Armenian International Policy Research Group

Poverty, Inequality, and Growth in Armenia
Cross-Country Evidence

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Abstract

This study examines key trends in poverty and equity in Armenia and evidence on how growth and economic policies have influenced these trends. The paper also uses household surveys for 43 developing and transitional economies over the 1980-2002 period to analyze the impact of growth on poverty and income inequality from a cross-country perspective and to determine the main factors that significantly affected trends of poverty and income distribution.

The views expressed in this Working Paper are those of the author(s) and do not necessarily represent those of the Armenian International Policy Research Group. Working Papers describe research in progress by the author(s) and are published to elicit comments and to further debate.

I. INTRODUCTION

Poverty alleviation and equity considerations are playing an increasingly important role in the operational work of the IMF. This is because it is socially unacceptable to have poverty in the midst of plenty, and because equitable adjustment programs are more likely to be sustainable. In this regard, additional efforts are being made to increase the use of poverty and social impact analysis techniques for the assessment of the distributional impact of policy reforms supported in the operations of the IMF.

Prior to the breakdown of the Soviet Union, inequality and poverty were not major political or economic problems in Armenia. **With the transition to a market economy and the collapse in output during the first half of the 1990s, poverty and inequality increased dramatically.** While strong growth in recent years has reduced poverty and inequality, more than half of Armenia's population is still considered poor. There is also a great deal of inequality as measured by the Gini coefficient for per capita income. In this connection, poverty reduction has recently assumed a more important position in the reform agenda of the Armenian authorities.

A poverty reduction strategy paper has been prepared to guide the Armenian authorities' efforts at reducing absolute poverty from 51% in 2001 to about 20% by 2015. The 2003 poverty reduction strategy paper (PRSP) of Armenia outlines the government's approach to achieving this goal, with well-developed interventions in four broad areas: creating a framework for sustained rapid economic growth and transformation, ensuring good governance and security, directly increasing the ability of the poor people to raise their incomes, and directly improving the quality of the life of poor people.

This paper uses a new cross-country data set (43 countries for the period 1980-2002) on poverty, inequality, and growth in order to respond to the following questions:

- What are the determinants of poverty, would growth affect inequality, and how does inequality affect growth? Is Armenia's objective to reduce poverty to less than 20 percent of the population by 2015 realistic?
- Would targeted increase in government expenditure and good governance reduce the level of poverty and improve income distribution?
- What policy implications flow from the empirical results, as they pertain to the poverty reduction strategy in Armenia?

Part II of the paper aims to provide a broad picture of the evolution of poverty and inequality situation in Armenia based on the most recent household survey data available. Part III estimates the main relationships of interest using a panel data for 43 developing and transition economies. The last part discusses the main results of the study and their policy implications for Armenia. It offers some recommendation for strategies to alleviate poverty in future.

II. BRIEF ANALYSIS OF THE POVERTY AND INEQUALITY SITUATION IN ARMENIA

Poverty is a multidimensional phenomenon, encompassing both monetary and non-monetary aspects. A common component of all poverty measurement and analysis is the setting of a poverty threshold, or a poverty line. Persons with welfare levels below the line are defined to be poor, and those above are deemed non-poor. Despite the limitations of such as approach poverty measures of these sorts are useful in that: (i) they serve a monitoring role on the evolution of living standards and (ii) can be important means of focusing policy attention and public debates on the deprived groups.

A. Main Results of the Household Surveys

Estimations of poverty in Armenia are mainly based on the three nation-wide household surveys on living conditions conducted by the National Statistical Service in 1996, 1998/99 and in 2001. The poverty lines for each survey were based on actual consumption patterns of Armenian households. The main results of the household surveys are summarized below.

Table 1. Poverty and Inequality

	1989	Household Surveys		
		1996	1998/99	2001
Poor population (% of total)	20.0	54.7	55.1	50.9
Very poor population (% of total)	….	27.7	22.9	15.9
Poverty gap [2]	….	21.5	19.0	15.1
Severity of poverty[3]	….	11.1	9.0	6.1
Gini coefficient [4](income)	0.25	0.60	0.59	0.54
Gini coefficient (expenditure)	0.25	0.44	0.37	0.34

Source: Armenian authorities, National Statistical Service

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[2] The poverty gap index sums all the poverty gaps in the population, that is, the amount of money needed to bring all the poor up to the poverty line as a share of income. For instance, a poverty gap of 10% means that the average poor person's expenditure (income) is 90% of the poverty line.

[3] Severity of poverty index gives greater weight to those furthest below the poverty line (and this accounts for the inequality among the poor by giving more weight to those that are far below the poverty line).

[4] The Gini coefficient is one of the most popular representations of income inequality. It is based on Lorenz curve, which plots the share of population against the share of income received, with minimum value of 0 (reflecting perfect equality) and a maximum value of 1 (reflecting total inequality).

Poverty virtually did not exist during the Soviet area. However, in 1989 about 20 percent of the population in Armenia lived below the poverty as a consequence of the December 1988 earthquake and the inflow of about 360,000 refugees from Azerbaijan into Armenia due to the Karabakh conflict.

Like other countries of the former Soviet Union, Armenia has had a dramatic rise in both poverty and inequality after the breakdown of the Soviet Union in 1989/90. **In 2001, about 51 % of Armenia's population lived on less than US$1 a day at the 1993 PPP, as compared to 20% in 1989.** Poverty in Armenia is much worse for urban households than rural. Poor urban households enjoyed few economic opportunities with less than one half of their income coming from wages, self-employment, and farming. Slightly more than half of their income came from remittances, transfers, and selling off household assets. In contrast, poor households in rural areas received over 85% of their income from farming and wage labor. Land privatization partly explains why the incidence of poverty was lower in rural areas than in urban areas and why extreme poverty has been contained in rural areas.

