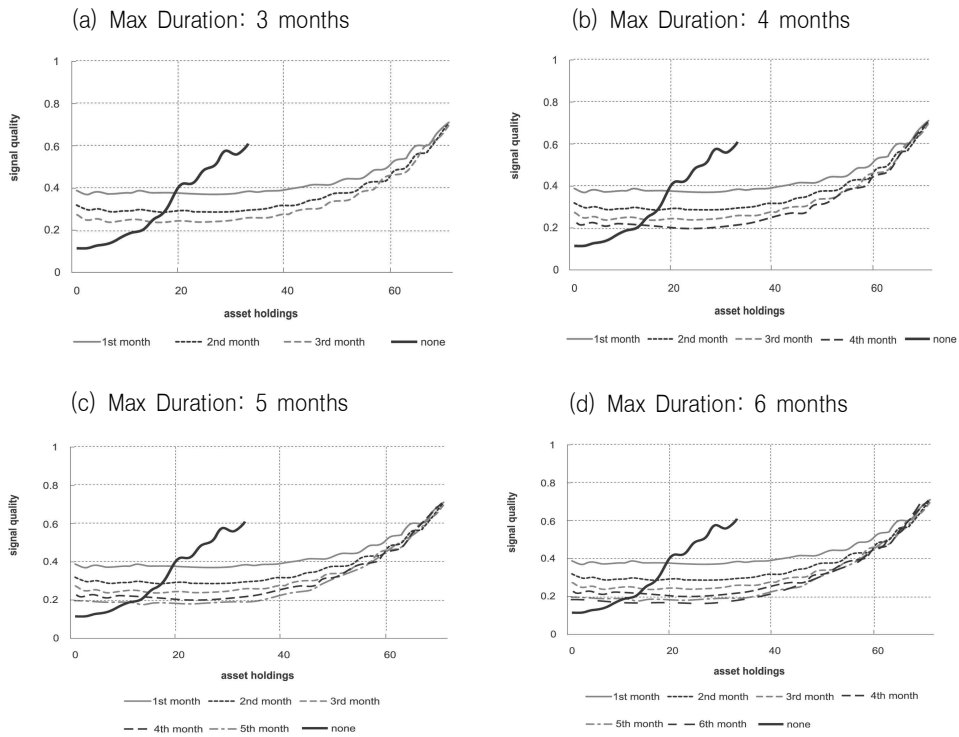
[Figure 5]는 구직활동을 선택한 실업자[18]들의 평균 정보 정확성을 실업급여 수급 여부와 자산보유규모에 따라 표현한 것이다. 각 사람들이 입수하는 정보 정확성의 평균값은 자산보유규모가 늘어날수록 증가한다. 또한 수급자들의 경우 수급기간이 늘어날수록 정보 정확성의 평균값이 하락한다.

[Figure 4]의 수급자 및 비수급자의 분포와 [Figure 5]를 함께 살펴보자. [Figure 4]에서 수급자(패널 a)는 자산보유규모 20에서 80 사이에 폭넓게 분포하고 있지만 비수급자(패널 b)는 자산보유규모 0에서 30 사이에 분포하고 있다. 한편, [Figure 5]의 정보 정확성 평균값은 패널 (a) 수급자의 경우 최소 0.2, 최대 0.7을 갖는 반면 비수급자는 최소 0.1, 최대 0.6을 갖는다. 이는 실업급여를 수급하지 못하는 사람들의 정보 정확성 임계값(threshold information quality)이 상대적으로 낮기 때문에 덜 정확한 정보를 입수하더라도 구직활동을 선택한다는 사실을 보여주는 것이다. 따라서 [Figure 4]의 분포와 [Figure 5]의 정보 정확성의 평균값을 적용하면 수급자들의 구직확률이 상대적으로 높은 이유를 이해할 수 있다.

