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A Meta-analysis on Changes in the Determinants of Poverty**

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Research on Poverty in Transition Economies: A Meta-analysis on Changes in the Determinants of Poverty^{*}

Kazuhiro Kumo

Abstract

Research on the increase in poverty in the transitional economies affected by the collapse of socialism began soon after the economic transition began. However, the nature of poverty in the former Soviet Union and Central and Eastern Europe differs, and two phases have been observed: a phase of increasing and stabilising poverty in the 1990s and a phase of declining poverty in the 2000s. Taking into account the possibility that the impact of household size, education level, and urban domicile, which are factors employed in traditional poverty research, may differ depending on the year or the region, this paper attempted a meta-analysis.

The results generally supported the hypothesis. In the 1990s, there was no difference between urban and rural populations in the probability of falling into poverty. After 2000, however, urban domicile became a significant factor in reducing the probability of falling into poverty. In addition, differences were observed between the former Soviet Union and Central and Eastern Europe in the factors affecting the poverty situation. This phenomenon is considered to indicate one of the directions for research in comparative transitional economics in the future. Furthermore, the trend in poverty dynamics seen here can probably also be regarded as indicating steady progress in “transition”.

JEL Classification Numbers: I32, I39, P36, P46.

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1. Introduction

The purpose of this paper is to describe, through previous research, how the factors causing households to fall into poverty in former socialist countries have been explored in the more 20 years since the beginning of the economic transition.

It has been widely acknowledged that economic disparities were small and levels of poverty were low in socialist countries (McAuley, 1979). Although it was impossible to make detailed studies because hardly any data was made publicly available, it can be said that it was commonly acknowledged that income redistribution, government-set wage rates, and generous social security kept poverty at low levels in the socialist countries (McAuley, 1979). However, it is known that as the economic transition began, this situation changed. The well-known Milanovic (1997) employed various types of household survey data to estimate the total number of people with incomes below the poverty line. Based on his calculations, in 18 countries located in the former Soviet Union and Southern/Eastern Europe, the number of people in poverty increased by ten times (from 14 million to 147 million people) in 1993–1995, the period following the beginning of the economic transition, compared with 1987–1988, which was before the economic transition. However, this was based on a poverty line of income of 4 U.S. dollars per person per day at 1993 purchasing power parity, so it can be said to be a fairly high estimate. Nevertheless, this does probably not affect the overall trend. In addition, the increase in the number of people in poverty in Russia was striking. In 1987-1988, just 2.2 million (1.5%) of the total population of 146 million people (1987) was in poverty, but after the economic transition began, the number of poor in Russia increased by 30 times to 66 million people, 44% of the total population of 148.5 million people (1993) (Milanovic, 1997, Figure 1).



Source: Prepared by the author by Milanovic (1997).

Even under socialism, it was not the case that poverty did not exist at all. It needs to be pointed out that it was merely impossible to investigate it due to the inaccessibility of data. At the same time, however, poverty in regions that had been in the socialist bloc increased due to the economic transition, and it can be said that it became widespread than before.

What is interesting here is the impact that “poverty” had as a problem associated with economic transition, and the extent to which the problem is unique to transition economies. Poverty itself is a widely observed phenomenon, so it can be said that the most important task is to determine whether it is actually a problem of “transition economies”. Therefore this paper will carefully examine research on poverty in transition economies conducted over the past 20 years or so, and with regard to poverty in transition economies, by exploring trends such as which factors have been studied, how they are different or similar to such factors in other countries, and whether differences are observed among transition economies, aims to take into account the nature and achievements of poverty research in transitional countries during the 20 years since the economic transition began.

2. Poverty in Transition Economies

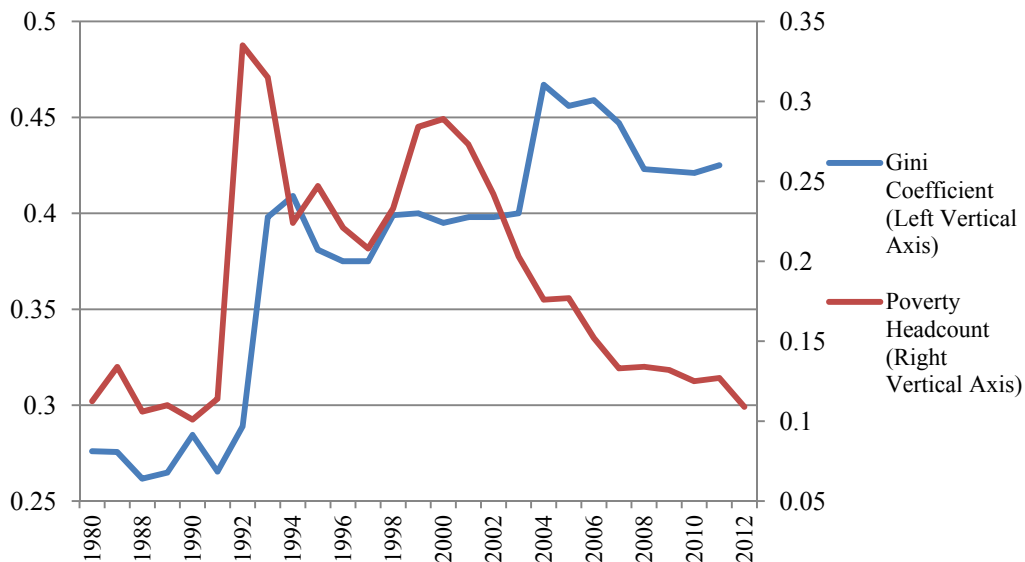
The increase in poverty in transition economies described by Milanovic (1997), which mentioned in the introduction, has been described as “sudden poverty” in previous research (Ruminska-Zimny, 1997). This expression sees the rapid increase in poverty in former socialist countries that had established generous systems of social security. Certainly, a big change occurred in the poverty headcount between the socialist era and the after the beginning of the economic transition. Nevertheless, as it was mentioned in the introduction, there is hardly any data for the socialist era. What can be used are various estimated series, such as the one illustrated in Figure 2, which shows the poverty headcount (the percentage of the population with incomes below the “cost of maintaining a minimum standard of living”) and the Gini coefficients for per-capita income in Russia from 1980, before the collapse of the Soviet Union, to 2010s.

The poverty headcount, which was 11.4% in 1991, began rising as the economic transition began at the end of 1991, reaching 31.5% in 1993. Similarly, the Gini coefficient, which indicates the level of income disparity, jumped from 0.265 in 1991 to 0.398 in 1993. This can be said to illustrate the occurrence of the “sudden poverty” in the transition economies described by Ruminska-Zimny (1997).

However, it is easy to see two contrasting periods, a sudden increase during the 1990s and a decline during the 2000s. It can be pointed out that these trends were closely related to the economic situation. Figure 3 shows the poverty headcount in Russia alongside gross domestic product (GDP) per capita. At the beginning of the 1990s, when the economy shrank in conjunction with the economic transition, the poverty headcount increased sharply. From 1999, however, when

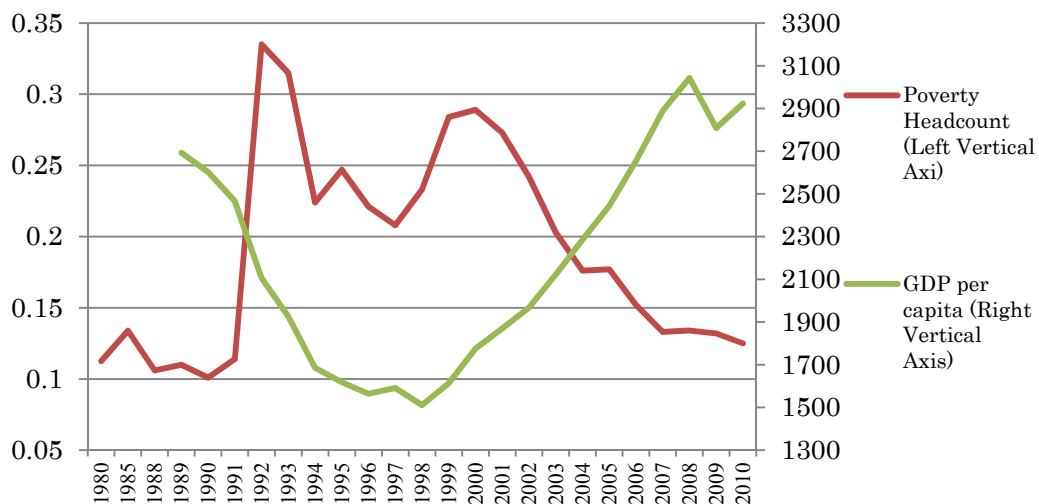
the economy began growing on a sustained basis, the poverty headcount trended downwards. The correlation between the poverty headcount and per-capita GDP in Figure 3 is -0.76, illustrating that the poverty headcount declines as per-capita GDP increases.

