Shortages and the Informal Economy in the Soviet Republics: 1965-1989

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Our research question is…

- The **net** effect of the informal economy on shortages was positive or negative?
- The development of the informal economy was really stimulated by the intensifying shortages?

Shortages

Informal Economy

Source: various internet websites.

Background (1)

- The study of the Informal/Second Economy started in the late 1970's by Gregory Grossman (1977)'s study.
- Since then, although a number of attempts have been made to estimate the size of the second economy, they have suffered either methodological deficiency or limitations in the scope of time and regions.
- After the collapse of the soviet union, most of researchers shifted their interests and faced the necessity to study the transition.

Background (2)

- Study of the second economy and relating problems were stopped and remain unsolved.

- Lack of statistical data usable for empirical examination.
- There are no research which examined both of informal economy and shortages in an integrated manner.
- **But now we are able to access to before-closed archival materials. Ex) Kim (1999; 2003).**

Aim of This Study

- We measure the informal economy and shortages from 1965 to 1989.
- We estimate the relationships between the informal economy and shortages using various methods including fixed-effects model and instrument variable approach.

Possible relationships between them (1)

The informal economy may interact with shortages in the official economy.

Under the condition that people facing shortages are forced to rely on alternative informal channel;

- Positive relationship: **stabilizing** effects ⇒**the sign is negative**
  - An increase in the total supply of goods and services could lead to reduction in shortages in the official economy.
  - Demand for consumer goods and services satisfied in the informal economy means less shortages in the official economy.

- Negative relationship: **destabilizing** effects ⇒**the sign is positive**
  - Using inputs taken away from the official economy for production in the informal economy intensifies shortages in the official economy.
  - Firms wanted to sell their produced goods and services in the informal economy in order to make a larger profit.
  - Also households accumulated money from informal economy activities might use it in the official economy.

Possible relationships between them (2)

- **We assume the existences of the both effects.**
- **In sum, it is still not clear whether the net effect of the informal economy on shortages was positive or negative.**
- **It is likely that there is an endogenous relationships between them.**
- **So, the net effect should be examined in integrated manners.**

Data definitions: dependent/endogenous variables

variables	definitions
(a) *sem_nmp*	Size of Informal Economy as compared to NMP.
(b) ***shortage_mid***	Shortages Indicator: retail inventories as of compared to NMP.

Data of informal economic activities of household (expenditure side) is derived from HBS

	Money expenditures		Self-consumption
Total expenditure	Official retail trade networks	Trade between citizens	

Second Economy activities following Grossman (1977)'s two criteria:

(a) Being directly for private gain;

(b) Being in some significant respect in knowing contravention of existing law.

Data definitions: dependent/endogenous variables

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	Money expenditures		Self-consumption
Total expenditure	Official retail trade networks	Trade between citizens	

Our focus is here.

We use only this component to measure the informal economy to understand its relationship with shortages.Self-consumption might be a different kind of informal economic activity.

$$sem\_nmp = \frac{\text{Aggregated size of the trading between citizens}}{\text{Net Material Products}}$$

Data definitions: dependent/endogenous variables

variables	definitions
(a) ***sem_nmp***	Size of Informal Economy as compared to NMP.
(b) *shortage_mid*	Shortages Indicator: retail inventories as of compared to NMP.

The shortage indicator is defined as the ratio of household disposable money income to retail inventories at the state and cooperative retail networks, following Chawluk and Cross (1997), and Kim (2002):

$$\boldsymbol{shortage\_mid} = \frac{\text{Disposable money income}}{\text{Inventories in state and cooperative retail networks}}$$

- The higher the index gets, the more severe shortages appear.
- This is the only indicator which makes republican comparison possible: Alternative indicators such as presented by Kornai (1976) and Asgary et al. (1997) are not obtainable for the long-run and for every republic.

Data definitions: Exogenous variables

variables	definitions
(1) Demography	
pop_ln	Population density in the log form.
family	Number of persons in a family.
(2) Economic factors	
income_ln	Household money income per capita in 1965 rubles in the log form.
Sectoral NMP share	*ind_share*; *agr_share*; *const_share*; *trade_share*; *foreign_share*.
gnmp_pp	Real economic growth in the log form.
Taxrate	Tax-related expenditures as compared to household money income.
wage_gap	Average wage gap between workers/employees and collective farmers.
dostavka_shop	Amount of goods deliveries per retail shops.
(3) Education	
rvuz	Number of universities per 1000 persons.
grad	Number of graduates from higher education organizations per capita.
(4) Ethnicity: *slav*	Modefied “Russification” Index.
(5) Crime: *clark_pop*	Per capita rate of crimed of officialdom derived from Clark (1993)

Result (1): Informal Economy equations: fixed effect model

shortage_mid	0.459***	0.497***
income_ln	-6.502***	-2.480**
density_ln	6.158***	0.192
family	-4.419***	-1.871*
gnmp_pp	-0.070***	-0.088***
ind_share	-0.002	
agr_share	0.381***	0.274*
const_share	-0.051	
trade_share	1.535***	
foreign_share	0.023	
taxrate		0.254
wage_gap		3.086***
dostavka_shop		-0.025
runiv		-1.255***
grad		0.047***
slav		0.061
clark_pop		-0.085
constant	52.684***	38.352***

