INCOME REDISTRIBUTION THROUGH INTERGOVERNMENTAL TRANSFERS IN UKRAINE

by

Olexiy Burlaka

A thesis submitted in partial fulfillment of
the requirements for the degree of

Master of Arts in Economics

The National University of "Kiev Mohyla Academy"

2002

Approved by _____
Chairperson of Supervisory Committee

_____

_____

_____

Program Authorized
to Offer Degree_____

Date _____

The National University of "Kiev Mohyla Academy"

Abstract

INCOME REDISTRIBUTION THROUGH INTERGOVERNMENTAL TRANSFERS IN UKRAINE

by Olexiy Burlaka

Chairperson of the Supervisory Committee: Professor Serhiy Korablin,
Institute for Economic Forecasting at the
National Academy of Sciences of Ukraine

Distributional questions are central to any polity, but in a representative democracy potential beneficiaries can vote for politicians who support redistribution. If redistribution becomes excessive, however, economic growth can be stifled. In this thesis, the redistribution of income in Ukraine is examined. The focus is on the distribution of the central government's revenues among different oblast governments, which were highly responsible for the large part of the total public expenditures in Ukraine. The institutional features of Ukraine, such as peculiarities of the intergovernmental relations and characteristics of the tax system, are taken into consideration. An empirical study, based on the latest panel data (1998-2000), tests implication of the median voter hypothesis: redistribution in favor of median income oblasts. The evidence is found to be inconsistent with that implication. The analysis suggests that the redistribution of revenues among the regions in Ukraine is directed from the middle-income regions to the poor and the rich regions. Redistribution in favor of the rich oblasts is explained by interest group activities. Redistribution in favor of the poor is explained by that groups' relatively high vote participation in elections.

TABLE OF CONTENTS

LIST OF FIGURES

Page

LIST OF TABLES

Page

ACKNOWLEDGMENTS

I wish to express my gratitude to my thesis advisor Dr. Ronald N. Johnson for his insightful suggestions and his patience. I am also highly indebted to Dr. Ghaffar Mughal, Dr. Stefan Lutz and Dr. Roy Gardner for useful comments. I thank my friends Aleksandr Amialchuk and Natalia Zaderey, EERC students, for help. Finally, I am thankful for Oksana Kuziakiv, EERC Research Center, and Saule Il'inykh, Fiscal Analysis Office, for their assistance in obtaining the data.

GLOSSARY

Consolidated budget is a total of all the budgets that are parts of the National budget system.

Deterministic voting - assumption that each voter votes with certainty for the candidate whose platform is closest to the voter's ideal point.

Director's Law - the hypothesis that in a democracy redistribution is from the tails of income redistribution to the center.

FAO – Fiscal Analysis Office.

Interest group - organized group of people who act in order to promote their common interests.

Local budgets are oblast budgets, mis'ki (town) budgets, rayonni (district) budgets, rayonni in towns' budgets, village budgets.

Logrolling is trading votes in the democracy.

Median voter theorem. If decision is made over the single dimensioned issue and all voters have single-peaked preferences the median position cannot lose under majority rule.

National budget system consists of the state budget, budget of the Autonomous Republic of Crimea, and local budgets.

Public expenditure is expenditures made by the government

Public goods - some kinds of goods that are non-rival and non-excludable.

Rational ignorance of voters - concept stating that voters realize they are unlikely to affect an outcome of election and rationally decide to avoid expenses on acquiring and processing information about candidates.

State taxes - taxes which are established by Verkhovna Rada and levied only by national government.

Local taxes – taxes which are established by Verkhovna Rada; however, they are at the disposal of the local government. The local government can levy and collect them.

Free riding. The refusal of an individual to buy a certain kind of non-excludable good because the individual believes that other people will buy it and he will get it for free.

Chapter 1

INTRODUCTION

Hardly anybody would deny that at the present time government plays a large role in any economy. Politicians are in charge of a wide range of activities and control great amounts of money. How these funds are used is a complicated issue due to the non-availability of market mechanisms in the allocation of most public services. Democratic regimes use voting mechanisms to make decisions about the size and directions of public expenditures, but majority voting is not a simple substitute for the market. Indeed, majority voting often results in redistribution.

A simple model of size of the government developed by Allan Meltzer and Scott Richard (1981) predicts that under democracy the size and the direction of governmental programs depends on income of the median voter relative to mean income. The higher the mean income relative to the median income, the larger part of the total economy's income is controlled by the government. If the difference between median and mean income of the voters expands, the Meltzer-Richard model predicts that the size of government will expand.

Significant parts of government expenditures are often devoted to programs that can be considered as redistributional. But, if income distribution is very unequal, the rich may find it too costly to bear it and bring about the collapse of democracy. Daron Acemoglu and James A. Robinson (2001), inspired by the historical evidence from Europe and Latin America, develop a model that explains political transitions, and collapse of democracy.

According to Daron Acemoglu and James A. Robinson, in societies with great income inequality democratic regimes may not lead to consolidation because of excessive redistribution. However, a state controlled by the rich elite may also be politically unstable, because of the threat of revolution. Rich elite may wish to avoid revolution and undertake democratic reforms. The authors assert that under certain conditions, democracy cannot be sustained and the state can experience cyclical political transformation. Some asset redistribution may reduce income inequality and lead to consolidation of society that decreases the probability of revolution and coups and provides sustainable democracy.

The argument of Daron Acemoglu and James A. Robinson indicates that the role of democracy in the development of a country is not clear. Their point is consistent with the empirical results offered by Robert J. Barro (1997). His empirical findings suggest that very high levels of democracy in a country, defined by a subjective index of political rights, slows down economic growth, whereas a relatively low index of democracy contributes to the economic growth. Therefore, granting democratic rights up to some point is expected to promote economic growth. Democracy, however, may be considered good from a non-economic point of view.

The basic model of voter behavior used by Daron Acemoglu and James A. Robinson, and Meltzer and Richard is the median voter model, a model that is central in studies in the area of public choice. The essence of the model is that the policy crucially depends on the preferences of the median voter. In general, the median voter model has performed well (Mueller, 1989). However, more recent research indicates that actual outcomes of the political decision-making process may deviate from the one predicted by the median voter model (e.g. Aronsson and Wikstrom, 1993). One possible reasons for these deviations is the effect of special interest groups.

This thesis studies public expenditure allocation in Ukraine. Particularly, the effect of the interest group activity is inquired. Various interest groups have the incentive to lobby their interests at the national level. The focus is on the distribution of the central government's expenditures among the different administrative units, which are responsible for the large part of the total public expenditures in Ukraine during the last few years.

The expenditures of the Consolidated Budget of Ukraine are as large as 30% of the Gross Domestic Product.[1] Great tax pressure and requests to reduce taxes, on the one hand, and claims to increase public funding, on the other hand, make the decisions about the size and the directions of public expenditure especially important.

The structure of the paper is as follows. The next chapter offers a review of the relevant literature, theory and empirical results that use the median voter model and analyze interest group behavior. The Ukrainian context (markets, agents, institutions) is described in Chapter 3. In Chapter 4, the median voter model is used to develop implications about the distribution of revenues. Chapter 5 contains description of the data and presents empirical evidence on the median voter model. Chapter 6 analyzes interest groups in Ukrainian context, includes discussion of the main results and policy implications. Chapter 7 contains conclusions.

[1] excluding Pension Fund

Chapter 2

LITERATURE REVIEW AND THEORY

Median voter approach and deterministic voting

The central model of decision making in the public choice literature is the median voter model. The model is grounded on the median voter theorem, which states that *if decision is made over the single dimensioned issue and all voters have single-peaked preferences the median position cannot lose under majority rule.*[2]

While initially median voter approach was applied to direct democracies only, in 1929 Harold Hotelling first presented the median voter theorem as an outcome of two-party competition in a representative democracy (Mueller, 1989, p.180).

A simple example of the median voter model, similar to the Hotelling model,[3] is described below. It applies median voter theorem to the decision as to the size of government. Its graphical representation is shown in Figure 1. The vertical axis shows the number of the voters who prefer a candidate's position on an issue, as reflected at the horizontal axis. It is assumed that each voter votes for the candidates whose position is closest to that most desired by the voter.[4] The distribution is assumed to be unimodal and symmetric.

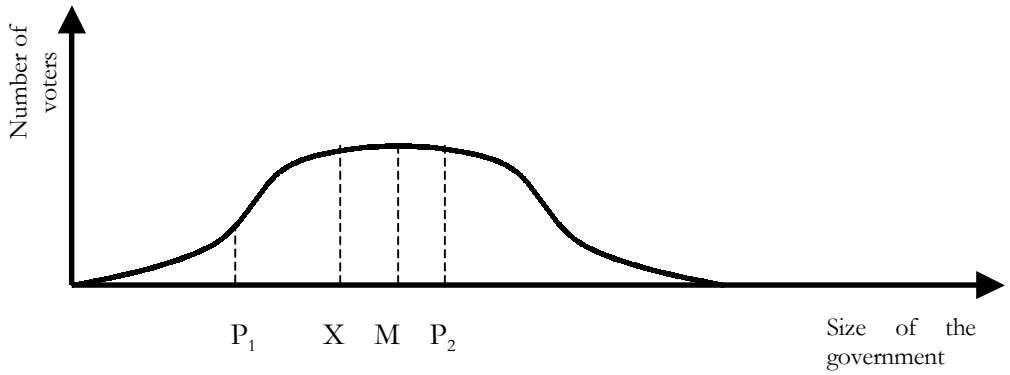
---

[2] Mueller (1989) also points out that the theorem was proven to reflect a decision making over the multidimentional issues, too.

[3] adopted from Mueller (1989), p.180

[4] deterministic voting assumption

Figure 1. Median voter decision under two-party political system.



If there are only two candidates P_1 and P_2 and voter X is exactly half way between P_1 and P_2, which means that $X=1/2\ (P_1 + P_2)$, P_1 receives all votes to the left of X and P_2 receives all votes to the right of X. Median voter (M) supports P_2, therefore, P_2 wins.

P_1 has an incentive to move rightward and catch more votes. P_2 has an incentive to move to the center, as well. Therefore, both candidates try to get a support of the median voter (M) and their positions are adjusted to reflect the preferences of the median voter in a greater extent. At the equilibrium both candidates have the same platform.

A particularly relevant model, where voters make a decision over one-dimensioned issue, is that of Allan Meltzer and Scott Richard (1981). This elegant model considers the share of income redistributed as the size of the government. It is assumed that the economy is in general equilibrium and both taxation and redistribution are the only government activities. Real government budget is balanced and voters are fully informed in the model. Tax rate is a constant fraction of earned income, all people get the same lump-sum welfare payment. "Under the majority rule, the voter with median income … is decisive. Voters

with income below the income of the decisive voter choose candidates who favor higher taxes and more redistribution; voters with income above the decisive voter desire lower taxes and less redistribution… When the mean income rises relative to the income of the decisive voter, taxes rise, and vice versa" (p.924). Thus, the model predicts that when mean income is higher than median income, income will be distributed from rich to poor people. The size of government (the share of income redistributed) will be greater, the higher the mean income relative to the median voter income is. Allan Meltzer and Scott Richard do an empirical investigation and find some support of their model (Miguel Gouveia and Neal A. Masia, 1998).

Both Hotelling and the Meltzer-Richard models assume one-dimensioned domain of preferences. In a multidimensional world voters can have multi-peaked preferences and that can lead to cycling problems, which implies that there is no equilibrium (Mueller 1989, p.196). However, importance of cycling problems in voting is likely to be overestimated. Gordon Tullock (1981) studies this problem and points out that although we live in multidimensional world, "we observe not only is there no endless cycling, but acts are passed with reasonable dispatch and then remain unchanged for very long period of time" (p.189). The author claims that "endless cycling is theoretically possible, but unlikely in practice if the number of voters is large" (p.190). Tullock's explanation for the low probability of problems with cycling is the existence of logrolling and coalition formation. It means that in situations when from a theoretical point of view endless cycling can be expected to occur, the voters create coalitions and trade votes. One party agrees to support the decision in favor of the other party, the other party supports the decision in favor of the first party.

The median voter model usually has good performance (i.e. considerable explanatory power (Mueller 1989)), but sometimes empirical research suggests that the median voter approach cannot explain public choice outcomes.