Figure 2. Poverty Headcount and Gini Coefficients of Income in Russia, 1980-2011.



Source: Prepared by the author by Braithwaite (1995); Rosstat, *Sotsial'noe polozhenie Iurovenzhisni naseleniya Rossii*, 1998, 2001,2004, 2010, 2011, 2013.

Figure 3. Poverty Headcount and GDP per capita in Russia, 1989-2010.



Source: Prepared by the author by Rosstat, *Sotsial'noe polozhenie Iurovenzhisni naseleniya Rossii*, 1998, 2001,2004, 2010, 2011, 2013; World Bank, *World Development Indicators 2005*, CD-ROM, and World Bank, *World Development Indicators 2012*, CD-ROM.

Needless to say, this is not something that is limited to Russia. The other socialist countries in Eastern Europe also had various systems, such as social security systems providing pensions, healthcare, systems for ensuring employment, and so on (McAuley, 1979; Braithwaite, Grootaert and Milanovic, 2000). As a result, it can be said that the transition to market economies that took place in these countries exhibited a similar phenomenon in that it made poverty more apparent. However, it must also be pointed out that the situation was not exactly the same in every region.

Table 1. Poverty Headcount. Poverty lines were defined by each country.
Top Half: Former Soviet States; Bottom Half: European and Asian Transitional Economies.

Year	Armenia	Azerbaijan	Georgia	Kazakhstan	Tajikistan	Turkmenistan	Kyrgyz	Belarus	Moldova	Ukraine	Russia
1993											
1994											30.9
1995		68.1									
1996				34.6				38.6			
1997								32.1			
1998								33			31.4
1999	55.5				96			46.7			
2000								41.9		31.5	
2001	48.3	49.6		46.7				28.9			
2002			52.1	44.5				30.5		28.1	19.6
2003			54.5	37.5	72.4			27.1	29	19.3	17.4
2004				33.9				17.8	26.5	14.7	14.1
2005				31.6				12.7	29	8.4	11.9
2006				18.2			61	11.1	30.2	6.8	11.1
2007			23.4	12.7	53.5		54.6	7.7	25.8	4.6	
2008	27.6	15.8	22.7	12.1			31.7	6.1	26.4	2.9	
2009	34.1		24.7	8.2	46.7		31.7	5.4	26.3		
2010	35.8						33.7		21.9		

Year	Hungary	Poland	Croatia	Latvia	Romania	Serbia	Macedonia	Bosnia	Kosovo	Arbania	China	Viet Nam
1993	14.5	23.8										58.1
1994					21.5							
1995					25.4							
1996		14.6									6	
1997	17.3											
1998											4.6	37.4
1999		14.3										
2000		14.8			35.9							
2001		15.6			30.6							
2002		16.6	11.2	7.5	28.9	14	19.1			25.4		28.9
2003					25.1		19.2		37.7			
2004		19	11.1	5.9	18.8	14.6	18.5	17.7	43.7		2.8	19.5
2005		18			15.1		20.4		34.8	18.5		
2006		15.1			13.8	9	19		45.1			16
2007		14.6				6.6		14				
2008		10.6				6.1				12.4		14.5
2009						6.9			34.5			
2010						9.2						

Prepared by the author by World Bank, *World Development Indicators 2005*, CD-ROM, and World Bank, *World Development Indicators 2012*, CD-ROM.

Table 1 shows poverty headcounts in the countries that comprised the Soviet Union, the transition economies of Central and Eastern Europe, as well as China and Vietnam. A look at this table enables a number of facts to be confirmed. The top half shows figures for the countries that comprised the Soviet Union, while the bottom half does the same for the transition economies of Central and Eastern Europe and the Asian countries. The figures obtained have been presented, generally and on the whole, poverty headcounts are clearly lower in the bottom half. The average for the top half is 30.1%, and that for the bottom half is 19.2%, and if China and Vietnam are omitted, the latter is 18.9%. Furthermore, a comparison of the 1990s and 2000s reveals that the poverty headcount trended downwards. The averages for the top half were 46.7% in the 1990s and 27.4% in the 2000s, while those for the bottom half were 21.6% in the 1990s and 18.6% in the 2000s. It can be seen that the decline in poverty headcount during the 2000s was most conspicuous in the countries that comprised the Soviet Union. That has actually been pointed out by researchers such as Razumov and Yagodkina (2007) and Bobkov (2007).

The collapse of socialism delivered a transitional shock to the regions, and the number of people in poverty increased sharply. The increase was particularly conspicuous in the 1990s, and the situation was especially severe in the countries that formerly comprised the Soviet Union. However, the situation changed in the 2000s, and it can be pointed out that the poverty headcount in each country exhibited a clear downward trend.

So how was poverty in the transition economies described? During the socialist era, or the Soviet era, the risk of falling into poverty was regarded as high for households in rural areas and households with children (McAuley, 1979; Braithwaite, 1995). This view would be in line with the insights provided by general research on poverty.

With the appearance of “sudden poverty” (Ruminska-Zimny, 1997) during the beginning of the economic transition in 1989–1991, poverty also became more widespread in urban areas during the 1990s (Gerry, Nivorozhkin and Rigg, 2008). Later, urban poverty was seen to increase in developing countries worldwide, particularly in Latin America (Ravallion, Chen and Sangraula, 2007). However, the transition economies in Europe did not exhibit such a trend. On the contrary, the number of people in poverty in urban areas there can actually be said to have declined. Furthermore, in the transition economies the relative difference in the poverty headcount in urban areas in comparison with that in rural areas can be said to have decreased. Given the above, the 1990s can be perceived as a period in which the poverty headcount increased and stabilized at a high level, while the 2000s can be perceived as a period in which the poverty headcount trended downwards.