다음과 같은 직관적인 설명도 가능하다. 상대적으로 높은 의중구직확률을 갖고 있음에도 불구하고 잦은 실직으로 인해 충분한 자산을 보유할 기회를 얻지 못한 사람들이 바로 비수급자들이다. 따라서 이들은 큰 도움이 되지 않는 구직정보에도 구직활동을 선택하게 되고 이것은 사후적으로 구직확률을 떨어뜨리게 된다. 반대로 수급자들은 실업급여 수급

18) '구직활동을 선택한 실업자'는 지난 기간에 구직활동을 했으나 일자리를 얻지 못해서 실업자로 구분되었고 이번 기간에 구직활동을 선택한 사람들을 가리킨다. 따라서 실업자 가운데 이번 기 구직활동을 포기한 사람은 정보 정확성의 평균값을 구할 때 포함하지 않았다.

[Figure 5] Maximum Duration of UI Benefits and Average Information Quality



요건을 갖추기 위해 일정 기간 고용관계를 유지했기 때문에 상대적으로 많은 자산을 보유하고 있다. 자산을 많이 보유할수록 보다 정확한 정보를 관찰했을 때 구직활동을 시작하기 때문에 이들의 사후적 구직확률은 비수급자들보다 높아지는 것이다.

[Figure 5]의 또 다른 특징은 실업급여 지급기간이 주어졌을 때 실업급여를 장기간 수급하는 사람들의 정보 정확성 평균값이 떨어진다는 것이다. 이러한 현상 때문에 실업급여 지급기간이 늘어날수록 전체 수급자들의 정보 정확성 평균값이 하락하게 되고, 결과적으로 전체(평균) 구직확률(U→E)이 하락한다. <Table 6>에서 확인할 수 있듯이 수급자의 경우 구직확률은 29.9%(3개월)에서 24.3%(6개월)로 하락하고, 실업상태에 잔류할 확률은 68.9%(3개월)에서 74.6%(6개월)로 상승한다.

개개인이 관찰하는 구직 관련 정보는 그 지속성이 매우 높다고 가정하였다. 그래서 정확한 정보를 관찰한 사람은 지속적으로 정확한 정보를 관찰하게 되고, 그렇지 못한 사람은 지속적으로 부정확한

정보를 관찰하게 된다. 첫 번째 실업급여 수급기간에 구직활동에 성공한 사람들의 평균 정보 정확성은 상대적으로 높은 반면 실패한 사람들의 평균 정보 정확성은 상대적으로 낮다. 두 번째 실업급여 수급기간에는 상대적으로 정확한 정보를 관찰하여 일자리를 얻은 사람들이 실업자 풀(pool)에서 빠져나가기 때문에 남은 수급자들의 평균 정보 정확성은 이전보다 낮아질 수밖에 없다.

[Figure 5]는 이러한 현상을 분명히 보여준다. [Figure 5]에서 실업급여 수급기간이 3개월에서 6개월로 연장될 때 장기간 실업급여를 수급하며 실업상태에 남아 있는 사람들의 평균 정보 정확성이 지속적으로 감소한다. 따라서 <Table 6>과 같이 수급기간이 6개월로 연장되면 수급자들의 평균 구직확률(24.3%)과 비수급자들의 평균 구직확률(23.8%)의 차이는 현저히 줄어든다.

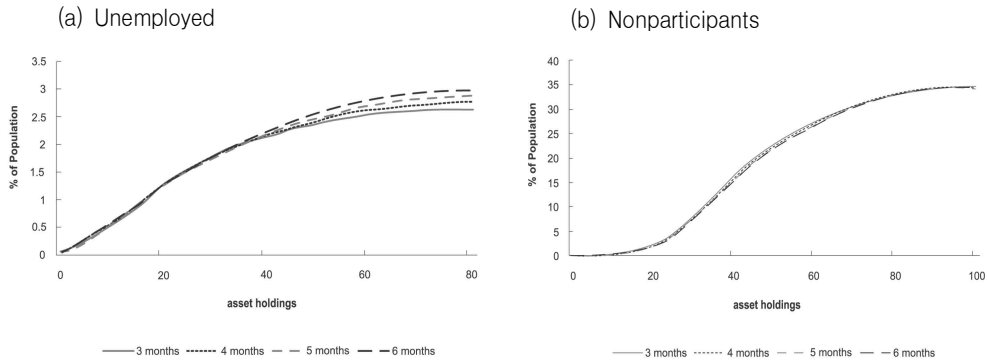
이와 같은 원리가 고용으로부터 실업으로 이동할 확률(E→U)에도 적용된다. 고용에서 실업으로의 이동은 고용기회가 있었지만 기업의 생산성이 악화되어 고용관계를 지속할 수 없었던 사람들이 새로운 일자리를 찾아 구직활동을 했음에도 불구하고 일자리를 찾지 못한 경우다. 그런데 기업의 생산성이 악화되어 고용관계를 종료하는 사람들은 주로 실업급여 자격을 획득한 사람들이다. 실업급여 수급자들의 경우 실업급여 지급기간이 연장되면 평균 구직확률이 하락함을 보였는데, 이는 다시 말하면 구직에 실패할 확률이 높아진다는 것이다.

