DETERMINANTS OF THE PARTY LOYALTY: VOTING PATTERNS OF THE UKRAINIAN MPs

by

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Date _____

Kyiv School of Economics

Abstract

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This work investigates the determinants of the deputies' loyalty to the faction/group the member he/she is of, when voting on economic policy related laws in the parliament. To evaluate the determinants of party loyalty we use data the roll call votes from VIII convocation of the parliament and information on personal and demographic characteristics, political activity and financial wellbeing of the parliament members (MPs). In addition, we extend the Hix (2005) Agreement index for measuring the party loyalty in the countries like Ukraine where the options "did not vote" and "absent" are often used strategically by the MPs. The econometric analysis shows that the following factors seem to increase deputies' loyalty to the faction/group: being elected under the proportional representation system, the party size, the number on the party list, previous position in business and public sectors, usage of a Facebook account. The family wealth exceeding one million UAH and higher number of the convocations served in the parliament are associated with a lower loyalty.

To Larisa Bybko

For Her Incredible Love

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LIST OF ABBREVIATIONS

PR – Proportional Representation

SMD – Single-member district

MPs – Members of Parliament

EP – European Parliament

VRU – The Verkhovna Rada of Ukraine

Chapter 1

INTRODUCTION

Nowadays Ukraine goes through many economic and institutional reforms. Last four years a lot of reform laws like land, banking, pensions were voted and passed in the parliament. However, often important laws are inhibited and do not receive the necessary support. What determines the votes in the parliament? Do we observe party loyalty and what factors affect it?

In the beginning, a simple explanation for such concepts as a political party and loyalty to the party. The political party is some legal structure with well-known determined members who share identical principles about how and which legislative rules should be established then used and how could be implemented inside a country. If a deputy is willing to do things to help his party get ahead shows that he/she is being loyal to it.

Almost all studies about the legislative behavior in the Ukrainian parliament are based on the voting data before 2012. Nevertheless, the last five years are very dynamic and radically different from previous ten years in Ukraine. The country is affected by war, crisis, and many economic and institutional reforms. All of these factors may affect legislature and voting behaviors among deputies, thus it is very important to understand if factions work effectively in the new reality. This work is different from the previous Ukrainian scholars because of the new legislative environment and the different measurement of party loyalty.

Factions with a high level of cohesion (defined as "the extent to which, in a given situation, group members can be observed to work together for the group's goal

in one and the same way" by Ozbudun, 1970) should work more effectively than those whose members were changing all the time or chose a passive voting role. The last one affects the productive work of the entire parliament and, thus, prevent the state ability from moving in the chosen direction.

There are a number of factors, which can affect party loyalty and can explain its different levels. For example, the political system maturity and its stability have a straight connection to the party loyalty. Consequently, even policymakers do not have a tendency to identify themselves with any definite structure and as a result could easily switch from one group to another.

Another factor, which directly affects the loyalty, is the election rules. Namely, if electoral institutions force legislators to compete with co-partisans for preference calls and there is no provision for pooling votes within the entire party lists politicians are likely to deviate from collective electoral strategies when they will be elected.

This work studies the determinants of the party loyalty among Ukrainian parliament members on the sample of the economy-related laws. The main contributions of this paper expand a well knowing agreement index in VRU reality, which can be used in the future studies of votes in other post-Soviet countries with a voting culture similar to Ukrainian, where we have five variants of answers such as "Yes", "No", "Abstain", "Did not vote" and "Absent" and MPs are usually passive (rather chose "Did not vote" than "No"). Also, we add new determinants of the party loyalty as the availability of Facebook account and family wealth. I intend to analyze the deputy's loyalty and make conclusions about the Ukrainian parliament factions/groups cohesion in making economic direction.

The data for the analysis are gathered from the Verkhovna Rada of Ukraine and Declarations websites and transformed for further analysis. The voting data are

roll-call votes in the parliament (VIII convocation) during the period of 2014-2017. Totally, the votes dataset contains more than 10000 votes for 422 deputies. The second dataset is information from the declarations of the parliament members. In Ukraine, the anti-corruption law requires all government officials to fill in and make public a declaration of income. The information on Declarations website about deputies' declarations is available for two years 2015 and 2016.

An empirical hypothesis is developed on the basis of the political-economic models and existing empirical evidence. In particular, I am testing the relationship between the party loyalty of each deputy and the following factors: type of mandate (PR or SMD); the size of faction; ranks on the party list; gender of the MP; deputy's activity as requests to the president and to the cabinet of ministry; financial wellbeing and other factors.

