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What do we really know about income mobility in Korea?

Key words: income mobility, intergenerational income elasticity, intragenerational income mobility, intergenerational relative income mobility, intergenerational absolute income mobility

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<Abstract>

Although many studies show that Korea's income mobility is declining, it is difficult to draw organized information from previous studies, primarily because the mobility concept is inherently multi-faceted, and different researchers convey different meanings using the same terminology. To systemically examine the findings of previous studies and check the status of income mobility in Korea, this study categorizes the mobility concept using two dimensions: absolute vs. relative and within-generation vs. between-generations. The normative validity is clearer for intergenerational income mobility than in the intragenerational sense. In contrast, to determine whether intergenerational relative income mobility is deteriorating empirically requires further study using big data, while the decrease in intergenerational absolute income mobility and intragenerational income mobility is relatively clear.

I . Introduction

Income mobility refers to the likelihood of an individual's economic status changing over time. Many studies show that income mobility in Korea is declining. This observation is consistent with the commonly held perception that there are very few so-called "rags-to-riches," or "dragon rising from small stream" stories nowadays, or that individuals are becoming less likely to improve their economic status based on effort or merit, as the economic structure has become rigid.

The possibility to move up or down the economic ladder, within a certain period or across generations is a channel through which short-term inequality translates into structural inequality. The extent of income mobility is viewed as a core indicator of whether societies are functioning properly. Therefore, decreasing mobility, or the public perception of it, is highly likely to erode social cohesion.

However, it is difficult to extract systematic information on income mobility in Korea from previous studies, mainly because different researchers use different concepts of income mobility. The concept of income mobility itself is inherently multi-faceted. People even have different definitions of mobility. As researchers assume different concepts without recognizing their differences, it becomes difficult to identify the status of Korea's income mobility today. Therefore, it is necessary to identify the meaning of income mobility, as assumed in different studies. First, it is necessary to systematically classify different income mobility concepts.

Second, income mobility should be discussed considering that various concepts have

different normative implications. That is, as long as there are different concepts of income mobility, the level of importance of each is different, as well as why these concepts require policy attention. Although some concepts of income mobility are clearly suitable to pursue as policy goals, others are not. If a discussion proceeds under the implicit assumption that all concepts of income mobility are normatively preferable without clarifying such differences, it becomes difficult to focus on the more important aspects of income mobility.

Third, different data characteristics and methods are required to determine the level of income mobility and whether it has changed based on the chosen concept. Depending on the concept used, a certain set of conditions must be satisfied to reach a significant conclusion. The implications of a conclusion may vary greatly, depending on a study's data characteristics or methods. If one is not fully aware of the aforementioned, there is a significant risk that the data or methods used in a study may not match its conclusion.

This study aims to identify evidence of Korea's income mobility in existing studies, and aspects that require further research for a better understanding of such mobility. These aims can be accomplished by examining the results of accumulated research and properly positioning each study. To do so, it is essential to clearly distinguish the types of income mobility concepts (what we mean by income mobility) and discuss the normative meaning of each type (why we should be interested or why it is of public interest), both of which are key points in this study. In addition, this study clarifies the research method and characteristics of data that are required to support key income mobility concepts, and attempts to understand previous studies accordingly (what evidence we have on income mobility in Korea).

II. Types and Implications of Income Mobility Concepts

Income mobility is a change in income distribution between two different points in time, that is, a single bivariate joint distribution of income. For conceptual classification, it is useful to observe income mobility using the 2 x 2 framework, which combines two dimensions. The first dimension concerns the setting of two different points in time, which serve as a basis for observation, that is, whether to observe intergenerational or intragenerational income mobility. The second dimension concerns what needs to be defined as income mobility, regardless of the interval between two observation points. It can be depicted as a generic case of two income distributions of two points whether they are within generation or between generations. For example, whether to define a change in the income level or rank as income mobility is the most representative type on the second dimension. This can be understood as absolute vs. relative or a correlation (between incomes before and after change) vs. positional change in income.

Combining these two dimensions, the concepts of income mobility are divided into the following four types: (i) the degree of correlation of income across generations (intergenerational income elasticity), (ii) a change in income position across generations, (iii) a difference in income change over a certain period between individuals or groups within a generation, and (iv) an intragenerational income group change over a certain period. For example, this can be explained as (i) the effect a father's income level has on his child's, (ii) the effect a father's relative position in his generation's income distribution has on the position of his child in his or her income distribution, (iii) how persistent an individual's income is after a certain period of time (a few years or decades), and (iv) how persistent an individual's or a group's relative position in an income distribution is over a certain period of time, for example, share of people changing decile group.

Table 1. Schematic representation of income mobility concepts

		Length of the observation period	
		Intergenerational	Intragenerational
Income mobility concept	Income level change	(i) Intergenerational income elasticity	(iii) Income persistence in a certain period
	Positional change	(ii) Intergenerational income rank change	(iv) Income positional change in a certain period

If the generic elements of income mobility are divided into more types, the number of income mobility concepts increases when combined with the time factor. For instance, Field (2001) divided income mobility into six concepts (not taking the observation period into account).¹ If they are considered with the time dimension, it produces 2 x 6 or 12 types of income mobility concepts.²

In fact, one single value for the income mobility level is insufficient to draw implications of these four types shown in Table 1. More specifically, it is difficult to draw practical implications for income mobility by simply observing a joint income distribution between two points in time only once. This is because significant implications for socioeconomic structural changes can be drawn only when income mobility is compared with that in other countries, or the level of income mobility is observed over time. For instance, some of the most common observations include that income mobility has dropped, or it is lower than that in other countries. This is similar to income inequality in that observing the level of inequality relative to other countries or inequality trends over time is more valuable than drawing policy implications using only the Gini coefficient at a particular point.

A. Intergenerational absolute income mobility (intergenerational income elasticity)

Less association between origins and destinations in the intergenerational context is widely considered to be socially desirable. Not depending on family background is often equated with the openness of society or greater equality of opportunity. The appeal of this concept is that one's success should depend on talent and efforts rather than on parental circumstances.

We categorize intergenerational income mobility into absolute and relative for simplicity. Intergenerational absolute mobility refers to correlation between the income level of parents and children, whereas intergenerational relative mobility pertains to association between the positions of parents and children in their own income distribution.

Solon (1992), who is considered to have set the standards for studies on intergenerational income elasticity (IGE), used income combinations of parent and child generations to estimate the correlation coefficient of intergenerational income. Therefore, there is active mobility if the regression coefficient (IGE) is low when log permanent income in the child generation is regressed to that of the parent generation.

In the following model, Y_{si} denotes the permanent income (representing quality of life over one's life cycle) for a son in family i and Y_{pi} for the same variable for his father, and ρ

¹ ①individual income growth (time dependence), ②positional change, ③income share change, ④non-directional income movement, ⑤directional income movement, ⑥equalization of longer-term incomes relative to initial income

² Many mobility indices are in use. These include the correlation coefficient of the income level, correlation coefficient of rank in income distribution, determinant of transition matrix, immobility ratio, value of change in income share, average change in income rank, and so on.

denotes the true population correlation between Y_{si} and Y_{pi} .

$$(1) \quad \ln Y_{si} = \rho h Y_{pi} + \varepsilon_i$$

$$(2) \quad \rho = \frac{\text{Cov}(h Y_s, h Y_p)}{\text{Var}(h Y_p)}$$

If the estimate of ρ is 0.4, it indicates that when a father's income is 10% higher than his generation's mean value, his child's is 4% higher than their generation's. In other words, the IGE shows intergenerational income persistence and can be regarded as an opposite concept to income mobility, in that it gauges the impact of the parent generation's income on that of the child generation.