Miguel Gouveia and Neal A. Masia (1998) use Meltzer-Richard model and empirically test the hypothesis that "…as the ratio of the mean voter's income to the median voter's income increases, the size of government increases" (p.161). The authors use US state-level data and "… is comprised of a balanced panel of the 50 states over thirteen year period 1979-1991" (p.165). Particularly, the dataset includes ratio of the mean to the median income and two measures of the government size: publicly provided private goods as a percentage of income and redistributive funds as a percentage of income (p.165). Miguel Gouveia and Neal A. Masia employ fixed effect estimation. Fiscal federalism and migration issues are incorporated into the analysis. The hypothesis finds "a minimal support at best". The authors suggest developing new models of size of the government that "might incorporate the behavior of elected officials or interest groups or of the motivation for redistributive spending" (p.173).

It is suggested that one of possible explanations of low support of Meltzer-Richard model in the previously discussed paper is that the analyzed data was aggregated at the state level. Such conclusion can be made after consideration of the research by Geoffrey K. Turnbull and Peter M. Matias (1999), who state that median voter model tends to be a good tool for explaining demand for general expenditures, not individual expenditures. They also investigate whether median voter model can be efficiently applied to spending decisions of the different tiers of governments. The authors test the hypothesis using different specifications of log-linear models. Their conclusion is that the explanatory power of "the median voter model does not extend beyond the lowest tier of local government" (p.135).

However, the findings are sensitive to the time periods, budgetary structure and degree of urbanization.

The median voter theorem is also applied by Branko Milanovich (2000) to examine income redistribution and income inequality. He uses a rich dataset for 24 countries "which were, with two exceptions, democracies at the time of the surveys" (p.372). The author tests two hypotheses:

1) hypothesis about "relationship between inequality in distribution of factor income and redistribution" (p.394),

2) median voter hypothesis is an explanation for redistribution.

The first hypothesis is strongly supported. "More unequal factor-income countries redistribute more toward the poor and very poor" (p.394). As for the second hypothesis, author claims that "…the median voter must gain from the process of redistribution…" (p.390). The support of the second hypothesis turns out to be weaker than the support of the first hypothesis. The results suggest that median voter does not obtain a net benefit. One of the explanations suggested by the author is that the data includes only monetary transfers, while consideration of in kind transfers is very likely to make median voter net beneficiary.

There are many papers in where the median voter approach is compared to other public choice models. The paper by James Murdoch, Todd Sandler and Laurna Hansen (1991) aims to compare two competing approaches: median voter model and oligarchy choice model using defense expenditures. The essence of the latter model is that decision is made by oligarchy "who oversees defense decisions" (p.626).[5]

[5] Unfortunately, the authors do not describe the model in details. They only make a reference to their previous work.

The authors introduce two alternative proxy variables for median income:

- GDP per employed person,
- Average income.

It is argued that the former is better proxy because it is much more sensitive to the macroeconomic fluctuation.

The paper analyzes data on military expenditures of NATO members. The conclusion is that in some countries the median voter model performs better, whereas in others the oligarchy model is better. There are some cases where none of the models is supported.

Stronger results are obtained by Thomas Aronsson and Magnus Wikstrom (1993). They analyze local public expenditures in Sweden. Using cross-section data on Swedish municipalities, the median voter model is tested against extended "random decisive voter model". The latter model's specification nests the former model but it allows non-median voter to be decisive. The median voter model is rejected in favor of the extended model.

The works of James Murdoch, Todd Sandler, Laurna Hansen and Thomas Aronsson and Magnus Wikstrom have shown that although the median voter model performs quite well in some circumstances, it fails in others.

While the models of deterministic voting assume complete information and certainty, in real life these assumptions do not hold, and that may explain the failure of median voter models in many cases. There are several models that may account for peculiarities left out of median voter model. The probabilistic voting model is one.

Probabilistic voting

Under probabilistic voting, candidates are assumed to maximize their expected number of votes, the sum of the probabilities that each voter will vote for the candidate. Probabilistic voting allows for situations with incomplete information.

A model where candidates face uncertainty about the distribution of voters preferences is presented by Mueller (p.203). Voters have biases toward the certain candidates. The biases are assumed to be random. While the candidates know the parameters of the biases distribution, they do not know the exact position of each voter. On the basis of the model, the author reaches the conclusion that the principle 'one man, one vote' is distorted, because candidates choose the platforms where higher weights are assigned to the groups with smaller uncertainty in distribution of bias terms.

In the above model, not only do candidates not know everything they need to about voters, but also voters do not have complete information about the candidates. The voters may get such knowledge, but acquiring and processing information is costly. If voters are rational, they compare costs and benefits of voting. The concept of 'rational ignorance' states that when the number of voters is large, each voter knows that his vote is very unlikely to affect the outcome. As a consequence, rational voters do not waste resources to find out details about candidates' positions and remain 'rationally ignorant'.

When voters are 'rationally ignorant', candidates are interested in providing information to the electorate. In this case, not only the position of the candidates on various issues is important, but also the money spent in an election campaign may affect the outcome. The funds that politicians spend during the elections usually come from the contributions. It creates a mechanism that is often used by interested individuals or interest groups.

A simple model that includes the effect of contributions is discussed below. It is drawn from Mueller (1989), pp.207-216.

Assumed there are only two candidates. In order to win the elections, candidate maximizes votes. His objective function[6] is

$$V_c = f(P_c, P_o, C_c, C_o, \ldots)$$

where V_c is expected number of votes for the candidate,

P_c, P_o are the platforms of the candidate and his opponent, respectively,

C_c, C_o are campaign expenditures of the candidates, respectively.

First partial derivative of the function with respect to own campaign expenditure is assumed to be positive and the derivative with respect to the opponent's expenditure is negative, which means that increase of own campaign expenditure increases the number of aye votes the candidate receives and decrease the number of aye votes for the opponent. The idea behind the assumptions is that an increase in campaign expenditures allows a candidate to provide information to the electorate that increases the chances of the candidate to win the election. While candidate may use his own wealth in the election campaign, he usually seeks contributions from other individuals who are interested in certain changes in legislation.

Muller's model assumes that individual voter's objective function, measured in money units, is:

$$O_i = \pi_c(V_c - V_o)g(P_c) + (1-\pi_c)(V_c - V_o)g(P_o) - C_{ic} - C_{io}$$

where $\pi_c(V_c-V_o)$ is the probability that the candidate **c** will win,

$g(P_c)$ is the expected individual's gain from candidate **c** victory, while $g(P_o)$ is expected gain from the candidate **o** victory,

C_{ic} and C_{io} are the contributions of the individual **i** to the candidates **c** and **o**, respectively.

One of the implications of the median voter model (e.g. Hotelling model) is that both candidates have the same platforms. However, this implication relies on the assumption that there is complete information. In Mueller's model, there are 'rationally ignorant' voters. Hence, the platforms do not have to be same. As mentioned above, candidates can have different information about the voters' preferences, which implies the choice of different initial positions. The expected number of votes for candidate (V_i) is a function of both platforms and contributions to the election campaigns. Even if the functional forms of both V_c and V_o is assumed to be the same, the initial contributions do not have to be the same, therefore, (V_c-V_o) does not have to be equal zero, as well.

If it is assumed that platforms are fixed; that is, contributions affect the number of votes, but not the platforms, the first order conditions of individual's objective function maximization can be found by taking derivatives and solving the following equation:

---

[6] Following Mueller it is assumed that elections is a zero-sum game, thus, opponent's contributions are included into the candidate's objective function.

$$\frac{\partial O_i}{\partial C_{ic}} = \pi_c' * (\frac{\partial V_c}{\partial C_{ic}} - \frac{\partial V_o}{\partial C_{ic}}) * g(P_c) -$$
$$- \pi_c' * (\frac{\partial V_c}{\partial C_{ic}} - \frac{\partial V_o}{\partial C_{ic}}) * g(P_o) - 1 = 0$$

that can be reduced to

$$\pi_c' * (\frac{\partial V_c}{\partial C_{ic}} - \frac{\partial V_o}{\partial C_{ic}}) = \frac{1}{g(P_c) - g(P_o)}$$

The model is symmetric; thus, an analogous first order condition follows from $\frac{\partial O_i}{\partial C_{io}} = 0$.

These simple algebraic manipulations show that when candidates' platforms are not affected by contributions, at most one C_i will be greater than zero. In other words, each individual will contribute to only one candidate whose platform is the most beneficial for the individual.

However, the assumption about fixed platforms is very strong. Candidates need more contributions in order to bring information to 'rationally ignorant' voters and may realize that adjustment of their programs may lead to larger contributions and, consequently, stronger support and higher probability of winning the election. Due to these considerations, the model is developed further and assumption that platforms (P_i) of the candidate depends on the contributions (C_i) now becomes:

$$P_c = h(C_{ic});$$

$$P_o = m(C_{io})$$

where h(*) and m(*) are some functions.

The implication of the new model is that it may be rational for the i-th individual to contribute to both candidates:

$$\frac{\partial O_i}{\partial C_{ic}} = \pi_c g'h' - 1 = 0$$
$$\frac{\partial O_i}{\partial C_{io}} = (1-\pi_c) g'm' - 1 = 0$$

The first order conditions allow the author to conclude that "the higher a candidate's probability of winning, and the more sensitive his platform is to the level of contributions, the greater will be the contributions from contributor i" (p.208).

The model shows that, if there is incomplete information and candidates can adjust their platforms, contributors may decide to pay both candidates. In this case both candidates will adjust their platforms in favor of the contributor (or group of contributors).

Thomas Stratmann (1992) presents an alternative, but simple model of probabilistic voting. The total number of voters for the candidates is assumed to be a sum of votes of interest group members, votes of informed voters and votes of uninformed voters. Campaign contributions made by an interest group increases the number of 'for candidate' votes of uninformed electorate. In order to increase contributions, candidate may adjust his program in favor of interest group, but it will lead to loss of informed electorate's votes.

The author uses the model to check the rationality of contributors, who, if being rational, do not contribute to the candidates whose support is guaranteed anyway, and do contribute to the candidates whose decision is affected by the

contribution. Switching regression technique is applied in the article. The results support the median legislator model. But some contributions are made to candidates who would support contributor's interest anyway are made.

Not only election campaigns, but behavior of elected officials is a subject of research. The evidence is that after winning an election, the office holder often behaves as an agent of his constituency. Sam Peltzman (1985) develops a simple principal-agent model that provides an economic interpretation of the history of voting in the US Congress. The econometric analysis of more than eighty years of voting in the US Congress supports the hypothesis that congressmen behave as representatives of their constituencies. Changes in voting patterns are found to correspond mainly to the changes of the economic interests of the electorate.

Usually, the electorate includes several groups of people with similar interests. The groups may realize their common interest and act in order to promote it. The theoretical models described above suggest two mechanisms that allow this to occur: decreasing candidate's uncertainty about the preferences of the voters-members of the group and making contribution to the candidate's election campaign. If the candidate wins, he promotes the interests of the group, whose interests are usually different from the interest of median voter. This is a reason why the median voter model fails in many cases.

It is recognized that the interest group activity is important in the public choice analysis. Thus, there is a great amount of the literature devoted to this subject.

Interest groups behavior

Mancur Olson (1973) in his book *The Logic of Collective Action* provides the theoretical background for the study of group behavior. According to Olson (p.2), the mere premise of a possible gain from the actions of a group does not lead to the conclusion that group members (rational, self-interested, selfish, etc)

would actually achieve their common interests. The main reason is that organizing the group has a cost. While "… all of the members of the group … have a common interest in obtaining … collective benefit, they have no common interest in paying the cost of providing collective good" (p.21). The larger the group, the greater the cost of organizing (p.47). Therefore, it is less costly to organize a small group than a large one. Moreover, the larger the group, the smaller the fraction of the total group benefit each individual gets. It means that given a constant amount of total benefits, each member of a smaller group gets a larger benefit (p.48).

The model of interest group behavior developed by Gary Becker (1983) embodies Mancur Olson's argument. Becker assumes that there are two interest groups, s and t, consisting of homogenous individuals. The number of their members is n_s and n_t, prior to tax incomes are Z_s^0 and Z_t^0 , incomes after redistribution are Z_s and Z_t, respectively. The rise of the individual's income is considered as a subsidy (R_s), reduction – as a tax (R_t):

$$R_s = Z_s - Z_s^0$$

$$R_t = Z_t^0 - Z_t$$

The revenue from taxes is $S=n_tF(R_t)$, where $F(R_t)$ is a function that represents deadweight loss from tax distortion, $F(R_t) \leq R_t$.

All revenues are spent on subsidies $S=n_sG(R_s)$, where G is the cost of providing subsidy, $G(R_s) \geq R_s$.

Amount of taxes raised is determined by an influence function (I^t) that depends on pressure through s (p_s) , through t (p_t) and other variables (x):

$$n_t F(R_t) = - I^t(p_s, p_t, x)$$

The amount of subsidies (I^S) is determined by a similar influence function:

$$n_s G(R_s) = I^s(p_s, p_t, x)$$

Balanced budget assumption implies that

$$I^s + I^t = 0$$

Groups spend real resources producing political pressure. The production function of pressure is

$$p = p(m,n)$$

where **m** is a total amount of the real resources spent on the production of pressure,

n is a number of members of the group,

m=an, **a** is real resources spent per member of the group .

