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Taking Down the Wall: Transition and Inequality

by Serhan Cevik and Carolina Correa-Caro

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Prepared by Serhan Cevik and Carlina Correa-Caro*

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Abstract

This paper investigates the main determinants of income inequality in transition countries during the period 1990–2018. To this end, we address a major methodological challenge that lies at the core of the cross-country literature on income inequality: the potential endogeneity of income growth, which is largely ignored by most empirical studies. We adopt a two-pronged empirical strategy by (i) using trading partners' weighted average real GDP as an instrumental variable (IV), and (ii) estimating the model via the two-stage least squares (2SLS) approach for static models and the Generalized Method of Moments (GMM) estimator for dynamic models. Our empirical findings are consistent with the Kuznets curve that illustrates a nonlinear relationship between income inequality and the level of economic development. We also find that the redistributive impact of fiscal policy is statistically insignificant and taxation and government spending appear to have the opposing effects on income inequality in transition economies.

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Keywords: Income distribution; income inequality; fiscal policy; transition economies

Author's E-Mail Address: scevik@imf.org; ccorreacaro@gmail.com

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I. INTRODUCTION

Three decades after the fall of the Berlin Wall, the transition countries of Central and Eastern Europe (CEE) and the Commonwealth of Independent States (CIS) have long abandoned central planning and transformed state-dominated economies with greater openness and integration with the global economy. In this context, the dramatic economic, political and structural changes after the breakup of the Soviet Union—against a backdrop of widespread increases in income inequality across the world since the 1980s—make the CEE/CIS countries a thought-provoking case to explore the evolution and dynamics of income distribution. While the extent of income inequality within and across countries over time reflects deep structural changes such as globalization, technological progress and demographic trends, institutional characteristics and macroeconomic policy choices are also expected to have played an important role to facilitate inclusive growth, both by influencing pre- and after-tax income distribution.

The level of income inequality, as measured by the Gini coefficient, in transition economies before the breakup of the Soviet Union was estimated to be significantly lower than in the rest of the world.[1] However, the average gross Gini coefficient in transition countries increased by 15 percent from 39 in 1990 to 45 in 2018; the average net Gini coefficient (after taxes and transfers) increased at a faster pace from 27 to 32 over the same period. In other words, income inequality worsened in the CEE/CIS countries during the transition process, with no significant improvement in the redistributive impact of fiscal policy over time, as measured by the difference between gross and net Gini coefficients. Some degree of income inequality is unavoidable and it may even stimulate investment and innovation, but there is mounting evidence that elevated levels of inequality cause financial instability and undermine the pace and sustainability of economic growth (Benabou, 1997; Aghion, Caroli, and Garcia-Peñalosa, 1999; Berg and Ostry, 2011; Cingano, 2014; Ostry, Berg, and Tsangarides, 2014).

In this paper, our objective is to investigate the main determinants of income inequality in 29 transition countries, with a focus on the distributional impact of fiscal policy, during the period 1990-2018. In exploring the drivers of income distribution, we make an important contribution to the literature by addressing a major methodological challenge caused by the potential endogeneity between income inequality and economic growth, which is largely ignored by most empirical studies. To address this problem, we adopt a two-pronged empirical strategy by (i) using a country's trading partners' weighted average real GDP as an instrumental variable (IV) for its own income per capita, and (ii) estimating the model via the two-stage least squares (2SLS) approach for static models and the Generalized Method of Moments (GMM) estimator for dynamic models.

Econometric evidence presented in this study confirm that real GDP per capita—instrumented by trading partners' weighted average real GDP per capita—has a significant positive effect on

[1] The Gini coefficient is the most commonly used measure of income inequality, summarizing the disparity between individuals as a number ranging from 0 and 100. Higher values indicate greater inequality, with a value of 0 meaning perfect equality and a value of 100 meaning maximum inequality.

income inequality, while its squared term imposes a significant a negative effect. This pattern of coefficients on income per capita is consistent with the Kuznets curve that illustrates a nonlinear relationship between income inequality and economic development. We also find that fiscal policy is statistically insignificant in transition economies during the period 1990-2018, and taxation and spending have the opposing effects on income inequality. These findings are systematically robust to the inclusion of control variables and the use of alternative measures of income inequality and fiscal policy instruments, and do not change with different estimation methodologies. All in all, the empirical results presented in this paper suggest that fiscal policy can be designed better to have a greater redistributive effect, especially in the long term, by enhance the progressivity of taxation and government spending.