There are two main results of the research. First, a deputy chosen under the proportional representation system seem to be more loyal to the party and his/her loyalty grows with his/her position on the party list (i.e. less safe seats ensure higher party loyalty). Second, the factors like faction sizes, family wealth, and usage of Facebook account are also important in determining deputy's loyalty.

The structure of the thesis is as follows: Chapter 2 describes the literature on the main measurement of party loyalty and its determinants. The methodology of the analysis and the model description are presented in Chapter 3; Chapter 4 defines the data used and descriptive statistics; the main empirical results are reviewed in Chapter 5. Chapter 6 provides the final conclusions of this paper and ideas for the future research.

Chapter 2

THE LITERATURE REVIEW

In this chapter, I will explain and review different methodologies of the measurement a party cohesion. The second part of the chapter discusses the main determinants of a party loyalty and cohesion covered in the previous research.

2.1. Measurement of a party cohesion/discipline

The previous literature suggests several measurements available for the party cohesion. One of them, the earliest work is due to Rice (1928), who proposes the 'index of voting likeness' defined as the absolute difference between the number of "Yes" and "No" votes of the members of a party, divided by the sum of "Yes" and "No" votes. Rice's index excludes abstain votes as we can observe in the European Parliament and in the Verkhovna Rada of Ukraine.

On the other hand, Attina F. (1990) proposes to use the index-of-agreement (IA) specifically for the European Parliament, which means including to the IA three call options (Yes, No and Abstain). How can we calculate Attina's IA? For example, we have some voting results, where the number of "Yes" is the highest result. IA is the percentage measure of the relation between the total number of all options, and the difference between the numbers "Yes" and the sum of "No" and "Abstain".

The Attina's index can produce negative outcomes on individual votes. For instance, if the voting result is the following: all three voting behaviors separated into three identical parts, than Attina's index is near -33%. For this reason, Hix et

al. (2005) develop their own, the most popular, Hix 'Agreement Index' (AI). This is equal to the share of the difference between 3/2 from the maximum of the number of "Yes" and "No" or "Abstain" votes expressed, by each group as a given choice and of the sum of all answers, from the total sum of all options. As a result, the AI is 1 when all deputies of a party vote together and 0 when they are correspondingly separated between all three behaviors.

As a result, the agreement index produces cohesion scores from zero to one and it is a good alternative to the Rice and Attina's indices for measuring loyalty of a party in any parliament with three voting options. Also, Hix et al. (2005) obtain the results, which are perfectly correlated with Attina's index and have a strong correlation to the Rice's scores.

In a recent work, Cherepnalkoski et al. (2016) study the legislative behavior in the Eighth European Parliament and use Krippendorff's Alpha as a cohesion measurement. This approach takes into account co-voting by chance and holds the scenario, in which the agreement is to be measured between two different political groups, in opposition to Hix AI.

In this thesis, we calculate Hix Agreement Index and compare it with the average deputies loyalty by faction/groups constructed later. Also for Ukraine it could be important two more factors: "Did not vote" and "Absent" for this reason we need to add to Hix AI five more variables, by entering a coefficient of a quarter opposed to one half to have zero loyalty when the members of a party are equally divided between all five voting options.

2.2. Main determinants of party loyalty and cohesion

Electoral system and party switching

There is a direct connection between elective rules, individual legislator behavior, and election performance. Thames (2013) mentions that differences in party loyalty might be greater in those systems that do not allow party switching. Also, Herron (2002) finds that a lawmaker which switch his first party to another one is less cohesive with his successive faction's behavior.

In 2016 we witnessed the implementation of the imperative mandate in Ukraine, when BPP congress terminated powers of two MPs: Tomenko and Firsov. The mandate is one of the obligations to maintain parliamentary membership during the legislature's term, according to our legislative system. This fact clearly lowers incentives for party switching. "Party and parliamentary discipline and, consequently, the stability of majority governing coalitions will come less from the imperative mandate, but more from the better control of parties over their electoral lists and a better party control over political money" (Shukan, 2009).

Palamarenko (2010) remarks that existing barriers (for example imperative mandate) are only partially effective. He examines reasons, which could affect MP's decision to dissent against his party in Verkhovna Rada. He divides causes to defect from the party into two main groups: institutional constraints and individual determinants. Despite frequent changes in Ukrainian electoral legislation and laws, which define the status of the parliament member, he concludes that institutional-level factors are more stable over time and they determine the significance of individual factors.

Since 2014 (VIII convocation) Ukraine has a parliamentary-presidential system with the mixed-member electoral system, unlike the presidential-parliament system

that existed in 1998-2002 (Herron, 2002 and Thames, 2013) and proportional representation closed the list system in 2007 (Palamarenko, 2010). This could predetermine differences in behavior according to the seat type.