While poverty remained stable over 1996-1999, it has declined by 5 percentage points from 1999 to 2001. Extreme poverty declined by about 12 percentage points from 1996 to 2001. There have also been improvements in terms of reduced depth and severity of poverty. These positive developments are partly due to the strong economic growth registered since the mid- 1990s and the improvements in targeted social policy, in particular, following the introduction of the state system of family allowances in January 1999.

Income inequality increased dramatically. The Gini coefficient for per capita income (where zero reflects perfect equality and 1 total inequality) more than doubled rising from 0.25 in 1988 to about 0.59 in 1998, and then declined to 0.54 in 2001.[5] The Gini coefficient for per capita consumption, however, is relatively modest and compares favourably with other transition and developing countries.[6] It has also improved by 3 percentage points declining from 0.37 in 1998 to 0.34 in 2001. This is one of the highest among transition and developing economies of similar per capita income levels. The very poor, who represented 23% of the population, received only 5 percent of the total income, and shared 10 percent of the total expenditures. While the richest 10 percent earned 45% of the total income, they consume 30 % of the total expenditure (Figure 1). Distribution of income and expenditures by deciles shows that extreme polarization is the main determinant of poverty. The impact of income distribution on poverty in section D shows that poverty level in Armenia would have been substantially less than its current level had the Gini coefficient of income remained at the 1989 level of 0.25 (close to the current income distribution of Poland or Latvia.

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[5] An income-based measure is bound to show higher inequality than one based on consumption. Also measurement errors are thought to be greater for income, which tends to inflate inequality.

[6] The large transfer of income from Diaspora Armenians to their relatives in Armenia explains the significant difference between the Gini coefficients as measured by income and expenditure.

In Armenia, as well as in most other transition economies, poverty is induced primarily by inadequacy of income rather than of human development (a broader socio-economic measure). The Human Development Index (HDI) measured on a scale of 0 to 1, is a composite of three measures: health, as proxied by life expectancy; knowledge, as proxied by literacy rate; and standard of living, as proxied by real per capita income. Armenia's HID for 2001 was 0.729, placing it in the "medium" human development category. Armenia ranks 100th out of 175 countries for which the index is computed. The level of human capital in Armenia is quite high by international standards: there is universal literacy, infant mortality is low, and life- expectancy is high.[7] These advantages have been inherited by Armenia. In the long run, they can only be sustained by better social policy.

Figure 1: Cumulative Distribution of Income and Expenditures by Deciles, 1998/99
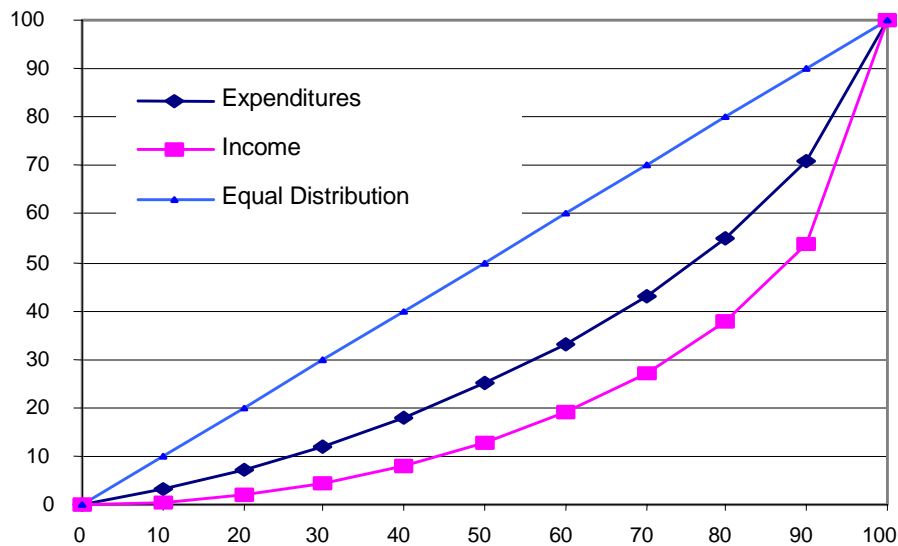
B. Causes of High Poverty and Inequality

Causes of widespread poverty are attributed to the sharp decline in output in the early 1990s, the increase in inequality associated with corruption and transition to market economy, and fiscal adjustment.

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[7] In the long run, they can only be sustained by better economic growth and social policy. See for example UNDP (2001), pp.141-144.

B.1 Contraction in Output and Increase in Unemployment

Contraction in output during 1991–93 was so deep (a cumulative of about 60 percent) that at end 2003 real GDP was still below its 1989 level despite the strong growth registered in recent years. With the collapse of the Soviet Union, most public enterprises went into bankrupt, throwing people out of work and into poverty. In addition, the conflict over the Nagorno-Karabakh region, which resulted in the closure of the Armenian border with Azerbaijan and Turkey, have delayed and acted as a constrain on economic recovery. As a result, poverty increased dramatically rising from 20% of the population in 1989 to 60 percent by 1996. The composition of output changed drastically in the 1990s as unproductive sectors, particularly manufacturing, contracted mainly due to the collapse of regional trade and payments agreements with the former Soviet Union Republics. The evolution of the composition of output, employment, and growth during 1990-2003 is shown in Table 2.

After the collapse of the Soviet Union unemployment increased sharply. In the 1990s, industry and services combined lost about 650,000 workers (more than one-third of the labor force) whereas agriculture absorbed about 250,000 workers. The rest 400,000 left the country or joined the informal sector. With a large influx of workers to a relatively fixed amount of land, productivity in agriculture—and therefore the returns to agriculture— declined. The modest real growth in agricultural output was offset by unfavorable price dynamics (prices for agricultural products lagged behind the CPI inflation) and by an increase in labor share in agricultural output. The base of growth in industry, construction, and services was quite narrow and did not generate sufficient employment. Average annual per capita real growth was about 8 percent during the past eight years (one of the highest among transition and developing economies).