The structure of this paper is as follows. Section II provides an overview of the related literature. Section III describes the data used in the analysis Section IV introduces the salient features of our econometric strategy. Section V presents the empirical results, including a series of robustness checks. Finally, Section VI offers concluding remarks with policy implications.

II. RELATED LITERATURE

There is an extensive literature on the determinants of income distribution. In a seminal paper, Kuznets (1955) conjectured that a country's income distribution becomes less egalitarian as its level of economic development increases, and that growth brings about more equality only after the level of income per capita reaches a certain threshold. This implies that income distribution evolves along an inverted U-shaped curve—economic growth resulting in relatively more inequality in the initial stages of development and greater equality at advanced stages. Greenwood and Jovanovic (1990), Banerjee and Newman (1993), Galor and Zeira (1993), Perotti (1993), and Barro (2000) find a positive correlation between growth and income inequality in a cross-section of international data. This hypothesis, however, is challenged by other studies. Adelman and Robinson (1989), Anand and Kanbur (1993), and Ravallion (1995), among others, show that there is no empirical support for Kuznets' conjecture.

Looking beyond the Kuznets curve, there is extensive evidence indicating that macroeconomic instability tends to depress income growth for the poor and, thereby, leads to greater income inequality (Datt and Ravallion, 1998; Ferreira, Leite, and Litchfield, 2007). Another intensely debated issue is the role of globalization, which has many dimensions including greater openness to foreign trade and investment. From a theoretical point of view, the impact of trade openness on income inequality depends on factor endowments—countries with higher (lower) levels of human capital experience increases (decreases) in inequality. In the empirical literature, however, some scholars, such as Dollar and Kraay (2004), argue that globalization benefits the poor, while others, such as Barro (2000) and Milanovic (2005) show that greater openness leads to an increase in inequality, especially in countries with higher income levels. Similarly, the relationship between foreign direct investment (FDI) and income inequality is extensively investigated and found to be positive. While Evans and Timberlake (1980) argue that dependence on FDI tends to exacerbate income inequality by altering the occupational structure

of developing economies and producing both a highly-paid elite and large groups of marginalized workers, Alderson and Nielson (1999) show an inverted U-shaped relationship between income inequality and the stock of FDI per capita.

Financial development is found to affect income distribution by enhancing human capital accumulation, improving the access to capital for entrepreneurial activity, and changing the sectoral composition of employment (Beck, Demirguc-Kunt, and Levine, 2007; Demirguc-Kunt and Levine, 2009). Most of the empirical literature reaches the conclusion that financial development lowers income inequality in the long term (Galor and Zeira, 1993; Banerjee and Newman, 1993; Clarke, Xu, and Zou, 2006), except at the very early stages of development (Greenwood and Jovanovic, 1990). However, because the distribution of capital income is significantly more unequal than the distribution of labor income, the concentration of wealth could become one of the root causes of income inequality over time (Rajan and Zingales, 2003; McKenzie and Woodruff, 2006; Rajan, 2010).

The literature also focuses on the relationship between demographic and social characteristics and income inequality. Population growth is found to be critical, mainly through its effect on the demographic composition. First, while an increase in the supply of unskilled young workers may depress income growth (Alderson and Nielsen, 1999), an increase in the share of the population older than 65 years tends to worsen income inequality (Deaton and Paxson, 1997). Second, as pointed out by Kuznets (1955), the urbanization process becomes decisive, especially in the initial stage of economic development, because the evolution from an agrarian economy to industrialization leads to significant income disparities between and within rural and urban areas. Third, education forms a vital link between the pace and quality of growth and income distribution, although the relationship is not straightforward. Although cross-country studies indicate that a higher level of educational attainment brings about greater equality in the distribution of income, the type, quality, and distribution of education result in an intricate effect on income inequality, particularly in connection with skill-biased technological change (Barro, 2000; Checci, 2000).