Full incomes of the members of the groups are $Z_t = Z_s^0 - R_t - a_t$, $Z_s = Z_s^0 + R_t - a_t$. The conditions for maximizing individual's income are

$$\frac{dR_t}{da_t} = -1 \qquad \frac{dR_s}{da_s} = 1$$

Becker states that these conditions can be easily transformed into the conditions of the "political market equilibrium" (p.378):

$$\frac{dR_t}{da_t} = \frac{1}{n_t F}\frac{\partial I^t}{\partial p_t}\frac{\partial p_t}{\partial m_t}\frac{\partial m_t}{\partial a_t} = \frac{I_t^s p_m^t}{F'} = -1$$

$$\frac{dR_s}{da_s} = \frac{1}{n_s G'}\frac{\partial I^s}{\partial p_s}\frac{\partial p_s}{\partial m_s}\frac{\partial m_s}{\partial a_s} = \frac{I_s^s p_m^s}{G'} = 1$$

The author draws several inferences from the model. He shows that "politically successful groups tend to be smaller relative to the size of the groups taxed to pay their subsidies" and that "free riding and other costs of organizing pressure groups, and the capacity of losers limit the political gain of winners".

The model suggests that competition among pressure groups "favors efficient methods of taxation" (p.386) and that "policies that raise efficiency are more likely to be adopted than policies that lower efficiency" (p.384).

William R. Dougan and James M. Snyder, Jr. (1996) apply game theory and develop a "costly redistributive voting game". The model is applied to the problem of income redistribution and should be considered because much expenditure of the Ukrainian budget is devoted to redistributional programs. One of the main implications of the model is that asymmetry among interest groups imposes significant deadweight cost.

It is important to note that the authors state that "…the median voter result that is predicted in those cases in which a stable equilibrium exists fails to account for important aspects of public policy such as the use of the regulatory powers of the government to benefit what appear to be well organized and occasionally quite small associations of individuals" (p.50).

The interest group theory is used by Robert Plotnick (1986), who developed an interest group model of direct income redistribution and tested it on US data. In the abstract, the author states that "benefit levels depend on variables such as taxpayer income and the price of benefit but, unlike median voter models, the model also implies a role for interest groups strength and competition between political party". Plotnick finds the model feasible and states that a richer model is needed.

Cary M. Atlas et al (1995) are also interested with redistributional issues. They take a closer look on "how … growing government pie is divided between the various political subdivisions of a nation"(p.624). The authors find that "the per capita federal net spending obtained by a state is determined by both economic and political-institutional factors", such as "states' per capita congressional representation" (p.624). It means that not only concentration of the interest groups within the state, but also institutional arrangements, such as a procedure of parliament formation and election procedure, matter.

The authors focus on the effect of different per capita representation of the different states in the US Senate. They find that states with smaller population get "significantly higher level of per capita federal net spending" (p.628). The paper suggests that the analysis of redistribution may include an analysis of the institutional arrangements, such as allowed number of voters in different election divisions.

In this thesis, expenditure redistribution among the Ukrainian oblasts is examined. Unfortunately, the data on the population's income distribution in each region is not available to the author ruling out a direct test of median voter hypothesis. Nevertheless, the median voter model is an important part of the apparatus applied in the analysis of redistribution.

Sociological surveys suggest that Ukrainians are quite ignorant of the political processes and elections. Hence, the theoretical framework described above suggests room for the interest group activity.

In the following chapter Ukrainian institutional arrangements are described in more detail.

Chapter 3

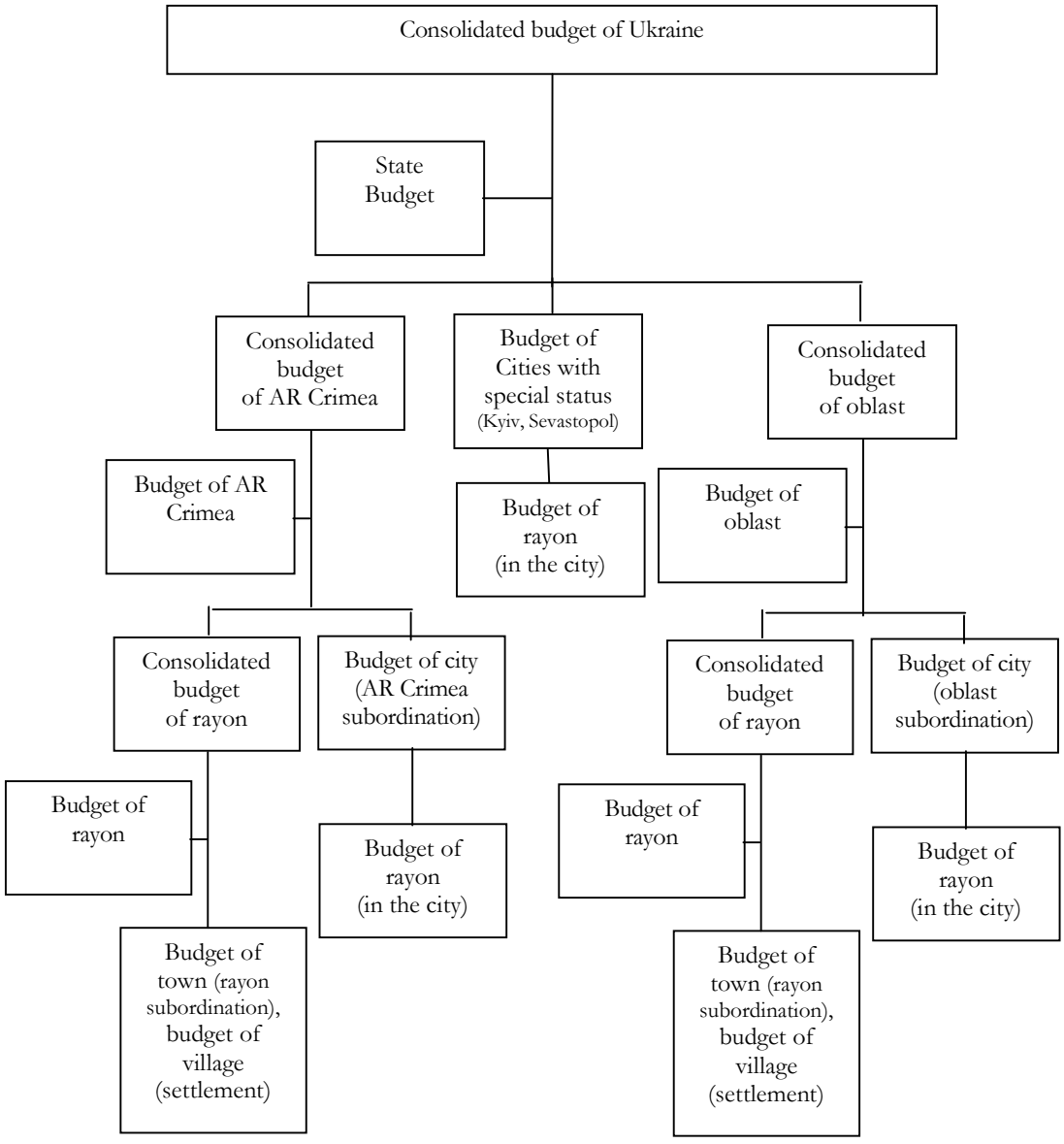
DESCRIPTION OF THE ACTORS, MARKETS & INSTITUTIONS

Ukraine is a newly independent state and its legislation is in the process of construction and improvement. This is especially true for the budget legislation. Until the 2001, all budgets of Ukraine were based on *the Law on Budget System of Ukraine*, which was annulled only by the Budget Code enacted in July 2001. Thus, during the period that is studied the same law regulated the budget relations.

According to the budget legislation,[7] budget system of Ukraine consists of the state budget, budget of the Autonomous Republic of Crimea (AR Crimea), and local budgets. Local budgets are defined to include budgets of *oblast* (region), *rayon* (district), city, and *rayon* in the city, settlement and village. Hierarchy of budgets is shown in Figure 1. The Law does not define the budget of AR Crimea as local budget; however, the budget of AR Crimea is considered as local budget in the thesis because the structure of the budget of AR Crimea is the same as the structure of oblast budgets.

[7] This study is concentrated on the 1998-2000 years. Thus, only legislation that was valid during that period is considered.

Figure 2. Consolidated Budget of Ukraine



Adapted from Gorodnichenko Y. (2001)

Local governments, the activity of which is regulated by the *Law on the Local Self-Governance in Ukraine*, control the local budgets. The law gives local governments considerable independence. They can own communal property, levy taxes, determine the tax rates and tax privileges. However, the *Law on the System of Taxation*[8] explicitly determines the list of local taxes and charges. The list consists of two taxes (advertisement tax and communal tax) and fourteen charges. However, these taxes and charges are of minor importance (the share of the local tax revenues in the local budgets very rarely reaches 5% and the average is less than 3%). Thus, the real ability of the local governments to levy taxes is very limited (Gorodnichenko, 2001). Therefore, the whole budget system of Ukraine heavily relies on the state (general) taxes and the most part of money the local governments have at their disposal are, in fact, indirect transfers from the central government.

Delineation of the revenues as well as expenditures among the local governments at the different levels is not clearly defined. It leads to continuous conflicts among levels of governments (Kravchenko, 1999).

Fiscal Analysis Office suggests that the process of the transfer's distribution should be more transparent. It should tend to equalize the government spending per capita; however, determination principles applied in Ukraine are so fuzzy and the fiscal discipline is so low that even relatively rich regions can get donations (FAO, 1999).

The Law on Budget System sets the floor rates of the state taxes that are to be received by the subnational budgets. The actual fractions are specified by *The Law on State Budget*, which is adopted every year. Comparison of the laws on state budgets in 1998-2000 years shows that the fractions changed every year.

[8] The law is still effective, but it is expected that new Tax Code will be enacted in the nearest future.

Moreover, the actual amounts of transfers to the local budgets are usually different from those specified by the law.

The process of development of the draft budget law usually starts at the Ministry of Finance of Ukraine.[9] The revenues and expenditures are planned at the different departments of the ministry almost independently. The ministry collects claims from the other ministries and state programs and considers situation with the local authorities. On the basis of this information, it calculates expenditure part of the budget. After both parts of the draft are drawn, they are compared and necessary changes are made in order to get required (or allowed) surplus (or deficit). The draft comes through the accommodation procedure and it is backed by other interested players (for example, Ministry of Justice, Ministry of Economy). The last stop for the draft is the Cabinet of Ministries of Ukraine, where it is approved, and comes to the Verkhovna Rada. Changes are usually made at the Verkhovna Rada during the first, second and third readings. After the law is passed by the Parliament, the President of Ukraine signs it.

The main actors in the investigation process are Ministry of Finance, Cabinet of Ministries, other ministries and programs, local governments, Parliament, President and some public organizations.

As it was mentioned above, during the development of the draft legislation, the Ministry of Finance of Ukraine considers the claims of other ministries. It may or may not include the claims in full scope into the draft. It seems reasonable that other agents have incentives to overestimate their actual expenditure because they desire to control more resources and, in fact, this takes place (Gorodnichenko, 2001). These agents try to protect their interests by exerting pressure on the

[9] In principle, other agents (committees of the Verkhovna Rada or single representatives) have power to introduce budget legislation, too. However, the draft developed by the executive branch is usually supported.

Ministry of Finance directly or through other organization (Parliament, President Administration, etc).

Local administrations usually try to affect budget process in order to get higher subsidies or higher share of taxes collected at their disposal. For achieving this purpose, the local governors often exert a 'coordinated pressure' on the central authorities, and political support may be the payment the central authorities is offered (Gorodnichenko, 2001). The Region's Party of Ukraine is one of the examples of region organization in order to affect the activity of Verkhovna Rada. The referendum that took place in the year 2000 received strong support from the presidential administration and included a question about the creation of the two-tier Supreme Council in Ukraine. This was an attempt by regional leaders to exercise control over decisions at the national level. If it had been implemented, it would have been necessary to consider an analysis similar to that provided by Cary M. Atlas et al (1995). That is, to consider per capita representation in the upper tier of the Council (Senate). The reason is that in this case per capita representation in a hypothetical Ukrainian Senate would be different across oblasts. At the present time per capita representation in Ukrainian Parliament is required by the *Law of Ukraine on Election of Representatives* to be relatively equal across election divisions.