Result (2): Shortages equations: fixed effect model

sem_nmp	0.136***	0.151***
income_ln	1.324***	1.051**
density_ln	-2.489***	-3.318***
family	-0.171	0.919*
gnmp_pp	0.027**	0.024**
ind_share	-0.010	
agr_share	-0.047	
const_share	0.032	
trade_share	0.039	
foreign_share	-0.046**	-0.082***
taxrate		0.703***
wage_gap		-0.198
dostavka_shop		0.039***
runiv		0.654
grad		-0.015
slav		0.021
clark_pop		0.043
constant	1.832	-5.288

Given the finding that both the informal economy and shortages enter significantly in the other equation, we estimate the two equations using the instrument variable approach.

In other words, we endogenize shortages and the informal economy using external instruments.

Result (3): Structural equation model: IV/GMM

Informal Economy equation

sem_nmp model		
shortage_mid	0.932	***
	(2.850)	
income_ln	-1.469	**
	(-2.150)	
gnmp_pp	-0.096	***
	(-4.260)	
agr_share	0.382	**
	(2.550)	
wage_gap	3.715	***
	(5.150)	
grad	0.040	***
	(3.460)	
number of obs	369	
R-sq	0.329	
Underidentification test (Anderson canon. corr. LM statistic)	30.605	***
Sargan statistic (overidentification test of all instruments)	0.782	

Instrument for shortage_mid: density_ln and dostavka_shop.

Shortages equation

shortage_mid model		
sem_nmp	0.179	***
	(2.660)	
income_ln	1.251	***
	(3.690)	
density_ln	-2.241	***
	(-4.400)	
gnmp_pp	0.029	
	(2.370)	
foreign_share	-0.085	***
	(-4.780)	
dostavka_shop	(0.034)	***
	2.640	
runiv	(0.719)	***
	3.050	
number of obs	368	
R-sq	0.245	
Underidentification test (Anderson canon. corr. LM statistic)	44.903	***
Sargan statistic (overidentification test of all instruments)	1.940	

Instrument for sem_nmp: wage_gap and agr_share.

Result (4): Structural equation model: 3SLS

Informal Economy equation (sem_nmp)		
shortage_mid	0.915	***
income_ln	-1.144	*
gnmp_pp	-0.096	***
agr_share	0.422	***
wage_gap	3.848	***
grad	0.030	***
Republic dummies		
Ukraine	4.314	***
Belarus	-0.404	
Uzbek	18.694	***
Kazakh	2.419	***
Georgia	18.434	***
Azerbaijan	11.078	***
Lithuania	3.024	***
Moldova	5.664	***
Lativa	-0.293	
Kyrgyz	14.129	***
Tajik	14.047	***
Armenia	9.497	***
Turkmen	15.523	***
Estonia	-1.024	
constant	11.725	*

Shortages equation (shortage_mid)		
sem_nmp	0.157	***
income_ln	1.156	***
density_ln	-2.626	***
gnmp_pp	0.031	***
dostavka_shop	0.009	
Republic dummies		
Ukraine	6.003	***
Belarus	5.614	***
Uzbek	0.144	
Kazakh	-1.491	***
Georgia	3.038	
Azerbaijan	5.222	***
Lithuania	5.040	***
Moldova	6.734	***
Lativa	4.741	***
Kyrgyz	-0.608	
Tajik	0.611	
Armenia	5.037	***
Turkmen	-3.485	***
Estonia	4.650	***
constant	-1.472	

Result Summary and Conclusion

We measured the informal economy and shortages from 1965 to 1989 at the level of the Soviet republics, and then estimated the relationships of the two.

Our main findings:

- Informal economy equations:

Shortages is positive and statistically significant at 1% level in all models. This indicates that shortages cause the informal economy to increase.

- Shortage equations:

Coefficients on informal market are positive and statistically significant at 1% level, which suggests that an increase in the informal economy intensifies shortages in the official economy. Hence, the informal economy does not work as a stabilizer for the national economy, rather as destabilizer.

This suggest the reinforcement of shortages by the informal economy and the intensification of shortages by the informal economy. These two variables formed a vicious circle, which could lead to destabilizing the Soviet system. These built-in destabilizing factors indicate that the Soviet economic system was highly unstable.

Danke schön!