Institutional factors and political regimes tend to influence how income is distributed across the society. In particular, democratic countries are expected to be more equal than autocratic regimes, as democracy may enable income redistribution through various policy channels. Rodrik (1999) shows that countries with a democratic regime of governance are associated with greater income equality, while other studies find that authoritarian systems of governance result in greater income inequality (Muller, 1988; Burkhart, 1997). Similarly, Gradstein and Milanovic (2004) conclude that the process of democratization leads to greater income redistribution and hence lower income inequality in transition economies. However, the literature is not conclusive on this issue. There are studies that find a positive relationship between democracy and income inequality (Huber, 2005) as well as between the process of democratization and income inequality in a panel of OECD countries (Dreher and Gaston, 2008). In this context, the extent of institutional change in transition economies since the disintegration of the Soviet Union—involving both a sociocultural transformation and far-reaching political and economic reforms—

may have diverging effects on income inequality (Kornai, 2006). While democratization can facilitate income redistribution, economic liberalization and the emergence of the private sector may result in greater income inequality by altering the sectoral composition of economic activity and changing the returns to capital and skills. In particular, a number of studies finds that privatization during transition from central planning to market economy worsens income inequality (Bandelj and Mahutga, 2010; Grimalda, Barlow, and Meschi, 2010).

There is also a large and growing literature that focuses on fiscal policy as a critical instrument to shape income distribution, even though fiscal policy is traditionally assigned a limited role concentrating on the provision of public goods and services and long-term fiscal sustainability without directly taking into account distributional considerations. As shown by the large variation in net income inequality across countries, fiscal policy can influence income distribution through the level and progressivity of taxation and expenditure policies (Musgrave, 1959; Feenberg and Poterba 1993; Auten and Carroll 1999; Benabou 2000; Muinelo-Gallo and Roca-Sagales 2011; Woo and others, 2017). Well-targeted public spending can improve income distribution by providing greater equality of access to education and health care, thereby redistributing ownership of the factors of production. Taxation plays an important role in attaining greater equity in the distribution of income through the progressivity of the tax system and by generating sufficient revenues to fund public spending on social programs. Although Bird and Zolt (2005) present that taxation, especially of the top earning bracket, as an obstacle to growth and an ineffective tool for fiscal redistribution, Bastagli, Coady, and Gupta (2012) show that direct income taxes and cash transfer schemes reduced the average Gini coefficient by about one-third in Organization for Economic Co-operation and Development (OECD) countries during the period 1985–2005.

Transition economies maintained relatively low levels of income inequality compared to the rest of the world in part because of redistributive policies designed to provide full employment, education, healthcare, and housing (Flakierski, 1992; Kornai, 1992; Gradstein and Milanovic, 1994; Milanovic, 1999). With the shift towards greater openness and market liberalization, however, all CEE/CIS countries have experienced a sustained increase in income inequality, albeit at varying levels (Aghion and Commander, 1998; Tridico, 2010; Aristei and Perugini, 2012). The literature suggests a plethora of factors as the principal determinants of income inequality in transition economies: wage decompression and unemployment due to corporate restructuring out of state ownership, inflation caused by price liberalization, fiscal adjustment by reducing government spending and increasing taxation, asset transfers and privatization, and technological change facilitated by greater openness and globalization (Forster and Toth, 1997; Flemming and Micklewright, 1999; Keane and Prasad, 2000; Lehmann and Wadsworth, 2001; Birdsall and Nellis, 2003; Fleisher, Sabirianova, and Wang, 2005; Flabbi, Paternostro, and Tiongson, 2007).

III. DATA OVERVIEW

We construct an unbalanced panel dataset of annual observations on 29 transition economies from 1990 to 2018.[2] Macroeconomic, demographic and institutional statistics are compiled from the IMF's Government Finance Statistics (GFS) and World Economic Outlook (WEO) databases, the World Bank's World Development Indicators (WDI) database, and the International Country Risk Guide (ICRG) database. A composite index of structural reform progress is drawn from the Transition Indicators database of the European Bank of Reconstruction and Development (EBRD). Our dependent variable is income inequality as measured by the net Gini coefficient (after taxes and transfers). This series is obtained from the Standardized World Income Inequality Database (SWIID), constructed by Solt (2009) using the United Nations World Income Database (UNWIDER) and the Luxembourg Income Study (LIS). The SWIID provides comparable estimates for two definitions of the Gini coefficient—the first based on market income and the second net of taxes and transfers—on an annual basis.[3] This allows us to assess income inequality before and after fiscal redistribution through taxation and transfers and provides comparable Gini figures across countries over a long span of time. However, the imputation methodology to standardize observations collected from various sources makes these series subject to measurement uncertainty (Jenkins, 2015; Ferreira, Lustig, and Teles, 2015). As further robustness checks, we use alternative measures of income inequality based on the gross Gini coefficient from the SWIID and the net Gini coefficient provided by the United Nations University's World Income Inequality Database (WIID), which compiles actual, not imputed, data.[4] Although it is not possible to make a clear distinction between gross and net Gini coefficients in the WIID dataset, most of the data appear to be on a net income basis and have a high degree of correlation with the net Gini coefficient series from the SWIID database.