In his estimation, Solon emphasized the concept of permanent income that indicates one's long-term economic status and data representativeness (Solon, 1992). When using income with a large component of temporary variability, it is hard to accurately reflect an individual's economic level over his or her lifetime. Also, as workers with high permanent earnings tend to have high earnings growth rates, it is easy to understate their gap in permanent earnings in early age comparisons of current earnings, and later-career comparisons tend to overstate it. Normally, permanent income is best observed between the early thirties and mid-forties (Haider & Solon, 2006), and panel data over a long period are needed to extract the income variable closest to this age.

If the panel data that include the income of parents and their children are only short-term, the child generation's income is observed at a young age while that of the parent generation is observed at an older age. Both factors contribute in underestimating the IGE.

Data representativeness is equally important. As long as the regression coefficient has a negative correlation with the parent generation's income variability, as in equation (2), when the parent generation's income data are concentrated in a particular group, and thus, are more homogeneous or heterogeneous than they actually are, intergenerational elasticity will have a bias. For example, if the parent generation has an elderly bias, and the elderly group has greater income inequality than the entire parent generation, the income elasticity coefficient shows a downward bias. If data are concentrated in a particular group that shows more homogeneity and loses representation, the intergenerational income correlation coefficient has an upward bias. That is, the key to an intergenerational elasticity study is whether it is possible to identify parent and child income in an appropriate age range through representative long-term panel data.

Solon (1992) utilized the Panel Study of Income Dynamics (PSID), which has been compiled since 1968. He limited the child generation's birth years to 1951-1959 and used the average income of multiple years as parents' income. This ensured that children were at least 25 years old in 1984, the year of observing child generation income. The average age of the child generation used by Solon (1992) was 29.6 years old, that of the parent generation was 42, and the US's intergenerational elasticity was estimated at 0.4. In comparison, the results of the instrumental variables estimation showed that it was around 0.5. Solon highlighted that the instrumental variables estimation method, which used years of education, overestimated income elasticity, and interpreted it as an upper limit for the regression coefficient.

These results showed a much higher level of intergenerational elasticity in the US than previous studies, which used less representative data. In addition, intergenerational income mobility was lower in other countries, which was accepted as a finding that differed from conventional wisdom at that time. Nonetheless, his study has since been accepted as a methodological standard and his results used as a baseline in intergenerational elasticity studies. For reference, IGE is relatively low in Scandinavian countries and Canada, at 0.3 or

less (Corak & Heisz, 1999). In East Asia, the estimate for IGE of Japan is 0.4 or higher (Ueda, 2009), Singapore is reported to be similar to the United States, and China shows high persistence of 0.4-0.7 (Ueda, 2015).

However, careful interpretation with regard to economic development stages is necessary when comparing income elasticity coefficients across countries. This is because it is not easy to compare IGE between fast growing and already slowed economies and draw direct and narrow implications on income mobility. Specifically, if structural changes, including expanding education and job opportunities accompany a fast-growing economy, intergenerational income mobility is very likely to be high. In contrast, if an economy grows without such structural changes, income elasticity will be higher. Since East Asian countries, including Korea, demonstrated that growth dramatically increases an ordinary individual's ability to generate income, it is natural to expect a low level of income elasticity. On the contrary, developing countries, such as those in South America, usually show a higher level of income elasticity than developed countries. Considering that impacts of such structural changes are amplified in a fast-growing economy, it limits the utility of comparing IGE between countries at different stages of economic development, because the size of IGE reflects a combined impact of income mobility and economic growth rate.

The type of income used for empirical analysis is also important. It is common to compare the wage and earned income of one parent and a child because it is not possible to separate an income change due to changes in the number of income earners in a household when household income is used. Since the number of income earners in a household reflects the complexity of non-economic factors, such as household composition (increasing number of double-income households) and population aging, as well as economic factors, it would be difficult to interpret a change when observing the intergenerational elasticity of household income. On the contrary, even recognizing the problem of its combination with other factors, a researcher could determine that the household income level is more important in reflecting the economic environment of children, as they grow older. Nevertheless, it is important to recognize the implications and limitations of the type of income selected for empirical analysis.

B. Relative intergenerational income mobility

The idiom “rags to riches” refers to an open socioeconomic structure in which anyone who grows up in a relatively poor environment can “make it big” based on his or her effort. That is, the relative position in an income distribution considerably changes over generations.

This demonstrates that relative intergenerational income mobility is the concept of income mobility closest to conventional wisdom, which values openness and fairness. However, the level of data required to measure this type of income mobility is far greater than that of other types. In case of measuring intergenerational income elasticity mentioned in the previous section, it is necessary to have long-term panel data and extract the income level of parent and child generations from such data. In contrast, measuring relative intergenerational mobility requires information of each of the parent and child generations' relative position in an income distribution, which is much harder to gather. Since panel data usually secure representativeness when data are first sampled, the parent generation's position in an income distribution can be obtained to some degree. However, there is no information about the child generation's position in their income distribution.

Owing to the aforementioned problem, it is difficult to conduct a study on relative intergenerational income mobility. Although relative intergenerational income mobility is the

most important concept to determine whether conventional perceptions about declining income mobility are true or false, it is hard to find solid evidence to support such judgment. In this regard, Chetty's study (2014) was considered a significant milestone, as he used big data to overcome such data limitations and has greatly expanded the possibilities of determining income mobility based on evidence. Chetty (2014) measured the correlation between parent and child income percentile ranks using administrative earnings records for children born between 1971 and 1993. A linked parent-child sample was constructed using population tax records spanning 1996-2012. Since this population-based sample includes all US citizens, the children's rank in their generation's income distribution can be identified, unlike previous studies based on panel survey.

This study obtained some surprising findings. The rank based measures of intergenerational income mobility have not declined but remained stable. The relationship between a child's income rank and a parent's income rank remains almost same over time. The interpretation is that children in the US today have the same chances of climbing the income ladder relative to their parents born in the 1970s, which is not consistent with popular perceptions today. Nevertheless, the consequences of family background are larger today than before due to increase in income inequality, that is, the marginal distributions of income have widened considerably during the period. Thus, when the rungs of the ladder grow apart, it can amplify the difference in the initial conditions, although the chances of moving up the ladder do not change. In addition, the conceptual distinction between mobility and inequality is worth emphasizing.

Another important implication from the finding is the need to note the decoupling between future income position and early indicators, which are commonly used as proxies for income mobility. The fact that the stability of relative intergenerational mobility has been accompanied by increasing socio-economic gaps in school performance, parental input, and availability of social networks implies that using these early indicators for predicting future income status requires considerable caution.

C. Intragenerational income mobility

Relative intragenerational income mobility commonly divides income distribution into groups (decile, quintile, percentile, and so on) at two points in time, and then presents it in a transition matrix, which indicates the percentage of those who remain in the same group or move to another group at the next point in time. The limitation of this method is that it does not reflect any mobility within the same group.

On the other hand, absolute intragenerational income mobility is primarily concerned with a different income increase between groups. As it focuses on the overall changes in income distribution, such as if a particular group's income increase exceeds or lags behind other groups, it is used more in terms of perseverance of poverty or inclusiveness of economic growth.

With regard to normative validity or why intragenerational income mobility matters, especially in the context of policy, it should be examined in connection with the preferred state. The generic concept of income mobility is change in income or position at two points in time, whether two years or two generations. For intergenerational sense, it is generally agreed that income mobility is good for society and policy, and it is easily accepted as a policy goal due to a broad consensus that an individual's effort and merit should be an important income determinant, rather than socioeconomic backgrounds of parents passing from one generation to another. However, it is much more difficult to evaluate intragenerational income mobility

normatively. Unless the level of effort or merit does not change much over an individual's life cycle, it is hard to evaluate increasing or decreasing income over a particular period of time as necessarily positive, and it is interpreted differently based on income stability perspectives.