Table 2. Structure of Output, Employment, and Growth

	Share of Production (In Percent of GDP)			Share of Employment (In Percent of total)			Annual Per Capita Growth Rates (In Percent)	
	1990	1994	2002	1990	1994	2001	1990–93	1994–2003
Agriculture	13	43	24	17	34	44	-6	3
Industry	45	29	22	31	24	14	-18	5
Construction	18	7	13	12	7	5	-30	14
Services	24	21	41	40	35	37	-23	9
Total	100	100	100	100	100	100	-18	8

Sources: Armenian authorities; National Statistical Service.

Despite the strong economic growth since the mid-1990s, unemployment rate remained in the 15-20 percent range according to unofficial estimates. The official unemployment rate, however, showed a modest decline from 12 percent in 1995 to slightly less than 9 percent in 2003. Nevertheless, the unemployment rate in Armenia is considered one of the highest among transition economies.

Large variations in growth among different sectors of the economy, inflation, and employment resulted in a heavy concentration of winners from growth. Real growth in agriculture, which currently employs about 45 percent of the labour force, has been substantially lower than for the overall economy (a cumulative increase of 26 percent from 1996 to 2002 as compared to 48 percent for the whole economy). Also as a result of the slower rise in prices of agricultural products than the general price level, nominal income in the agricultural sector has increased by less than 40 percent during 1996-2002, as compared with an increase of 83 percent for the whole economy. This is partly due to the unequal distribution of income, which skews consumption towards luxury food products and non-food items. The situation is even worse if the change in nominal income is calculated on per capita basis since employment in agriculture has increased by about 4 percent while employment in the rest of the economy has decreased by 40 percent from end 1995 to end 2002.[8]

B.2 Increase in Inequality and Corruption

Poverty increased not just because of the sharp fall in output in the early 1990s, but because of greater inequality in the distribution of income. There are two arguments for why inequality hinders poverty reduction. First, the higher the level of inequality the smaller are the absolute gains of the poor as the economy grows. Second, inequality hinders sustainable high economic growth.[9] The main causes of the rise in inequality from the early 1990s to 1998 are: (i) the prevalence of widespread corruption; (ii) the erosion of the state by narrow vested interests, which have undermined state institutions and blocked reforms that would serve the public good; and (iii) the collapse of formal wages and income opportunities in favour of incomes from diverse forms of self-employment, mainly subsistence-type agriculture and urban activities.

The benefits from corruption tend to accrue to the better-connected individuals in society, who belong mostly to the high-income groups. High and rising corruption increases income equality and poverty by (a) reducing economic growth; (b) lowering the

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[8] Productivity of labor in agriculture declined steadily during 1990-2000. The agricultural sector was unable to absorb productively the large influx of displaced workers, particularly from the industrial and construction sectors, that occurred in the 1990s. In 2001, the productivity of labor in agriculture is estimated at about half of its level in 1990.

[9] See World Bank (2001).

progressivity of the tax system; (c) reducing the effectiveness of social spending and the formation of human capital; and (d) perpetuating an unequal access to education.[10] An important implication of these results is that policies that reduce corruption will also reduce income inequality and poverty (Box 1).

While the scale of corruption was reduced in the past few years, it is still very high as compared with the Baltic and eastern European transition countries (Table 6). In 2003, Transparency International ranked Armenia at the 78th place among 133 countries. Transparency International's Corruption Perceptions Index (CPI) measures the level of corruption as perceived by business people, risk analysts, investigative journalists, and the general public. The CPI focuses on corruption in the public office for private gain. It ranges between 10 (highly clean) and 0 (highly corrupt). Finland, which tops the global list, scored 9.7. Armenia scored 3.0 in 2003, or just below the threshold for a "high level" of corruption as defined by Transparency International.[11] In 2000, Armenia was 76th on the list of 90 countries surveyed with a score of 2.5. This suggests that the international watchdog (Transparency International) has found a certain reduction in the scale of corrupt practices in Armenia (Box 1).

B.3   Fiscal Adjustment or Retrenchment

In the course of macroeconomic stabilization during 1994-1998, fiscal policy moved to a tighter fiscal stance. Most of the adjustment, however, has been made on the expenditure side including **drastic cuts in spending on social sectors and reduction in subsidies to public enterprises.** Government expenditure declined sharply from about 40 percent of GDP in the early 1990s to 22 percent of GDP by 1998. As a result, there has been a dramatic decline in the share of public resources devoted to education and health care. Government spending on education and health have plunged from 15 percent of the national budget in 1991 to just 4 percent in 2003. The decline in public resources for education has deteriorated the quality of education in the public sector and the accessibility of health care has clearly suffered. Tax revenues in terms of GDP failed to improve significantly, remaining in the range of 13-16 percent of GDP, due to administrative difficulties in taxing newly emerging sectors of the economy and high tax evasion.

In principle, a larger government (as measured by the ratio public expenditure to GDP) is likely to harm growth prospects.[12] This is particularly the case if the government maintains ineffective public programs and a bloated bureaucracy. However, in a retrenchment of the public sector, programs that benefit the poor might be cut. Also, if

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[10] See Gupta, Sanjeev and others (1998).

[11] Countries scoring less than 2.0 are considered the worst cases where corruption is perceived to be "pervasive." Among them are Georgia and Azerbaijan which were ranked in the 124 place.

[12] See the empirical results in the IMF Working Paper, Iradian (2003).

public employment plays a safety net role then retrenchment may lead to increasing inequalities. However, the impact of the size of the government on inequality is less clear. In this connection, Part III assesses the impact of reduction in the size of the government on poverty and inequality from a cross-country perspective.

Box 1. Good Governance and Corruption

Good governance is crucial to promoting high-quality growth with equity and the implementation of second-generation reforms. It entails guaranteeing the rule of law, promoting the accountability, efficiency, and transparency of the public sector, and tackling corruption. In a transitional society such as Armenia, where the newly established institutions and laws are not functioning properly, the incentives and opportunities for corruption grow and its effects on country's social-political life and economy become more pervasive.