According to the Constitution Article 76, Ukrainian Parliament consists of four hundred and fifty representatives. They may participate in fractions and committees. According to the law, several institutions have power to introduce legislation. In particular, the list includes representatives, Cabinet of Ministers and the President. The drafts are discussed in the profile committees first, and are then debated in Parliament. Usually, decisions are made by roll-call voting. Infrequently, secret voting is used. For acts a simple present majority is decisive.

Other voting rules are applied in rare cases such as changes to the Constitution and impeachment of the President.

Strong political culture is not a feature of Ukraine. There are one hundred and seventy six political parties registered, however, only a bit more than thirty parties conducted an active political life even on the eve of Parliamentary election 2002. A lot of the parties are hardly distinguishable. Their titles, while often well-known in western countries, such as Social Democratic Party, Liberal Party, Conservative Party are simple borrowings and these Ukrainian parties usually have nothing in common with western parties of the same name. The possible reason for borrowing of the titles is to mislead the voters.

According to the sociological surveys, people spend little time on assessing political processes; that is, they are 'rationally ignorant'. (Materials of organized by Ukrainian National Committee of Youth Organizations and Konrad Adenauer Foundation seminar "Young politicians and elections 2002" that took place March 15-16, 2002 in Kyiv).

The facts mentioned above suggest that there is much space for interest group activity and, indeed, political analysts suggest that many parties are created in order to protect business interests. However, since the analysis here is concentrated on the redistribution of income among the regions, it is necessary to distinguish interest groups whose interests are highly concentrated within regions. According to the Constitution, Ukraine is a unitarian state; the legislation is not really different across oblasts,[10] regions are very integrated and not large

[10] At the present time, there are several special economic zones in Ukraine. They are not considered to create a difference in the legislation across oblasts. There are several reasons for it. First of all, a zone does not cover the entire oblast in the sense of its territory and types of activity. It may give special status to a district or to the some kind of economic activity in the oblast, not both. Secondly, it usually gives special status to the least developed district or to the suffering type of activity in order to attract investment, etc. Finally, the special status is given for a relatively short period of time. Thus, it is very implausible that special zones can create a powerful interest group. It is much more plausible that it can be a result of the

(compared to different states in the US or countries in the EU). Thus, interest groups are likely dispersed across oblasts. Nevertheless, there might be cases where local interest groups are especially relevant.

These could be regional business groups. It seems reasonable that major business groups within oblasts can have significant influence on local governments. Members of the local interest group may actually hold seats in local government, where they can direct expenditures and benefit from increasing local budgets at cost of other regions. An example of such a benefit is municipal construction investment into the infrastructure of the region, etc., which in turn is the revenues of construction companies.

Strong influence on local government creates a very strong incentive for these groups to lobby their local interests at the national level. It means that the groups have incentives to affect the decisions made in the Verkhovna Rada in order to increase the transfers to their regions where they can control or, at least, strongly influence local governments' decisions.

It is hard to measure the activity of the groups directly because it is usually hidden from outsiders. In order to incorporate the groups into the analysis, proxy variables are used. These issues are analyzed in more detail in Chapter 6.

---

activity of the interest group, but in this case this group is to be reflected by other included variables. It has two implications:

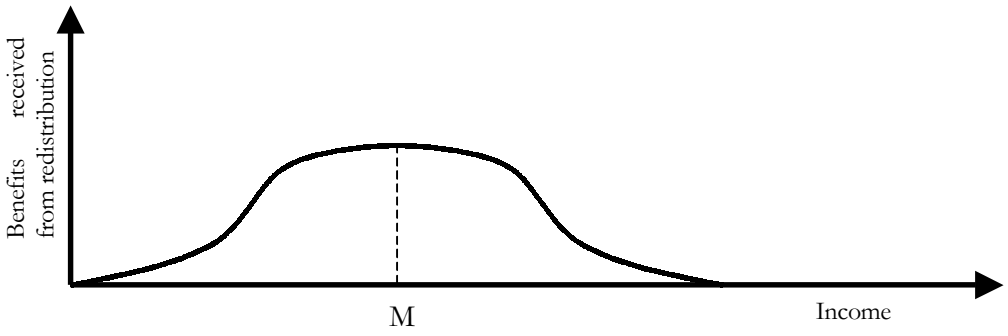
1. There is no reason to think that the legislation is different across oblast.
2. Special economic zones can be neglected in the research.

Chapter 4

IMPLICATIONS OF THE MEDIAN VOTER THEOREM

The Meltzer-Richard (1981) model of government size implies that if mean income is higher than the median voter's income redistribution is from rich to poor. In constructing their model, however, Meltzer and Richard make a number of simplifying assumptions. In particular, they assume that redistribution takes the form of a lump transfer with the necessary tax revenues collected through a proportional tax on income. As Mueller (1989, p. 448) points out, "tax and subsidy programs are generally more flexible than the Meltzer-Richard model assumes. Given a choice between taking only from the rich and taking from both the rich and the poor, the selfish median voter should take from both". That is, the median voter will claim the greater share of government transfers. If, for example, the median voter's income is approximately equal to the mean, as in Figure 3, redistribution would be from both tails of the distribution to the center. This pattern of income redistribution would be consistent with Director's law of income redistribution (Mueller, 1989, p. 448).

Figure 3. Income redistribution from the tails of income distribution to the middle .



Even if income distribution is skewed to the left, as it often is, the median voter model predicts that transfer to the median group or individual will be higher than that received by voters located at either ends of the distribution. However, if income distribution is highly skewed to the left, it may be difficult empirically to distinguish the standard median voter hypothesis from the hypothesis that the median voter is altruistic. If altruistic, the median voter may support a policy that does not give that individual the largest transfer, but instead provides more to the lower income groups. If either the distribution is highly skewed to the left or the median voter is altruistic, one could empirically observe a negatively sloped relation between income and transfers rather than the inverted U-shaped function as reflected by the distribution shown in Figure 3. Thus, knowledge of the underlying income distribution is important to drawing implications.

Although data on the distribution of income within the various regions is not available, data on expenditures in Ukraine, Table 1, provides some information on the distribution of the income.[11]

Table 1. Distribution of households according to per capita monthly expenditures in the first quarter of 2001

	All households	Urban households	Rural households
Proportion of households with expenditures less than average, %	55.8	57.3	52.1

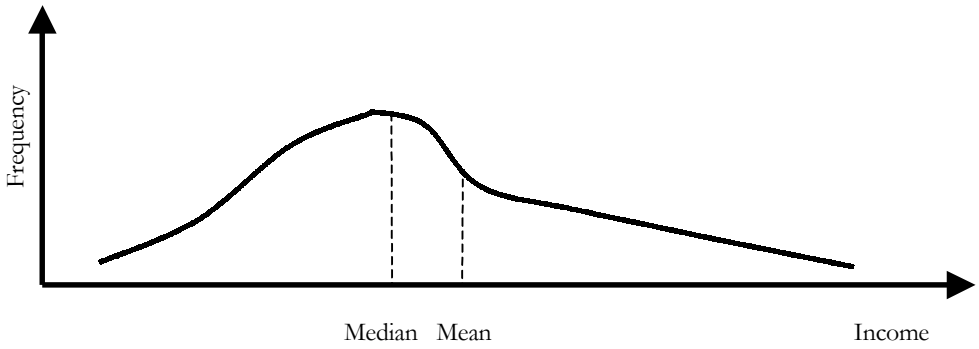
* Source: Derzhcomstat

The data indicate that the median voter's income is below the average, but the difference between them does not appear to be large. While not all characteristics

[11] The data is based on the survey of households' expenditures. Such indirect way of income estimation is expected to be much better measure than direct one because in Ukraine tax evasion is practiced very widely and the actual income is hidden.

of income distribution in Ukraine are known, the distribution of income is likely similar to that shown in Figure 4.

Figure 4. Shape of income distribution in Ukraine



In general, the conditions in Ukraine appear to fit the standard median voter model. While income distribution is skewed to the left, the median voter's income appears to be distinguishable from that of the very poor.[12] Moreover, Ukraine does not have a single constant tax rate but many different taxes and rates. Thus, the median voter model predicts that for Ukraine **redistribution is from the tails of the income distribution to the median income oblast.**

In the next chapter, the above implication of the median voter model is tested. There it is assumed that the income distribution can be approximated by use of quadratic function, income and income squared. The signs on the coefficients of these two variables, implied by the median voter model, are positive and negative respectively. In addition, the point where the quadratic function reaches a maximum is to be inside the relevant interval determined by the range of incomes. If instead, the empirical results reveal a strictly positive relation between income and transfers, or a U-shaped functional relationship, the median voter

[12] Although the GINI coefficient for Ukraine appears to be high, around 30, it is lower than comparable measures for Russia and other economies in transition. See Jan Svejnar (2002, p. 20).

model is refuted. As mentioned above, if the results suggest a negative relationship between transfers and income that outcome may be due to a highly skewed income distribution rather than a refutation of the median voter hypothesis. Thus, the stronger result, in terms of refutation, would be a finding of a positive or U-shaped relation between transfers and income.

Chapter 5

EMPIRICAL EVIDENCE ON THE MEDIAN VOTER THEOREM

This chapter is devoted to hypothesis testing. On the basis of analysis of the theory and institutional arrangements in Ukraine, an econometric model is developed and the hypothesis stated in the previous chapter is tested. The chapter begins with a description of the data.

Data description

The initial dataset consists of yearly fiscal, economic and demographic characteristics of the twenty four oblasts, Autonomous Republic of Crimea, cities of Kyiv and Sevastopol. The data are for the years 1998-2000.

There are three main data sources: State Statistical Committee (Derzhcomstat), Fiscal Analysis Office (FAO) and WEB-site of the International Foundation for Election Systems (IFES) - http://www.ifes-ukraine.org.[13]

The initial dataset includes variables that are measured directly and are drawn from the official statistics. This dataset includes the following variables:

- Total local government expenditures (LE). Source – FAO. This variable measures total expenditures at the local level, financed from both national and local sources.

[13] Recently, problems with this site appeared. The data also can be received at the official site - http://www.cvk.ukrpack.net

- Local Taxes (revenues from the local taxes) (LT). Source – FAO. The variable represents the amount of local taxes collected in the oblast.

- Total tax revenue collected in oblasts (TAXREV). Source – FAO. It measures the amount of taxes collected in the oblast, including state and local taxes.

- Average wage in oblast (AVWAGE). Source – Derzhcomstat.

- Population of oblast (POP). Source - Derzhcomstat.

- Voter participation rate in the second round of the president elections in 1999 (PRESELEXT). Source – IFES.

- Number of people of different age groups in the regions. The variable covers only 2000. Source - Derzhcomstat.

- Number of employed in different sectors of the economy (manufacturing, agricalture, etc). Source - Derzhcomstat.[14]

Using this data two other variables are generated: "State taxes collected in the oblast" (STREV) and "Transfers from central to local government" (LEFST). The variable STREV is calculated by subtracting the local taxes (LT) from the total tax revenues collected in the oblast (TAXREV). Local budgets are assumed balanced so that total expenditures are equal to local tax revenues plus transfers from the central government.[15] Transfers from the central government to local (LEFST) is calculated by subtracting local taxes (LT) from total local government

[14] The variable is not directly used in the models. It is exploited in order to produce indexes.

[15] Actually, local budgets usually are not balanced. However, the deficit/surplus is very small, it is rarely more than 0.5-1%. Thus, we can neglect it.

expenditures (LE). All fiscal variables are adjusted for inflation (price index in 1998 is 1) and divided by the population. Thus, the variables are in per capita real terms.

Methodology

In general, tests of the median voter model have utilized data where each cross-sectional observation is an independent political unit with revenues and expenditures determined by the voters residing within the jurisdiction (e.g., Borcherding and Deacon, 1972). However, the greater part of an oblast's consolidated budget revenue comes from transfers, and the power to tax is mainly at the national level. Ukrainian legislation allows two local taxes and fourteen charges. But, as mentioned previously, the share of local tax revenue in local budgets rarely reaches 5%, making it of relatively minor importance. This concurs with Yuriy Gorodnichenko (2001) who also claims that the ability of the local government to levy taxes is very limited. Thus, voters do not determine taxes at the regional level. This fact and unavailability of detailed income data makes a direct test of the median voter model infeasible. However, as explained in Chapter 4 it is still possible to draw inference about the applicability of the median voter model based on the pattern of observed transfers to the various oblasts.

Although most intergovernmental transfers are used to finance programs such as education and health and do not appear to be designed as direct transfers, there are two reasons to consider them as the redistributional in nature. The first is that expenditures on education and healthcare are likely to have substantial redistributive effects (Norman Gemmell, 1985). The second reason is that central government revenues that are collected by region may be spent in another region. In other words, revenues from state taxes may be redistributed across regions.