APPENDIX

3.1 Overview of the Soviet Second Economy (3): Relative Sizes

Fig. 3a: Income Side

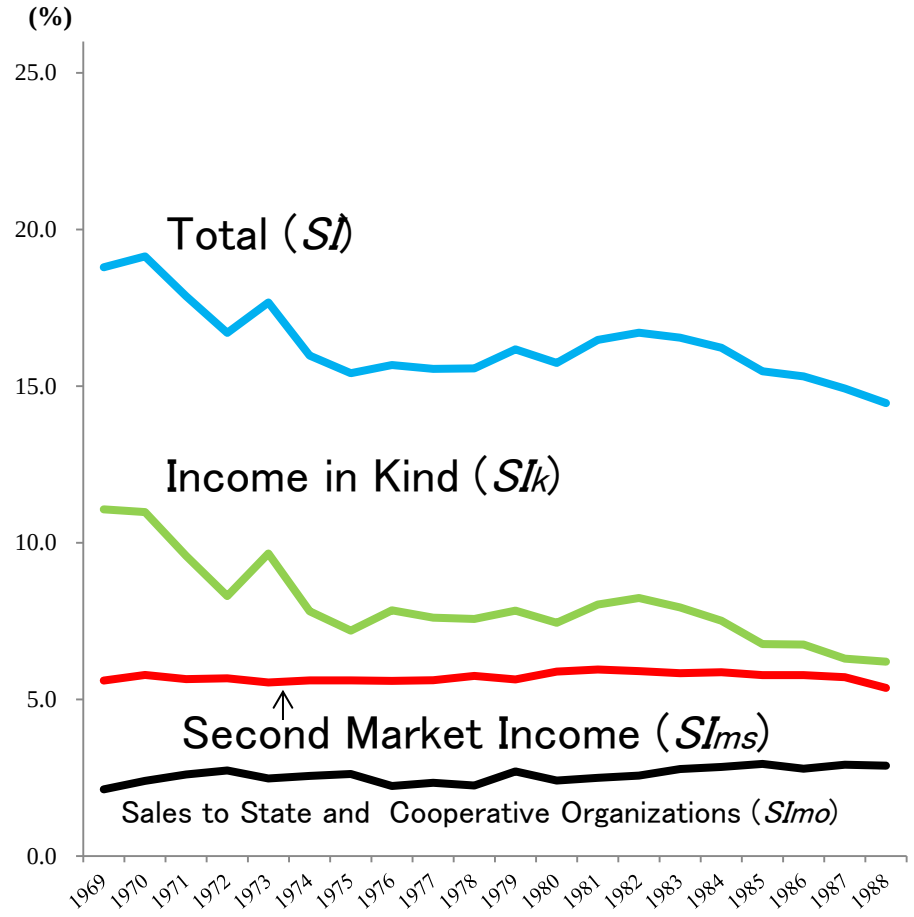
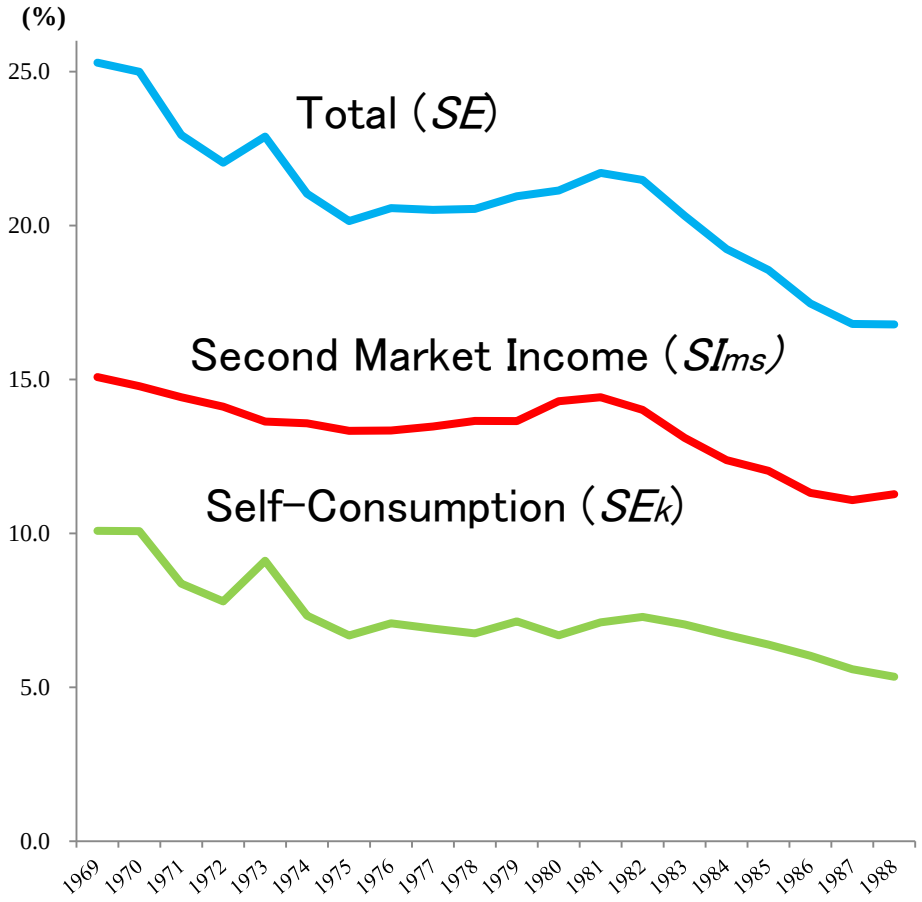
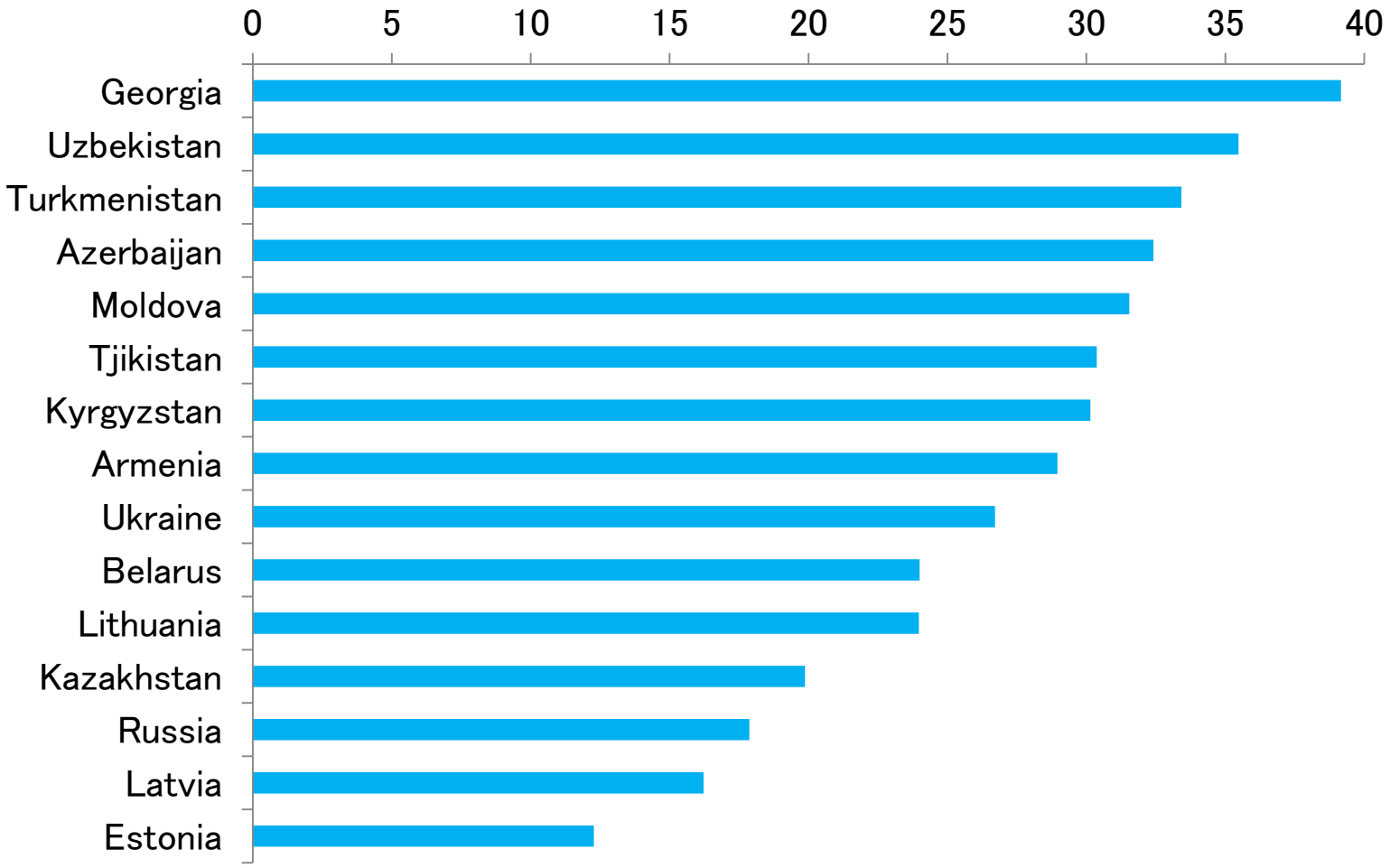