If an intragenerational income change in a relatively short period is interpreted as income variability, as opposed to permanent income, such mobility is not preferred in a system that usually prefers income flow stability to risks associated with variability. In general, people tend to prefer a stable income stream to one with continual fluctuations, and even economic policy pursues stability.

In contrast, if it is the case that the income group is maintained without any significant change for a certain period due to structural and institutional obstacles, such as monopolized opportunities to enter the labor market and discriminatory factors in opportunities to increase income, intragenerational income mobility is recognized as a positive phenomenon. However, even under this scenario, a policy goal is to remove structural and stiffening obstacles instead of actively promoting an income group change within a certain period. This is because it is fundamentally difficult to clearly determine whether an income change within a particular period is a preferred phenomenon, arising from an open economic structure, or a negative one caused by excessive shocks.

Notably, income mobility is considered more preferable for at least the top and bottom income groups at both ends of the income distribution, rather than across all groups, and this has garnered much attention. This is because, in terms of fairness, it is not preferable if the income of the bottom and top groups is entrenched, and there is a strong perception that immobility in these parts is largely attributable to socioeconomic structural factors.

Cross-country comparisons are not easy for intragenerational income mobility, as the magnitudes of the differences are highly sensitive to the income type used in the data set for individual country, measurement method, and observation period. Considering this difficulty, Chen (2009) examined short-term positional mobility using a standardized dataset, which was constructed through an international joint effort. The Cross-National Equivalent Files (CNEF) consists of comparably defined variables from multiple waves of longitudinal data from four countries: Canada, the US, the UK, and Germany.

The study observed a high degree of similarity in intragenerational relative income mobility across countries. In addition, the choice of observation period mattered. While the share of individuals who remained in the same decile between one year and the next was the lowest in the UK, at around 40%, and the highest in Canada, at nearly 50% over the 1990s, the cross-national differences decreased significantly when measured with a five-year interval, showing 25~30% for all the countries.

III. Previous Studies on Korea's Income Mobility: What we know about income mobility and its changing trend

A. Intergenerational Income Elasticity (Intergenerational absolute mobility)

Kim et al. (2009) and Kim (2009) conducted early studies that estimated Korea's intergenerational income mobility using Solon's methodology (1992). Using a split-off child household sample in the Korean Labor and Income Panel Study (KLIPS), their method measures an intergenerational correlation in income through combinations of parents and children, which were established by connecting parents and split-off children in the original household sample. They found that Korea's intergenerational elasticity was around 0.2,

which was lower than that of other countries in the existing literature. These studies have a great significance in that they have opened the door to international comparative studies on the level of intergenerational income mobility in Korea using standard methods.

However, since KLIPS began in 1998, these early studies inevitably have limitations, in that the panel period is short, and the sample size is small. Since the sample period was short, the child generation's average age was relatively lower, the parent generation's average age was higher, and a relatively smaller sample size was obtained during sampling to extract split-off children. Unlike Solon (1992), who set upper and lower limits for children's age due to a limited sample size, they did not limit children's age. The main problem is that measuring children's income at an earlier age and parent's income at an older age is highly likely to underestimate the IGE, as mentioned in the second section.

Kim *et al.* (2009) used the first to sixth KLIPS and limited the sample to independent split-off households; the fathers' average age was 53.3 while that of children was 32.3. Kim (2009) used the first to tenth KLIPS, employed monthly average wage, annual household income, and net household asset as economic status variables, and utilized the 10-year average to calculate parent generation income. In 1998, the children's average age was 34.3 while the average age of a father was 56.4.

Since the panel observation period was short and did not include the period before split, the parent's income in these studies is not their income when children lived with them but their income after split. This is one of the limitations of data characteristics, considering that the main reason to observe parent-child income combinations is to ascertain the effect of the socioeconomic environment during a child's upbringing has on its economic status. However, this limitation may not be important if it is assumed that there is no reason that the parent generation income significantly changes before or after the split, or parent generation income is at a similar level to permanent income.

Ueda (2013) and Kim (2017) combined KLIPS and household survey data and estimated permanent income by combining information about hypothetical fathers. After extracting sons' income and retrospective information about socioeconomic variables of the parent generation such as fathers' education and occupation from the panel data, they imputed it using a household survey. They combined multiple data for estimation to avoid the difficulty of extracting permanent income from within the panel data. Income elasticity estimated in these two studies was quite different at 0.2 and 0.38, respectively.

Several studies have attempted to find the trend of IGE over time. Using KLIPS, Kim *et al.* (2012) combined the latest income data of the child generation with that of the parent generation and compared the results. IGE was found to increase over time. Compared to the aforementioned studies that attempted to compare their results with those in other countries but had limitations in drawing clear implications due to data characteristics, the study drew its original implications by observing a change in estimates over time. Nonetheless, it is also important to note that the results can be interpreted in two ways: child income approached permanent income as the child's age increased with increasing panel data span, albeit slightly, or intergenerational income mobility actually declined.

In a closely related study, Hyun (2018) showed that intergenerational elasticity was greater in a sample with a narrower age range than the entire sample. This implied that closer the child generation's age was to the age of earning permanent income, the higher was the accuracy of intergenerational elasticity. As the proportion of temporary income decreases in an income distribution and permanent income increases with age, measuring the income of a young child gives a lower estimated intergenerational elasticity, as noted by Haider and Solon (2006). Recently, data compiled over a longer period at least partially explains the rapid decrease in income mobility.

In summary, many observations have shown that Korea's intergenerational elasticity is lower overall than that in developed countries but has recently begun to increase. Because the panel data have been accumulated in a relatively shorter period, it is difficult to extract a sample that can represent permanent income in parent and child generations. Therefore, it is difficult to horizontally compare Korea's intergenerational elasticity with that of other countries and determine direct differences in intergenerational income mobility. Also, further study is necessary to understand if there is a resolution to the recent increase in income elasticity due to data limitation or declining income mobility.

More fundamentally, a careful interpretation is needed when comparing intergenerational elasticity in advanced economies, as noted in the previous section. If the economic structure shifts to expand education and job opportunities equally and broadly during economic growth, the income level of a mostly poor parent generation has low correlation with the child's income level. Furthermore, this effect is amplified when the economy has grown quickly, and the intergenerational elasticity coefficient is directly affected by economic growth, as it measures a correlation between the previous income level and the changed one in absolute terms. It implies that in terms of IGE and income mobility, the implications are limited when directly comparing Korea and other developed countries, which have shown large differences in economic growth rates relative to Korea, over the past decades.

B. Intergenerational relative income mobility

Intergenerational income mobility is commonly perceived as whether a position held by parents in each household in the parent generation remains the same in the child generation. It concerns whether an individual's position in an income distribution has changed between parents and children regardless of how the income distribution itself has changed. However, it is hard to find studies in Korea that provide information on intergenerational relative income mobility and present direct implications.

This is primarily due to data limitations, as it is not possible to extract relevant information on the position of the child generation in the overall income distribution, while it is possible to compare the income level between parents and children through KLIPS. While data representativeness of the parent generation was ensured when KLIPS was designed, it is impossible to identify the relative position of the income of children in their generation's income distribution.

Although some studies used KLIPS to draw implications about income mobility by analyzing the transition matrix between the income groups of parent and child generations, they consider the child generation included in KLIPS to be a representative sample of the entire income distribution, which is a limitation (Lee, 2017; Kim, 2009). In fact, it is one of the most fundamental difficulties in examining relative intergenerational income mobility.