Descriptive statistics for all variables used in this study are presented in Table 1. There is a significant degree of dispersion across transition economies in terms of income inequality and overall macroeconomic and institutional performance. It is essential to analyze the time-series properties of the data to avoid spurious results by conducting panel unit root tests. We check the stationarity of all variables by applying the Im-Pesaran-Shin (2003) procedure, which is widely used in the empirical literature to conduct a panel unit root test. The results, available upon request, indicate that the variables used in the analysis are stationary after logarithmic transformation.

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[2] The list of CEE/CIS countries includes Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kosovo, Kyrgyz Republic, Latvia, Lithuania, FYR Macedonia, Moldova, Montenegro, Poland, Romania, Russia, Serbia, Slovak Republic, Slovenia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan.

[3] The SWIID is available at https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/LM4OWF.

[4] The WIID is available at https://www.wider.unu.edu/database/world-income-inequality-database-wiid4.

Table 1. Summary Statistics

Variable		Obs	Mean	Std. Dev.	Min	Max
Net Gini (SWIID)	overall	698	31.58	5.08	17.40	44.50
	between			4.64	23.78	41.08
	within			2.00	22.54	35.00
Gross Gini (SWIID)	overall	698	43.81	7.26	21.90	56.90
	between			6.91	23.63	55.67
	within			1.85	34.04	47.99
Net Gini (WIID)	overall	528	32.86	5.81	20.10	55.50
	between			4.52	25.84	44.90
	within			4.10	20.06	52.57
Real GDP per capita	overall	761	213948	521011	254	3400000
	between			502955	485	2489286
	within			141971	475338	1124662
Tax revenue	overall	757	23.96	8.44	2.57	45.80
	between			7.56	11.25	39.52
	within			3.73	9.23	47.83
Government spending	overall	760	35.72	10.08	8.54	71.90
	between			8.58	18.17	50.17
	within			5.74	15.10	72.05
Income tax	overall	488	26.30	12.12	-4.47	62.28
	between			10.81	5.24	39.41
	within			6.49	4.51	58.93
Education spending	overall	698	4.60	1.65	0.99	13.54
	between			1.28	2.60	8.09
	within			1.08	1.64	14.46
Health spending	overall	740	3.65	1.56	0.77	7.04
	between			1.49	1.14	5.88
	within			0.58	1.78	6.31
Trade openness	overall	737	96.18	33.07	23.22	192.35
	between			24.37	54.17	143.18
	within			22.72	13.74	176.05
Financial development	overall	552	34.31	21.45	0.92	101.29
	between			16.64	11.44	73.13
	within			15.25	5.21	88.89
Agriculture	overall	693	11.68	9.96	1.52	56.61
	between			7.90	2.33	27.79
	within			5.86	4.46	47.26
Old age dependency	overall	782	17.49	6.44	5.36	32.65
	between			5.99	6.49	25.54
	within			2.60	9.35	25.79
Transition index	overall	818	2.96	0.82	1.00	4.06
	between			0.55	1.51	3.73
	within			0.61	0.29	3.75
EU membership	overall	812	0.20	0.40	0.00	1.00
	between			0.25	0.00	0.52
	within			0.31	0.32	0.78
Bureaucratic quality	overall	519	2.08	0.86	1.00	4.00
	between			0.78	1.00	3.28
	within			0.38	0.66	3.80
Corruption	overall	519	2.68	0.97	1.00	5.00
	between			0.57	2.00	3.72
	within			0.79	1.23	4.65
Democracy	overall	519	4.21	1.53	1.00	6.00
	between			1.28	1.83	5.55
	within			0.88	1.42	7.38

Source: Authors' calculations.