Surveys in Armenia indicate that administrative corruption involving side payments is widespread and that the public and enterprises view state institutions as having a high level of dishonesty. A survey undertaken in 2001 by the IMF Office in Armenia assessed perception of corruption by 95 major businesses and senior public officials. Most respondents ranked police, tax and customs authorities, and the judiciary as the most dishonest institutions from a list of 12 public and civil society structures. There was a high level of distrust towards courts, more than 80% of the surveyed considered the judiciary the least trusted institutions. The results of the survey indicate three major reasons for corruption: (1) impunity of high-level authorities; (2) low wages in the public sector; and (3) absence of law enforcement mechanism. Low wages are perceived as a major cause of corruption. Low wages of civil servants create additional incentives for them to take bribes or to be engaged in other rent seeking activities.

Law enforcement, which is an important indicator of good governance, is to a large extent ineffective in Armenia. More than half of the surveyed enterprises in Armenia strongly disagreed with the statement that "businesses in Armenia are protected from government's arbitrary interference". In Armenia the lack of transparency and mechanisms of horizontal accountability in higher echelons of the executive branch overpowers individual officeholders. They give privileges to private enterprises in exchange of various forms of rent. Unnecessary and arbitrary protection of private economic activities by the government (for private reasons) becomes one source of free market distortions by establishing monopolies in some sectors of economy, such as the imports of gasoline, wheat, and sugar.

The Armenian government has recently taken serious steps towards implementing reforms in the areas of governance and anti-corruption. Parliament has adopted laws on civil service and on financial disclosure for high-level public officials. In 2003, the government adopted an anti-corruption program including a time bound action plan. Improved governance and reduced corruption are not only essential to encourage more investment and growth, but they will also produce a more equitable income distribution and reduced poverty for any given level of aggregate GDP. The government's ability to finance the social system and improve the position of the poorest in society is seriously compromised if it cannot collect the revenues due to it. Armenia must improve governance to ensure that the government serves the interests of all, not just the few, if the good economic growth rates of recent years are to be sustained and exceeded, and poverty in the country to be reduced.

Larger government spending on social sectors (education, health, housing, and infrastructure) is necessary to alleviate poverty and to promote human development. The market for education and health services is imperfect and governments in different countries have no other choice but to intervene on grounds of equity and efficiency. Spending on education, health, and housing now account for less than 7 percent of GDP in Armenia as compared with an average of 12 percent of GDP in countries with relatively equal income distribution and lower poverty levels. Some might argue that it is more efficient that the private sector provides the services of education and health. Also important is investment in physical infrastructure, including investment in housing, transport and communications.

C. Social Safety Net

In many transition and developing economies pensions play a critical role in supporting the poorest households. In Armenia the elderly are among the most vulnerable to poverty. Pensions have great potential for equalizing income. Unfortunately, **Armenian pensions have decreased in real terms through 2001 instead of increasing to help mitigate rising inequality.** Average pensions have fallen relative to average wages from 33 percent in 1996 to 19 percent in 2001, and then rose slightly to 21 percent in 2003 (Table 3). In contrast, the average pension as share of the average wages was 25% in Georgia, 32% in Azerbaijan, and 37% in Russia. Assuming pensioners had no other source of income, this would put almost all of them below the extreme poverty line. Since the number of pensioners is large (about 18 percent of the population) the decline in pensions relative to average wages is clearly an important contributing factor to inequality.

Table 3. Living Standards Indicators

	1996	2001	2003 Est.
GDP per capita, US$	491	706	870
Average monthly salary, in dollars [13]	23.1	43.1	53.6
Average monthly pension, US$	7.7	8.3	11.2
Pension as % of average salary	33	19	21

Source: National Statistical Service, Armenia

The shadow economy is the main reason for the decrease in the collection base of the mandatory social insurance payments. If compliance were to increase from the current 40% to 100%, the pension payments would improve substantially and the average monthly pension could more than double (rising from $11/month to $23/month.

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[13] The minimum monthly salary has been raised from 5,000 drams (about $9) to 13,000 drams (about $23) effective January 2004.

Presently, the financial resources earmarked for pension security account for about 4% of GDP, substantially lower than other transition economies (10-12% in the Baltic countries). However, transfers alone would not solve the problem of poverty in Armenia. Even with perfect targeting, additional five percentage points of GDP would be needed to be spent as transfers in order to bring the consumption of the very poor up to the poverty line (assuming that the leakage rate is minimized). It is unlikely that transfers of this scale will be feasible given the current low tax collection in Armenia (about 15 percent of GDP) as compared to 30% of GDP in the Baltic countries. On the other hand, transfers are palliatives and do not address the fundamental causes of poverty, namely lack of employment opportunities and low productivity.

Emigration has played a very important role as a safety net for many households with unemployed workers. The 2001 household-survey revealed that remittances (assistance from Diaspora Armenian) account for 13 percent of household income, slightly more than half of wages, which accounted for 25 percent. Assistance from relatives living abroad also exceeded the official benefits and pensions by 3.5 percentage points. This comparison underlines the critical importance of the external labor market, principally the Russian Federation.

D. Growth and Distribution Component of Changes in Poverty Measures

Using the methodology developed by Datt and Ravallion (1992), it is possible to decompose **changes in poverty into a growth component, an inequality component** plus a residual. The growth component explains what percentage of the change in a poverty measure is due to a change in the mean expenditure while holding the distribution constant. The inequality component explains what percentage of the change in a poverty measure is due to a change in the distribution while keeping the mean expenditure constant. The change in poverty (P) in year t can be expressed as

$$P_t = P(z/\mu_t, L_t), \tag{1}$$

Where, z is the poverty line, μ_t is the mean income and L_t is a vector of parameters fully describing the Lorenz curve at date t. The level of poverty may change due to a change in the mean income μ_t relative to the poverty line, or due to a change in relative inequalities L_t. For Armenia, for example, the overall change in poverty (P) between 1996 and 2001 can be written as:

$$P_{2001} - P_{1996} = G(2001, 1996; r) + D(2001, 1996; r) + R(2001, 1996; r) \tag{2}$$

| growth | redistribution | residual |
| component | component | |

The results of the decomposition for Armenia's are given in Table 5. **The results show that over 1996-2001, as a whole, the growth component has been responsible for most of the decline in poverty.** In 1999-2001, the redistribution component has augmented the favorable impact of growth on poverty.