Hix (2005) finds that legislative parties are more cohesive in parliamentary than in presidential systems. This can push deputies to be more loyal to their parties.

Parliament power

Hix et al. (2005) find that cohesion of the main party groups has grown as the powers of the parliament have increased and as the importance of those party groups has grown.

Partisanship and type of mandate

Thames (2013) examines the behavior of the Ukrainian MPs using data from the III convocation of the Verkhovna Rada. He makes conclusions that in comparison with nonpartisan SMD deputies, partisan SMD, and partisan PR are more cohesive. The most likely to change a party are nonpartisan SMD.

Using the panel data structure of a complete database of roll-call votes in the Russian's Duma from 1994 to 2003 Kunicova and Remington (2008) inspect the influence of Russia's mixed electoral system (where one half of all deputies elected like SMD and one half like PR) on factional voting cohesion for votes on budget bills. They find a diffident evidence that SMD representatives defect from the faction position on budget bills more often than PR deputies, even taking into account such intervening factors as the party committee membership, ideology, faction and the evolution of the post-communist political system.

List position

Herron (2002) claims that controlling only for the type of seat is not enough. It is also crucial to take into account the interaction among them in mixed systems. Using the voting data of the VRU, he finds that control over the dual candidacy and the safety of the deputy position on the list are also significant.

Party size

An increase in the size of a party group leads to more cohesion, while the smaller party groups are more divided and have less party loyalty, and later may dissolve. This is confirmed by Hix et al. (2005) in studying of roll-call votes in the European Parliament over the period of 1979-2001.

Deputies popularity

MPs expect that dissent brings them more popularity or higher office positions, and also make a guarantee to be elected at the next election or other benefits. Politicians, who are more popular, tend to dissent with higher probability due to policy benefits (Palamarenko, 2010).

Based on the existing literature, we can conclude that party loyalty received due attention in the literature. There are a lot of studies dedicated to instruments for measuring party cohesion (so-called indexes) and causes influencing the party loyalty (or as vice versa the party discipline). The reason, why such studies are still relevant, is that different defects of existing indexes, which could be applicable only to a specific legislative system at all. On the other hand, the causes that influence the loyalty could be different in different countries (e.g. party size could have one effect in the EU parliament, but absolutely another one in the Ukraine's parliament). Earlier studies on Ukrainian parliament were not particularly focused

on the determinants of party loyalty and date back to periods when Ukraine had different electoral system. In addition, my work will contribute to a better understanding of the determinants of the party loyalty in countries with mixed electoral system like Ukraine.

Chapter 3

METHODOLOGY

The main question to be answered in this thesis is what determines the deputy loyalty to factions or groups to which he/she belongs. In this section, I describe the construction of the main variable and the empirical model used for the econometric analysis.

Construction of the party loyalty variable

It is created a variable for measuring personal deputy loyalty to the faction/group the deputy belongs to ("loy_dep"). In addition, the Hix Agreement Index is redesigned so as to take into account five possible actions of the deputy when voting in the parliament and this modified AI is used to evaluate the accuracy of the "loy_dep" dependent variable.

Before proceeding further, I present some definitions used in my research.

The majority of a faction/group is defined as 50% + 1 of votes on a particular law.

The switcher - a deputy who changed his/her membership in a faction or group at least once during the study period.

The deputy loyalty to the faction/group is a continuous variable between zero and one hundred, which represents the average percent of deputy votes in line with the majority of his/her faction/group.

For example, we have 9 deputies from one faction for voting1 and voting2 with the following results of the voting represented in the Table 1.

Table 1. The votes options

Deputy	**Voting1**	**Voting2**
1	yes	yes
2	yes	yes
3	yes	yes
4	yes	no
5	yes	no
6	no	no
7	no	no
8	didn't vote	no
9	absent	no

Table 2. The voting matrix

Deputy	**Voting1**	**Voting2**	**Deployal**
1	1	0	0.5
2	1	0	0.5
3	1	0	0.5
4	1	1	1
5	1	1	1
6	0	1	0.5
7	0	1	0.5
8	0	1	0.5
9	0	1	0.5

Therefore, we have the number of “yes”=5, “no”=2, “didn’t vote”=1 and “absent”=1 for the voting1 and “yes”=3, “no”=6 in the voting2, with 9 results in total for each voting.

The majority on the two votes as defined in this research is equal to 5 (truncation of the 9/2 + 1). The majority votes behavior in voting1 is "yes" and "no" in voting2.