IV. EMPIRICAL STRATEGY

We present a static model of income inequality as a point of reference, but we also account for the persistence in income inequality by estimating a dynamic version of our model including the lagged dependent variable according to the following econometric specification:

$$ln(GINI_{i,t}) = \lambda_0 + \theta ln(GINI_{i,t-1}) + \mu FP_{i,t} + \beta X_{i,t} + \eta_i + \nu_t + \varepsilon_{i,t}$$

in which $GINI_{i,t}$ is the net Gini coefficient in country i at time t, λ_0 is the intercept term; and $GINI_{i,t-1}$is the lagged dependent variable, which is included to capture persistency in inequality over time. The term $FP_{i,t}$ is a set of fiscal policy instruments (tax revenue and government spending as a share of GDP); and the term $X_{i,t}$ denotes a vector of control variables including real GDP per capita, the share of agriculture in GDP, trade openness as measured by the share of exports and imports in GDP, financial development as measured by credit to the private sector as a share of GDP, demographic characteristics as captured by the share of population over 65 years of age, a composite index of structural reform progress, and a binary variable for membership to the European Union (EU).[5] The η_i and ν_t coefficients denote country- and time-specific effects, while and $\varepsilon_{i,t}$ is an idiosyncratic error term that satisfies the standard assumptions of zero mean and constant variance. To account for possible heteroskedasticity, robust standard errors are clustered at the country level.

With regard to econometric modeling, there are a number of methodological hurdles in exploring the determinants of income inequality within and across countries. First, obtaining consistent and unbiased parameter estimates is difficult because of the potential endogenous reaction of real GDP growth to changes in income inequality. Second, the standard estimation techniques, such as the fixed-effects and random-effects models, do not explicitly deal with temporally and spatially correlated errors in panel data, yielding inefficient coefficient estimates with biased standard errors. Third, income inequality tends to be persistent over time, raising the possibility of first-order serial correlation.

To deal with these potential econometric problems, we introduce trade-weighted per capita income of a country's main trading partners as an IV for its real GDP per capita and implement the 2SLS approach for static models and the IV-GMM estimator for dynamic models. The results indicate that trading partners' weighted average real GDP per capita is highly correlated with a county's own real GDP per capita, but remains unaffected by changes in income inequality. This makes it a suitable IV, providing robust and consistent parameter estimates that are not influenced by unobserved country-specific effects and possible joint endogeneity of the explanatory variables.

[5] We introduce additional control variables, such as composite measures of bureaucratic quality, corruption and democracy, as robustness checks.

V. ESTIMATION RESULTS

The static estimations via the standard fixed effects and random effects models and our preferred IV-2SLS approach, presented in Table 2, demonstrate a consistent picture. Focusing on the empirical results obtained by the IV-2SLS approach, we find that real GDP per capita—instrumented by trading partners' weighted average income per capita—has the expected positive effect on income inequality, with a high degree of statistical significance. Its squared term is also found to be statistically significant, but with a negative coefficient on the net Gini coefficient. This pattern of coefficients on real GDP per capita is consistent with the Kuznets curve that illustrates a nonlinear relationship between income inequality and the level of economic development. That is, income inequality tends to worsen as income increases until a certain threshold, after which a higher level of income leads to an improvement in the distribution of income across society.

With regards to our principal variable of interest, the results indicate that the redistributive impact of fiscal policy becomes insignificant at conventional levels once we control for endogeneity between real GDP growth and income inequality by instrumenting a country's real GDP per capita by its trading partners' weighted average income per capita. Nevertheless, it should be noted that taxation and government spending appear to have the opposing effects on income inequality in our sample of transition economies during the period 1990-2018. The coefficient on government spending has the desired negative sign, indicating that an increase in government spending could lower the net Gini coefficient. Taxation, on the other hand, appears to have a worsening effect on income inequality, as an increase in the tax-to-GDP ratio results in a rise in the net Gini coefficient.

Turning to other control variables, we find that trade openness worsens income inequality, while financial development helps improve the distribution of income in transition economies. Both the share of agriculture and old age dependency are found to be have positive coefficients, confirming the importance of economic structures and demographic characteristics in determining income distribution. Finally, the static estimation results indicate that both the process of transition—from central planning to open and rule-based economy—and EU membership have statistically significant worsening effects on income inequality among the CEE/CIS countries over the period 1990-2018.