3. Determination of the Literature to be Surveyed: Literature Search Procedures

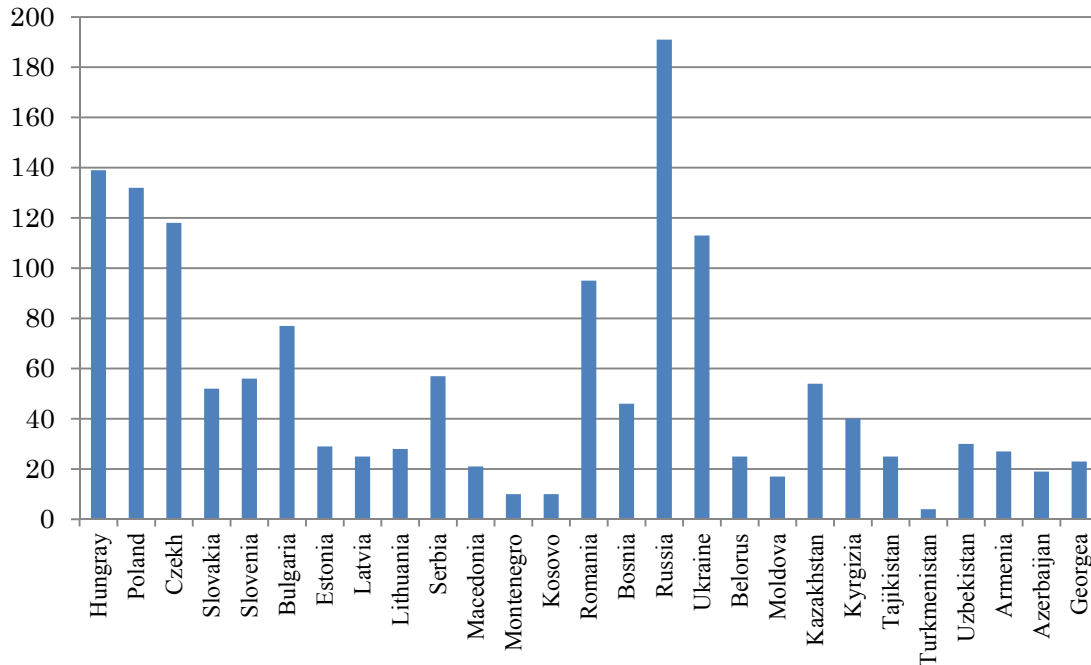
Before performing the meta-analysis for this paper and surveying literature to form the basis for that, it was first necessary to identify and list the literatures to be surveyed with avoiding subjective selection biases. This paper used Econlit, a well-known electronic database of academic literature, to search for literatures published in the 25-year period between January 1989 and October 2013¹. To limit the subjects covered, the author searched for words directly related to the topic, such as “poverty” and “poor”. This paper also used words that could be related such as “disparity (differential), and used the “and/or” combination function to extract a wide range of literature. In addition, to search for empirical research on the regions this research should cover, the author used “and/or” to search for keywords such as “transition economies”, “Eastern Europe”, and “Central Europe”. At this stage, the author had identified 338 pieces of literature, of which the author was able to actually obtain 318.

Actually, however, it was impossible to track down a sufficient number of papers. A serious problem was the frequent absence of research on specific countries. Furthermore, although predictable given the size of the country, the usability of data, and so on, the search results were incredibly skewed toward Russia. Therefore, in addition to the above, the author performed keyword searches (Econlit Subject searches) using “poverty + (specific country name)”, which produced a total of 1,463 (though some were duplicated) papers and academic writings. This enabled one to gather a reasonably wide range of literature on the transition economies of Central and Eastern Europe (Figure 4).

Here, this paper eliminated one-page news articles, comments concerning already-published papers, correspondence among their writers, reviews, and so on from this investigation. The author also decided to exclude papers included in books and discussion papers from international organizations and research organizations such as universities. This reduced the number of papers surveyed, and there is a risk that important papers have been omitted. However, one also should take account of the fact that many papers contained in books have previously been published in academic journals, with the books containing revised versions of them, and that while academic journals can be expected to maintain certain standards through processes such as peer review, the same level of quality may not be ensured for papers included in books and discussion papers published by research organizations. Another reason for this decision was that the number of book papers involving quantitative investigations, at least ones covering the regions this paper was investigating, is limited.

¹ Information from books and journals are not included in the Econlit database as soon as they are published. Taking into account the time lag between the publication of information and its inclusion in the database, and the reproducibility of the analysis performed in this paper, literature published up to approximately one year before this paper was written is covered.

Figure 4. The Number of Papers by Target Country,
by Keyword Searches Using “Poverty + <Specific Country Name>”
(1,463 in total, though some were overlapped. 1,320 if without overlapping)



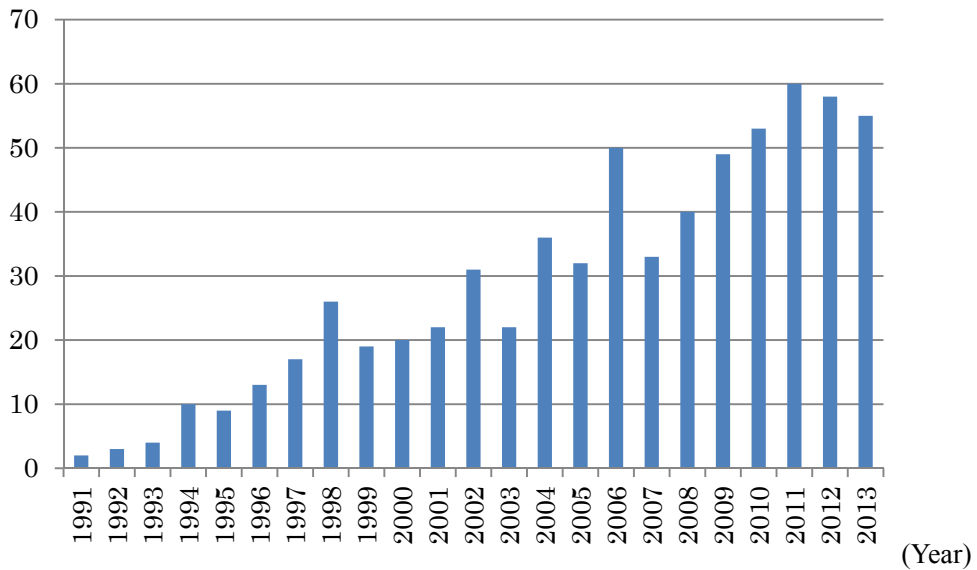
Source: Prepared by the author by the search results by Econlit.

The author also restricted the investigation to literature written in English, ignoring research conducted in Japanese, Russian, or other languages. In that sense, this paper follows the conventional approach of systematic review (Borenstein *et al.*, 2009). This decision was also aimed at ensuring a certain level of quality for research results.

Over half the literature for some of the countries of the former Soviet Union comprised discussion papers from international organisations, particularly the World Bank, papers from books, and so on. Although these could not be included in the author’s investigation, the author collected as many of the 892 papers from academic journals as he could (Figure 5a, Figure 5b)². The number of studies extracted from the database is shown in Figure 5a, but of the total of 892, the author was only able to obtain 547. However, several hundred of the papers published in the countries of Central and Eastern Europe were written in the local language, and although it must be noted that they could not be included in this paper’s investigation, by performing searches using country names, the author was able to significantly increase the amount of literature for the meta-analysis.

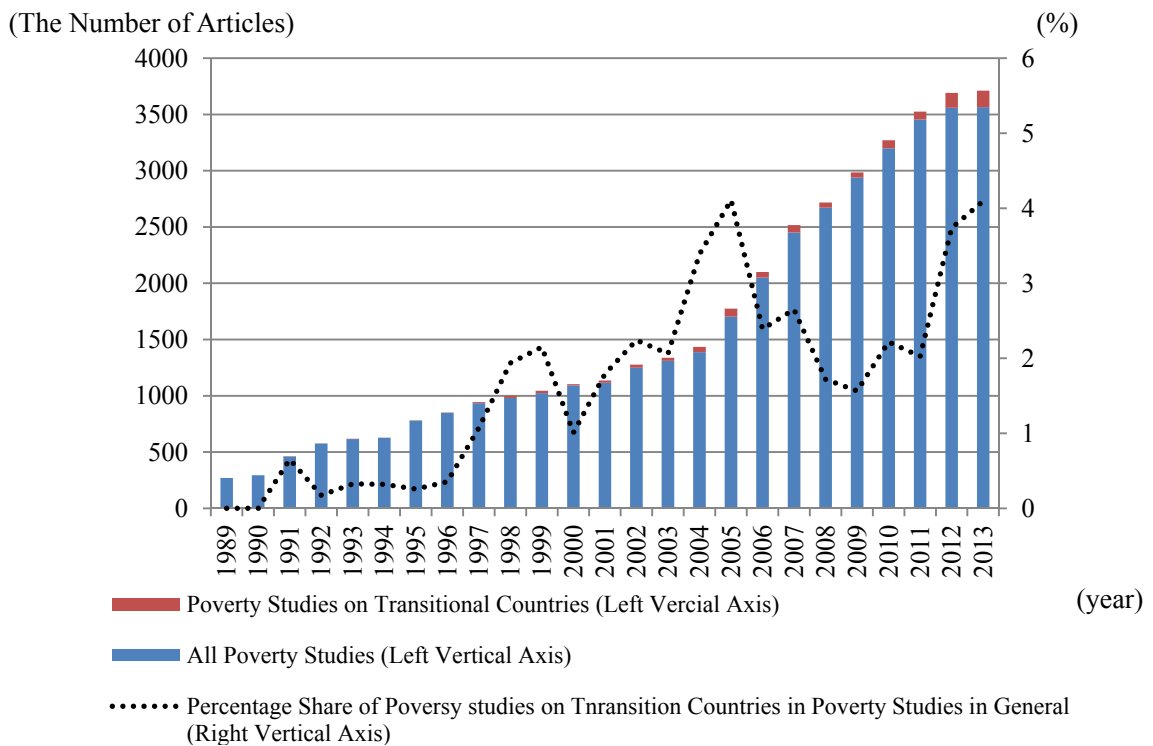
² This will be discussed later, but the literature subject to be used for the meta-analysis was not selected arbitrarily. Instead, all the analytical results that could be obtained were collected.