Next, it is constructed a voting matrix for all deputies votes in these particular voting. I put 1 if his/her votes behavior equal to the majority's behavior and 0 otherwise (Table 2).

The deputy loyalty (Table 2 the "Deployal" column) is calculated as a percent of 1's in all votes for each deputy. For deputy 1 this becomes (1+0)/2=0.5, for the deputy 4 it is equal (1+1)/2=1.

For the switchers we use all factions/groups they belonged to during the investigated period for correct calculations, and the majority for every voting and for right designs of average party loyalty.

Construction of the modified Agreement Index

To measure a party group cohesion Hix et al. (2005) uses the following 'Agreement Index' (AI):

$$AI_i = \frac{\max(Y_i, N_i, A_i) - \frac{1}{2}[(Y_i + N_i + A_i) - \max(Y_i, N_i, A_i)]}{(Y_i + N_i + A_i)}$$

- Hix (2005)

Y_i denotes the number of "Yes" votes expressed by group i on a given vote;
N_i = "No" votes;
A_i = "Abstain" votes.

With preservation of the main idea of AI where we have 1 in the situation when all party members vote together and 0 when they are equally divided between all three variants, I create new AI for five possible answers:

$$AI_i = \frac{\max(Y_i, N_i, A_i, DV_i, AT_i) - \frac{1}{4}[(Y_i + N_i + A_i + DV_i + AT_i) - \max(Y_i, N_i, A_i, DV_i, AT_i)]}{(Y_i + N_i + A_i + DV_i + AT_i)}$$

Where DV_i = "Didn't vote" votes;

AT_i = "Absent".

As a result, the AI still equals 1 when all the members of a party vote together and equals 0 when the members of a party are equally divided between all five of these voting options.

According to the formula, I calculate a new modified AI for all faction/groups taking into account all switchers.

Now we can compare modified AI and the deputy loyalty variable across factions. I calculate the average party loyalty for each faction/group using the deputy loyalty. Figure 5 shows that the two measures are quite comparable with maximum difference equal to 9% and the average difference of 4% for all faction/groups. This enables us to apply the deputy loyalty to the organization the member he/she is of, as the independent variable of the study.

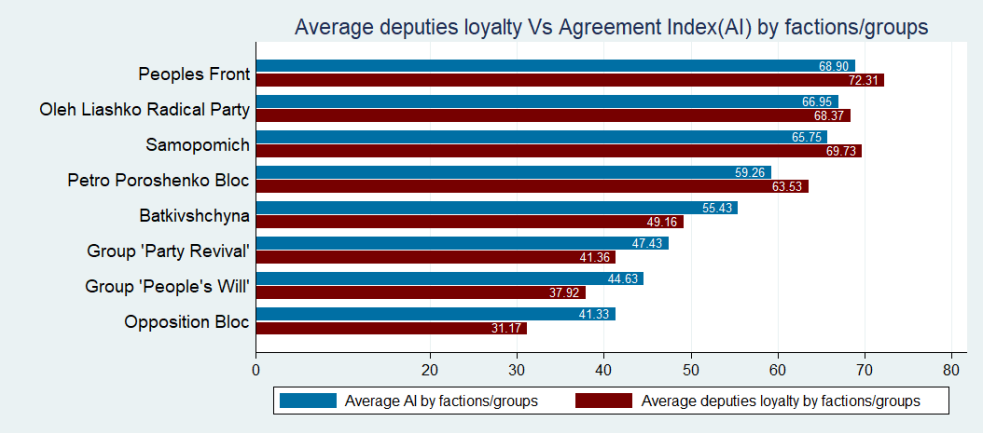

Figure 1. The comparison of a party loyalty AI and from a deputy loyalty

Empirical model

In our analysis, we make use of the linear models to assess the factors influencing loyalty of the Ukrainian MPs.

First, our sample is limited only to deputies, who were the members of some faction or group and have electronic declarations to estimate the following model:

$$loy\_dep = \beta_0 + \beta_1 * pr + \beta_2 * activity + \beta_3 * knopkodavstvo + \beta_4 * switch + \beta_5 * factionsize + \beta_6 * convocations + \beta_7 * position + \beta_8 * fb + \beta_9 * female + \beta_{10} * land + \beta_{11} * property\_m2 + \beta_{12} * familywealth1kUAH + \beta_{13} * liabilities1kUAH + \beta_{14} * age + \beta_{15} * age2$$