Fig. 3b: Expenditure Side



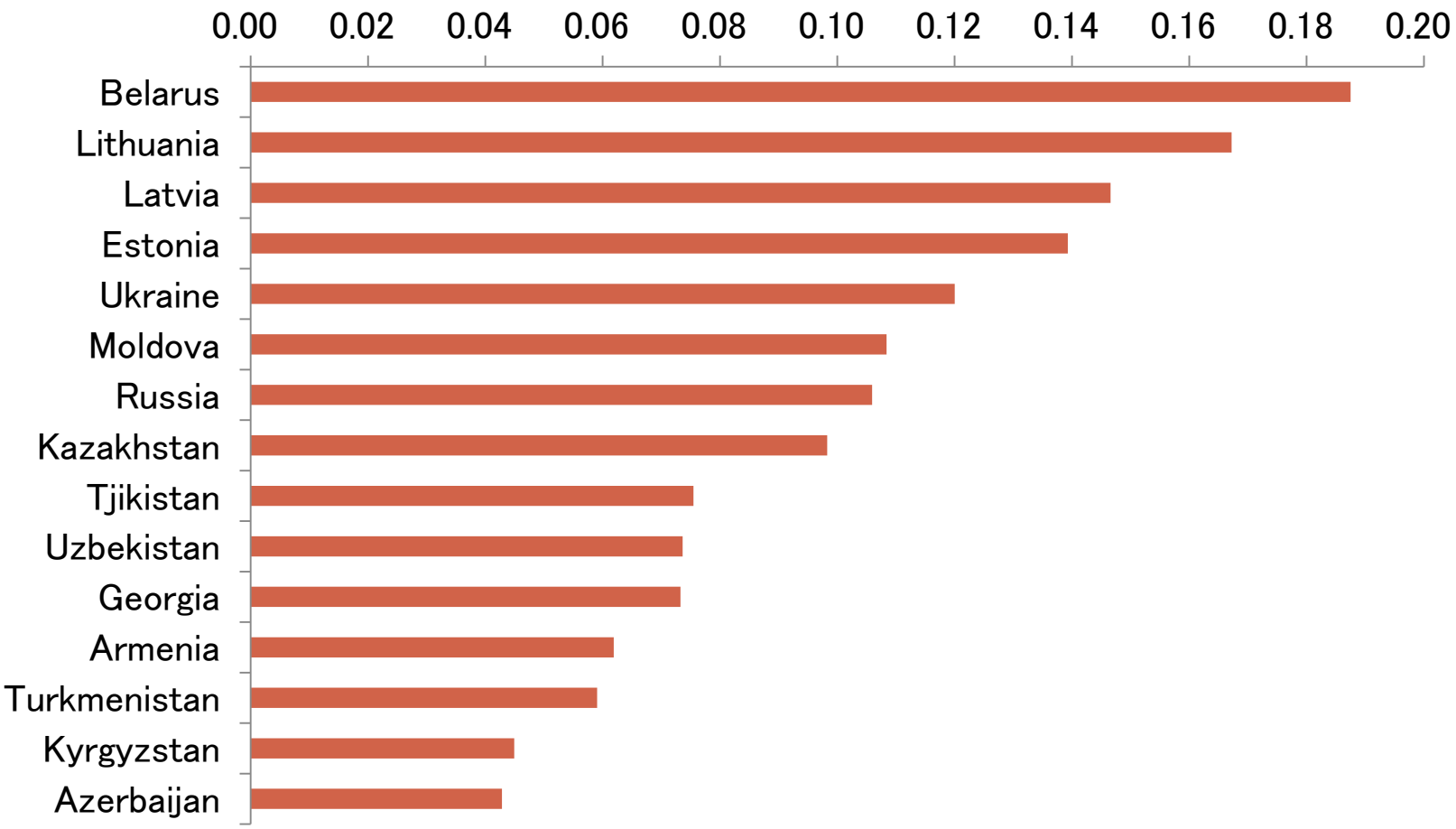
3.2 Comparing Union Republics (1): Size

Fig. 4: Period-Average of the Size of the Second Expenditure (%)