Figure 5a. The Number of Research Article on Poverty, targeting Transition Countris and Published in Academic Journals, January 1998-October 2013.



Source: Prepared by the author by the search results by Econlit.

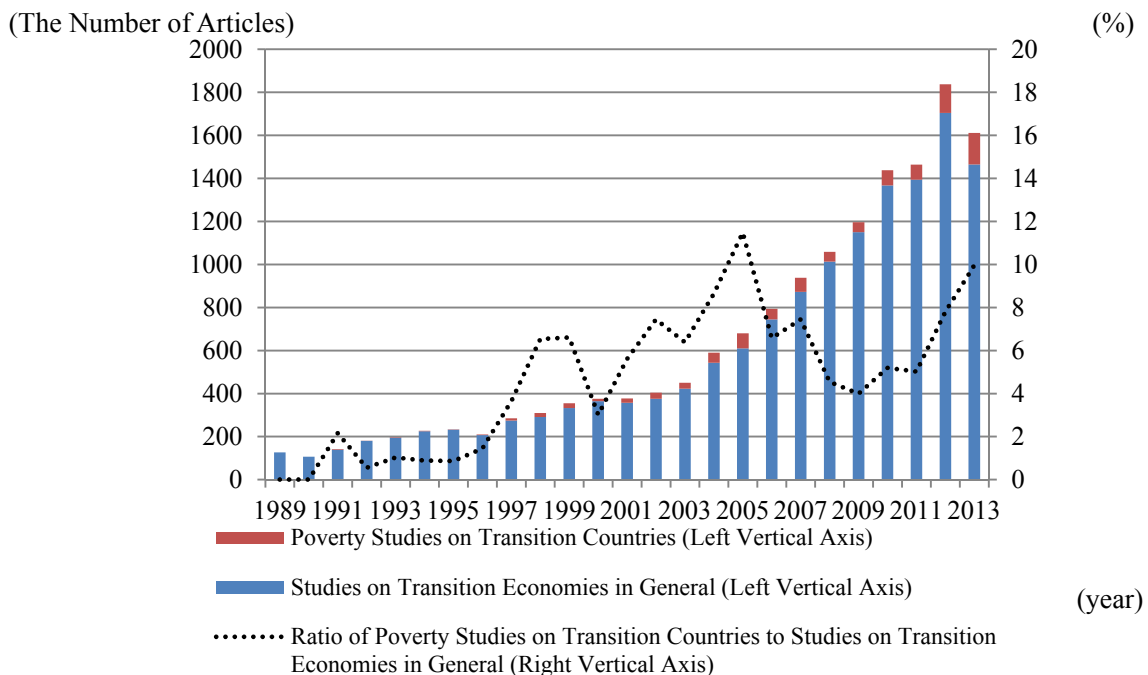
Figure 5b. The Number of (1) Poverty Studies in General in Academic Journals, (2) Poverty Studies on Transitional Countries in Journals, and (3) The Ratio of Poverty Studies in Transitional Countries to Poverty Studies in General, January 1989 – October 2013.



Source: Prepared by the author by the search results by Econlit.

Figure 5a suggests that there was a steady increase in the amount of poverty research in transition economies after the beginning of the economic transition in 1989. However, the database did not yield even one paper published in an academic journal for 1989 and 1990. This may mean that data that had been kept confidential during the socialist era was increasingly made public, and that a certain accumulation of data such as household survey data was needed before research could begin. In fact, the increase in research from 2000 may only have been possible once household survey data was accumulated. However, it may also be necessary to take into account the increase in the number of journals. A comparison with Figure 5b, which shows the results of a search performed using “poverty” as the keyword with no other restrictions (i.e. no specification of the region etc.), shows that poverty research as a whole increased sharply from the beginning of the 2000s. It can therefore be said that poverty research on transition economies followed the overall trend for poverty research in general. Nevertheless, it cannot be denied that the accumulation of research progressed steadily. And at the same time, as Figure 5b shows, research on poverty in transition economies as a proportion of total, non-region-specific poverty research, increased from less than 1% in the mid-1990s (1996) to 1.5–4%+ by 2013 (Figure 5b), which probably indicates that the increase in the number of journals was not the only contributor to the increase in poverty research on transition economies.

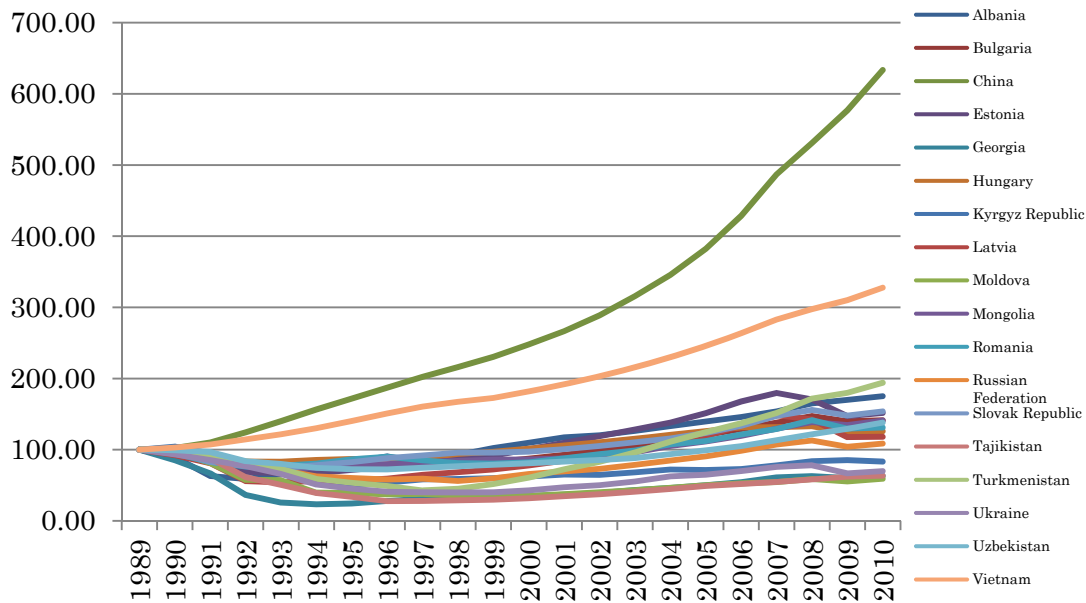
Figure 5c. The Number of (1) Studies on Transition Economies in General in Academic Journals, (2) Poverty Studies on Transitional Countries in Journals, and (3) The Ratio of Poverty Studies in Transitional Countries to Studies on Transition Economies in General, January 1989 – October 2013.



Source: Prepared by the author by the search results by Econlit.