One of the most noteworthy methods used to circumvent this problem is to attempt indirect estimation using environment variables, including education, as proxy variables for income. Specifically, education is widely agreed to significantly contribute to improving economic status and is often used as a proxy for income; therefore, this method is widely recognized for its usefulness.

However, studies in Korea that examined relative intergenerational income mobility with education as a proxy variable have thus far not reported consistent results. After observing the economic status of top college students, Kim (2015) found that economic status was passed on through education while decreasing intergenerational mobility. Oh and Joo (2017) found that relative income mobility has recently declined in the top income group. They set

the occupation and education level of the fathers of household heads during their upbringing as the environment variable, observed the percentage of those household heads in the top 20% income group raised in a poor environment and moved to a higher income group, and found that it had decreased since 2000. Nevertheless, when all income groups were analyzed, it was shown that income mobility recently remained unchanged or increased.

Kim *et al.* (2014) analyzed parents' education level and children's academic performance in the OECD Program for International Student Assessment (PISA), and found that although globally, it was common that parents' education level led to a gap in children's academic performance, Korea showed a relatively smaller gap. The score gap between the children of high school graduate fathers and college graduate fathers was the fifth smallest among OECD member states. It suggests that if children's academic performance is accepted as an important predictor for future income in Korea, parents' relative economic level is less likely to result in an economic gap between their children than in other countries. In addition, although it was a short-term observation, this trend declined from 2006 to 2009, implying that income mobility improved.

These observations imply that when top college students or the top income group were observed in relation with their upbringing environment, Korea's relative intergenerational income mobility was found to have declined, and the upper class's economic status was passed on more strongly. On the other hand, Korea's intergenerational relative income mobility was reported to have improved or remained stable when all income groups were observed.

However, it should be noted that these observations are indirect ones that used proxy variables. To directly analyze whether the structure is changing in a way that prevents a rags-to-riches story, big data analysis, including the income status of parent and child generations needs to be conducted to observe the trend of intergenerational relative income mobility through an actual income variable.

C. Intragenerational income mobility

Existing studies on intragenerational income mobility in Korea were conducted using the following methods: (i) transition matrix analysis, which examined how much and how far an individual moved within the observation period across income groups divided evenly into deciles or quintiles after setting two points in time, and (ii) observation of whether an individual entered or dropped out of income groups that were defined based on the percentage of specific income, such as median income (low income group, middle income group, top income group, etc.). As (i) deals with changes in decile or quintile rankings, it can classify relative intragenerational income mobility; (ii) includes both absolute and relative intragenerational income mobility, as it is a combination of ①baseline adjustment due to a change in the income distribution itself (differences in income increase for each income group) and ②an individual's movement across groups.

As mentioned, normative implications are not very clear about intragenerational income mobility. For instance, while it is considered preferable to move from the low-income group to the middle-income group, there are negative policy implications when individuals in the middle-income group fall into the low-income group, as the stability of the middle class is regarded as a preferable state (Yun, 2013; Won, 2013).

On one hand, this reflects the conceptual inconsistency we place on income mobility, in that intragenerational income mobility per se has not been valued. On the other hand, this suggests that we think of it mainly in the context of policy directions. The importance of

intragenerational income mobility is whether or how to expand/reduce a particular income group, say, the middle-class or low-income group, or alleviate its perseverance. Kang *et al.* (2008) measured Korea's intragenerational income mobility based on KLIPS, demonstrating that income mobility in the low- and high-income groups was relatively higher than in the median income group. Furthermore, they checked its persistence by observing individuals entering or leaving the low-income group, finding that employment, age, and sex all affected the persistence of poverty.

Seok (2008) and Kim *et al.* (2012) used early data from KLIPS and examined Korea's income mobility after the Asian financial crisis, based on a transition matrix that used deciles and three income groups each. The method compares the short-term transition matrix and examines the trend of mobility over time. They presented a common observation that mobility across income groups has recently declined significantly. This trend was also consistent with a study by Yoon (2017), which included the latest figures from KLIPS. Seok (2008) and Yoon (2017) observed that it is becoming less common to escape the poor group and drop out of the top income group. In terms of entrenched poverty, escaping or entering poverty relied on whether the household head was employed and the number of those employed in a household. It is assumed that difficulty entering the labor market and enhancing skill sets and population aging have a combined effect on poverty perseverance. Unlike other studies that mainly used the transition matrix, Seong (2011) utilized KLIPS and estimated the degree to which an individual's relative income ranking changed within an income distribution. This study found that changes in ranking significantly decreased from 1998-1999 to 2007-2008, which was mainly attributed to labor market rigidity and population aging.

These analyses commonly focused on income status immobility rather than the stability of income flux, emphasizing the positive appeal of intragenerational income mobility, and observed that it has recently declined. It is underpinned by the assumption that economic structural obstacles are structural factors of intragenerational income status. Even if this direction is accepted, there has been little progress on identifying whether economic factors, such as a labor market structure, or non-economic factors such as population aging, are the main reason poverty is becoming firmly entrenched, and therefore, it is challenging to present policy alternatives.

IV. Discussion

Although a widely shared consensus among the public and the academic community is that Korea's income mobility is declining, the extent of such consensus is not clear in terms of empirical evidence. While outlining prior empirical studies and classifying the concepts of income mobility used in them, this study examined the apparent aspects of income mobility and those that require further investigation.

As the concept of income mobility is fundamentally multi-faceted, an understanding of income mobility should be comprehensive, rather than rely on observations in a single aspect. In addition, while research on these multiple concepts is likely to be fragmented, synthesizing them is important for comprehensive understanding.

The income mobility concept most similar to the expression "rags to riches" is intergenerational relative income mobility, and its normative validity is the clearest among four types of income mobility concept. However, until now, no studies have observed the situation in Korea directly, due to problems of data requirement, which requires researchers to identify the relative positions of parent and child generations in each generation's income

distribution. There is a desperate need to enhance the level and scope of research in this area in the future through big data analysis, such as tax administration data or national health insurance data. According to studies that used environment variables such as education and place of residence as proxy variables to income, although there is no sign of a decline in relative intergenerational income mobility in all income groups, mobility is declining in the top income group. Yet, these results do not reduce the need to find direct evidence of intergenerational relative income mobility using income data, because the results from proxy variables could be different from the ones with big data analysis, as in Chetty (2014).

As for absolute intergenerational income mobility in Korea, while results indicated that it is healthier than that in advanced economies, it is difficult to draw direct implications from comparing Korea with other advanced countries, as the available panel data for Korea is compiled over a relatively shorter period. In addition, and more fundamentally, as the concept of intergenerational elasticity itself relies on an absolute income increase, it is not clear whether it is useful to directly compare an economy that has grown rapidly and advanced economies whose growth has been subdued. In countries such as Korea, where rapid economic growth was accompanied with structural transformation, expanding opportunities for education and employment, intergenerational income mobility tends to be higher, because the income of the child generation has little association with the income of the parent generation, who were generally poor.

Nonetheless, recent studies reveal that intergenerational elasticity is increasing as more recent data are updated. Additional investigation will determine whether it reflects an economic structural change that intensifies rigidity, or if it becomes possible to observe income close to permanent income as data accumulate over a longer period.

Studies on intragenerational income mobility usually conclude that income mobility has been declining. Although these studies did not discuss what intragenerational income mobility means to policy in detail, related studies mainly noted the problem of entrenched poverty based on the premise that intragenerational income mobility is a positive goal. Furthermore, they cited rigidity in entering and leaving the labor market and population aging as a reason behind declining income mobility. Therefore, a more in-depth study is necessary on the relative proportion of such factors.