Table 2. Determinants of Income Inequality—Static Models

Dependent variable	Net Gini Coefficient		
Estimation method	FE	RE	IV
Real GDP per capita	0.148***	0.091***	0.395***
	[0.031]	[0.025]	[0.029]
Real GDP per capita^2	-0.011***	-0.003***	-0.004***
	[0.002]	[0.001]	[0.001]
Taxation	0.056***	0.106***	0.043
	[0.013]	[0.023]	[0.057]
Government spending	-0.001*	-0.097*	-0.031
	[0.018]	[0.028]	[0.041]
Trade openness	0.027***	0.109***	0.072***
	[0.011]	[0.019]	[0.034]
Financial development	-0.019***	-0.047***	-0.023***
	[0.004]	[0.011]	[0.007]
Share of agriculture	0.023*	0.191***	0.060**
	[0.011]	[0.013]	[0.033]
Old age dependency	0.165*	0.009*	0.048
	[0.025]	[0.020]	[0.052]
Transition index	0.082***	0.299***	0.199***
	[0.025]	[0.035]	[0.055]
EU membership	0.042***	0.027***	0.090***
	[0.009]	[0.019]	[0.020]
Fixed effects	Yes	Yes	Yes
Number of observations	433	433	433
Number of countries	29	29	29
R^2	0.49	0.62	0.20

Source: Authors' calculations.

Notes: Robust standard errors are reported in parentheses. ***, ** and * denote significance at the 1, 5 and 10 percent levels. All regressions include a constants term, which is not displayed in the table.

The impact of fiscal policy on income inequality remains unchanged when we estimate the dynamic model, including the lagged Gini coefficient, via the IV-GMM approach. Controlling for the high degree of persistence in income inequality over time, the dynamic specifications, presented in Table 3, show that the sign and significance of the coefficients on taxation and government spending do not change compared to the static specifications. This is also the case when we include control variables, which appear to have broadly similar coefficients with a diminished statistical significance in the dynamic model that has the lagged dependent variable.

Table 3. Determinants of Income Inequality—Dynamic Models

Dependent variable	Net Gini Coefficient		
Estimation method	IV-GMM (1)	IV-GMM (2)	IV-GMM (3)
Net Gini coefficient$_{t-1}$	0.851***	0.817***	0.438***
	[0.016]	[0.041]	[0.046]
Real GDP per capita	0.138**	0.203**	0.127**
	[0.072]	[0.025]	[0.029]
Real GDP per capita^2	-0.008***	-0.011**	-0.006**
	[0.003]	[0.006]	[0.001]
Taxation		0.002	0.015
		[0.012]	[0.209]
Government spending		-0.008	-0.052
		[0.010]	[0.091]
Trade openness			0.079**
			[0.106]
Financial development			-0.011**
			[0.010]
Share of agriculture			0.026
			[0.030]
Old age dependency			0.181
			[0.152]
Transition index			0.149*
			[0.152]
EU membership			0.017*
			[0.016]
Fixed effects	Yes	Yes	Yes
Number of observations	602	588	405
Number of countries	29	29	29
F-stat	2438.69	983.51	529.28
[p-value]	0.00	0.000	0.000
R^2	0.93	0.89	0.76

Source: Authors' calculations

Notes: Robust standard errors are reported in parentheses. ***, ** and * denote significance at the 1, 5 and 10 percent levels. All regressions include a constants term, which is not displayed in the table.

We carry out an extensive sensitivity analysis, as presented in Table 4, to attain a more nuanced picture and to confirm our baseline results. First, we truncate the sample at the 5st and 95th percentiles to exclude outliers and find no significant change relative to the baseline results. Second, we use alternative measures of income inequality based on the gross Gini coefficient drawn from the SWIID dataset and the net Gini coefficient drawn from the WIID dataset and obtain similar empirical results indicating that fiscal policy does not have a significant effect on income inequality and that taxation and spending have the opposing effects as in the baseline

findings. Third, we estimate the model using five-year nonoverlapping intervals instead of annual observations and attain a broadly similar picture with some changes in the magnitude of estimated coefficients but not in their significance. Fourth, to obtain a more granular assessment of fiscal policy, we use the share of income taxes in total as a measure of tax progressivity and the ratio of education and health spending to GDP as measures of social expenditures. The results suggest that income tax helps improve income distribution, as expected, but this effect remains statistically insignificant at conventional levels. Similarly, we find that both education and health spending have a mitigating effect, which is not statistically significant at conventional levels. Finally, we introduce composite measures of bureaucratic quality, corruption and democracy as additional control variables and conclude that the quality of institutions matters for income inequality, but the inclusion of these variables does not alter the baseline findings.