Looking at the position of poverty research in the field of transition economy research in general (Figure 5c), it can be seen that not only has transition economy research itself been increasing in quantitative terms, research dealing with the problem of poverty as a proportion of all transition economy research has increased since the end of the 1990s compared with the beginning of the economic transition. It can therefore be said that “poverty” is gathering interest as a research topic in this field.

Figure 6. GDP per capita in Transitional Economies. (1989=100)



Source: Prepared by the Author by World Bank, *World Development Indicators 2012*, CD-ROM.

Next, the author read the titles and abstracts of all the papers he had been able to collect, eliminating those on topics that were obviously different. The author limited the literature to be collected here to that dealing with European transition economies. In other words, this research did not include Asian transition countries, i.e. China and Vietnam, in the subject of the investigation. There were clear reasons for this. First, China and Vietnam did not experience transitional shock and a subsequent recession, something that all the former socialist countries of Eastern Europe and the Soviet Union faced with. Figure 6 shows an index of per-capita GDP in transition economies with 1989 as the base year, and these two countries were the only ones that did not see their per-capita GDP drop after 1989 to below the level they were in that year. It is also difficult to imagine that the factors behind the poverty that occurred in those two countries had the same characteristics as those behind the “sudden poverty” that arose in the transition economies of Europe. Furthermore, a search using the keywords “China /and/ poverty” turned up 1993 pieces of literature. This figure is far higher than the 1,320 pieces from keyword searches specifying the names of all the European

transition economies as regions, which the author mentioned earlier, so there is a lack of balance. In other words, “knowledge from poverty research on China” might be over-representative when investigating “knowledge from poverty research in transition economies as a whole”. For the above reasons, the author deemed that it would be inappropriate to deal simultaneously with research covering China and Vietnam in addition to the European transitional economies.

Of all the 547 academic-journal papers that the author was able to obtain, 15 included results of analysis that could be used to perform a meta-analysis of differences over time and between regions in the determinants of poverty, and these are listed in Table 2. So the author was actually only able to extract results of analysis from fewer than 3% (2.74%) of all the pieces of literature.

Not all the 547 academic-journal papers described empirical research. Some of them explained policy trends, and many did not actually constitute poverty research³. There are reasons that the number of studies from which results of analysis can be extracted is so small, and they will be discussed these here.

No systematic review of all the poverty research conducted in transition economies exists. However, it is necessary to mention Lokshin (2009) as a previous review of poverty research, albeit one limited to Russia. Lokshin (2009) adopted the unusual approach of studying only literature written in the Russian language, and investigated the methods used for analysing poverty in Russia as seen through 250 papers published between 1992 and 2006. He found that whereas 48% of 145 empirical studies published in the top nine American economic journals in 1965 carried out some kind of regression analysis and performed statistical testing by providing standard errors, only 12% of 250 empirical studies in economics published in Russian journals between 1992 and 2006 carried out a regression analysis, and only 8% of them provided standard errors and performed testing (Table 3).

³ The searches were keyword searches, with JEL (Journal of Economic Literature) codes also added. The applicable codes were I300/I320/I390, P360, and P460, which cover subjects such as welfare and consumer economics. The 892 papers retrieved included a lot of papers focused mainly on analysis of education, pensions, and medical care.

Table 2. Papers, the Results of Which would be Utilized in Meta-Analysis (1): Explained Variable - Poverty Risk/Poverty Ratio.									
Published Year	Author	Target Areas	Estimated Period	Methods	The Number of Estimation Results to be Utilized	Explained Variables	Explaining Variables	Significance	The Number of Samples
2010	Brück, Danzer, Muravyev and	Ukraine	1996	Probit	4	Risk of Poverty	Household Size Unemployment Urban Residence	+ + +	22990
2009	Mills and Mykerezzi	Russia	1994-98 2000-03	Tobit	6	Poverty Ratio	Number of Urban Residence Higher Education	+ - - -	1288
				Tobit		Poverty Ratio	Number of Children Urban Residence Higher Education	+ - - -	2146
				Tobit		Poverty Ratio	Number of Children Urban Residence Higher Education	+ - - -	2156
2008	Szulc	Poland	2000	Probit	3	Risk of Poverty	Number of Children Urban Residence Higher Education	+ - - -	35952
2008	Dimova and Wolff	Bulgaria	1995, 97, 2001	Probit	3	Risk of Poverty	Number of Urban Residence Higher Education	+ no - -	2319-2633
2008	Rhoe, Babu and Reidhead	Kazakhstan	1996	Logit	2	Risk of Poverty	Number of Urban Residence Higher Education	+ - - -	1996
2008	Gerry, Nivorozhkin and Rigg	Russia	2004	Logit	7	Risk of Poverty	Rural Residence Number of Children Household Size Higher Education	+ + - - -	53970
2007	Robinson and Guenther	Tajikistan	2003	Logit	6	Risk of Poverty	Dependency Ratio	+ +	665-992
2007	Kristic and Sanfey	Bosnia and Herzegovina	2001-04	Probit	1	Risk of Poverty	Household Size Urban Residence Higher Education	+ - - -	915
2006	Bhaumik, Gang and Yun	Russia	2000	Probit	2	Risk of Poverty	Urban Residence Higher Education Number of Children	no - - +	416-2101
2006	Alexandrova, Hamilton and Kuznetsova	Russia	2002	Probit	1	Risk of Poverty	Urban Residence Higher Education Number of Children	- - - +	3905
2006	Szulc	Poland	1993, 99	Probit	12	Risk of Poverty	Urban Residence Higher Education Number of Children	- - - +	32000
2005	Kolev	Bulgaria	2001	Probit	4	Risk of Poverty	Existence of Children	+ +	2411
						Risk of Poverty	Existence of Children	+ +	1225
2004	Bezemer and Lerman	Armenia	1998	Ligistic Regression	1	Risk of Poverty	Household Size	+	1458
2004	Gustafsson and Nivorozhkina	Russia	1989, 2000	Logit	3	Risk of Poverty	Higher Dependency Ratio	- +	1187
						Risk of Poverty	Higher Education Dependency Ratio	- - +	1131
1999	Commander, Tolstopiatenko and Yemtsov	Russia	1992-93	Probit	2	Permanent Poverty	Dependency Ratio Higher Education	+ - -	4700
				Probit		Permanent non- Poverty	Dependency Ratio Higher Education	- - +	4700

Source: Prepared by the Author.

Table 3. Reporting Style of Empirical Studies:
Journal Articles in the US in 1965 vs. Russian Journal Articles in Russia, 1992-2006

	US, 1965	Russia, 1992-2006
Parameter Estimation	100%	75%
Report of Standard Errors	53%	8%
Regression Analysis	48%	12%

Source: Lokshin (2009), Table 3.

The conclusion of Lokshin (2009) was that given external criteria such as whether a paper features regression analysis or reports standard errors, it was difficult to say that the poverty studies in Russia met the normal standards for poverty research. Limiting the investigation to literature in the English language means that the final research results tend to also appear as literature in English, which reaches a wider number of readers, so it can be said to be the normal method for meta-analysis (Borenstein, Hedges, Higgins and Rothstein, 2009). Additionally, Lokshin's view can be said to support the approach of this paper, which is to conduct a review focusing on literature in English only. It is also understood that it is quite possible, as was the case with this paper, that only 3% of studies retrieved using the keyword "poverty" include content that can be used for meta-analysis⁴.

4. Meta-analysis of Poverty Research in Transition Countries

The meta-analysis this paper will perform here will be to combine partial correlation coefficients and t-values. This paper will combine partial correlation coefficients using the fixed-effect model and random-effects model and determine combined values to be referred by testing for homogeneity (Borenstein, Hedges, Higgins and Rothstein, 2009). Regarding t-values, the author will determine the weights using rankings, impact factors, and so on⁵, and present them as integrated t-values with or without weighting. Furthermore, by calculating fail-safe N (Mullen,

⁴ To give another example, if papers published between January 1989 and October 2013 are searched for using the keywords "Poverty /and/ Russia", it was shown that 191 papers were retrieved (Figure 3). However, of these 37 were in the Russian language, 32 were published in the journal *Problems of Economic Transition*, and 20 were discussion papers. The papers in Russian and the discussion papers were excluded from the study, but 32 (23.9%) of the remaining 134 papers were published in the journal *Problems of Economic Transition*. This journal is not a typical scientific journal. Instead, its stated role is to describe the current state of economic research within Russia by carrying English translations of papers published in Russian-language journals. Poverty research in Russia itself is as described by Lokshin (2009), so it is extremely rare for analytical papers to be featured in *Problems of Economic Transition*.