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What do we really know about income mobility in Korea?

Key words: income mobility, intergenerational income elasticity, intragenerational income mobility, intergenerational relative income mobility, intergenerational absolute income mobility

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What do we really know about income mobility in Korea?

<Abstract>

Although many studies show that Korea's income mobility is declining, it is difficult to draw organized information from previous studies, primarily because the mobility concept is inherently multi-faceted, and different researchers convey different meanings using the same terminology. To systemically examine the findings of previous studies and check the status of income mobility in Korea, this study categorizes the mobility concept using two dimensions: absolute vs. relative and within-generation vs. between-generations. The normative validity is clearer for intergenerational income mobility than in the intragenerational sense. In contrast, to determine whether intergenerational relative income mobility is deteriorating empirically requires further study using big data, while the decrease in intergenerational absolute income mobility and intragenerational income mobility is relatively clear.

I . Introduction

Income mobility refers to the likelihood of an individual's economic status changing over time. Many studies show that income mobility in Korea is declining. This observation is consistent with the commonly held perception that there are very few so-called "rags-to-riches," or "dragon rising from small stream" stories nowadays, or that individuals are becoming less likely to improve their economic status based on effort or merit, as the economic structure has become rigid.

The possibility to move up or down the economic ladder, within a certain period or across generations is a channel through which short-term inequality translates into structural inequality. The extent of income mobility is viewed as a core indicator of whether societies are functioning properly. Therefore, decreasing mobility, or the public perception of it, is highly likely to erode social cohesion.

However, it is difficult to extract systematic information on income mobility in Korea from previous studies, mainly because different researchers use different concepts of income mobility. The concept of income mobility itself is inherently multi-faceted. People even have different definitions of mobility. As researchers assume different concepts without recognizing their differences, it becomes difficult to identify the status of Korea's income mobility today. Therefore, it is necessary to identify the meaning of income mobility, as assumed in different studies. First, it is necessary to systematically classify different income mobility concepts.

Second, income mobility should be discussed considering that various concepts have

different normative implications. That is, as long as there are different concepts of income mobility, the level of importance of each is different, as well as why these concepts require policy attention. Although some concepts of income mobility are clearly suitable to pursue as policy goals, others are not. If a discussion proceeds under the implicit assumption that all concepts of income mobility are normatively preferable without clarifying such differences, it becomes difficult to focus on the more important aspects of income mobility.

Third, different data characteristics and methods are required to determine the level of income mobility and whether it has changed based on the chosen concept. Depending on the concept used, a certain set of conditions must be satisfied to reach a significant conclusion. The implications of a conclusion may vary greatly, depending on a study's data characteristics or methods. If one is not fully aware of the aforementioned, there is a significant risk that the data or methods used in a study may not match its conclusion.

This study aims to identify evidence of Korea's income mobility in existing studies, and aspects that require further research for a better understanding of such mobility. These aims can be accomplished by examining the results of accumulated research and properly positioning each study. To do so, it is essential to clearly distinguish the types of income mobility concepts (what we mean by income mobility) and discuss the normative meaning of each type (why we should be interested or why it is of public interest), both of which are key points in this study. In addition, this study clarifies the research method and characteristics of data that are required to support key income mobility concepts, and attempts to understand previous studies accordingly (what evidence we have on income mobility in Korea).

II. Types and Implications of Income Mobility Concepts

Income mobility is a change in income distribution between two different points in time, that is, a single bivariate joint distribution of income. For conceptual classification, it is useful to observe income mobility using the 2 x 2 framework, which combines two dimensions. The first dimension concerns the setting of two different points in time, which serve as a basis for observation, that is, whether to observe intergenerational or intragenerational income mobility. The second dimension concerns what needs to be defined as income mobility, regardless of the interval between two observation points. It can be depicted as a generic case of two income distributions of two points whether they are within generation or between generations. For example, whether to define a change in the income level or rank as income mobility is the most representative type on the second dimension. This can be understood as absolute vs. relative or a correlation (between incomes before and after change) vs. positional change in income.

Combining these two dimensions, the concepts of income mobility are divided into the following four types: (i) the degree of correlation of income across generations (intergenerational income elasticity), (ii) a change in income position across generations, (iii) a difference in income change over a certain period between individuals or groups within a generation, and (iv) an intragenerational income group change over a certain period. For example, this can be explained as (i) the effect a father's income level has on his child's, (ii) the effect a father's relative position in his generation's income distribution has on the position of his child in his or her income distribution, (iii) how persistent an individual's income is after a certain period of time (a few years or decades), and (iv) how persistent an individual's or a group's relative position in an income distribution is over a certain period of time, for example, share of people changing decile group.

Table 1. Schematic representation of income mobility concepts

		Length of the observation period	
		Intergenerational	Intragenerational
Income mobility concept	Income level change	(i) Intergenerational income elasticity	(iii) Income persistence in a certain period
	Positional change	(ii) Intergenerational income rank change	(iv) Income positional change in a certain period

If the generic elements of income mobility are divided into more types, the number of income mobility concepts increases when combined with the time factor. For instance, Field (2001) divided income mobility into six concepts (not taking the observation period into account).¹ If they are considered with the time dimension, it produces 2 x 6 or 12 types of income mobility concepts.²

In fact, one single value for the income mobility level is insufficient to draw implications of these four types shown in Table 1. More specifically, it is difficult to draw practical implications for income mobility by simply observing a joint income distribution between two points in time only once. This is because significant implications for socioeconomic structural changes can be drawn only when income mobility is compared with that in other countries, or the level of income mobility is observed over time. For instance, some of the most common observations include that income mobility has dropped, or it is lower than that in other countries. This is similar to income inequality in that observing the level of inequality relative to other countries or inequality trends over time is more valuable than drawing policy implications using only the Gini coefficient at a particular point.

A. Intergenerational absolute income mobility (intergenerational income elasticity)

Less association between origins and destinations in the intergenerational context is widely considered to be socially desirable. Not depending on family background is often equated with the openness of society or greater equality of opportunity. The appeal of this concept is that one's success should depend on talent and efforts rather than on parental circumstances.

We categorize intergenerational income mobility into absolute and relative for simplicity. Intergenerational absolute mobility refers to correlation between the income level of parents and children, whereas intergenerational relative mobility pertains to association between the positions of parents and children in their own income distribution.

Solon (1992), who is considered to have set the standards for studies on intergenerational income elasticity (IGE), used income combinations of parent and child generations to estimate the correlation coefficient of intergenerational income. Therefore, there is active mobility if the regression coefficient (IGE) is low when log permanent income in the child generation is regressed to that of the parent generation.

In the following model, Y_{si} denotes the permanent income (representing quality of life over one's life cycle) for a son in family i and Y_{pi} for the same variable for his father, and ρ

¹ ①individual income growth (time dependence), ②positional change, ③income share change, ④non-directional income movement, ⑤directional income movement, ⑥equalization of longer-term incomes relative to initial income

² Many mobility indices are in use. These include the correlation coefficient of the income level, correlation coefficient of rank in income distribution, determinant of transition matrix, immobility ratio, value of change in income share, average change in income rank, and so on.

denotes the true population correlation between Y_{si} and Y_{pi} .

$$(1) \quad \ln Y_{si} = \rho h Y_{pi} + \varepsilon_i$$

$$(2) \quad \rho = \frac{\text{Cov}(h Y_s, h Y_p)}{\text{Var}(h Y_p)}$$

If the estimate of ρ is 0.4, it indicates that when a father's income is 10% higher than his generation's mean value, his child's is 4% higher than their generation's. In other words, the IGE shows intergenerational income persistence and can be regarded as an opposite concept to income mobility, in that it gauges the impact of the parent generation's income on that of the child generation.