Table 5. Decomposition of Poverty Incidence into Growth and
Redistribution Components (in %)

period	change in poverty	growth component	redistribution component	residual
1988-96	34.4	25.5	7.1	1.8
1996-99	-4.5	-3.4	-0.9	-0.2
1999-01	-5.0	-3.9	-0.8	-0.3

Source: Author's calculations.

As shown in Table 5, almost three-fourth of the increase in poverty from 1988 to 1996 is explained by the sharp fall in output during this period and one-fourth due to the substantial increase in equality. Likewise, both growth and inequality components contributed to the modest decrease in poverty since 1996. However, the size of the growth component far exceeds the inequality component, suggesting that poverty reduction is principally due to rising mean expenditure. In sum, had the income distribution remained constant at the pre-transition level (Gini-coefficient of 0.25) the poverty level in Armenia would have been significantly much lower in 2001.

One could estimate the poverty-growth and poverty-inequality elasticities for Armenia using econometric method of cross country data (see Part III). Such elasticities then could be used to project the growth rates required to achieve the Armenian government's target of reducing poverty to 20 percent of the population by 2015. Poverty-growth elasticities show the percentage change in a poverty measure which would be induced by one percent increase in the mean expenditure while keeping the distribution of expenditure fixed. Similarly, poverty-inequality elasticities show the percentage change in a poverty measure which would be implied by one percent decrease in the Gini-coefficient while holding the mean expenditure fixed.

III. ANALYSIS OF THE RELATIONSHIP BETWEEN GROWTH, POVERTY AND INEQUALITY

This section examines, in a cross-section empirical framework, the relationship between growth on one hand and poverty reduction and income distribution trends on the other hand. It also identifies some of the macroeconomic variables that significantly reduce poverty and improve income distribution. The macroeconomic variables examined in the paper is the government expenditure and the structural variables is governance or corruption level. The relative efficacy of growth-oriented and re-distributive policies in alleviating poverty and promoting equity continues to be a matter of discussion and debate. Economic growth may not be a sufficient condition on poverty alleviation. In theory at least, if income inequality increases, it is possible for a country to enjoy positive economic growth without

any benefit to its poorest segment of population---the rich get riches while the incomes of the poor stagnate or decline. Therefore, the relationship between economic growth and income distribution is critical.

A. Brief Survey of Literature

Kuznets (1955) was pioneer of the research on how growth affects income inequality. He **argued that the effects of economic growth on income distribution change at different stages of development.** Specifically, income inequality widens in the early phases of economic development; becomes stabilized for a while; and then narrows in the later phases as economies mature. Kuznets' hypothesis implies that growth benefits the poorest groups of society less than one-for-one in the early stage of (industrial) development and more than one-for-one later one.

A growing number of studies on the effects of economic growth on income distribution has challenged, on both theoretical and empirical grounds, the traditional view that the poor fail to gain either relatively or in absolute terms. **Several empirical studies concluded that the Gini coefficients are relatively stable over time within countries but different across countries.** For example, Li, Squire and Zou (1998) found such results using the data set on Gini coefficients covering 112 developed and developing countries for the period 1947-94. This suggests that inequality is largely determined by factors that change only slowly within countries but are quite different across countries.

There is no strong empirical evidence suggesting a general tendency for growth to make income distribution more or less equal. For example, Dollar and Kraay (2002) investigated empirically the relationship between growth and poverty. Using a sample of 80 countries over four decades, they examined the relationship between the effects of economic growth on the income of the bottom 20 percent of the population and found that income of this group has a unitary elasticity with respect to growth. In other words, economic growth does not disadvantage the poor by excluding them from growth induced prosperity. They also found that the poverty-growth relationship does not change in negative growth episodes or positive growth periods (i.e., incomes of the poor do not fall more than proportionally during economic crisis).

The 2001 World Development Report also concludes that there are no systematic effects of economic growth on income inequality across countries. The differences in inequality at a given rate of growth could reflect that fact that the combination of policies and institutions that led to this growth differed across countries---and that these differences in policies matter for income distribution.

Cross-country empirical evidence provides little support for the view that growth is detrimental to equity. In a recent econometric study based on 50 developing countries, Adams (2003) found that economic growth had no statistical effect on income distribution: inequality may rise or fall with economic growth.

Box 2. Poverty Reduction Policies in Malaysia

The impressive record of poverty reduction in Malaysia---from 50 percent of the population in 1970 to 8 percent in 2000---can be attributed to basically two factors. The first factor was rapid economic growth (an annual average per capita growth of 3.8 percent) with macroeconomic stability, promotion of labour-absorbing industries, high level of public sector investment in building the country's physical and social infrastructure, and enterprise for the Malay population. The second factor, was the government's poverty reduction programs which targeted at specific groups in both rural and urban areas, including redistribution of assets, access to credit, subsidies for education and health, and safety nets for the very poor.