⁵ This follows the Borenstein et al. (2009) methods for assessing the standard of research.

1989) at the significant level of 5%, the author will confirm the confidence for the integrated t-values calculated here.

What needs to be taken into account when performing a meta-analysis is investigation relating to publication bias (Mullen, 1989). In this paper the author produce a funnel plot and check publication bias. Then the author performs the analysis by estimating a meta-regression model to confirm the existence of real effect⁶.

What one must mention first is the difficulty of grasping poverty dynamics using “transition factors”. In the case of macro-level themes such as the study of economic policy or path dependence, variables such as the degree of progress with privatization or the European Bank for Reconstruction and Development’s progress in transition indicators can also be regarded as explanatory variables. However, to understand the phenomenon of poverty at the individual or household level, such factors cannot be used in an approach that measures progress in the economic transition. Having said that, phenomena such as the privatization (shift to private ownership) of housing, at least in the case of Russia, occurred throughout the country at more or less the same time. Basically what happened was that ownership of the apartments that people lived in at the time was just handed over to their owners almost free of charge. Factors that occur for all agents simultaneously cannot be explanatory variables for phenomena that occur subsequently at the individual level. On the other hand, if one traces individual studies, the variables employed in them are the main variables that are widely used in poverty research (including in research on developing countries). In other words, the variables are the education level of wage earners, the genders of the highest wage earners, whether the household is located in a rural or an urban area, the number of children, the number of pensioners, the industries in which the wage earners work, ethnicity, and so on. Household surveys such as the Russia Longitudinal Monitoring Survey (RLMS) allow ownership (nationalized, privately owned, foreign owned, etc.) of companies at which household members work to be observed, but no papers employing such attributes as explanatory variables could be found.

So here the author will instead investigate how the phenomena changed during the economic transition, and whether different phenomena appeared depending on the specific region. This will be based on the examination of the poverty level in transition economies that this paper looked at in Section 1. This is the recognition that first, the poverty problems in the 1990s and those from 2000 onwards may have been of a different nature (Figure 1). Furthermore, the nature of poverty in regions that belonged to the former Soviet Union and the nature of poverty in other regions, i.e. Central and Eastern European countries may have differed (Table 1).

The above determines a direction for classifying previous research. In addition to combining the results of all the studies, the author will focus on the differences of whether the

⁶ These methods are as defined by Borenstein et al. (2013, 2014).

studies concerned former Soviet republics or Central and Eastern European countries and whether they covered the 1990s or the 2000s by combining the data for each separately⁷. Furthermore, regarding the explained variable, the author focuses on studies that determine a fixed poverty line and use the qualitative variable of regarding households below that line as having fallen into poverty as the explained variable. The results are shown in Table 4.

Table 4. Meta-Analysis of Estimation Results:
Explained Variables – Risk of Poverty/Poverty Ratio

	The Number of Estimation Results to be Utilized in Meta-Analysis	Combined Partial Correlation			Integrated T-value			Failsafe Number (Rosental's Method)
		Fixed Effect	Random Effect	Test for Homogeneity	Weighted T	Unweighted T	Median	
All the Studies								
Household Size	56	0.11*** (105.70)	0.067** (2.46)	809.57***	30.17***	4.63***	1.98	19455
Higher Education	46	-0.05*** (49.31)	-0.069*** (8.38)	2152.08***	-42.48***	-6.21***	-3.37	30623
Rural Residence	43	0.044*** (44.63)	0.025*** (3.15)	1924.09***	28.33***	4.17***	1.98	17702
Soviet Union vs. Central and East Europe.								
Soviet Union								
Household Size	31	0.073*** (42.54)	0.069*** (14.49)	131.53***	58.18***	8.98***	2.85	9621
Higher Education	25	-0.063*** (35.97)	-0.078*** (12.88)	183.19***	-29.6***	-4.36***	-4.03	8070
Rural Residence	22	0.063*** (40.56)	0.035*** (3.08)	790.30***	23.60***	3.53***	1.75	4505
Central and East Europe								
Household Size	25	0.020*** (14.47)	0.03*** (6.14)	202.07***	15.44**	2.36**	1.98	2177
Higher Education	21	-0.050*** (34.15)	-0.059*** (3.94)	1898.29***	-30.57***	-4.43***	-1.98	7158
Rural Residence	21	0.03*** (23.31)	0.015 (1.43)	909.20***	5.94***	0.86	1.98	252
1900s vs. 2000s								
1990s								
Household Size	26	0.017*** (10.72)	0.036*** (6.82)	211.96***	14.69***	2.05*	1.98	2204
Higher Education	26	-0.018*** (11.45)	-0.051*** (7.38)	297.92***	-16.9***	-2.36**	-1.98	2705
Rural Residence	24	0.011** (6.34)	0.01 (0.013)	57.93***	5.79***	0.8	1.98	695
2000s								
Household Size	30	0.06*** (42.60)	0.064*** (11.98)	217.94***	59.56***	10.16***	2.85	9398
Higher Education	20	-0.088*** (56.64)	-0.093*** (7.55)	934.11***	-45.11***	-7.06***	-5.64	15021
Rural Residence	19	0.076*** (53.62)	0.043*** (3.77)	1044.69***	36.1***	5.79**	4.28	9133

Note: Asymptotic Z-values are in the parenthesis. Significant at ***: 1% level; **: 5% level.
Source: Estimated by the Author.

⁷ As can be seen from the “estimate period” in Table 2, though this was completely unintentional, the period of analysis of all the studies can be classified as either 1990s or 2000s onwards, as none of them covered both periods.

For almost all the analyses, the null hypothesis relating to the assumption of homogeneity is rejected, so this paper will look at the results of the random-effects model. Here the author will discuss Table 5. When all the studies are combined, increases in the education level of wage earners reduce the probability of falling into poverty, increases in household size raise the poverty risk, and households located in rural areas are more likely to fall into poverty. These results are fairly typical. The analytical results extracted here are all based on micro data, and simply confirm the understanding obtained not just from studies on transition economies, but from a wide range of other studies.

What the author wants to focus on, however, is the differences when data for the 1990s and the 2000s, and data for the Soviet Union and Central and Eastern Europe, are combined separately. In the 1990s, households in rural areas were no more likely to fall into poverty than those in urban areas. In the 2000s, however, a rural location increased the probability of households falling into poverty.

Differences could also be seen when data was combined separately for countries that comprised the Soviet Union and countries in Central and Eastern Europe. The above findings applied to Central and Eastern Europe. In other words, in Central and Eastern Europe rural location did not raise the probability of poverty. What needs to be pointed out here is that this result is not due to extreme bias in the sample. When the author checked the effect of the rural domicile variable on poverty probability in the 1990s, the author combined the results of 24 analyses, and 10 of these were for countries that comprised the former Soviet Union.

Whichever the case, the same can be said concerning the integrated t-values. When combining data without weighting them by taking into account third-party evaluations of the academic journals in which papers were published, all variables were significant for all combinations. However, integrated t-values that had been unweighted were always smaller than those that had been weighted, and were no longer significant in the above two cases. Fail-safe N was fairly large in every case, which can be said to indicate a high level of confidence in the estimated results for the combined t-values.