In his estimation, Solon emphasized the concept of permanent income that indicates one's long-term economic status and data representativeness (Solon, 1992). When using income with a large component of temporary variability, it is hard to accurately reflect an individual's economic level over his or her lifetime. Also, as workers with high permanent earnings tend to have high earnings growth rates, it is easy to understate their gap in permanent earnings in early age comparisons of current earnings, and later-career comparisons tend to overstate it. Normally, permanent income is best observed between the early thirties and mid-forties (Haider & Solon, 2006), and panel data over a long period are needed to extract the income variable closest to this age.

If the panel data that include the income of parents and their children are only short-term, the child generation's income is observed at a young age while that of the parent generation is observed at an older age. Both factors contribute in underestimating the IGE.

Data representativeness is equally important. As long as the regression coefficient has a negative correlation with the parent generation's income variability, as in equation (2), when the parent generation's income data are concentrated in a particular group, and thus, are more homogeneous or heterogeneous than they actually are, intergenerational elasticity will have a bias. For example, if the parent generation has an elderly bias, and the elderly group has greater income inequality than the entire parent generation, the income elasticity coefficient shows a downward bias. If data are concentrated in a particular group that shows more homogeneity and loses representation, the intergenerational income correlation coefficient has an upward bias. That is, the key to an intergenerational elasticity study is whether it is possible to identify parent and child income in an appropriate age range through representative long-term panel data.

Solon (1992) utilized the Panel Study of Income Dynamics (PSID), which has been compiled since 1968. He limited the child generation's birth years to 1951-1959 and used the average income of multiple years as parents' income. This ensured that children were at least 25 years old in 1984, the year of observing child generation income. The average age of the child generation used by Solon (1992) was 29.6 years old, that of the parent generation was 42, and the US's intergenerational elasticity was estimated at 0.4. In comparison, the results of the instrumental variables estimation showed that it was around 0.5. Solon highlighted that the instrumental variables estimation method, which used years of education, overestimated income elasticity, and interpreted it as an upper limit for the regression coefficient.

These results showed a much higher level of intergenerational elasticity in the US than previous studies, which used less representative data. In addition, intergenerational income mobility was lower in other countries, which was accepted as a finding that differed from conventional wisdom at that time. Nonetheless, his study has since been accepted as a methodological standard and his results used as a baseline in intergenerational elasticity studies. For reference, IGE is relatively low in Scandinavian countries and Canada, at 0.3 or

less (Corak & Heisz, 1999). In East Asia, the estimate for IGE of Japan is 0.4 or higher (Ueda, 2009), Singapore is reported to be similar to the United States, and China shows high persistence of 0.4-0.7 (Ueda, 2015).

However, careful interpretation with regard to economic development stages is necessary when comparing income elasticity coefficients across countries. This is because it is not easy to compare IGE between fast growing and already slowed economies and draw direct and narrow implications on income mobility. Specifically, if structural changes, including expanding education and job opportunities accompany a fast-growing economy, intergenerational income mobility is very likely to be high. In contrast, if an economy grows without such structural changes, income elasticity will be higher. Since East Asian countries, including Korea, demonstrated that growth dramatically increases an ordinary individual's ability to generate income, it is natural to expect a low level of income elasticity. On the contrary, developing countries, such as those in South America, usually show a higher level of income elasticity than developed countries. Considering that impacts of such structural changes are amplified in a fast-growing economy, it limits the utility of comparing IGE between countries at different stages of economic development, because the size of IGE reflects a combined impact of income mobility and economic growth rate.

The type of income used for empirical analysis is also important. It is common to compare the wage and earned income of one parent and a child because it is not possible to separate an income change due to changes in the number of income earners in a household when household income is used. Since the number of income earners in a household reflects the complexity of non-economic factors, such as household composition (increasing number of double-income households) and population aging, as well as economic factors, it would be difficult to interpret a change when observing the intergenerational elasticity of household income. On the contrary, even recognizing the problem of its combination with other factors, a researcher could determine that the household income level is more important in reflecting the economic environment of children, as they grow older. Nevertheless, it is important to recognize the implications and limitations of the type of income selected for empirical analysis.

B. Relative intergenerational income mobility

The idiom “rags to riches” refers to an open socioeconomic structure in which anyone who grows up in a relatively poor environment can “make it big” based on his or her effort. That is, the relative position in an income distribution considerably changes over generations.

This demonstrates that relative intergenerational income mobility is the concept of income mobility closest to conventional wisdom, which values openness and fairness. However, the level of data required to measure this type of income mobility is far greater than that of other types. In case of measuring intergenerational income elasticity mentioned in the previous section, it is necessary to have long-term panel data and extract the income level of parent and child generations from such data. In contrast, measuring relative intergenerational mobility requires information of each of the parent and child generations' relative position in an income distribution, which is much harder to gather. Since panel data usually secure representativeness when data are first sampled, the parent generation's position in an income distribution can be obtained to some degree. However, there is no information about the child generation's position in their income distribution.

Owing to the aforementioned problem, it is difficult to conduct a study on relative intergenerational income mobility. Although relative intergenerational income mobility is the

most important concept to determine whether conventional perceptions about declining income mobility are true or false, it is hard to find solid evidence to support such judgment. In this regard, Chetty's study (2014) was considered a significant milestone, as he used big data to overcome such data limitations and has greatly expanded the possibilities of determining income mobility based on evidence. Chetty (2014) measured the correlation between parent and child income percentile ranks using administrative earnings records for children born between 1971 and 1993. A linked parent-child sample was constructed using population tax records spanning 1996-2012. Since this population-based sample includes all US citizens, the children's rank in their generation's income distribution can be identified, unlike previous studies based on panel survey.

This study obtained some surprising findings. The rank based measures of intergenerational income mobility have not declined but remained stable. The relationship between a child's income rank and a parent's income rank remains almost same over time. The interpretation is that children in the US today have the same chances of climbing the income ladder relative to their parents born in the 1970s, which is not consistent with popular perceptions today. Nevertheless, the consequences of family background are larger today than before due to increase in income inequality, that is, the marginal distributions of income have widened considerably during the period. Thus, when the rungs of the ladder grow apart, it can amplify the difference in the initial conditions, although the chances of moving up the ladder do not change. In addition, the conceptual distinction between mobility and inequality is worth emphasizing.

Another important implication from the finding is the need to note the decoupling between future income position and early indicators, which are commonly used as proxies for income mobility. The fact that the stability of relative intergenerational mobility has been accompanied by increasing socio-economic gaps in school performance, parental input, and availability of social networks implies that using these early indicators for predicting future income status requires considerable caution.

C. Intragenerational income mobility

Relative intragenerational income mobility commonly divides income distribution into groups (decile, quintile, percentile, and so on) at two points in time, and then presents it in a transition matrix, which indicates the percentage of those who remain in the same group or move to another group at the next point in time. The limitation of this method is that it does not reflect any mobility within the same group.

On the other hand, absolute intragenerational income mobility is primarily concerned with a different income increase between groups. As it focuses on the overall changes in income distribution, such as if a particular group's income increase exceeds or lags behind other groups, it is used more in terms of perseverance of poverty or inclusiveness of economic growth.

With regard to normative validity or why intragenerational income mobility matters, especially in the context of policy, it should be examined in connection with the preferred state. The generic concept of income mobility is change in income or position at two points in time, whether two years or two generations. For intergenerational sense, it is generally agreed that income mobility is good for society and policy, and it is easily accepted as a policy goal due to a broad consensus that an individual's effort and merit should be an important income determinant, rather than socioeconomic backgrounds of parents passing from one generation to another. However, it is much more difficult to evaluate intragenerational income mobility

normatively. Unless the level of effort or merit does not change much over an individual's life cycle, it is hard to evaluate increasing or decreasing income over a particular period of time as necessarily positive, and it is interpreted differently based on income stability perspectives.