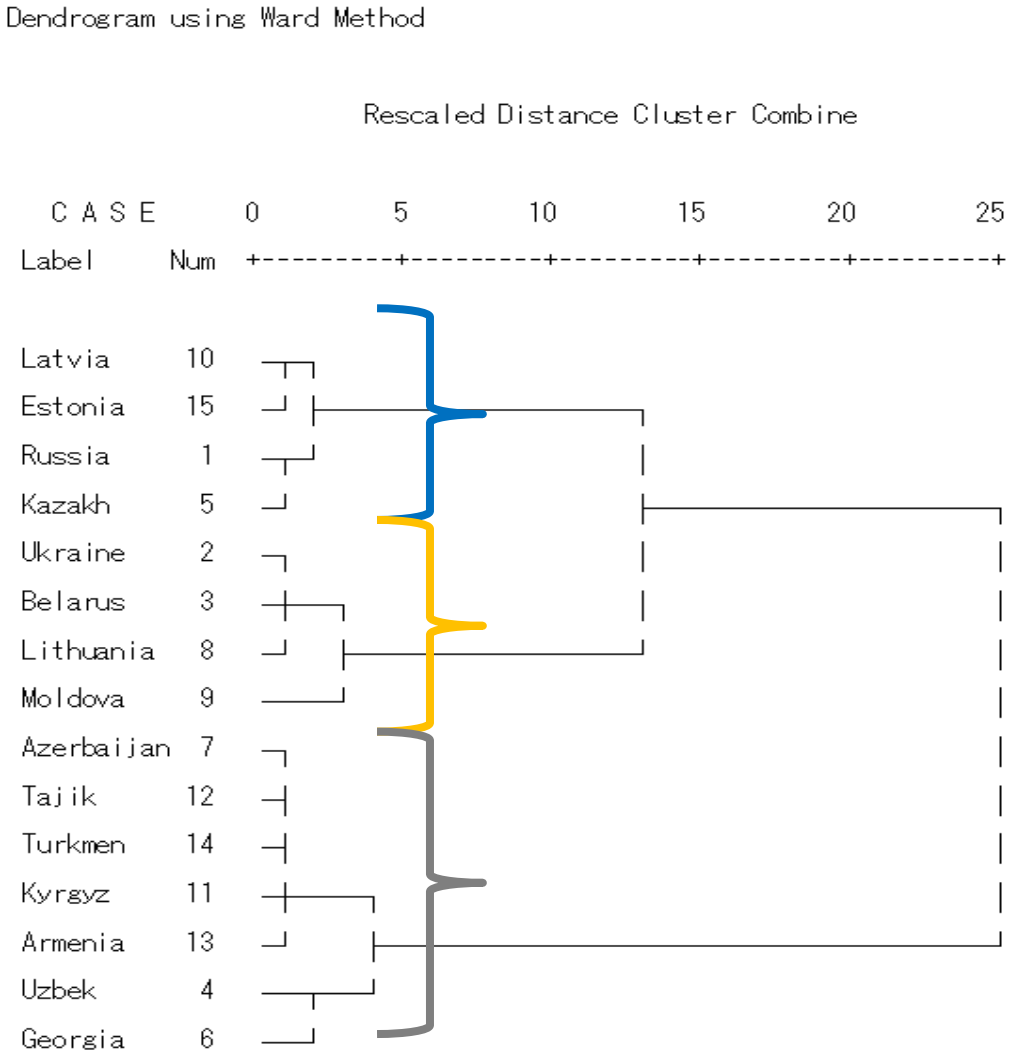


3.2 Comparing Union Republics (2): Movement

Fig. 5: Coefficient of Variance, rates of second expenditure



3.2 Comparing Union Republics (3): Clustering



Clustering republics, using Income, Expenditure, relative size of the each second economy components parameters.

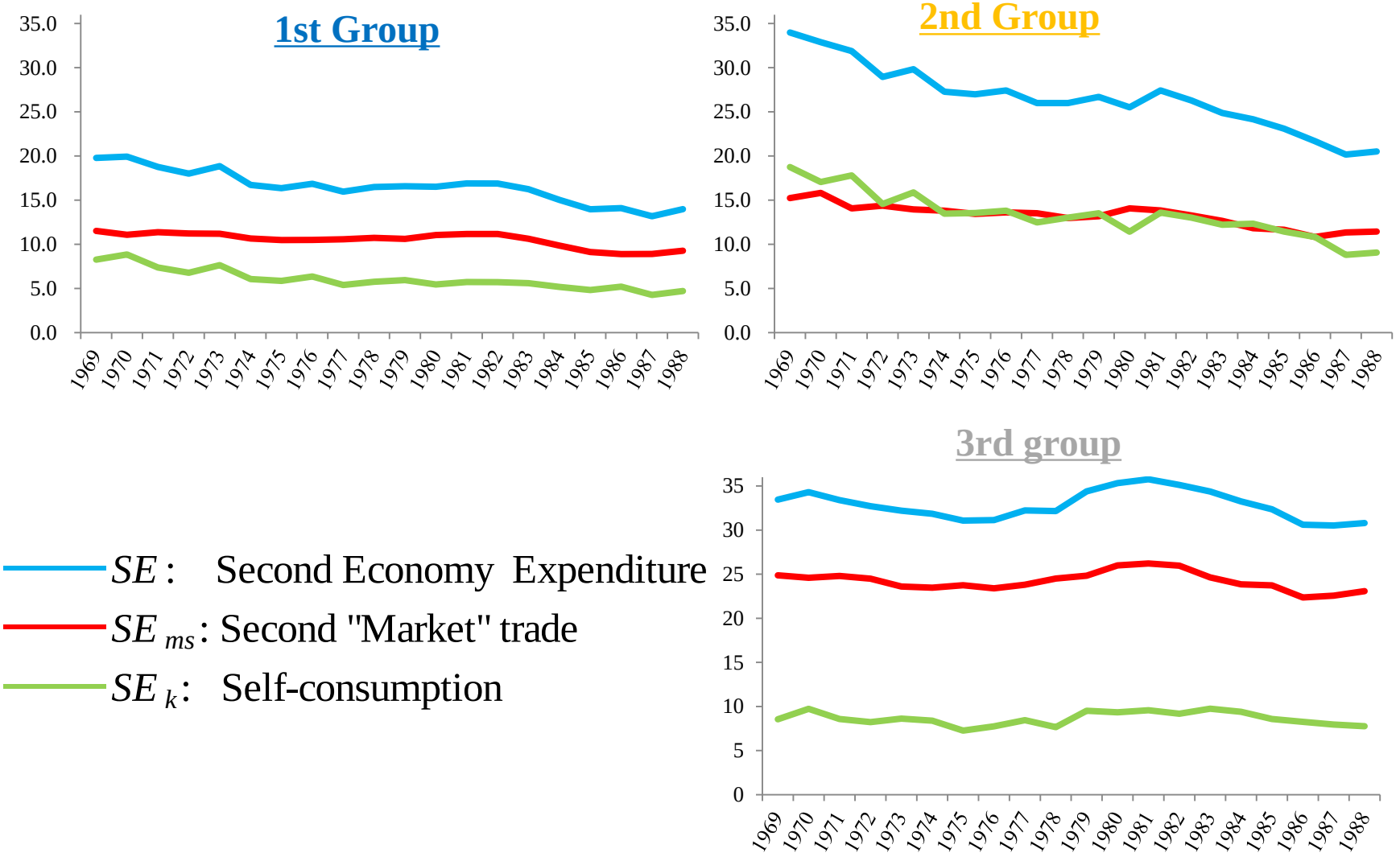
1st Group: Russia, Kazakh, Latvia, Estonia