사업장의 경영난으로 인해 고용관계가 종료되어 구직활동을 시작하는 사람들의 상당수가 실업급여 수급자격을 갖춘 취업자들인데, 실업급여 지급기간이 연장되면 이들의 평균 구직확률이 떨어져 새로운 일자리를 찾는 것이 용이하지 않게 된다. 따라서 고용에서 실업으로 이동할 확률이 높아진다. 결과적으로 실업급여 지급기간의 연장은 수급자들을 중심으로 실업상태에 잔류할 확률을 높이고 해고를 겪은 수급자들의 재취업 가능성을 떨어뜨리기 때문에 경제 전체의 실업률을 높이게 되는 것이다.

라. 경제 전체의 평균 자산보유규모

<Table 5>는 실업급여 지급기간이 늘어날수록 평균 자산보유규모가 증가한다는 사실 또한 보여준다. 실업급여 지급기간이 3개월일 때 경제활동인구의 평균 자산보유규모는 36.0이고, 지급기간이 6개월일 때 평균 자산보유규모는 37.2가 된다. 자산보유규모의 변화 정도는 MP 기본모형과 큰 차이를 보이지 않는다. 하지만 비경제활동상태에 있는 노동자를 포함할 경우 평균 자산보유규모는 3개월 38.9에서 6개월 40.2로 보다 확대됨을 알 수 있다. 자산을 많이 보유한 사람들이 노동

[Figure 6] Distributions of Unemployed and Nonparticipants



시장에서 이탈할 가능성이 높기 때문에 비경제활동을 고려하지 않을 경우 우리가 관찰하는 자산분포는 오른쪽 부분이 단절된 형태가 될 수 있음을 시사한다.

[Figure 6]은 각각 실업급여 지급기간이 연장될 때 실업과 비경제활동인구의 분포가 오른쪽으로 치우친다는 것을 보여주는데, 그 효과는 실업자들의 분포에서 더욱 분명히 나타난다.

V. 결론 및 정책적 함의

지금까지 서로 다른 모형에서 실업급여 지급기간의 연장이 노동시장에 어떤 차이를 가져오는지 살펴보았다. 본 연구에서 다룬 모형은 취업자와 실업자로만 구성되어 있는 모형(Mortensen-Pissarides 기본모형)과 비경제활동을 포함한 모형(고용정보모형)이다. 고용정보모형에서 실업은 '구직활동을 하였으나 일자리를 얻지 못한 상태'로, 비경제활동은 '비구직활동'으로 정의했는데, 이는 매칭이 이루어진 후 매칭의 결과에 따라 실업과 비경제활동을 구분하는 것이 실제 데이터의 구분과 일치하기 때문이다.

개별 노동자들이 위험 기피적이며 차입제약에 직면했을 경우 정부정책이 노동시장의 유연성을 높이는 방향으로 추진될 때 경제 전체의 후생수준을 떨어뜨릴 가능성이 있다. 즉, 자본시장이 불완전해서 노동자들이 자본시장에서 돈을 빌리고 빌려주는 것이 자유롭지 못할 때 실직에 따른 소득의 감소는 상당한 효용의 감소로 이어질 수 있기 때문이다. 따라서 노동시장의 유연성을 높이는 정책은 실업급여제도와 같은 고용보호제도의 보완을 필요로 한다. 실업급여 지급기간 연장에 초점을 맞춘 본 연구의 정책적 시

사점은 다음과 같다.