If an intragenerational income change in a relatively short period is interpreted as income variability, as opposed to permanent income, such mobility is not preferred in a system that usually prefers income flow stability to risks associated with variability. In general, people tend to prefer a stable income stream to one with continual fluctuations, and even economic policy pursues stability.

In contrast, if it is the case that the income group is maintained without any significant change for a certain period due to structural and institutional obstacles, such as monopolized opportunities to enter the labor market and discriminatory factors in opportunities to increase income, intragenerational income mobility is recognized as a positive phenomenon. However, even under this scenario, a policy goal is to remove structural and stiffening obstacles instead of actively promoting an income group change within a certain period. This is because it is fundamentally difficult to clearly determine whether an income change within a particular period is a preferred phenomenon, arising from an open economic structure, or a negative one caused by excessive shocks.

Notably, income mobility is considered more preferable for at least the top and bottom income groups at both ends of the income distribution, rather than across all groups, and this has garnered much attention. This is because, in terms of fairness, it is not preferable if the income of the bottom and top groups is entrenched, and there is a strong perception that immobility in these parts is largely attributable to socioeconomic structural factors.

Cross-country comparisons are not easy for intragenerational income mobility, as the magnitudes of the differences are highly sensitive to the income type used in the data set for individual country, measurement method, and observation period. Considering this difficulty, Chen (2009) examined short-term positional mobility using a standardized dataset, which was constructed through an international joint effort. The Cross-National Equivalent Files (CNEF) consists of comparably defined variables from multiple waves of longitudinal data from four countries: Canada, the US, the UK, and Germany.

The study observed a high degree of similarity in intragenerational relative income mobility across countries. In addition, the choice of observation period mattered. While the share of individuals who remained in the same decile between one year and the next was the lowest in the UK, at around 40%, and the highest in Canada, at nearly 50% over the 1990s, the cross-national differences decreased significantly when measured with a five-year interval, showing 25~30% for all the countries.

III. Previous Studies on Korea's Income Mobility: What we know about income mobility and its changing trend

A. Intergenerational Income Elasticity (Intergenerational absolute mobility)

Kim et al. (2009) and Kim (2009) conducted early studies that estimated Korea's intergenerational income mobility using Solon's methodology (1992). Using a split-off child household sample in the Korean Labor and Income Panel Study (KLIPS), their method measures an intergenerational correlation in income through combinations of parents and children, which were established by connecting parents and split-off children in the original household sample. They found that Korea's intergenerational elasticity was around 0.2,

which was lower than that of other countries in the existing literature. These studies have a great significance in that they have opened the door to international comparative studies on the level of intergenerational income mobility in Korea using standard methods.

However, since KLIPS began in 1998, these early studies inevitably have limitations, in that the panel period is short, and the sample size is small. Since the sample period was short, the child generation's average age was relatively lower, the parent generation's average age was higher, and a relatively smaller sample size was obtained during sampling to extract split-off children. Unlike Solon (1992), who set upper and lower limits for children's age due to a limited sample size, they did not limit children's age. The main problem is that measuring children's income at an earlier age and parent's income at an older age is highly likely to underestimate the IGE, as mentioned in the second section.

Kim *et al.* (2009) used the first to sixth KLIPS and limited the sample to independent split-off households; the fathers' average age was 53.3 while that of children was 32.3. Kim (2009) used the first to tenth KLIPS, employed monthly average wage, annual household income, and net household asset as economic status variables, and utilized the 10-year average to calculate parent generation income. In 1998, the children's average age was 34.3 while the average age of a father was 56.4.

Since the panel observation period was short and did not include the period before split, the parent's income in these studies is not their income when children lived with them but their income after split. This is one of the limitations of data characteristics, considering that the main reason to observe parent-child income combinations is to ascertain the effect of the socioeconomic environment during a child's upbringing has on its economic status. However, this limitation may not be important if it is assumed that there is no reason that the parent generation income significantly changes before or after the split, or parent generation income is at a similar level to permanent income.

Ueda (2013) and Kim (2017) combined KLIPS and household survey data and estimated permanent income by combining information about hypothetical fathers. After extracting sons' income and retrospective information about socioeconomic variables of the parent generation such as fathers' education and occupation from the panel data, they imputed it using a household survey. They combined multiple data for estimation to avoid the difficulty of extracting permanent income from within the panel data. Income elasticity estimated in these two studies was quite different at 0.2 and 0.38, respectively.

Several studies have attempted to find the trend of IGE over time. Using KLIPS, Kim *et al.* (2012) combined the latest income data of the child generation with that of the parent generation and compared the results. IGE was found to increase over time. Compared to the aforementioned studies that attempted to compare their results with those in other countries but had limitations in drawing clear implications due to data characteristics, the study drew its original implications by observing a change in estimates over time. Nonetheless, it is also important to note that the results can be interpreted in two ways: child income approached permanent income as the child's age increased with increasing panel data span, albeit slightly, or intergenerational income mobility actually declined.

In a closely related study, Hyun (2018) showed that intergenerational elasticity was greater in a sample with a narrower age range than the entire sample. This implied that closer the child generation's age was to the age of earning permanent income, the higher was the accuracy of intergenerational elasticity. As the proportion of temporary income decreases in an income distribution and permanent income increases with age, measuring the income of a young child gives a lower estimated intergenerational elasticity, as noted by Haider and Solon (2006). Recently, data compiled over a longer period at least partially explains the rapid decrease in income mobility.

In summary, many observations have shown that Korea's intergenerational elasticity is lower overall than that in developed countries but has recently begun to increase. Because the panel data have been accumulated in a relatively shorter period, it is difficult to extract a sample that can represent permanent income in parent and child generations. Therefore, it is difficult to horizontally compare Korea's intergenerational elasticity with that of other countries and determine direct differences in intergenerational income mobility. Also, further study is necessary to understand if there is a resolution to the recent increase in income elasticity due to data limitation or declining income mobility.

More fundamentally, a careful interpretation is needed when comparing intergenerational elasticity in advanced economies, as noted in the previous section. If the economic structure shifts to expand education and job opportunities equally and broadly during economic growth, the income level of a mostly poor parent generation has low correlation with the child's income level. Furthermore, this effect is amplified when the economy has grown quickly, and the intergenerational elasticity coefficient is directly affected by economic growth, as it measures a correlation between the previous income level and the changed one in absolute terms. It implies that in terms of IGE and income mobility, the implications are limited when directly comparing Korea and other developed countries, which have shown large differences in economic growth rates relative to Korea, over the past decades.

B. Intergenerational relative income mobility

Intergenerational income mobility is commonly perceived as whether a position held by parents in each household in the parent generation remains the same in the child generation. It concerns whether an individual's position in an income distribution has changed between parents and children regardless of how the income distribution itself has changed. However, it is hard to find studies in Korea that provide information on intergenerational relative income mobility and present direct implications.

This is primarily due to data limitations, as it is not possible to extract relevant information on the position of the child generation in the overall income distribution, while it is possible to compare the income level between parents and children through KLIPS. While data representativeness of the parent generation was ensured when KLIPS was designed, it is impossible to identify the relative position of the income of children in their generation's income distribution.

Although some studies used KLIPS to draw implications about income mobility by analyzing the transition matrix between the income groups of parent and child generations, they consider the child generation included in KLIPS to be a representative sample of the entire income distribution, which is a limitation (Lee, 2017; Kim, 2009). In fact, it is one of the most fundamental difficulties in examining relative intergenerational income mobility.