2nd Group: Ukraine, Belarus, Lithuania, Moldova

3rd Group: Central Asian Countries, excluding Kazakh, and Caucasian Countries

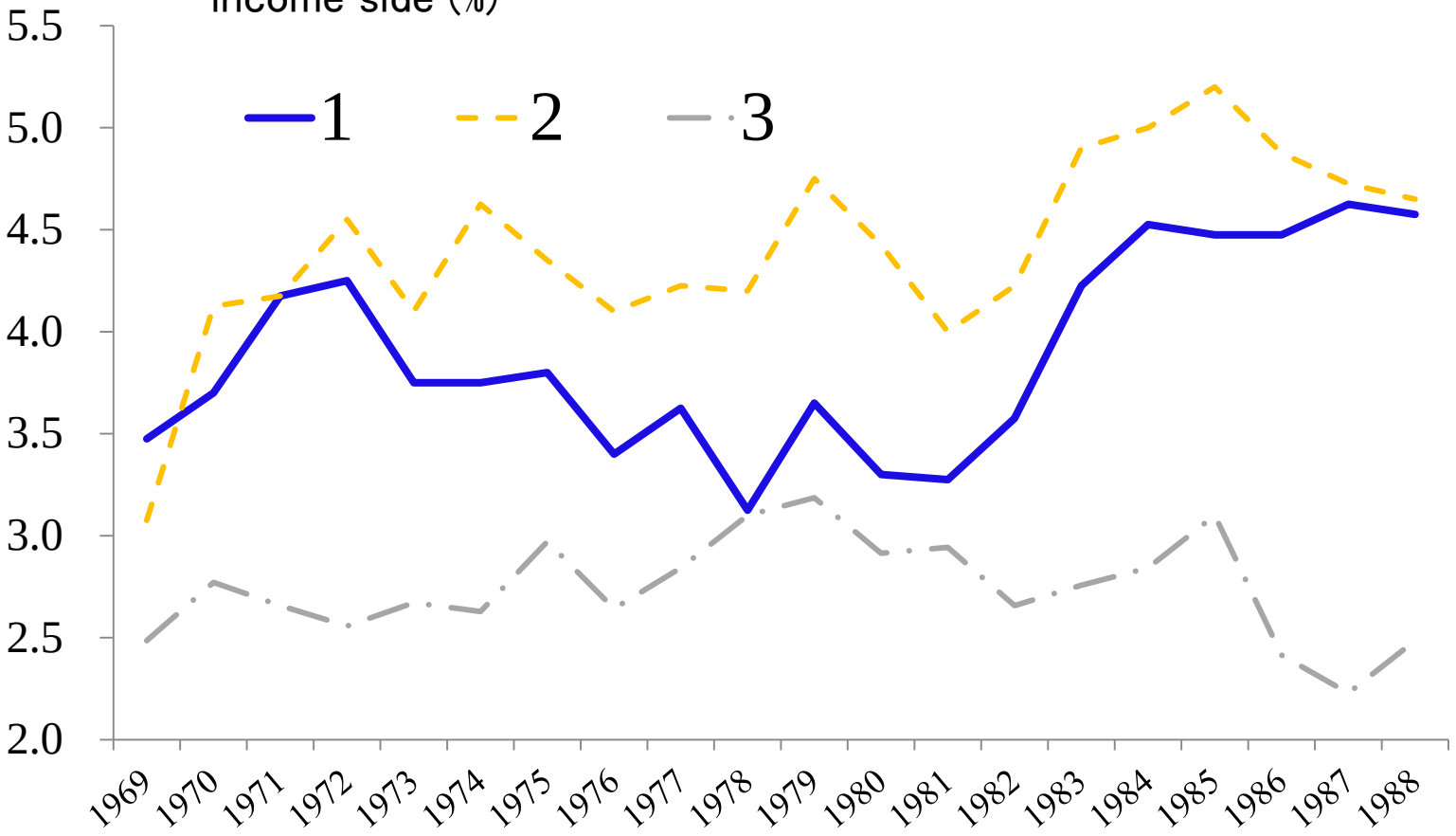
3.2 Comparing Union Republics (5)

Fig. 6: Size and Dynamics of the Second Economy: Group Average, Expenditure Side



3.2 Comparing Union Republics (6): Sales to State and Cooperative Organizations

Fig. 7: Sales of products to the state and cooperative organizations, income side (%)