국내 노동시장에서 경제활동인구의 유출입규모가 상대적으로 크지 않아서 비경제활동인구를 고려하지 않아도 된다면 MP 모형의 결과와 같이 실업급여 지급기간의 연장은 실업률 상승에 미미한 영향을 미칠 것으로 보인다. 반면, 국내 노동시장에서 경제활동인구 유출입이 매우 크고 빈번해서 비경제활동인구를 반드시 고려해야 한다면 고용정보모형의 결과가 적용될 수 있다. 따라서 실업급여 지급기간이 늘어나면 경제활동인구가 감소하고 실업률은 상승한다.

끝으로 모형이 함의하는 실업급여 지급기간 변화의 효과를 현실에 그대로 적용하기에는 다음과 같은 한계가 있음을 밝혀둔다. 첫째, 노동시장에서 활동하는 경제주체들의 교육수준, 생산성, 그리고 여가에 대한 가치 등의 차이를 모두 반영하지는 않았다. 둘째, 모든 노동자는 차입이 불가능하다고 가정했다. 셋째, 비정규직 근로자들을 고려하지 않았다. 추후 연구는 이러한 가정의 완화를 통해 보다 현실적인 노동시장의 변화를 설명하는 방향으로 전개될 것이다.

무엇보다 실업급여 지급기간의 변화가 노동시장의 수급에 미치는 효과는 실증적인 측면에서 고려되어야 할 문제다. 따라서 제도 변화에 따른 경제주체의 반응을 분석할 수 있는 자료가 있다면 실증분석이 우선적으로 수행되어야 할 것이다. 이러한 실증분석을 바탕으로 보다 현실적인 모형을 수립할 수 있다면 실업급여 연장 등 제도의 변화가 노동시장에 미치는 효과를 보다 다각적으로 살펴볼 수 있을 것으로 기대한다.

참 고 문 헌

김용성, 「외국사례 분석을 통한 노동시장 성과와 제도적 요인 간의 관계 및 정책적 시사점 고찰」, KDI 정책포럼 제206호, 한국개발연구원, 2008.

황덕순, 「실업급여」, 『한국의 노동 1987~2002』, 한국노동연구원, 2003, pp.468~487.

Atkinson, Anthony B. and John Micklewright, "Unemployment Compensation and Labor Market Transitions: A Critical Review," *Journal of Economic Literature* 29(4), December 1991, pp.1679~1727.

Bils, Mark, Yongsung Chang, and Sun-Bin Kim, "Comparative Advantage in Cyclical Unemployment," NBER Working Paper 13231, July 2007.

Burdett, Kenneth, "Unemployment Insurance Payments as a Search Subsidy: A Theoretical Analysis," *Economic Inquiry* 17(3), July 1979, pp.333~343.

Cahuc, Pierre and André Zylberberg, *Labor Economics*, MIT Press, 2004.

Card, David and Phillip B. Levine, "Extended Benefits and the Duration of UI Spells: Evidence from New Jersey Extended Benefit Program," *Journal of Public Economics* 78(1-2), October 2000, pp.107~138.

den Haan, Wouter J., Garey Ramey, and Joel Watson, "Job Destruction and Propagation of Shocks," *American Economic Review* 90(3), June 2000, pp.482~498.

Fredriksson, Peter and Bertil Holmlund, "Improving Incentives in Unemployment Insurance: A Review of Recent Research," *Journal of Economic Surveys* 20(3), July 2006, pp.357~386.

Hamermesh, Daniel S., "Unemployment Insurance and Labor Supply," *International Economic Review* 21(3), October 1980, pp.517~527.

Hæfke, Christian and Michael Reiter, "Endogenous Labor Market Participation and the Business Cycle," Working paper, Universitat Pompeu Fabra, March 2006.

Katz, Lawrence F. and Bruce D. Meyer, "The Impact of the Potential Duration of Unemployment Benefits on the Duration of Unemployment," *Journal of Public Economics* 41(1), February 1990, pp.45~72.

Kim, Sun-Bin, "Unemployment Insurance Policy with Endogenous Labor Force Participation," *Journal of Economic Theory and Econometrics* 19(4), December 2008, pp.1~36.

Korea Employment Information Service, *Yearly Statistics of Employment Insurance*, 2000~2006.

Lalive, Rafael, Jan van Ours, and Josef Zweimüller, "How Changes in Financial Incentives Affect the Duration of Unemployment," *Review of Economic Studies* 73(4), October 2006,

pp.1009~1038.