One of the most noteworthy methods used to circumvent this problem is to attempt indirect estimation using environment variables, including education, as proxy variables for income. Specifically, education is widely agreed to significantly contribute to improving economic status and is often used as a proxy for income; therefore, this method is widely recognized for its usefulness.

However, studies in Korea that examined relative intergenerational income mobility with education as a proxy variable have thus far not reported consistent results. After observing the economic status of top college students, Kim (2015) found that economic status was passed on through education while decreasing intergenerational mobility. Oh and Joo (2017) found that relative income mobility has recently declined in the top income group. They set

the occupation and education level of the fathers of household heads during their upbringing as the environment variable, observed the percentage of those household heads in the top 20% income group raised in a poor environment and moved to a higher income group, and found that it had decreased since 2000. Nevertheless, when all income groups were analyzed, it was shown that income mobility recently remained unchanged or increased.

Kim *et al.* (2014) analyzed parents' education level and children's academic performance in the OECD Program for International Student Assessment (PISA), and found that although globally, it was common that parents' education level led to a gap in children's academic performance, Korea showed a relatively smaller gap. The score gap between the children of high school graduate fathers and college graduate fathers was the fifth smallest among OECD member states. It suggests that if children's academic performance is accepted as an important predictor for future income in Korea, parents' relative economic level is less likely to result in an economic gap between their children than in other countries. In addition, although it was a short-term observation, this trend declined from 2006 to 2009, implying that income mobility improved.

These observations imply that when top college students or the top income group were observed in relation with their upbringing environment, Korea's relative intergenerational income mobility was found to have declined, and the upper class's economic status was passed on more strongly. On the other hand, Korea's intergenerational relative income mobility was reported to have improved or remained stable when all income groups were observed.

However, it should be noted that these observations are indirect ones that used proxy variables. To directly analyze whether the structure is changing in a way that prevents a rags-to-riches story, big data analysis, including the income status of parent and child generations needs to be conducted to observe the trend of intergenerational relative income mobility through an actual income variable.

C. Intragenerational income mobility

Existing studies on intragenerational income mobility in Korea were conducted using the following methods: (i) transition matrix analysis, which examined how much and how far an individual moved within the observation period across income groups divided evenly into deciles or quintiles after setting two points in time, and (ii) observation of whether an individual entered or dropped out of income groups that were defined based on the percentage of specific income, such as median income (low income group, middle income group, top income group, etc.). As (i) deals with changes in decile or quintile rankings, it can classify relative intragenerational income mobility; (ii) includes both absolute and relative intragenerational income mobility, as it is a combination of ①baseline adjustment due to a change in the income distribution itself (differences in income increase for each income group) and ②an individual's movement across groups.

As mentioned, normative implications are not very clear about intragenerational income mobility. For instance, while it is considered preferable to move from the low-income group to the middle-income group, there are negative policy implications when individuals in the middle-income group fall into the low-income group, as the stability of the middle class is regarded as a preferable state (Yun, 2013; Won, 2013).

On one hand, this reflects the conceptual inconsistency we place on income mobility, in that intragenerational income mobility per se has not been valued. On the other hand, this suggests that we think of it mainly in the context of policy directions. The importance of

intragenerational income mobility is whether or how to expand/reduce a particular income group, say, the middle-class or low-income group, or alleviate its perseverance. Kang *et al.* (2008) measured Korea's intragenerational income mobility based on KLIPS, demonstrating that income mobility in the low- and high-income groups was relatively higher than in the median income group. Furthermore, they checked its persistence by observing individuals entering or leaving the low-income group, finding that employment, age, and sex all affected the persistence of poverty.

Seok (2008) and Kim *et al.* (2012) used early data from KLIPS and examined Korea's income mobility after the Asian financial crisis, based on a transition matrix that used deciles and three income groups each. The method compares the short-term transition matrix and examines the trend of mobility over time. They presented a common observation that mobility across income groups has recently declined significantly. This trend was also consistent with a study by Yoon (2017), which included the latest figures from KLIPS. Seok (2008) and Yoon (2017) observed that it is becoming less common to escape the poor group and drop out of the top income group. In terms of entrenched poverty, escaping or entering poverty relied on whether the household head was employed and the number of those employed in a household. It is assumed that difficulty entering the labor market and enhancing skill sets and population aging have a combined effect on poverty perseverance. Unlike other studies that mainly used the transition matrix, Seong (2011) utilized KLIPS and estimated the degree to which an individual's relative income ranking changed within an income distribution. This study found that changes in ranking significantly decreased from 1998-1999 to 2007-2008, which was mainly attributed to labor market rigidity and population aging.

These analyses commonly focused on income status immobility rather than the stability of income flux, emphasizing the positive appeal of intragenerational income mobility, and observed that it has recently declined. It is underpinned by the assumption that economic structural obstacles are structural factors of intragenerational income status. Even if this direction is accepted, there has been little progress on identifying whether economic factors, such as a labor market structure, or non-economic factors such as population aging, are the main reason poverty is becoming firmly entrenched, and therefore, it is challenging to present policy alternatives.

IV. Discussion

Although a widely shared consensus among the public and the academic community is that Korea's income mobility is declining, the extent of such consensus is not clear in terms of empirical evidence. While outlining prior empirical studies and classifying the concepts of income mobility used in them, this study examined the apparent aspects of income mobility and those that require further investigation.

As the concept of income mobility is fundamentally multi-faceted, an understanding of income mobility should be comprehensive, rather than rely on observations in a single aspect. In addition, while research on these multiple concepts is likely to be fragmented, synthesizing them is important for comprehensive understanding.

The income mobility concept most similar to the expression "rags to riches" is intergenerational relative income mobility, and its normative validity is the clearest among four types of income mobility concept. However, until now, no studies have observed the situation in Korea directly, due to problems of data requirement, which requires researchers to identify the relative positions of parent and child generations in each generation's income

distribution. There is a desperate need to enhance the level and scope of research in this area in the future through big data analysis, such as tax administration data or national health insurance data. According to studies that used environment variables such as education and place of residence as proxy variables to income, although there is no sign of a decline in relative intergenerational income mobility in all income groups, mobility is declining in the top income group. Yet, these results do not reduce the need to find direct evidence of intergenerational relative income mobility using income data, because the results from proxy variables could be different from the ones with big data analysis, as in Chetty (2014).

As for absolute intergenerational income mobility in Korea, while results indicated that it is healthier than that in advanced economies, it is difficult to draw direct implications from comparing Korea with other advanced countries, as the available panel data for Korea is compiled over a relatively shorter period. In addition, and more fundamentally, as the concept of intergenerational elasticity itself relies on an absolute income increase, it is not clear whether it is useful to directly compare an economy that has grown rapidly and advanced economies whose growth has been subdued. In countries such as Korea, where rapid economic growth was accompanied with structural transformation, expanding opportunities for education and employment, intergenerational income mobility tends to be higher, because the income of the child generation has little association with the income of the parent generation, who were generally poor.

Nonetheless, recent studies reveal that intergenerational elasticity is increasing as more recent data are updated. Additional investigation will determine whether it reflects an economic structural change that intensifies rigidity, or if it becomes possible to observe income close to permanent income as data accumulate over a longer period.

Studies on intragenerational income mobility usually conclude that income mobility has been declining. Although these studies did not discuss what intragenerational income mobility means to policy in detail, related studies mainly noted the problem of entrenched poverty based on the premise that intragenerational income mobility is a positive goal. Furthermore, they cited rigidity in entering and leaving the labor market and population aging as a reason behind declining income mobility. Therefore, a more in-depth study is necessary on the relative proportion of such factors.

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