Accordingly, for the purpose of this study all revenues of local governments received from the state (general) taxes are considered as transfers.

Choice of the model specification is based on consideration of theoretical as well as statistical aspects. A test of the stated hypothesis can be accomplished by inclusion of income and income squared (or their proxy) for each oblast as regressors. The amount of transfers is the regressand. The main objective is to estimate the signs and magnitudes of the coefficients on the income variables and derive the implied pattern of redistribution. Although the focus is on the income variables, one might expect that other variables can influence the outcome. Indeed, in the second stage of the analysis interest group influence will be examined. But the immediate concern is with population characteristics that may be correlated with the income variables. In studies of the demand for public goods population characteristics, such as age, are often included along with other explanatory variables. However, this study aims to highlight patterns of redistribution, not demand for public goods. Moreover, certain population characteristics may be conducive to the formation of effective interest groups. Although at this stage of the analysis variables that explicitly reflect population characteristics are not included in the analysis, there may be systematic differences across the various oblasts that if not account for could lead to biased estimates of income variables.

As mentioned above, the study uses panel data, 27 oblasts over 3 years, 81 observations in total. There are two well known options for controlling for differences across the 27 oblasts, a fixed effects or random effects model. Both options allow for systematic differences across oblasts.[16]

[16] If there are no systematic differences across the various oblasts after controlling for variation in income then estimates obtained using simple OLS pooled regressions should yield similar redistributional patterns to those obtained using either fixed or random effects models. Indeed, that is the case here.

At first sight, the fixed effects model would appear to be a good option. That model includes cross sectional dummies that can capture the effect of variables assumed to experience no change over time. The use of a fixed effects model can avoid possible problems due to correlation between individual specific oblast effects and the income variables. However, in this case there are both statistical and theoretical problems with the use of the fixed effects model. First, compared to the random effects model the fixed effects specification would cost many more degrees of freedom. Secondly, if the regressors, the income variables, do not vary much within each group, the oblasts in this case, they could be highly correlated with the cross sectional dummies. Since there only 3 within group observations combined with low variation of income variables within each group application of the fixed effects model is likely to result in insignificant estimates. Under these circumstances, application of the fixed effects model would not be appropriate from a statistical point of view. In addition, use of fixed effects implies that the underlying factors contributing to any systematic differences across oblasts are in fact fixed. But political fortunes can change and that can affect the distribution of revenues, suggesting that it is very unlikely that oblast specific effects were not subject to change during the period studied. Essentially, there is no reason to assume that the 'fixed' effects were really fixed.[17] Although the period involved, from 1998 to 2000, was rather short, two elections were held. Moreover, Ukrainian budget legislation and processes changed each year of the sample.

The random effects model avoids the problems mentioned above. It assumes that individual specific constant terms are randomly distributed among cross-sectional units (Greene, p.567). Importantly, the random effects model, compared to fixed effects model, has better asymptotic properties when the number of time period studied is small, as it is in this study. These considerations

[17] Mundlak (1978) argues that out individual effects should always be treated as a random.

argue for selecting the random effects model specification.[18] This study will use the Feasible GLS estimator, considered by Greene (p. 573) to have the better asymptotic properties.

Analysis of directions of the redistribution

In Chapter 4 the hypothesis implied by the median voter model was shown. It implies a bell-shaped function. In order to test this hypothesis as to the direction of redistribution, real per capita transfers to the local government are treated as a function of real wage and real wage squared.

$$RPCLEFST_{it}=\mu+\beta_1 RAVWAGE_{it}+\beta_2 RAVWAGE_{it}^2 +$$
$$+\beta_3\, RPCSTREV \quad \text{(Model 1)}$$

where

i - index for oblast,

t - index for year,

$RPCLEFST_{ij}$ is the real per capita transfers to the local government (local expenditures that are financed with redistributed state taxes),

$RAVWAGE_{it}$ is the real average wage in the region,

$RPCSTREV_{ij}$ is the real per capita amount of the state taxes collected in the oblast.

The reason for the latter variable to be included in the regression is that the amount of grants received is tied to taxes collected in the region in order to create

[18] Although Greene (2000) suggests application of formal statistical test for choice of model specification, a Hausman test, that test is not applied in the study. When the number of cross-sectional observations is small the Hausman test is not reliable. Properties of the fixed effects model depend on the assumption that T->infinity. Here T=3. Another point is raised by Baltagi (1995), who argues that "if either heteroscedasticity or serial correlation is present, the variances of the within and GLS estimators are not valid and the corresponding Hausman test statistic is inappropriate" (p.70). Visual analysis of the data raises suspicions about the presence of heteroscedasticity. If it is the case, as it appears to be, application of the Hausman test is likely invalid.

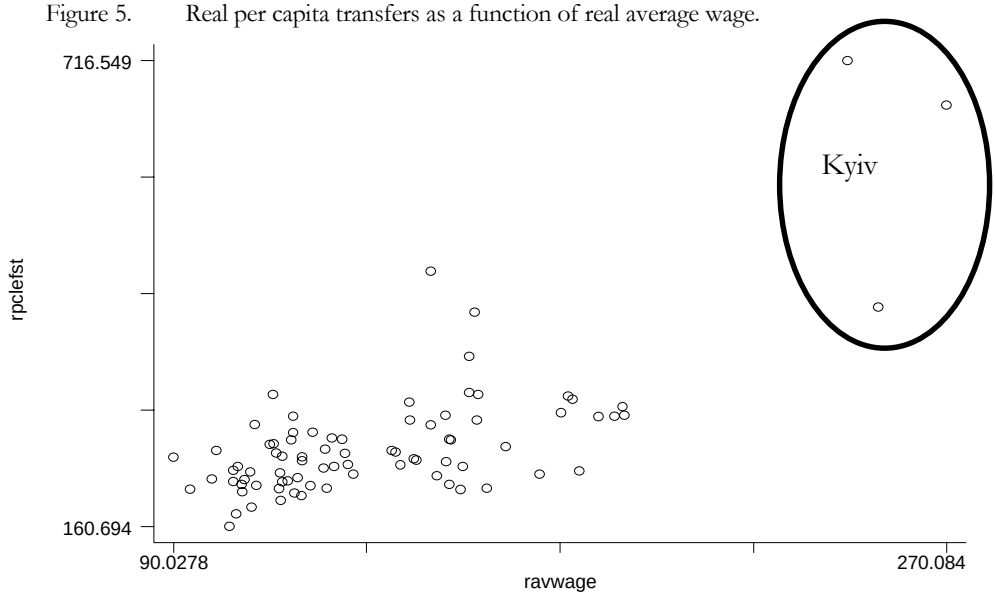
right incentives for collection of the taxes in the regions. The law defines mechanical rules that partially determine transfers as a fraction of taxes collected. For example, the law may say that 50% of the revenue collected from the region's enterprise profit tax becomes the revenue of the local budget. Inclusion of the RPCSTREV variable controls for the average amount of taxes collected in the region and paid back to the region.

During 1998-2000, *Budget laws* included several rules that partially mechanically determined the amounts of transfers. The rules usually set the share of the state taxes collected in the region to be transferred back to the region, therefore, the transfers to the local governments are expected to be correlated with collected in the regions state taxes. If more taxes collected in the region leads to the higher transfers to the region, β_3 is expected to be positive.

As it was mentioned in the previous chapter, the coefficient of quadratic term is expected to be negative, that is, under the hypothesis, β_2 is negative. It should reach its maximum at the point with positive wage, which requires that $\frac{\beta_1}{2\beta_2}<0$. Therefore, β_1 is expected to be positive under the hypothesis.

Figure 5 shows plots of per capita transfers and the real wage.

Figure 5. Real per capita transfers as a function of real average wage.



As one can see, the data may support a non linear relationship. Also, there is a reason to suspect a heteroscedasticity problem. Heteroscedasticity test rejects null hypothesis about constant variance at 1% significance level.[19]

The three observations circled represent Kyiv. They appear to differ from the other observations. Because Kyiv is the capital of Ukraine, many industries operate there, and with greater success than in other parts of Ukraine. Financial flows are concentrated there, too. The relation of the city and central government is regulated with the special law. The Kyiv budget receives a high share of the state tax revenues collected in the city.

The result of running the previously stated regression model, including observations on Kyiv, is shown in Table 2. As can be seen, the model performs relatively well as all coefficients are statistically significant at the 1 percent level.

[19] State-format output of the test is shown in the Appendix A.

As it is mentioned above, the random effect model is used. The same model is also estimated using simple OLS regression (as if it was not penal data). The results are not essentially different: the signs are the same, the magnitudes are comparable, but the standard errors are larger.

Table 2. Model 1 estimation results.[20]

Regressors	Regressand: rpclefst	
	Coefficient	p-Value
rpcstrev	**.2105126***	0.000
ravwage	**-2.335383***	0.009
ravwage_sq	**.00895***	0.003
_cons	**324.0481***	0.000
Number of groups		27
Number of time periods		3
p-Value (Wald chi^2)		0.0000

* - significant at 1% level of confidence

In order to check the sensitivity of the results to the content of the sample, the same model is estimated with data where the observations for Kyiv were excluded. The result of model estimation excluding Kyiv from the dataset is shown in Table 3.

Once again, the model generates a good fit and the results are similar to those obtained with the inclusions of observations on Kyiv. However, the estimated results refute the median voter hypothesis. They strongly suggest that the function is not bell-shaped. Indeed, it is U-shaped, as shown in Figure 6.

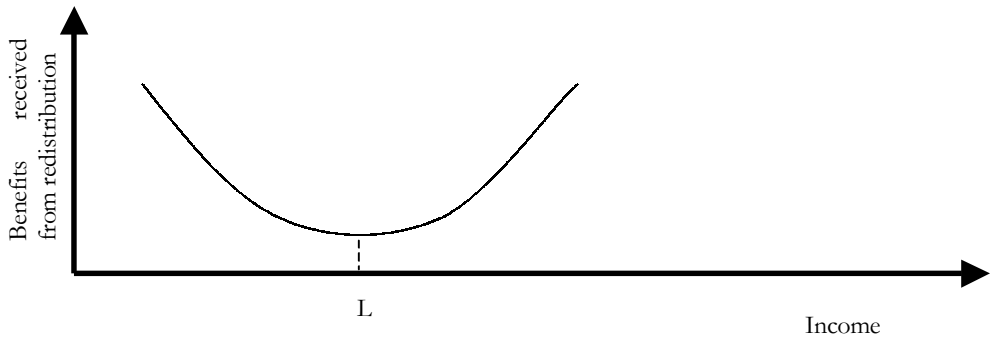
[20] Entire Stata-format output is shown in the Appendix A.

Table 3. Model 1 estimation results (Kyiv is excluded).

Regressors	Regressand: rpclefst	
	Coefficient	p-Value
rpcstrev	**.2531309***	0.000
ravwage	**-3.501624***	0.002
ravwage_sq	**.0126535***	0.000
_cons	**396.266***	0.000
Number of groups		26
Number of time periods		3
p-Value (Wald chi^2)		0.0000

* - significant at 1% level of confidence

Figure 6. Form of income redistribution across regions (empirical results)



However, it is important to discover whether the observed U-shaped redistribution function lies within the relevant range of the data. As was mentioned above, the exact position of the median voter in Ukraine is unavailable and the dataset is quite short. Furthermore, the study by Jan Svejnar (2002, p. 20) suggests that it is possible that official statistics underestimates income inequality in Ukraine. Thus, the income distribution function may be highly skewed to the left, implying that the location of the median voter is also highly skewed to the left. If that were the case, one could observe a negatively sloped redistribution function over the relevant range of the data that for some statistical reason slopes

upward beyond the relevant range. Although the signs of the estimated model strongly reject a patterns of redistribution from rich to poor regions, if one examines Figure 6 it can be seen that if point L (minimum of the function) is out of range of observed wages, only one segment of the curve is relevant. If point L is located near the right bound of the observed interval the hypothesis about redistribution from rich to poor regions can not be rejected nor can the median voter model.

Using the estimated coefficients from Table 2 and differentiating the quadratic specification, point L is estimated as

$RAVWAGE_L=(-\beta_1 /2\beta_2)= 2.335383/(2*.00895)=130.468324.$

Appendix B (p.69), contains the data on RAVWAGE. It can be readily seen that the calculated value is slightly less than the average but inside the observed interval. Therefore, both segments of the curve are to be considered. These calculations suggest that specification 1 of the empirical model strongly rejects the hypothesis of redistribution from rich and poor regions to median income regions.