Lalive, Rafael and Josef Zweimüller, "Benefit Entitlement and Unemployment Duration: The Role of Policy Endogeneity," *Journal of Public Economics* 88(12), December 2004, pp.2587~2616.

Meyer, Bruce D., "Unemployment Insurance and Unemployment Spells," *Econometrica* 58(4), July 1990, pp.757~782.

Moffitt, Robert, "Unemployment Insurance and the Distribution of Unemployment Spells," *Journal of Econometrics* 28(1), April 1985, pp.85~101.

Moffitt, Robert and Walter Nicholson, "The Effect of Unemployment Insurance on Unemployment: The Case of Federal Supplemental Benefits," *Review of Economics and Statistics* 64(1), February 1982, pp.1~11.

Montgomery, James D., "Social Networks and Labor Market Outcomes: Towards and Economic Analysis," *American Economic Review* 81(5), December 1991, pp.1408~1418.

Mortensen, Dale, "Unemployment Insurance and Job Search Decisions," *Industrial and Labor Relations Review* 30(4), July 1977, pp.505~517.

Mortensen, Dale and Christopher A. Pissarides, "Job Creation and Job Destruction in the Theory of Unemployment," *Review of Economic Studies* 61(3), July 1994, pp.397~415.

Pissarides, Christopher A., *Equilibrium Unemployment Theory*, MIT Press, 2nd ed., 2000.

Pries, Michael and Richard Rogerson, "Search Frictions and Labor Market Participation," *European Economic Review* 53(4), July 2009, pp.568~587.

Puhani, Patrick A., "Poland on the Dole: The Effect of Reducing the Unemployment Benefit Entitlement Period During Transition," *Journal of Population Economics* 13(1), March 2000, pp.35~44.

Rees, Albert, "Information Networks in Labor Markets," *American Economic Review*, *Papers and Proceedings* 56(2), May 1966, pp.559~566.

Tauchen, George, "Finite State Markov-Chain Approximations to Univariate and Vector Autoregressions," *Economics Letters* 20(2), 1986, pp.177~181.

van den Berg, Gerald J., "Nonstationarity in Job Search Theory," *Review of Economic Studies* 57(2), April 1990, pp.255~277.

부 록

A. 실업급여제도

여기서는 우리나라 실업급여제도에 대해 살펴본다. 실업급여의 수준은 퇴직 전 평균임금의 50%이고, 최고액과 최저액이 정해져 있다. 현행 최고액은 1일 40,000원이고, 최저액은 최저임금법상 시간급 최저임금액의 90%에 1일 근로시간 8시간을 적용하여 계산된다.

실업급여의 지급일수는 연령과 보험가입기간에 따라 본문의 <Table 1>과 같이 정해진다. 자격요건을 갖춘 근로자가 실업급여를 받을 수 있는 기간은 최소 3개월에서 최대 8개월이다. 실업급여의 경우 <Table A-1>에서와 같이 근로자와 사업주가 임금의 0.45%씩 부담하게 되어 있으나 고용안정 및 직업능력개발사업의 경우 기업의 규모에 따라 적게는 0.25%에서 많게는 0.85%까지 부담하도록 되어 있다.

<표 A-2>는 월평균 취업자 수, 고용보험 피보험자 수, 그리고 취업자 수 대비 피보험자 수의 비율을 보여준다. 2001년 월평균 피보험자 수는 685만명으로 전체 취업자(전체 임금근로자) 가운데 약 31.8%(50.6%) 가량을 차지했으나, 2007년 월평균 피보험자 수는 883만명, 비율도 37.7%(55.6%)로 2001년에 비해 다소 증가하였다.

<Table A-3>은 구직급여 수급인원의 추이를 보여준다. 2000~06년 취업자 대비 피보험자 비율의 증가는 미미했으나 실수급인원은 큰 폭으로 증가했다. 2000년 연간 구직급여 수급인원은 30만명이었고, 이들에게 지급된 총지급액은 연간 4,435억원이었다. 그러나 2006년 수급인원은 82만명으로 6년 사이에 50만명 이상 증가하였고, 총지급액도 1조 8,340억원으로 4배 가량 증가하였다. 그러나 구직급여(실업급여) 수급인원의 증가와 실업자 수 증가 사이의 상관관계는 찾아보기 어렵다.