Increased distribution of income because of the rising share of wages in family income and a more even distribution of wages, resulting from the broad expansion of education and improvement in literacy, have accompanied growth in Malaysia. Strong demand for labour contributed to rising wages---low inflation helped the real wage to rise significantly---supported by the growing productivity of a more skilled workforce. The expansion of government employment at lower levels also helped increase the demand for wage labour. Perhaps the most important overall factor was the shift of large numbers of workers out of the traditionally low-paid rural occupations into better paid modern sector employment.[14]

B. The Data

While data on social indicators have improved in recent years, international comparisons of poverty and income distribution statistics are still plagued by both conceptual and practical problems. **Comparing different survey-based measures of living standard poses a major problem.** Some surveys only obtain income and others only obtain consumption (see for example the case of Armenia in Table 1). **An income-based measure is bound to show higher inequality than a survey based on consumption.** Also, measurement errors are thought to be greater for income, which tends to inflate measured inequality.[15] Comparisons across countries at different development levels also pose a potential problem given variations in the relative importance of consumption of non-market goods. These problems clearly throw doubt on simple cross country comparisons of the measured levels of inequality and poverty. However, it can still be possible to detect the true relationship between poverty and aggregate affluence using special econometric methods that resolve some of the statistical estimation problems inherent when cross-section data are used.

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[14] See IMF Working Paper, Mahmoud Hasan Khan (2002).

[15] As discussed, for example, by Ravallion and Chen (1997).

This paper follows the work by Ravallion and Chen (1997) who investigated empirically how economic growth affect poverty and inequality in developing countries, and Adams (2003) who examined the impact of public sector employment and remittances on poverty and inequality. I extended their work by including in the data set several transition countries, using the results of recent household budget surveys, and introducing government expenditure to GDP ratio and corruption level as explanatory variables. The source for income distribution and poverty data are the World Bank database and IMF country staff reports, for income per capita in U.S. dollar calculated at PPP the source is the World Bank database, for government expenditure as percent of GDP is the International Financial Statistics of the IMF, and for governance measure the Corruption index from Transparency International.

The 43 developing and transition countries included in this study have at least two nationally-representative household survey since 1980 (many of the pre-1980 household surveys were of poor quality)[16]. In the data set two surveys for one country define what is called an interval. In constructing the intervals the following criteria are used: intervals must be 3 or more years in length, they must come form nationally-representative surveys and use either expenditure per person or income per person over time. To illustrate, Table 6 summarizes how poverty and inequality were established in selected survey years in 16 developing and transition countries. The full sample in this paper includes 89 intervals from 43 countries. The maximum GINI in my sample is .53 (Armenia) and the minimum is .25 (Latvia). Table 6 reveals four key findings. First, poverty, as measured by the $1 per person per day standard, has declined in most countries that have experienced a positive real per capita GDP growth, and increased in countries with negative growth rates. Second, inequality increased or decreased with positive real per capita growth (no clear relationship between growth and inequality). Third, poverty is in general lower in countries with larger government size and higher per capita income

C. Model and Empirical Results

The following three relationships are estimated:

$$\Delta P_{it} = \alpha_{it} + \beta_3 \, \mu_{it} + \beta_4 \, \Delta \, GINI_{it} + \Delta \, u_{it} \qquad (3)$$

$$\text{Log } P_{it} = \alpha_{it} + \beta_1 \log Y_{it} + \beta_2 \log GOV_{it} + \beta_3 \log GINI_{it} + u_{it} \qquad (4)$$

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[16] The full sample includes the following 43 countries: Armenia, Azerbaijan, China, Czech Republic, Hungary, Kazakhstan, the Kyrgyz Republic, Latvia, Lithuania, Poland, Romania, Russia, Slovenia, Ukraine, Algeria, Bangladesh, Burkina Faso, Costa Rica, Dominican Republic, Egypt, Gambia, Ghana, Honduras, India, Indonesia, Iran, Ivory Coast, Jordan, Madagascar, Malawi, Malaysia, Mauritania, Morocco, Nicaragua, Pakistan, Peru, the Philippines, Thailand, Tunisia, Turkey, Sri-Lanka, Uganda, Zambia, and Zimbabwe.

$$LogGINI_{it} = \alpha_{it} + \beta_5 logY_{it} + \beta_6(logY_{it})^2 + \beta_7 logGOV_{it} + \beta_8 \log CORR + v_{it} \qquad (5)$$

$$\Delta\mu_{it} = \alpha_{it} + \beta_9 \Delta GINI_{it} + \beta10\Delta GOV_{it} + \Delta w_{it} \qquad (6b)$$

where P is the measure of poverty in country i at time t, α_i is a fixed effect reflecting time differences between countries in distribution, Y is PPP per capita income in U.S. dollars, GOV is the share of government expenditure in GDP, GINI is the income distribution as measured by the GINI coefficient of income, μ is the annual real per capita GDP growth rate, CORR is the Transparency International's Corruption Perceptions Index, which focuses on corruption in the public office for private gain. It ranges between 10 (highly clean) and 0 (highly corrupt). Since all variables are expressed in log terms, the results can be interpreted as elasticities (the β's) of poverty or inequality with respect to the relevant variable, e.g. per capita income growth rate, government expenditure as share of GDP, income per capita at PPP, and measure of corruption. Ordinary least squares (OLS) estimates of equations (3) to (6) are presented in Table 7.

I first present the results using the basic specification equations (3a) and (3b) which regresses the change in poverty between two survey years for a country on per capita growth rate, changes in inequality, and changes in government expenditure to GDP ratios. The coefficient estimates for the elasticity of poverty with respect to growth are of the expected sign, highly significant, and of magnitude similar to other estimates reported in the literature. **The growth elasticity of poverty is 2.2** and is very close to the one estimated (2.1) by Ravallion and Squire (1998) on a smaller set of countries. This implies that a 10-percentage point increase in per capita growth can be expected to decrease poverty by 22 percent.

I find that **higher inequality levels are associated with higher poverty levels.** However, the coefficient estimate for the elasticity of poverty with respect to inequality, while is of the expected sign, is not significant in both equations (3a) and (3b). As for the impact of inequality on growth, I find that **an increase inequality would cause growth to slowdown.** According to the estimated equation (6b) in Table 7, a 10 percent increase in the Gini coefficient would be associated with a decrease in per capita growth of 2.7 percent. This finding would be more in line with Barro (2000), who find evidence that inequality negatively affects growth, than with Forbes (2000), who finds a positive relationship between inequality and growth (that is increase in inequality increase growth).