In order to provide additional verification of the hypothesis about the redistribution from rich to poor, which under the above conditions may be consistent with median voter model, the following reciprocal model is estimated:

$$RPCLEFST_{it}=\mu+\beta_1 *RPCSTREV_{it} + \beta_2 *1/RAVWAGE_{it} \quad \text{(Model 2)}$$

The hypothesis that redistribution is from rich to poor oblasts implies that the sign of the coefficient β_2 is positive. The results are represented in Table 4.

The results reveal that the coefficient on 1/RAWAGE is negative, but not statistically significant. Thus, the hypothesis of redistribution from rich to poor is rejected.

Table 4. Model 2 estimation results.

Regressors	Regressand: rpclefst	
	Coefficient	p-Value
rpcstrev	**.2443627***	0.000
1/ravwage	-1458.26	0.627
_cons	**178.0986***	0.000
Number of groups		27
Number of time periods		3
p-Value (Wald chi^2)		0.0000

* - significant at 1% level of confidence

The empirical results seem to be non-sensitive to the model specification and reject the median voter model. The median voter approach fails to explain the pattern of income redistribution across oblasts. Instead of a bell-shaped redistribution curve (or, at least, downward sloping curve), an U – shaped curve with minimum at point where wage is approximately 130 hrv is implied by the data. It means that the oblasts with the lowest wage have a relatively higher level transfer from the central government that those with the average wage. Increase in the average wage in a region is negatively correlated with transfers up to the point where the average wage is approximately 130 hrv. After that point, the slope of the function changes and increases in the average wage contribute to higher transfers.

In Chapter 2 reasons for the failure of the median voter model are discussed. In particular, interest group pressure is examined. In the next chapter, this explanation is considered in detail.

Chapter 6

EMPRICAL ANALYSIS OF GROUP ACTIVITY

Analysis of Ukrainian context suggests that the information about political parties and processes in Ukraine is far from perfect, the voters tend to be 'rationally ignorant'. There are numerous parties and voters might not be able to distinguish them. All this creates a large room for interest group activity, and is a possible explanation for the failure of median voter approach to elucidate the directions of redistribution. Since both poor and rich oblasts appear to have done better in terms of redistribution than those in the middle, there are at least two groups or forces that require explanation.

Redistribution in favor of rich oblasts.

At the present time, relatively high average income in the oblasts usually reflects existence of relatively well developed businesses. As Mancur Olson points out, "the segment of society that has the largest number of lobbies working on its behalf is the business community" (p.141), business groups usually have better organization because they are small: "the higher degree of organization of business interests and power of these business interest, must be due in large part to the fact that the business community is divided into a series of (generally monopolistic) 'industries', each of which contains only a small number of firms" (p.143).

In Ukraine industrial groups are represented in the Verkhovna Rada, and in some cases have their own parties. However, the focus of this paper is on groups whose interests are concentrated in the oblasts. The reason for this is simple – in order to lobby for an increase in transfers to an oblast, the group must be able to

gain considerably from the transfers. In other words, it has to be able to affect the distribution of budget expenditures at the local level. There are many ways how businesses can benefit from the increase of local government expenditures. The examples are infrastructure development, government purchases, and subsidies.

According to Jan Potters and Randolph Sloof (1996), who survey empirical studies to assess the influence of interest groups, typically "… an equation is estimated in which the dependent variable represents a decision variable of the public sector which the interest group is hypothesized to influence. Roughly, two sets of dependent variables can be distinguished. One set concerns the behavior of individual political decision-makers. The second set relates to policy outcomes" (pp.405-406).

The thesis uses the amount of transfers to the local government, which can be considered as a variable of the second type. In order to check the effect of business groups on the distribution of the transfers, additional interest group variables are included in the initial regression. If the explanation is valid, it would eliminate the upward part of U-shaped redistribution curve. Thus, relationship between transfers and average wage will not be quadratic.

The problem of finding appropriate interest group variables is very difficult. Jan Potters and Randolph Sloof (1996) argue that there are several possible interest group variables: campaign contributions, expenditures on lobbying, and characteristics of interest group and their environment (e.g. some measure of concentration).

In Ukraine data on campaign contributions and expenditures on lobbying is unavailable. Thus, a proxy variable based on the characteristics of interest groups or their environment is the only feasible option.

The proxy is constructed on the basis of employment shares. There are at least three reasons for this. Firstly, high concentration of employment in an industry means high concentration of interests and a small size of the group of people who manage it. Secondly, it may also mean that this small group has considerable access to resources that allows it to pay for lobbying on desired issues at both local and national levels. Moreover, it may have the ability to elect its own members to local government. And finally, from the political economy point of view, local government usually worries much about employment in the oblast, which implies higher power of the industry or business that employs a large share of the oblast's population.

The most straightforward idea is to use shares of employment in a sector as a proxy variable that reflects the power of that sector at the oblast level. The share is constructed using following formula:

$$ShareEmpl_{ij} = \frac{Empl_{ij}}{TEmpl_j}$$

where $Empl_{ij}$ is a number of employed in **i**-th sector (industry) in **j**-th region,

$TEmpl_j$ is a total number of employed in the region.

A larger share of employment in a sector (industry) is expected to lead to the concentration of interests and makes it more likely that the firms (or other organizations) in the sector (industry) will act as an interest group. Thus, the expected coefficient on this variable is positive.

In constructing these variables, the question of what types and how many industry sectors should be included arises. This is the reason why the Herfindahl-Hirschman Index of concentration is proposed as another proxy for the

importance of business for the region. However, for the purpose of this research the index is constructed on the basis of employment shares, not market shares as an original HHI.

HHI is calculated with the following formula and reflects the importance of a group's activity in the j-th region:

$$HHI_j = \sum_{i=1}^{n} ShareEmpl_{ij}^2$$

where $ShareEmpl_{ij}$ is the share of employed in the **i**-th sector (industry) in the **j**-th region,

n – quantity of the industries that are present in the region.

The index reflects the level of concentration of employees in the sectors of the regional economy. A high index means a high concentration and importance of at least some industry at the oblast level, and may be considered as reflecting power to affect decision making at the oblast and national levels.

An important question is at which level of the economy should the index be constructed? That is, how aggregated should the data be. The solution here is an index calculated at the aggregated branch level. For example, ideally it is to include the shares of the metallurgy, coal-mining and food processing industries. However, lack of data does not allow to make such index. The available data is more aggregated. It includes shares of employment in manufacturing, agriculture, transportation and communication services, construction, retailing services and some other sectors. On the basis of this data, the Herfindahl-Hirschman Index was constructed.[21] The variable is expected to reflect the influence of oblast

[21] The way how HHI is constructed and the description of the raw data are shown in the Appendix C.

business groups on the local governments, and hopefully not highly correlated with the average wage in the region.

It is expected that Herfindahl-Hirschman Index will have a positive coefficient, implying that concentrated employment leads to a more effective interest group and an increase in transfers to the region.

Following model is estimated and results are shown in Table 5:

$$RPCLEFST_{it}=\mu+\beta_1 RAVWAGE_{it}+\beta_2 RAVWAGE_{it}^2 +$$

$$+\beta_3 RPCSTREV +\beta_4 HHI_{it} \text{ (Model 3)}$$

where HHI_{it} is a Herfindahl-Hirschman Index for i-th region.

Table 5. Model 3 estimation results.

Regressors	Regressand: rpclefst	
	Coefficient	p-Value
rpcstrev	**.2091839***	0.000
ravwage	**-2.434928****	0.016
ravwage_sq	**.0092567***	0.003
hhi	-17.92432	0.836
_cons	**335.3623***	0.000
Number of groups		27
Number of time periods		3
p-Value (Wald chi^2)		0.0000

* - significant at 1% level of confidence

** - significant at 5% level of confidence

Variable HHI appears to exert statistically insignificant effect on transfers, nor does it eliminate the U-shaped transfer curve. All this suggests that the explanatory power of this proxy is very weak. In order to check on the explanatory power of the HHI variable, the wage variables are removed from the

model. The results of that estimation are shown in Table 6.

As can be seen, the coefficient on the Herfindahl-Hirschman Index turns out to be positive, but statistically insignificant. It suggests that Herfindahl-Hirschman Index has a little explanatory power, although it may work in the predicted direction.

Table 6. Estimation results of model with only HHI and RPCSTREV variables included

Regressors	Regressand: rpclefst	
	Coefficient	p-Value
rpcstrev	**.2534672***	0.000
hhi	34.24046	0.665
_cons	**157.3697***	0.000
Number of groups		27
Number of time periods		3
p-Value (Wald chi^2)		0.0000

* - significant at 1% level of confidence

** - significant at 5% level of confidence

Redistribution in favor of poor oblasts

Poor people form a very large group making it difficult to consider them as an interest group. Since they are poor, it is also unlikely they make significant money contributions to election campaign, although they may contribute their time to campaign activities. Moreover, costliness of information and 'rational ignorance' have their implications in this case, too. Evidence suggests that people with low income may spend more time on acquiring information about politics. It is consistent with the opinion that "potential groups of voters weight the expected returns from voting in a given election against the costs of voting in that election" (John E. Filer, Lawrence W. Kenny, and Rebecca B. Morton, 1993, p.64).

Analysis of the social protection system in Ukraine shows that a significant part of social expenditures relies on local budgets. Thus, the poor people are directly interested in increases in local budgets. There are several political parties (Communist Party of Ukraine, Progressive Socialistic Party of Ukraine) that historically rely on the poorest part of the society. They proclaim their strong support for social protection issues and find strong support from voters.[22] As mentioned above, poor people might have a low opportunity cost of taking part in the voting relative to potential gains. This may lead a higher voter participation rate among low income people and, consequently, they will elect a relatively higher number of representatives. If their representatives in the Verkhovna Rada behave as agents of their constituencies, as assumed here, redistributional programs will be promoted. This hypothesis, if true, would be supported by a negative correlation between income and voter participation rate.

In order to check this, the following regression is estimated.

$VPRPRES99_i = a_1 + a_2 * RAWAGE99_i$ (Model 4)

where $VPRPRES99_i$ is the voter participation rate in the president election of 1999,

$RAVWAGE99_i$ is the real average wage in the region in 1999.

Regression results are presented in Table 7. They suggest that there is a statistically significant relation between real wage and voter participation rate. The relation is negative, therefore, there is a tendency for higher voter participation rates in regions with lower average incomes.

[22] The large part of people who support these parties are pensioners. However, pensioners are one of the

Table 7. Model 4 estimation results.

Regreesors	Regressand: preselect	
	Coefficient	p-Value
ravwage	**-.1399202***	0.0001
_cons	**93.43615***	0.0000
Number of observations		27
R-squared		0.3522
p-Value (F-test)		0.0011

* - significant at 1% level of confidence

Voters' age structure may also contribute to explanatory power of the regression. However, the results in Table 8 indicate that inclusion of average age (avage) and average age squared (avage_s) variables does not change the main results.

Table 8. Altered model 4 estimation results (average age and average wage squared are included).

Regreesors	Regressand: preselect	
	Coefficient	p-Value
ravwage	**-.1143632***	0.007
avage	**-61.34345*****	0.089
avage_s	**.7956189*****	0.093
_cons	**1270.612*****	0.066
Number of observations		27
R-squared		0.3704
p-Value (F-test)		0.0033

* - significant at 1% level of confidence

*** - significant at 10% level of confidence

poorest segments of Ukrainian society, therefore, there is no contradiction in the argument.

Discussion of the results

Empirical study suggests that the redistribution in Ukraine takes place from the oblasts with modest income to poor and rich oblasts. Thus, the pattern of redistribution in Ukraine cannot be explained by median voter hypothesis. Special regional interest group activity is considered as an explanation of redistribution in favor of rich regions. Inclusion of proxies was expected to eliminate U-shaped curve.

Herfindahl-Hirschman Index of employment in the region is considered as a proxy for interest group power. The index fails to eliminate U-shape distribution curve. If both real wage variables are dropped from the regression, the HHI in a resulting model is positive (as theory predicts) but statistically insignificant. Therefore, an explanatory power of the constructed HHI is weak.

One of possible reasons for this failure is that the proxy is based on employment and does not reflect interest group behavior well enough. Another, more likely reason is that lack of data leads to use of more aggregated data than optimal one.

Analysis of voter participation rate suggests presence of negative relation between income of voters and their participation rate. It is an interesting result because studies of voter participation rate in western countries usually find positive correlation between these variables. While in both Ukraine and western democracies poor people have lower opportunity cost of voting, there is a difference. Ukraine is a Former Soviet Union country. Ukrainians (especially old people) inherited the custom of voting. Nevertheless, the result indicating higher voter participation in poorer regions implies that poor people get a relatively higher proportion of representatives in the Verkhovna Rada and, thus, when the

representatives simply protect the interests of their constituencies, redistribution in favor of poor regions increases.