The above results indicate that in the 1990s households in urban areas and rural areas had an equal likelihood of falling into poverty, and this situation was due to the transition economies being hit with a recession that occurred in conjunction with the change in the economic system. Compared with that of those in urban areas, the probability of households in rural areas falling into poverty was relatively higher in the countries that comprised the Soviet Union than those in Central and Eastern Europe. However, this situation changed in the 2000s, a phenomenon described by Gerry, Nivorozhkin and Rigg (2008) as a “ruralisation of poverty”. It may be said that this, in a sense, describes the process through which the economic turmoil that accompanied transition came to an end.

5. Detection of Publication Bias and Presence or Absence of Real Effect

Finally, to check for the existence of publication bias, the author will confirm the funnel plots. Additionally, meta regression analysis will be performed in order to check the presence of real effect. Figures 7a–c show funnel plots of the results of estimating the impact of each factor on poverty probability. It is difficult to determine whether the plots are horizontally symmetrical or triangular. Therefore, to verify whether publication bias exists or not the author will make estimates using a meta regression model concerning the existence of publication bias and the existence of real effect. The method follows that of Stanley and Doucouliagos (2012).

Regarding the detection of publication bias that can arise from assuming a specific sign relationship (positive/negative) (Publication Bias Type I. See Stanley and Doucouliagos, 2012), the author will regress the t -values of the k th estimate results to the reciprocal of the standard error.

$$t_k = \beta_0 + \beta_1 (1/SE_k) + v_k \quad (1)$$

Estimating this, this paper will test the null hypothesis that the intercept β_0 in equation (1) is zero. Unless the intercept β_0 is significantly zero, the distribution of the effect size is not be horizontally symmetrical, and publication bias is deemed to exist. This is known as the funnel-asymmetry test (FAT) (Stanley and Doucouliagos, 2012).

Furthermore, regarding publication bias that can arise from the fact that significant results are published more frequently, (Publication Bias Type II. See Stanley and Doucouliagos, 2012), this paper will test whether the intercept β_0 of the estimate expression in equation (1), where the left side is the absolute value, is zero (equation 2).

$$|t_k| = \beta_0 + \beta_1 (1/SE_k) + v_k \quad (2)$$

Regardless of whether publication bias exists, it is possible that the variable has a significant effect. This can be confirmed by testing the null hypothesis that the coefficient β_1 in equation (1) is zero. Because this expresses the precision of the estimated effect, it is referred to as the precision-effect test (PET) (Stanley and Doucouliagos, 2012). Furthermore, by estimating equation (3), which does not have a constant term,

$$t_k = \beta_0 SE_k + \beta_1 (1/SE_k) + v_k \quad (3)$$

an effect size that corrects publication bias can be obtained. If the null hypothesis that the coefficient β_1 is zero is rejected, a real effect exists and the estimate will be this β_1 value. This is referred to as the precision-effect estimate with standard error (PEESE) (Stanley and Doucouliagos, 2012).

Figure 7a. Funnel Plot for Estimation Results of the Effect of Household Size/Dependency Ratio on the Risk of Poverty/Poverty Ratio

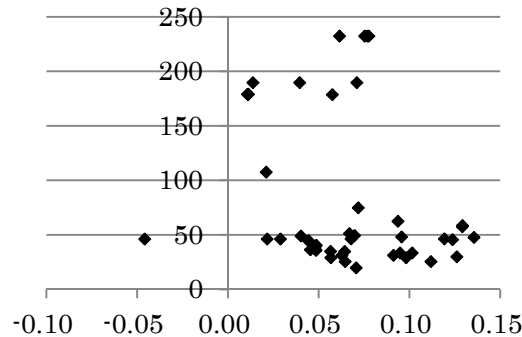


Table 5a. Meta-Regression Analysis on Publication Biases and the Existence of Real Effects of Household Size on Poverty Risks (Comparable with Figure 7a).

(a) FAT (Publication Bias Type I)- PET (Specification: $t = \beta_0 + \beta_1(1/SE) + v$)			
Estimation	OLS	Cluster-robust OLS	Random-effects Panel GLS
Model	(1)	(2)	(3)
Inrercept (FAT : $H_0 : \beta_0 = 0$)	2.43 ** (0.29)	2.43 ** (0.47)	2.74 ** (0.52)
1/SE (PET: $H_0 : \beta_1 = 0$)	0.046 ** (0.009)	0.046 ** (0.015)	0.043 ** (0.019)
# Observation	56	56	56
R-sqr.	0.5	0.5	0.5
Breusch-PeganTest: $\chi^2 = 11.13$, P = 0.000; Hausman Test: $\chi^2 = 2.13$, P= 0.14			
(b) Publication Bias Type II (Specification: $ t = \beta_0 + \beta_1(1/SE) + v$)			
Estimation	OLS	Cluster-robust OLS	Random-effects Panel GLS
Model	(4)	(5)	(6)
Intercept ($H_0 : \beta_0 = 0$)	2.44 ** (0.29)	2.44 ** (0.46)	2.69 ** (0.49)
1/SE	0.047 ** (0.0087)	0.047 ** (0.013)	0.045 ** (0.016)
# Observation	56	56	56
R-sqr.	0.56	0.56	0.56
Breusch-Pegan Test: $\chi^2 = 9.28$, P = 0.001; Hausman Test: $\chi^2 = 1.20$, P= 0.27			
(c) PEESE (Specification: $t = \beta_0SE + \beta_1(1/SE) + v$)			
Estimation	OLS	Cluster-robust OLS	Random-effects Panel ML
Model	(7)	(8)	(9)
SE	0.17 ** (0.038)	0.17 ** (0.041)	0.103 (0.18)
1/SE ($H_0 : \beta_1 = 0$)	0.061 ** (0.008)	0.061 ** (0.012)	0.05 ** (0.011)
# Observation	56	56	56
R-sqr.	0.63	0.63	-

Note: Standard Errors are in the Parenthesis. Significant at ***: 1% level; **: 5% level.

Source: Estimated by the Author.

[Intercept=0] was rejected by (a) and (b): Publication Bias exists;

1/SE is significant in (a), (b) and (c): Real Effects exist.

Figure 7b. Funnel Plot for Estimation Results of the Effect of Higher Educational Attainment on the Risk of Poverty/Poverty Ratio

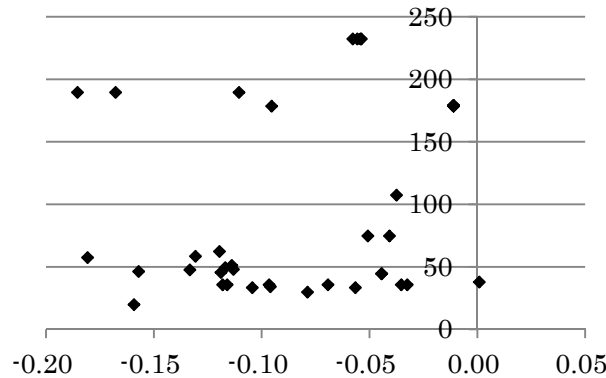


Table 5b. Meta-Regression Analysis on Publication Biases and the Existence of Real Effects of Educational Attainment on Poverty Risks (Comparable with Figure 7b).