Test for the impact of government size (as measured by government expenditure to GDP ratio) on poverty is also presented in Table 7, for the first time in empirical work on the determinants of poverty and inequality. The estimated equations show that **the elasticity of poverty with respect to government expenditure is of the expected sign and highly significant.** In other words, controlling for the per capita growth and income distribution level, a higher share of government expenditure in GDP can be statistically expected to reduce poverty (equations 3b, 4a, and 4b). Equation 3b implies that one percentage point reduction in government expenditure to GDP ratio would increase poverty by 0.72 percentage points.

Higher targeted government spending and good governance (or lower corruption) can be expected to reduce poverty and improve income distribution to the extent that rent seeking by privileged groups is avoided and government bureaucracies concentrate on enhancing the possibilities of the poor. While cutting the size of the government is likely to lead to faster growth (equation 6a), it would increase inequality (equations 5a and 5b). The estimated coefficient for the government size has always the right sign and is statistically significant. Therefore, there is some evidence that governments may be inefficient (more government means less growth) but with a benevolent face (more government increases equality).

Government spending on education, health, and infrastructure are areas that would belong to the win-win type of policies (that is both increase growth and reduce inequality). The estimated coefficient for corruption (equation 5a) has the right sign but not statistically highly significant. Further work is needed on examining the relationship between corruption level and inequality using a larger sample and different econometric estimation techniques. Also, for most countries in the sample information on corruption is available only for one or two years.

It should be emphasized, however, that **all these estimated elasticities are averages. In other words, there is considerable variation between countries and over time in the extent to which poverty responds to economic growth, inequality and government size.**

Table 6. Determinants of Poverty and Inequality in Selected Developing and Transition Economies

Country	Survey year	Population below the poverty line %	Gini coefficient of income min 0 max 100	Av. annual per capita growth 1/ %	Government expenditure as % of GDP	GNP per capita PPP in US$	Corruption Index 2/ min 0 Max 10
Armenia	1989	20.0	27.0		38.2	2,580	
	1996	54.7	60.0	-9.5	24.3	1,650	2.5
	2001	50.9	53.0	6.3	23.2	2,680	2.8
Azerbaijan	1989	21.0	30.7		36.9	3,020	
	1995	68.1	34.7	-9.8	21.1	1,690	
	2002	56.7	36.5	4.8	24.6	2,650	2.0
China (rural)	1990	50.3	33.5		20.1	1,340	
	1998	24.1	40.3	8.2	13.9	3,140	3.5
Egypt	1990	25.0	34.0	2.7	27.8	2,350	
	2000	16.7	37.8	2.6	32.0	3,550	3.4
India	1993	36.0	31.0		15.9	1,570	
	2000	28.6	36.7	3.5	17.0	2,370	2.7
Madagascar	1980	49.2	46.9		22.0	650	
	1994	60.2	43.4	-1.5	17.0	720	1.7
Malawi	1990	54.0	48.0		24.3	420	
	1998	65.3	50.3	0.8	25.7	550	2.9
Malaysia	1980	32.5	49.1		26.3	2,240	
	2000	8.1	44.3	3.6	21.0	8,130	4.9
Mauritania	1988	56.7	40.1		24.0	1,270	
	2000	46.3	39.0	1.3	30.0	1,650	na
Morocco	1985	26.0	39.7		30.4	1,940	
	1999	19.0	39.5	1.1	32.5	3,270	3.7
Pakistan	1980	30.7	35.7		19.7	660	
	2000	33.5	33.0	2.2	22.8	1,870	2.6
Sri Lanka	1990	20.0	30.1		30.3	1,956	
	1996	25.0	34.4	2.0	28.1	2,804	3.7
Thailand	1980	23.0	45.0		24.5	1,423	
	1996	12.0	43.4	8.0	16.4	6,477	3.2
Tunisia	1985	11.2	43.0		36.5	1,202	
	2000	4.0	41.0	2.8	32.0	2,128	4.8
Uganda	1989	62.0	37.3		12.0	710	
	2000	35.0	40.5	3.2	16.0	1,230	
Ukraine	1989	0.0	24.0		31.0	7,210	
	1998	26.0	29.0	-7.0	26.7	3,480	2.4

Source: World Bank database, IMF staff reports, and Transparency International for the corruption index.
1/ Annual average real per capita GDP growth from the previous survey year to the current year. For example ,
the average per capita growth rate for Armenia was 6.3% during 1996-2001.
2/ On a scale of 0 to 10. The smaller the score the higher is the corruption level.

Table 7. Results of the Panel Regressions
(t-Statistics in parenthesis)

| | Dependent Variable | | | | | | | |
| | change in poverty in percentage points | | log(poverty) | | log (GINI) | | Per capita Growth | |
Equation	(3a)	(3b)	(4a)	(4b)	(5a)	(5b)	(6a)	(6b)
Constant	4.23 (4.8)	3.47 (4.3)	-1.19 (1.4)	2.71 (3.4)	1.47 (4.5)	1.49 (5.7)	0.73 (0.9)	2.24 (6.23)
Log of income per capita				-0.89 (-7.1)	-1.24 (-3.8)	-1.26 (-3.8)	-0.49 (-4.1)	
Log of income per capita (squared)					8.77 (3.5)	8.75 (3.45)		
Per capita real GDP growth	-2.23 (-9.5)	-1.99 (-9.8)						
Change in Income Inequality	0.06 (0.7)	0.09 (0.8)						-0.27 (-4.5)
Log (GINI) Income Inequality			2.24 (5.9)	1.22 (3.9)				
Change in Government Size		-0.72 (-4.7)						0.11 (1.38)
Log (Government Size)			-0.85 (-3.0)	-0.23 (-1.2)	-0.21 (-2.7)	-0.22 (-3.4)		
Log (Corruption Index)					0.09 (1.65)			
Investment/GDP							0.22 (8.5)	
Fiscal deficit/GDP							-0.13 (-3.9)	
Government consumption/GDP							-0.04 (-1.8)	
CPI inflation rate							-0.04 (-13.5)	
Secondary school enrollemnt rate							0.04 (6.1)	
Catching-up							1.95 (3.6)	
R-squared	0.62	0.68	0.37	0.62	0.41	0.37	0.51	0.26
Number of countries	43	43	43	43	43	43	50	43
Number of observations	87	87	129	129	66	129	168	87

Sources: Authors' calculations.
Notes: Estimation is by the OLS technique.   Equation 6a is based on Iradian (2003).