Difference in the Size of the Second Economy: Income and Expenditure Side, % point

Fig. 8a: Income–Expenditure Gap, SE Income (%) – SE Expenditure (%)

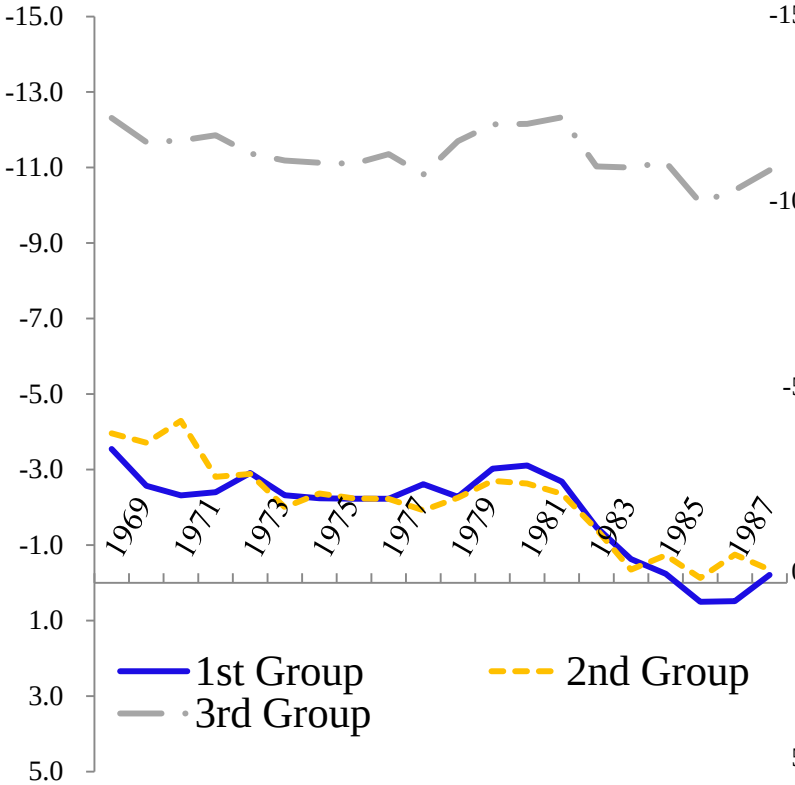
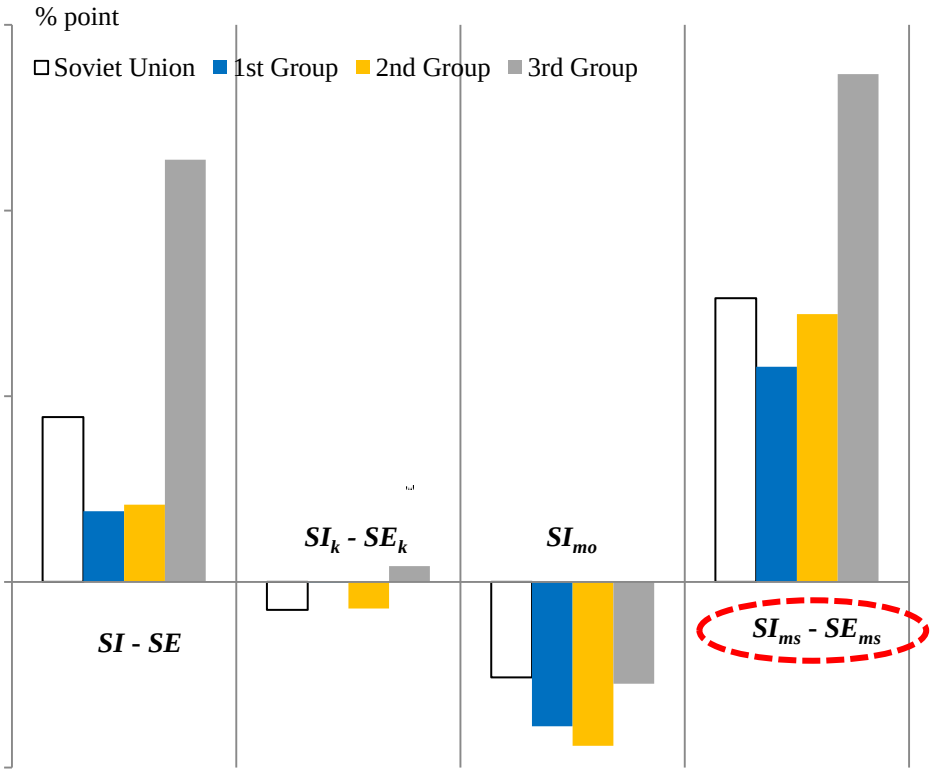


Fig. 8b: Breakdown of the Income–Expenditure Gap, period–average.



$$SI = SI_k + SI_{mo} + SI_{ms}.$$

$$SE = SE_k + SE_{ms}.$$

$$SI - SE = (SI_k - SE_k) + SI_{mo} + (SI_{ms} - SE_{ms}).$$

Shortage Indicator: 1975, 1985