VI. CONCLUSION

Three decades after the fall of the Berlin Wall, transition countries have long abandoned central planning and transformed state-dominated economies into greater openness and integration with the global economy according to market principles. The level of income inequality, as measured by the Gini coefficient, in transition economies before the breakup of the Soviet Union was estimated to be significantly lower than in the rest of the world. However, the average Gini coefficient for pretax market income in transition countries increased by 15 percent from 39 in 1990 to 45 in 2018; the average net Gini coefficient (after taxes and transfers) increased at a faster pace from 27 to 32 over the same period. In other words, income inequality worsened in the CEE/CIS countries during the transition process, with no significant improvement in the redistributive impact of fiscal policy over time, as measured by the difference between gross and net Gini coefficients.

This paper provides an empirical analysis of the evolution and dynamics of income inequality in 29 transition economies during the period 1990–2018. Unlike previous literature, we use the IV approach to address the potential endogeneity between income inequality and economic growth and focus on the redistributive impact of fiscal policy. Our empirical findings show that real GDP per capita—instrumented by trading partners' weighted average real GDP per capita—has the expected positive effect on income inequality, with a high degree of statistical significance. Its squared term is also found to be statistically significant, but with a negative on the net Gini coefficient. This pattern of coefficients on income per capita is consistent with the Kuznets curve that illustrates a nonlinear relationship between income inequality and economic development.

We also find that fiscal policy is statistically insignificant in transition economies during the period 1990-2018, and taxation and spending have the opposing effects on income inequality. These findings are systematically robust to the inclusion of control variables and the use of alternative measures of income inequality and fiscal policy instruments, and do not change with different estimation methodologies. All in all, the empirical results presented in this paper suggest that fiscal policy can be designed better to have a greater redistributive effect, especially

in the long term, by enhancing the progressivity of taxation and developing more targeted expenditure policies.

Table 4. Determinants of Income Inequality—Robustness Checks (IV-GMM)

Model specification	**Truncated sample**	**Alternative Gini coefficients**		**Five-year average**	**Alternative fiscal instruments**			**Additional controls**
Dependent variable	Net Gini (SWIID)	Gross Gini (SWIID)	Net Gini (WIID)	Net Gini (SWIID)	Net Gini (SWIID)	Net Gini (SWIID)	Net Gini (SWIID)	Net Gini (SWIID)
Gini coefficient$_{t-1}$	1.091***	0.882***	0.605***	0.379***	0.727***	0.550***	0.570***	0.805***
	[0.392]	[0.033]	[0.051]	[0.093]	[0.081]	[0.185]	[0.153]	[0.096]
Real GDP per capita	0.217***	0.204**	0.817*	0.278**	0.358**	0.555*	0.522**	0.169**
	[0.028]	[0.174]	[0.029]	[0.189]	[0.192]	[0.316]	[0.278]	[0.074]
Real GDP per capita^2	-0.056***	-0.011**	-0.043*	-0.017***	-0.019***	-0.031**	-0.029***	-0.005**
	[0.096]	[0.008]	[0.040]	[0.040]	[0.008]	[0.017]	[0.014]	[0.003]
Taxation	0.114	0.025	0.045	0.018				0.015
	[0.164]	[0.012]	[0.097]	[0.323]				[0.025]
Government spending	-0.046	-0.006	-0.052	-0.055				-0.012
	[0.074]	[0.013]	[0.053]	[0.045]				[0.008]
Income Tax					-0.001			
					[0.004]			
Education spending						-0.020		
						[0.021]		
Health spending							-0.010	
							[0.019]	
Bureaucratic quality								-0.012
								[0.023]
Corruption								0.005
								[0.008]
Democracy								-0.005
								[0.006]
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	295	405	314	115	315	386	410	401
Number of countries	22	29	20	26	23	22	24	18
F-stat	119.61	235.04	56.82	13.43	170.97	59.27	69.70	721.22
[p-value]	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R^2	0.79	0.86	0.50	0.38	0.84	0.44	0.49	0.94

Source: Authors' calculations

Notes: Robust standard errors are reported in parentheses. ***, ** and * denote significance at the 1, 5 and 10 percent levels. All regressions include a constants term, which is not displayed in the table. Control variables include trade openness, financial development, the share of agriculture, old age dependency, the transition index, and EU membership.

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