<Table A-4>는 2000~07년 사이의 월평균 실업자 수, 구직급여 수급자 수, 그리고 실업자 수 대비 구직급여 수급자 수의 비율을 보여준다. 월평균 실업자 수는 2000년 98만명에서 2007년 78만명으로 감소하는 추세지만 월평균 구직급여 수급자 수는 2000년 7만명에서 2007년 24만명으로 세 배 이상 증가하였다.

〈Table A-1〉 Employee's and Employer's Contributions

	Number of Employees	Employee's Contributions	Employer's Contributions
(a) Unemployment Insurance Benefits		0.45%	0.45%
(b) Employment Stabilization Program and Vocational Ability Development Program	less than 150	-	0.25%
	more than 150[1)]	-	0.45%
	more than 150~less than 1,000	-	0.65%
	more than 1,000[2)]	-	0.85%

Note: 1) Companies with Priority Support.
2) Projects by National or Local Governments.
Source: Korea Employment Information Service.

〈Table A-2〉 Average Monthly Employed Persons and Insured Persons

(Number in thousand, %)

	2000	2001	2002	2003	2004	2005	2006	2007
Employed Persons	21,156	21,572	22,169	22,139	22,557	22,856	23,151	23,433
Insured Persons	6,466	6,847	7,057	7,178	7,448	7,858	8,302	8,834
Ratio[1)]	30.6	31.8	31.8	32.4	33.0	34.4	35.9	37.7

Note: 1) Insured persons/employed persons.
Source: National Statistics Office, Korea Employment Information Service.

〈Table A-3〉 Benefit Recipients and Total Amount of Benefits

(number in thousand, billion Won)

	2000	2001	2002	2003	2004	2005	2006
Recipients	304	378	366	444	619	707	817
Amount	443.5	783.9	773.9	945.6	1327.4	1602.9	1834.0

Source: Korea Employment Insurance Service.

이는 제도 성숙의 효과로 인해 수급자 수가 증가한 것으로 해석할 수 있다. 따라서 2007년 월평균 구직급여 수급자들의 수는 실업인구의 약 3분의 1정도로 추정된다.

〈Table A-4〉 Average Monthly Unemployed Persons and Benefit Recipients

(number in thousand, %)

	2000	2001	2002	2003	2004	2005	2006	2007
Unemployed Persons	979	899	752	818	860	887	827	783
Benefits Recipients	74	113	105	123	174	204	222	243
Ratio[1)]	7.7	12.9	14.0	15.0	20.3	23.1	27.0	31.1

Note: 1) Benefit Recipients/Unemployed Persons.
Source: National Statistics Office, Korea Employment Information Service.

B. Mortensen-Pissarides 모형

우선 노동자의 문제와 기업의 문제를 축차적으로 나타낸다. 보유자산 a의 노동자가 생산성 z의 기업과 매칭을 이루어 일을 할 때의 가치함수를 $W(a,z)$로 나타내고, 보유자산 a의 노동자가 일을 하지 않을 때의 가치함수를 $U(a)$로 나타낸다.[1)]

가치함수 $W(a,z)$는 다음과 같다.

$$W(a,z)=\max_{\{c,a'\}}\left\{\begin{array}{l}\ln c+\beta\lambda U(a') \\ \quad +\beta(1-\lambda)E[\max\{W(a',z'),U(a')\}|z]\end{array}\right\} \tag{B1}$$

제약식은

$c+a'=(1+r)a+w(a,z)$

$a'\geq 0$

가치함수 $U(a)$는 다음과 같다.

$$U(a)=\max_{\{c,a'\}}\left\{\begin{array}{l}\ln c+B^s+\beta(1-sp)U(a') \\ \quad +\beta sp\max\{W(a',\bar{z}),U(a')\}\end{array}\right\} \tag{B2}$$

제약식은

$c+a'=(1+r)a+h$

$a'\geq 0$

1) 여기서 자세히 설명하지 않는 변수 및 파라미터들은 본문을 참조하기 바란다.