As can be seen, most inferences in the study are based on the statistical significance test, which is criticized by McCloskey (1985). However, in this study theory suggests only signs of the coefficients, not their magnitudes, so the best thing that can be done in response to the critique is to assess the reasonableness of the magnitude of the coefficients.

Estimates of Model 1 coefficients are within reasonable interval. They suggest that on average 20% of collected[23] in the oblast state taxes are transferred to the local budgets. On the first sight, the coefficient of quadratic term seems to be small, but if one considers that real average wage across regions during the period covered by the study is about 140 hrv, it becomes obvious that this term is important because 140*140*0.008=156.8, while average real per capita transfer to the oblasts is 264 hrv.

The research allows one to argue that, in fact, the transfers in Ukraine are not equalizing real per capita expenditures of local governments. Official declaration that transfers are targeted to equalize per capita expenditures does not appear to fit the period 1998-2000. If it is a government priority, then reform is needed. Of course, enactment of Budget Code has changed the rules a bit, but it is too early to assess its effect.

[23] per capita

Chapter 7

CONCLUSIONS

At the present time the Ukrainian central government controls a significant proportion of the country's GDP. While local governments are responsible of a large part of total public expenditures their revenues come from funds transferred to them from the central government. This thesis studies how these revenues are distributed among the different oblasts.

The central concept explaining how decisions are made in a representative democracy is the median voter theorem that argues political outcomes reflect the preferences of the median voter. There are, however, several reasons why actual outcomes under representative democracy can deviate from that predicted by median voter theorem. One reason is political influence of special interest groups.

The empirical results presented in this thesis indicate that the median voter model fails to explain the pattern of redistribution from the central government to the various oblasts. The average wage in each oblast is utilized to reflect the location of the median voter. It appears that the middle-income regions receive less in per-capita transfers compared to both poor and richer regions. In contrast, the standard median voter model would predict a transfer function with a quadratic shape, implying higher transfer to the middle-income groups. Interest group activity, where the participants are likely to come from either low or higher income households, may explain the failure of the median voter model.

Analysis of the political economy of Ukraine suggests that certain business or industry groups may have relatively low costs of organizing and be able to both

influence local government expenditures and lobby at the national level in order to increase transfers to the regions. To investigate this possibility, measures of employment that reflect the importance of an industry or sector in a region were obtained, and a Herfindahl-Hirschman Index (HHI) of concentration of employment constructed. The HHI was then used as a proxy for the relative political strength of industry as an interest group. Empirical results, however, did not provide strong support of the hypothesis. Inclusion of the HHI variables does not eliminate the U-shaped transfer pattern. If the wage variables are removed from the model specification, the coefficient on the HHI variable is positive, as the interest group argument suggests, but the explanatory power of the regression is weak. Therefore, this proxy does not appear to capture important information about these interest groups.

The explanation of redistribution in favor of poor oblasts is suggested by examination of voter participation rates. The results indicated that low-income voters have higher voter participation rates, perhaps because they have a lower opportunity cost relative to benefits of voting. Thus, poorer people elect a higher share of representatives, who then promote redistribution in favor of the poorer oblasts.

The role and scope of government have increased significantly world-wide in the last century, redistributional programs have expanded, and political pressures for redistribution are high. In a study by Daron Acemoglu and James A. Robinson (2001), the authors suggest that satisfying this demand may not lead to consolidation in a society. They argue that substantial transfers to numerous lower income voters at the expense of higher income groups can undermine democratic systems and lead to authoritarian regimes. While the empirical results presented in this thesis suggest that the pattern of redistribution in Ukraine is not conducive to those dire consequences, redistribution can still raise resentment.

Thus, Ukraine not only needs to reform its budgetary system, but to study its effect on redistribution. As a policy implication, the study suggests that *de facto* the transfers in Ukraine are not equalizing real per capita expenditures. If government declares the transfers are targeted to equalize per capita expenditures, further reform is needed. A number of steps in this direction were made with the recent *Budget Code* enactment. However, the effect of this change cannot be evaluated at the present time.

BIBLIOGRAPHY

Acemoglu, Daron, James A. Robinson,. 2001. "A Theory of Political Transitions." *American Economic Review*, Volume 91, Issue 4 (Sep): 938-63.

Aronson, Thomas, Magnus Wikstrom. 1996. "Local public expenditure in Sweden. A model where the median voter is not necessary decisive." *European Economic Review*, 40:1705-1716.

Atlas, Cary M., Thomas W. Gilligan, Robert J. Hendershott, and Mark A. Zupan. 1995. "Slicing the Federal Government Net Spending Pie: Who Wins, Who Loses, and Why," *American Economic Review*, 85(3) (June): 624-629.

Baltagi, B.H. 1995. *Econometric Analysis of Panel Data*. John Wiley and Sons. New York.

Barro, Robert J. 1997. *Determinants of Economic Growth: A cross-Country Empirical Study*. The MIT Press. Cambridge, Massachusetts.

Becker, Gary S. 1983. "A Theory of Competition Among Pressure Groups for Political Influence". *Quarterly Journal of Economics*, Volume 98, Issue 3 (Aug.): 371-400.

Borcherding, Thomas E., Robert T. Deacon. 1972. "The Demand for the Services of Non-Federal Government." *The American Economic Review,* Volume 62, Issue 5 (Dec.): 891-901.

Dougan, William R., James M. Snyder, Jr. 1996. Interest-group policies under majority rule", *Journal of Public Economics*, 61: 49-71.

Filer, John E., Lawrence W. Kenny, Rebecca B. Morton. 1993. "Redistribution, Income, and Voting." *American Journal of Political Science*, Volume 37, No. 1 (Feb.): 63-87.

Fiscal Analysis Office. 1999. Budget and Tax Review. Kyiv. (Група Фіскального Аналізу. 1999. Бюджетний і Податковий Огляд. Київ.)

Fiscal Analysis Office. 2000. Budget and Tax Review. Kyiv. (Група Фіскального Аналізу. 2000. Бюджетний і Податковий Огляд. Київ.)

Fiscal Analysis Office. 2001. Budget and Tax Review. Kyiv. (Група Фіскального Аналізу. 2001. Бюджетний і Податковий Огляд. Київ.)

Florina, Morris P., Roger G. Noll. 1978. "Voters, Legislators and Bureaucracy: Institutional Design in the Public Sector." *The American Economic Review,* Volume 68, Issue 2 (May): 256-260.

Frant, Govard. 1993. "Rules and Governance in the Public Sector: The Case of Civil Service." *The American Journal of Political Science,* Volume 37, Issue 4 (Nov.), 990-1007.

Gemmell, Norman. 1985. "The Incidence of Government Expenditure and Redistribution in the United Kingdom." *Economica*, Volume 52, Issue 207 (Aug.): 335-344.

Gorodnichenko, Y. 2001. "Effects of Intergovernmental Aid on Fiscal Behavior of Local Governments: Case of Ukraine." MA Thesis. EERC.

Gouveia, Miguel, Neal A. Masia. 1998. "Does the median voter model explain the size of government?": Evidence from the states." *Public Choice*, 97: 159-177.

Greene, William H. 2000. *Econometric Analysis*. New Jersey: Prentice Hall.

Harriss, C. Lowell. 1954. "Government Expenditure: Significant Issues of Definitions." *The Journal of Finance,* Volume 9, Issue 4 (Dec.): 351-364

Irvine, Ian J., J. Barry Smith. 1983. "The Estimation of Local Government Expenditure Responses to Inter-Governmental Transfers." *The Review of Economics and Statistics,* Volume 65, Issue 3 (Aug.): 534-536.

Kravchenko, Vasyl. 1999. Local finance of Ukraine. Kyiv: Znannya. (Кравченко Василь. *Місцеві фінанси України*: Знання – 1999).

McCaleb, Thomas S. 1980. "Excess Burden, Benefit Taxation, and Efficiency in Public Expenditure." *The American Economic Review,* Volume 70, Issue 3 (Jun.): 501-506.

McCarty, Therese A., Stephen J. Schmidt. 1997. "A Vector-Autoregression Analysis of State-Government Expenditure. " *The American Economic Review,* Volume 87, Issue 2 (May): 278-282.

McCloskey, Donald N. 1985. "The Loss Function Have Been Mislaid: The Rhetoric of Significance Tests." AEA Papers and Proceedings. Vol. 75(2): 201-205.

Meltzer, Allan H., Scott F. Richard. 1981. "A Rational Theory of the Size of Government." *The Journal of Political Economy*, Volume 89, Issue 5 (Oct.), 914-927.

Milanovic, Branko. 2000. "The median-voter hypothesis, income inequality and income redistribution: an empirical test with required data." *European Journal of Political Economy*, Volume 16: 367-410.

Mueller, Dennis C. 1989. *Public Choice II*. Cambridge University Press.

Mundlak, Y. 1978. "On the Polling of Time Series and Cross Sectional Data." *Econometrica*, 56, 69-86.

Murdoch, James C., Todd Sandler, Laurna Hansen. 1991. "An Econometric Technique for Comparing Median Voter and Oligharchy Choice Models of Collective Action: the Case of the NATO Alliance." *The Review of Economics and Statistics,*. Volume 73. Issue 4 (Nov.): 624-631.

Olson, Mancur. 1973. *The Logic of Collective Action.* Harvard University Press.

Peltzman, Sam. 1985. "An Economic Interpretation of the History of Congressional Voting in the Twentieth Century." *The American Economic Review*, Volume 75, Issue 4 (Sep.): 656-675.

Plotnick, Robert D. 1986. "An Interest Group Model of Direct Income Redistribution." *The Review of Economics and Statistics,* Volume 68, Issue 4 (Nov.):594-602.

Potters, Jan, Randolph Sloof. 1996. "Interest Groups: A survey of empirical models that try to asses their influence", *European Journal of Political Economy*, Volume 12: 403-442.

Schneider, Mark. 1989. "Intermunicipal competition, Budget-Maximizing Bureaucrats, and the Level of Suburban Competition." *The American Journal of Political Science,* Volume 33, Issue 3 (Aug.): 612-628.

Stratmann, Thomas. 1992. "Are Contributors Rational? Untangling Strategies of Politica Action Committees." *The Journal of Political Economy*, Volume 100, Issue 3 (Jun.): 647-664.

Strayer, Paul J. 1949. "Public Expenditure Policy." *The American Economic Review,* Volume 39, Issue 2 (Mar.): 383-404.

Svejnar, Jan. 2002. "Transition Econimies: Performance and Challenges." *Journal of Economic Prospectives*, Volume 16, Number 1: 3-28.

Teske, Paul, Mark Schneider, Michael Mintrom, and Samuel Best. 1993. "Establishing the Micro Foundations of a Macro Theory: Information, Movers, and the Competitive Local Market for Public Goods." *The American Political Science Review,* Volume 87, Issue 3 (Sep.): 702-713.

Turnbull, Geoffrey K., Peter M. Mitias. 1999. "The median voter model across levels of government." *Public Choice*, 99: 119-138.

Tullock, Gordon. 1981. "Why so much stability." *Public Choice,* 37(2).

Verbeek, Marno. 2000. *A Guide to Modern Econometrics.* John Wiley and Sons. Chichester.

Verkhovna Rada. 1996. *Constitution of Ukraine.* Visnyk Verkhovnoi Rady, № 30, p.141.

Verkhovna Rada. 1997. *The Law on Election of Representatives.* Visnyk Verkhovnoi Rady, № 43, p.280.

Verkhovna Rada. 1998. *The Law on The State Budget of Ukraine on 1998.* Visnyk Verkhovnoi Rady, № 21, p.109.

Verkhovna Rada. 1999. *The Law on The State Budget of Ukraine on 1999.* Visnyk Verkhovnoi Rady, № 8, p.59

Verkhovna Rada. 2000. *The Law on The State Budget of Ukraine on 2000.* Visnyk Verkhovnoi Rady, № 14-15-16, p.121.

Weimer, David L., Aidan R. Vining. 1992 *Policy Analysis: Concepts and Practice,* 2nd ed. New Jersey: Prentice Hall.