IV. CONCLUSIONS AND POLCIY IMPLICATIONS

The main conclusion of this paper is that growth would not affect inequality and that inequality may negatively affect growth. This paper also found strong evidence that higher rates of growth in per capita income are associated with higher rates of poverty reduction. The adverse distributional effect of growth in a number of the developing and transition economies has not been strong enough to change the conclusion that growth has benefited the poor. I found no support for the view that higher growth rates tended to accompany worsening distribution of income.

Economic growth reduces poverty because growth has little impact on income inequality. Income distributions do not generally change much over time. Analysis of the 43 countries and the 87 intervals included in the data set shows that economic growth has no statistical effect on income distribution: inequality may rise, fall or remain steady with growth.

The target to reduce poverty in Armenia from 51% in 2001 to 20% by 2015 is achievable. According to the poverty-growth and poverty-inequality elasticities estimated in this paper, an average annual per capita real GDP growth rate of 4.6 percent would be enough for Armenia achieve its poverty target by 2015. Annual per capita growth rate averaged about 8 percent in 1996-2003 and 11 percent in 2001-2003. In Iradian (2003) it was estimated that almost one-third of the real per capita growth since 1996 was attributed to the catching-up process (starting from a lower base of real GDP, following the sharp fall in output in the early 1990s). Also, in 2001-2003 higher public investment (than in the pervious years) following the $170 million grants from Lincy Foundation, which were earmarked to be spent on infrastructure and housing, have accounted alone for about 3 percentage points of annual real per capita growth. In the absence of these two factors (catching-up and Lincy grants) real per capita annual GDP growth rate could range 5-6 percent consistent with the recent IMF projection. Therefore, if the Armenian economy grows by at least 5 percent a year and if income distribution improves (lower GINI coefficient) then poverty could be reduced to significantly less than 20 percent of the population by 2015.

I have also found that fiscal retrenchment (or cut in the size of the government) pushes inequality and growth in different directions. That is cut in government expenditure to GDP ratio could lead to faster growth, but would be associated with increases in inequality. In the long run, one can argue that all pro growth policies (including cut in the size of the government) would lead to reductions in poverty. This is regardless of the impact that such a policy has on income distribution. That is, in the long run, a pro-growth strategy will benefit the poor. But economic adjustment programs that take into consideration income distribution are more likely to be sustainable.

The present IMF program in Armenia rightly focuses, among other things, on good governance and fighting tax evasion to increase significantly government tax revenues.

This would provide additional resources to the government to spend on social sectors and infrastructure. Further progress in poverty alleviation will depend not only on continued macroeconomic stability and sustained growth, but also on improvements in the targeting of social expenditures, the quality of public administration, and the integrity and efficiency of the judicial system. Increasing social expenditures is essential for poverty reduction, but it is not enough. The efficiency and effectiveness of those expenditures is equally important. In conclusion, a poverty reduction strategy should be based on the following three main pillars:

- *Maintaining Macroeconomic Stability*. Continued sound macroeconomic policies are essential to stimulate saving and investment and to create a favorable overall business climate which would help lay the basis for rapid, sustainable economic growth and poverty reduction.

- *Increasing Tax Revenues and Fighting Corruption.* The Armenian authorities could further boost collection of taxed to considerably increase their social spending and improve the business environment by tackling rampant corruption in earnest. Higher tax collection in relation to GDP could come largely from improved tax and customs administration and enforcing the law equally on all residents. In this regard, prompt and vigorous implementation of an effective anti-corruption strategy will be essential to improve the business climate and income distribution, and foster broad-based and sustained economic development.

- *Social Protection*. Resources released through improved tax administration would enable the government to spend more on social sectors and physical infrastructure to facilitate the development of human resources and to create opportunities for low-income and poor households to raise their incomes.

Fiscal policy has a major role for addressing the issue of poverty. The limited capacity of government expenditures in Armenia, given the relatively low tax collection as share of GDP as compared to many developing and transition economies, restricts the state's ability to spend more on social sectors to reduce poverty and income inequality. Adequate public investment in basic education, health, sanitation, and physical infrastructure, and a stable macroeconomic environment for saving and investment make a great contribution to this end.

The Armenian Government's Poverty Reduction Strategy should focus on the creation of an efficient governance system. In this regard, it is encouraging to note that the anti-corruption program is one of the three pillars of the Poverty Reduction Strategy of the Armenian government, along with the achievement of sustainable and equitable economic growth and human development program. Improved governance and reduced corruption are not only essential to encourage more investment and growth, but they will also produce a more equitable income distribution and reduced poverty for any given level of aggregate GDP.

What are the priorities for action to reduce poverty? Fundamental to improving the overall environment is reducing the elite's capture of the state at the national level, including through further market reforms to de-concentrate economic power. Today's structural inequality, which is closely linked to the political structure, runs the risk of becoming deeply embedded. Dealing with associated issues of governance is likely to be a prerequisite to reduced macroeconomic volatility and a business environment that fosters the investment needed to counter the extraordinary collapse in formal sector jobs. It is also a prerequisite to pro-poor budget allocations, backed by participatory engagement to foster greater accountability and responsiveness in service provision.

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