기업의 가치함수도 축차적으로 표현한다. 보유자산 a의 노동자와 매칭을 이루어 생산활동을 하는 생산성 z 기업의 가치함수를 $J(a,z)$라고 나타내고, 공석을 보유한 기업이 구인활동을 할 때의 가치함수를 V로 나타낸다. 가치함수 $J(a,z)$는 다음과 같다.

$$J(a,z) = z - w(a,z) + \frac{1}{1+r}\lambda V + \frac{1}{1+r}(1-\lambda)E[\max\{J(A^w(a,z),z'), V\}|z] \quad \text{(B3)}$$

여기서 $A^w(a,z)$는 매칭을 이룬 노동자의 최적저축함수를 나타낸다. 기업의 가치함수 V는 다음과 같다.

$$V = -k + \frac{1}{1+r}\left\{q\sum_a \max\{J(A^u(a),\bar{z}), V\}\frac{\mu^u(a)}{\sum_a \mu^u(a)} + (1-q)V\right\} \quad \text{(B4)}$$

여기서 $A^u(a)$는 자산규모가 a인 실업자들의 최적저축함수, 그리고 $\mu^u(a)$는 자산규모가 a인 실업자들의 수를 나타낸다. 기업들의 일자리 창출비용을 0이라고 가정하면 균형에서 자유진입조건이 만족되어 V는 0이 된다.

임금은 다음과 같은 일반적인 형태의 내쉬협상문제로부터 도출된다.

$$w(a,z) = \arg\max[W(a,z) - U(a)]^{\gamma}[J(a,z) - V]^{1-\gamma} \quad \text{(B5)}$$

제약식은

$$S(a,z) = W(a,z) - U(a) + J(a,z) - V \quad \text{(B6)}$$

마지막으로 시간에 따라 변화하지 않는 취업자와 실업자의 분포 μ^e와 μ^u는 다음과 같이 표현된다.

$$\mu^e(a',z') = \sum_{\Omega} 1\{z' \geq z^*(a')\}\pi(z'|z)(1-\lambda)\mu^e(a,z)\mathrm{c} + 1\{z' = \bar{z}\}\sum_{\Phi} 1\{\bar{z} \geq z^*(a')\}sp\mu^u(a) \quad \text{(B7)}$$

그리고

$$\mu^u(a') = \sum_{z'}\sum_{\Omega} 1\{z' < z^*(a')\}\pi(z'|z)(1-\lambda)\mu^e(a,z) + \sum_{\Omega}\lambda\mu^e(a,z) + \sum_{\Phi}\{1\{\bar{z} < z^*(a')\}sp + (1-sp)\}\mu^u(a) \quad \text{(B8)}$$

여기서 $\Omega = \{(a,z)|a' = A^w(a,z)\}$, $\Phi = \{a|a' = A^u(a)\}$, 그리고 $1\{\cdot\}$은 지시함수로서 $\{\cdot\}$이 참일 때 1의 값을, 그렇지 않을 때 0의 값을 갖는다.

균형은 다음과 같이 정의된다. 균형은 가치함수 $\{W(a,z),\ U(a),\ J(a,z),\ V\}$, 노동자의 최적소비 및 최적저축 함수, 기업 생산성의 임계값 함수, 균형내쉬협상임금, 공석-실업비율, 그리고 취업자와 실업자의 분포로 구성되며 다음을 만족한다.

i. 공석-실업비율, 균형내쉬협상임금, 취업자 및 실업자의 분포가 주어졌을 때 최적저축함수는 각각의 가치함수를 푼다.

ii. 가치함수와 취업자 및 실업자의 분포가 주어졌을 때 임계값의 함수 $z^*(a)$에서 매칭 잉여 $S(a,z^*(a))$는 0이 된다.

iii. 가치함수가 주어졌을 때 균형내쉬협상임금은 식 (B5)를 푼다.

iv. 균형내쉬협상임금, 생산성의 임계값 함수, 기업의 가치함수 $J(a,z)$와 취업자 및 실업자의 분포가 주어졌을 때, 자유진입조건이 만족되면 $V=0$가 된다.

v. 최적저축함수와 생산성의 임계값 함수가 주어지면 시간에 따라 변화하지 않는 분포함수는 식 (B7)과 (B8)을 만족한다.