APPENDIX A

Table 1. Model 1 estimation results.

```
Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        heteroskedastic
Correlation:   no autocorrelation

Estimated covariances      =        27          Number of obs      =        81
Estimated autocorrelations =         0          Number of groups   =        27
Estimated coefficients     =         4          No. of time periods=         3
                                                 Wald chi2(3)       =    151.57
Log likelihood             = -389.9051          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
    rpclefst |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    rpcstrev |   .2105126*  .0362395     5.81   0.000     .1394844    .2815407
     ravwage |  -2.335383*  .8906678    -2.62   0.009     -4.08106   -.5897062
  ravwage_sq |     .00895*  .002962      3.02   0.003     .0031447    .0147554
       _cons |   324.0481*  61.40039     5.28   0.000     203.7055    444.3906
------------------------------------------------------------------------------
* - significant at 1% level of confidence
```

Table 2. Model 1 estimation results (Kyiv is excluded).

```
Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        heteroskedastic
Correlation:   no autocorrelation

Estimated covariances      =        26          Number of obs      =        78
Estimated autocorrelations =         0          Number of groups   =        26
Estimated coefficients     =         4          No. of time periods=         3
                                                 Wald chi2(3)       =    192.60
Log likelihood             = -369.4517          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
    rpclefst |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    rpcstrev |   .2531309*  .0444508     5.69   0.000      .166009    .3402528
     ravwage |  -3.501624*  1.108692    -3.16   0.002     -5.67462   -1.328628
  ravwage_sq |   .0126535*  .0035541     3.56   0.000     .0056876    .0196193
       _cons |    396.266*  73.26203     5.41   0.000     252.6751     539.857
------------------------------------------------------------------------------
*  - significant at 1% level of confidence
```

Table 3. Model 2 estimation results.

```
Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        heteroskedastic
Correlation:   no autocorrelation

Estimated covariances      =        27          Number of obs      =        81
Estimated autocorrelations =         0          Number of groups   =        27
Estimated coefficients     =         3          No. of time periods=         3
                                                 Wald chi2(2)       =    101.27
Log likelihood             = -395.3813          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
    rpclefst |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    rpcstrev |   .2443627*   .038563      6.34   0.000     .1687805    .3199448
  ravwage_m1 |   -1458.26   2999.936    -0.49   0.627    -7338.027    4421.506
       _cons |   178.0986*   34.43759     5.17   0.000     110.6022    245.5951
------------------------------------------------------------------------------
*  - significant at 1% level of confidence
```

Table 4. Model 3 estimation results

```
Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        heteroskedastic
Correlation:   no autocorrelation

Estimated covariances      =        27          Number of obs      =        81
Estimated autocorrelations =         0          Number of groups   =        27
Estimated coefficients     =         5          No. of time periods=         3
                                                 Wald chi2(4)       =    151.23
Log likelihood             = -389.8882          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
    rpclefst |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    rpcstrev |   .2091839*  .0368752     5.67   0.000     .1369098     .281458
     ravwage |  -2.434928** 1.012492    -2.40   0.016    -4.419376   -.4504799
  ravwage_sq |   .0092567*  .0033172     2.79   0.005     .0027552    .0157583
         hhi |  -17.92432   86.53453    -0.21   0.836    -187.5289    151.6803
       _cons |   335.3623*  82.20097     4.08   0.000     174.2513    496.4732
------------------------------------------------------------------------------
*  - significant at 1% level of confidence
** - significant at 5% level of confidence
```

Table 5. Estimation results of model with only HHI and RPCSTREV variables included

```
Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        heteroskedastic
Correlation:   no autocorrelation

Estimated covariances      =        27          Number of obs      =        81
Estimated autocorrelations =         0          Number of groups   =        27
Estimated coefficients     =         3          No. of time periods=         3
                                                 Wald chi2(2)       =     91.73
Log likelihood             = -394.8209          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
    rpclefst |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    rpcstrev |   .2534672*  .0303029     8.36   0.000     .1940746    .3128599
         hhi |   34.24046   79.03632     0.43   0.665    -120.6679    189.1488
       _cons |   157.3697*  21.74736     7.24   0.000     114.7457    199.9938
------------------------------------------------------------------------------
* - significant at 1% level of confidence
```

Table 6. Model 4 estimation results.

```
      Source |       SS       df       MS              Number of obs =      27
-------------+------------------------------           F(  1,    25) =   13.59
       Model |  613.590736     1  613.590736            Prob > F      =  0.0011
    Residual |  1128.56232    25  45.1424926            R-squared     =  0.3522
-------------+------------------------------           Adj R-squared =  0.3263
       Total |  1742.15305    26  67.0058866            Root MSE      =  6.7188

------------------------------------------------------------------------------
   preselect |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     ravwage |  -.1399202*  .0379519    -3.69   0.001    -.2180836   -.0617567
       _cons |   93.43615*  5.350678    17.46   0.000     82.41622    104.4561
------------------------------------------------------------------------------
* - significant at 1% level of confidence
```

Table 7. Altered model 4 estimation results (average age and average wage squared are included).

```
      Source |       SS       df       MS              Number of obs =      27
-------------+------------------------------           F(  3,    23) =    6.10
       Model |  771.777548     3  257.259183            Prob > F      =  0.0033
    Residual |  970.375503    23  42.1902393            R-squared     =  0.4430
-------------+------------------------------           Adj R-squared =  0.3704
       Total |  1742.15305    26  67.0058866            Root MSE      =  6.4954

------------------------------------------------------------------------------
   preselect |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     ravwage |  -.1143632*  .0390101    -2.93   0.007    -.1950616   -.0336647
       avage |  -61.34345*** 34.59368    -1.77   0.089    -132.9059    10.21903
     avage_s |   .7956189***  .453799     1.75   0.093    -.1431358    1.734374
       _cons |   1270.612***   657.11     1.93   0.066     -88.7236    2629.948
------------------------------------------------------------------------------
*  - significant at 1% level of confidence
***  - significant at 10% level of confidence
```

Table 8. Heteroscedasticity test

```
  Cook-Weisberg test for heteroskedasticity using fitted values of rpclefst
       Ho: Constant variance
           chi2(1)      =     75.89
           Prob > chi2  =      0.0000
```

APPENDIX B

Table 8. Local taxes collected (thousands of hrv)

Oblast	lt98	lt99	lt00
AR Crimea	16000.9	19937.1	21381.5
Vinnitska	11146.6	11539.3	12209.9
Volynska	9695.1	11001.2	11472.2
Dnipropetrovska	29025.6	31704	34894.9
Donetska	36717	42113.8	44639.7
Zhytomyrska	8517.6	9297.7	10923.4
Zakarpatska	5211.4	7000.4	8514.4
Zaporizhska	21311.8	22135.4	22558.3
Ivano-Frankivska	7570.1	7845.2	9788.1
Kyivska	10175.8	10608.3	11452.7
Kirovogradska	5950.7	6337.8	7285.3
Luganska	19451.4	20765.1	20363.6
Lvivska	19524	21960.6	23856.8
Mykolayivska	7131.2	8926.8	10038.9
Odeska	21499.5	29187.7	30872.9
Poltavska	13555.3	15154.2	16317.9
Rivnenska	6959.4	7757.4	9002.1
Sumska	7681.6	8253.4	8378.5
Ternopilska	4620.6	5531.7	6046.1
Kharkivska	33245	37996	35497.6
Khersonska	6726.9	7879.9	8707.2
Khmelnitska	15805.3	14901.6	16370.7
Cherkaska	8654	8761.8	9862.5
Chernivetska	9354.2	9175.2	12118.2
Chernigivska	8174.1	9213.3	9912.9
Mean	13748.2	15399.4	16498.65
St.deviation	8907.84	10305.4	10331.8

Table 9. Local expenditure (thousands of hrv)

Oblast	le98	Le99	le00
AR Crimea	513539.9	650534.4	902982.3
Vinnitska	362496.3	409376	558882.9
Volynska	257063.2	285069.7	409003.1
Dnipropetrovska	1125342	1022190.1	1790055.4
Donetska	1516806	1389933.5	2288535.4
Zhytomyrska	431276.9	452348	458643.7
Zakarpatska	294711.5	437494.7	402021.8
Zaporizhska	656330.2	734037.7	897510
Ivano-Frankivska	354948.9	463976.1	558124.9
Kyivska	600883.4	924740.6	797177.9
Kirovogradska	265751.5	320299.5	456972.8
Luganska	575145.7	689893.2	1062198.6
Lvivska	625362.7	770750.4	971851
Mykolayivska	414353	397287.8	439606
Odeska	632303.5	740090.7	897381
Poltavska	805741.6	593377.8	617266.4
Rivnenska	296053.5	456639.5	387898.2
Sumska	345879.3	339489.8	536656.4
Ternopilska	253872.1	288787.1	425756
Kharkivska	1124469	975732.6	1330851.3
Khersonska	292818.4	298106.5	456929.2
Khmelnitska	382701.1	393992.1	512595.7
Cherkaska	400633.4	483663.9	475104.9
Chernivetska	207763.5	188884.9	258061.1
Chernigivska	282841	319617.5	533104.2
Mean	520763.5	561052.56	737006.808
St.deviation	323029.8	287948.4	473542.89

Table 10. Average Wage (HRv)

Oblast	avwage98	avwage99	avwage00
AR Crimea	143	168	225
Vinnitska	115	129	159
Volynska	105	118	150
Dnipropetrovska	189	209	273
Donetska	195	220	292
Zhytomyrska	118	134	164
Zakarpatska	108	130	172
Zaporizhska	183	215	289
Ivano-Frankivska	120	140	188
Kyivska	161	191	241
Kirovogradska	119	137	170
Luganska	163	184	232
Lvivska	132	152	196
Mykolayivska	145	169	227
Odeska	146	183	236
Poltavska	150	173	220
Rivnenska	120	135	173
Sumska	130	150	194
Ternopilska	104	112	135
Kharkivska	159	184	230
Khersonska	125	143	173
Khmelnitska	114	127	156
Cherkaska	127	146	175
Chernivetska	106	123	157
Chernigivska	122	141	177
Mean	135.96	156.52	200.16
St.deviation	26.59649	31.16237	43.944738

Table 11. Population (thousand people)

Oblast	pop98	pop99	pop00
AR Crimea	2129.3	2106.3	2089.3
Vinnitska	1835.3	1819.7	1803.5
Volynska	1065.1	1061.1	1055.9
Dnipropetrovska	3764	3733.6	3701.2
Donetska	5043.8	4987.3	4932.4
Zhytomyrska	1449.3	1437.7	1424.9
Zakarpatska	1281.5	1280.7	1277.3
Zaporizhska	2034.7	2016	1997
Ivano-Frankivska	1453.3	1450.3	1446.5
Kyivska	1858.4	1844	1824.9
Kirovogradska	1186.5	1172.5	1157.2
Luganska	2700.7	2668.1	2637.3
Lvivska	2719.3	2708.3	2696.3
Mykolayivska	1320.2	1307.6	1296.5
Odeska	2529.4	2510.2	2492
Poltavska	1704	1688.8	1673.3
Rivnenska	1186.8	1184.9	1182.5
Sumska	1364.6	1349.3	1332.5
Ternopilska	1163.5	1159	1152.7
Kharkivska	3004.1	2977.6	2949.6
Khersonska	1243.8	1234.1	1223.4
Khmelnitska	1480.1	1468.4	1455
Cherkaska	1474.5	1459.5	1446.6
Chernivetska	941.3	938.2	935.1
Chernigivska	1315.4	1299.8	1282.2
Mean	1889.956	1874.52	1858.604
St.deviation	959.8644	949.1349	938.86828

Table 12. Real Variables description (hrv)

Variable	Observation	Mean	St.dev	min	max
ravwage98	81	140.9259	33.07483	104	247
ravwage99	81	136.8071	34.28268	93.95973	254.1946
ravwage00	81	139.7963	38.41117	90.02785	270.0836
rpcstrev98	81	416.4412	277.8821	206.0866	1623.41
rpcstrev99	81	398.9229	268.4747	186.6731	1595.643
rpcstrev00	81	380.0489	284.5946	161.4814	1670.944
rpclefst98	81	280.007	103.9569	191.4399	716.5494
rpclefst99	81	249.0913	60.41562	160.6941	422.4995
rpclefst00	81	263.6257	85.87587	175.3959	663.852

APPENDIX C

Description of HHI construction

The data about employment in each oblast of the following structure is obtained:

Distribution of population, employed in the sectors of economy in ___ year in _____ oblast

№	Sector	Number of employed
1	Total	
2	Manufacturing	
3	Agriculture	
4	Forestry	
5	Fishery	
6	Transportation and communication services	
7	Constructuring	
8	Retailing	
9	meal services (restaurants, cafes , etc)	
10	Material-technical supplying	
11	Computer services	
12	services for population	
13	Lodging	
14	Health care and social protection	
15	Education and culture	
16	Science and scientific services	
17	financial services	
18	Governance and management of public and cooperative organizations	
19	Others	

As can be seen the data is initially in absolute values. On its basis, the shares of employed in each sector is calculated. Using the shares, HHI is calculated. (formulas are presented in the Chapter 5).