(a) FAT (Publication Bias Type I)- PET (Specification: $t = \beta_0 + \beta_1(1/SE) + v$)			
Estimation	OLS	Cluster-robust	Random-effects
		OLS	Panel GLS
Model	(1)	(2)	(3)
Inrrecept (FAT : $H_0 : \beta_0 = 0$)	-2.62 ** (0.44)	-2.62 * (0.72)	-6.84 * (2.97)
1/SE (PET: $H_0 : \beta_1 = 0$)	-0.046 ** (0.011)	-0.046 * (0.019)	0.0057 ** (0.0097)
# Observation	46	46	46
R-sqr.	0.37	0.37	0.37
Breusch-PeganTest: $\chi^2 = 11.13$, P = 0.000; Hausman Test: $\chi^2 = 2.13$, P= 0.14			
(b) Publication Bias Type II (Specification: $ t = \beta_0 + \beta_1(1/SE) + v$)			
Estimation	OLS	Cluster-robust	Random-effects
		OLS	Panel GLS
Model	(4)	(5)	(6)
Intercept ($H_0 : \beta_0 = 0$)	2.62 ** (0.44)	2.62 ** (0.72)	6.84 * (2.97)
1/SE	0.046 ** (0.011)	0.046 * (0.019)	-0.0057 (0.0097)
# Observation	46	46	46
R-sqr.	0.06 0	0.37	0.37
Breusch-Pegan Test: $\chi^2 = 9.28$, P = 0.001; Hausman Test: $\chi^2 = 1.20$, P= 0.27			
(c) PEESE (Specification: $t = \beta_0SE + \beta_1(1/SE) + v$)			
Estimation	OLS	Cluster-robust	Random-effects
		OLS	Panel ML
Model	(7)	(8)	(9)
SE	-4.82 ** (1.12)	-4.82 ** (0.89)	1.33 (2.82)
1/SE ($H_0 : \beta_1 = 0$)	-0.059 ** (0.011)	-0.059 ** (0.018)	0.019 (0.012)
# Observation	46	46	46
R-sqr.	0.61	0.61	-
Note: Standard Errors are in the Parenthesis. Significant at ***: 1% level; **: 5% level.			

Source: Estimated by the Author.

[Intercept=0] was rejected by (a) and (b): Publication Bias exists;

1/SE is significant in two of (a)-(c): Real Effects exist.

Figure 7c. Funnel Plot for Estimation Results of the Effect of Rural Residence on the Risk of Poverty/Poverty Ratio

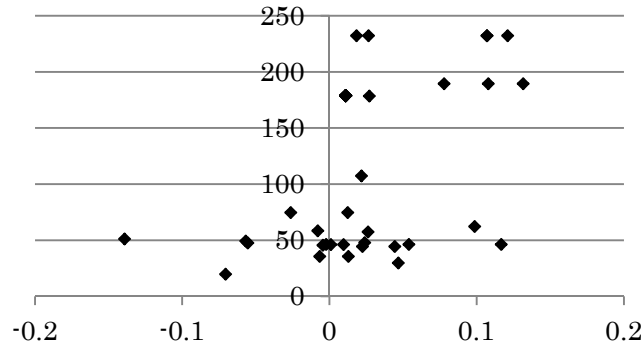


Table 5c. Meta-Regression Analysis on Publication Biases and the Existence of Real Effects of Rural Residence on Poverty Risks (Comparable with Figure 7c).

(a) FAT (Publication Bias Type I)- PET (Specification: $t = \beta_0 + \beta_1(1/SE) + v$)			
Estimation	OLS	Cluster-robust OLS	Random-effects Panel GLS
Model	(1)	(2)	(3)
Intercept (FAT : $H_0 : \beta_0 = 0$)	-0.73 (0.60)	-0.73 (1.23)	-0.9 (1.2)
1/SE (PET: $H_0 : \beta_1 = 0$)	0.093 ** (0.016)	0.93 ** (0.021)	0.094 ** (0.024)
# Observation	43	43	43
R-sqr.	0.59	0.59	0.59
Breusch-PeganTest: $\chi^2 = 11.13$, P = 0.000; Hausman Test: $\chi^2 = 2.13$, P= 0.14			
(b) Publication Bias Type II (Specification: $ t = \beta_0 + \beta_1(1/SE) + v$)			
Estimation	OLS	Cluster-robust OLS	Random-effects Panel GLS
Model	(4)	(5)	(6)
Intercept ($H_0 : \beta_0 = 0$)	0.41 (.046)	0.41 (0.85)	0.395 (0.87)
1/SE	0.087 ** (0.016)	0.087 (0.02) **	0.087 (0.021) **
# Observation	43	43	43
R-sqr.	0.58	0.58	0.58
Breusch-Pegan Test: $\chi^2 = 9.28$, P = 0.001; Hausman Test: $\chi^2 = 1.20$, P= 0.27			
(c) PEESE (Specification: $t = \beta_0SE + \beta_1(1/SE) + v$)			
Estimation	OLS	Cluster-robust OLS	Random-effects Panel ML
Model	(7)	(8)	(9)
SE	2.35 (1.7)	2.35 (3.12)	2 (6.86)
1/SE ($H_0 : \beta_1 = 0$)	0.087 ** (0.015)	0.087 ** (0.019)	0.088 ** (0.011)
# Observation	43	43	43
R-sqr.	0.68	0.68	-

Note: Standard Errors are in the Parenthesis. Significant at ***: 1% level; **: 5% level.

Source: Estimated by the Author.

[Intercept=0] was rejected by (a) and (b): Publication Bias exists;

1/SE is significant in (a), (b) and (c): Real Effects exist.

For the above estimates, the author will also use the least-squares method, cluster-robust OLS estimation, and unbalanced-panel estimation to confirm the robustness of the results. The results are shown in Table 5a-c. Here, the explained variables of poverty probability, the author produced funnel plots concerning three variables (number of family members, education level, and urban domicile), and also made estimates for all of them using a meta-regression model for publication bias and real effect.

According to these results, as is shown in (a) and (b) of Tables 5a–c except in the case of Table 5c (whether rural domicile affects the probability of poverty), the null hypothesis that the intercept β_0 in equations (1) and (2) is zero is rejected, indicating that publication bias exists. Regarding the real effect, however, in (a) of Tables 5a–c the null hypothesis that the coefficient β_1 in equation (1), the reciprocal of the standard error, is zero is rejected, and as shown in (c) of each table, the coefficient β_1 in equation (3), the reciprocal of the standard error, is estimated significantly in at least two of the three models. Therefore, regarding the probability of a household falling into poverty, it can be said that household size and education level have a real effect, the former positive and the latter negative. Where poverty “probability” (a two-value variable relating to whether income lies below a fixed poverty line), which attempts to grasp poverty directly, is the explained variable, a real effect can be detected with all three models. There is also the problem that publication bias has not been eliminated. However, it can probably be said that the results strongly suggest that the factors of household size, education level, and urban domicile, which have been dealt with in this paper and also investigated in numerous other studies of poverty in transition economies, certainly have an effect on the probability of individual households falling into poverty.

6. Conclusion

Taking into account the relationship with macro-indicators and research trends in the more than 20 years since transition began, with regard to poverty research in the countries that formerly comprised the Soviet Union and countries in Central and Eastern Europe, this paper has verified the results of empirical research on the factors that determine the poverty situation of households by combining them using a basic meta-analytical approach.

Research on poverty in this region, which increased as the socialist system collapsed, began shortly after the economic transition began. However, the nature of poverty in the former Soviet Union and Central and Eastern Europe differed, and two phases were observed: a phase of increasing and stabilising poverty in the 1990s and a phase of declining poverty in the 2000s. Unfortunately, it was impossible to locate any previous research employing transition factors as explanatory variables, so the author attempted a meta-analysis of the impact of household size, education level, and urban domicile, which are factors employed in traditional poverty research,

taking into account the possibility that their impact may differ depending on the period or the region.

The results generally supported the hypothesis. In the 1990s, there was no difference between urban and rural populations in the probability of falling into poverty. After 2000, however, urban domicile became a significant factor in reducing the probability of falling into poverty. In addition, differences were observed between the former Soviet Union and Central and Eastern Europe in the factors affecting the poverty situation. Identification of causes of these differences was beyond the scope of this paper, but this phenomenon is considered to indicate one of the directions for research in comparative transitional economics in the future.

At the same time, however, one must also mention the problem that publication bias was detected in all the cases the author put together in section 5 to verify its presence. This may suggest that advances in poverty research in transition economies remains not enough. On the other hand, it was shown that household attribute factors exert a real effect on the poverty situation. Although it must be recognized that poverty research in the countries that went through the economic transition has not investigated the effects of transition factors directly, the trend with the previous research examined here, which has been to expand the applicability of poverty-level determinants that are employed in stylized household analysis, can probably also be regarded as indicating steady progress in “transition”.

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