Next, to find the effect of the "seat safety" (defined as the deputy's position in the party list) I restrict the sample further to include only MPs elected under PR to:

$$loy\_dep = \beta_0 + \beta_1 * listnum + \beta_2 * activity + \beta_3 * knopkodavstvo + \beta_4 * switch + \beta_5 * factionsize + \beta_6 * position + \beta_7 * fb + \beta_8 * female + \beta_9 * age + \beta_{10} * age2 + \beta_{11} * land + \beta_{12} * property\_m2 + \beta_{13} * familywealth1kUAH + \beta_{14} * liabilities1kUAH + \beta_{15} * convocations$$

Third, I estimate the first model for three separate time periods. The first period covers the roll call votes from the first and the second sessions from November 2014 until July 2015. The second period covers the results from the third and the fourth sessions from September 2015 until July 2016. The last period is from September 2016 until October 2017, which include the fifth, sixth and the part of the seventh session. For each period, the dependent variable was recalculated too. This is done in order to understand whether the party loyalty varies over the convocation period, i.e. whether approaching end of the term affects the loyalty of the deputy. "The calendar effects are pervasive: all senators, even those representing export-oriented constituencies, take a more protectionist stance as they approach re-election" (Conconi et al. (2014) about policymakers' horizon and trade reforms in the U.S. Congress)[1].

The expected signs of the variables is listed in Table 3. Further, I provide intuition and explanations for the expected effects.

Table 3. Expected signs of the main variables

PR	+	Number on the party list	+
Female	+	Number of convocations	-
Presdif	+	Property	-
Faction Size	+	Family wealth	-
Activity	-	Liabilities	+
Age	+	Land	-
FB page	-		

[1] https://doi.org/10.1016/j.jinteco.2014.06.006

The type of mandate (proportional representation) is expected to increase party loyalty. The deputies that were elected as candidates from party list are more loyal to the party. (Kunicova and Remington (2008); Thames (2013)

The higher the difference between the electronic and written registrations the more likely the person is to vote with the majority of the party. The intuition for this result follows from the anecdotal evidence on "knopkodavstvo" (i.e. situation when the votes for the missing deputies are cast by their party members).

The impact of the group size is expected to be a positive, as increase in size of a group makes it more likely to be able to affect policy outcomes (Hix et al. (2005)).

The number of previous convocations in the parliament might make the deputy less loyal to the current party as the deputy may feel him/herself more confident to be re-elected in the future.

The deputy number on a party list is expected to have a positive impact: the more safe position the candidate has the less loyal to the party he is (Herron, 2002)).

Women are expected to be more loyal on average as they are in minority in the parliament and will have more incentives to vote with party majority.

Family wealth, land and the property are expected to decrease party loyalty because the more financially independent the deputy is less likely to depend on other party members. However, this relationship may be reverse as the wealth of MP may depend on his voting behavior. So, we aware some endogeneity in that case and to avoid this we use the declarations data of wealth for the 2015 year.

The liabilities influence the deputy to be more loyal and have higher chances to be re-elected in the future thus being able to decrease liabilities.

Popularity measured by the usage of Facebook page by the deputy is expected to negatively affect deputies' loyalty (Palamarenko, 2010).

Chapter 4

DATA DESCRIPTION

The data is collected from the official website of the Verkhovna Rada of Ukraine[2], from Declarations[3] website and "slovoidilo"[4] website. It includes the key information (gender, age, faction, activities, attendance, voting, declaration information etc.) about 422 deputies of the VIII convocation of the parliament (2014 – present).

In this research, I use the roll call votes cast by deputies' over almost 3 years period - between November 27, 2014 and October 1, 2017.

The first dataset consists of near 10000 roll call votes, scrapped from the Verkhovna Rada website. Out of these votes, I use a selection of 777 votes related to economic questions by using keywords like budget, taxes, tariffs, finance, credits, pensions etc. These votes will be used to construct a dependent variable – party loyalty of a deputy.

The second dataset comes also from the Verkhovna Rada's web pages with information on each deputy and consists of the general information about the MPs and their work in the parliament.

The third dataset is the data on deputies' declarations for 2015 and 2016 years obtained from VoxUkraine research, scrapped from Declarations website and the

[2] http://rada.gov.ua/
[3] https://declarations.com.ua/
[4] https://www.slovoidilo.ua/

declaration information from the VRU website for the deputies for whom information is not available in VoxUkraine research. The last two datasets will be used to create a set of independent variables. In addition, the information about the sector where deputy worked prior to being elected, for example, NGO, army, government obtained from the slovoidilo.ua analytical portal.

The VIII convocation of the Verkhovna Rada of Ukraine has six factions, two deputy groups and fifty-one nonaffiliated deputies (Figure 2).

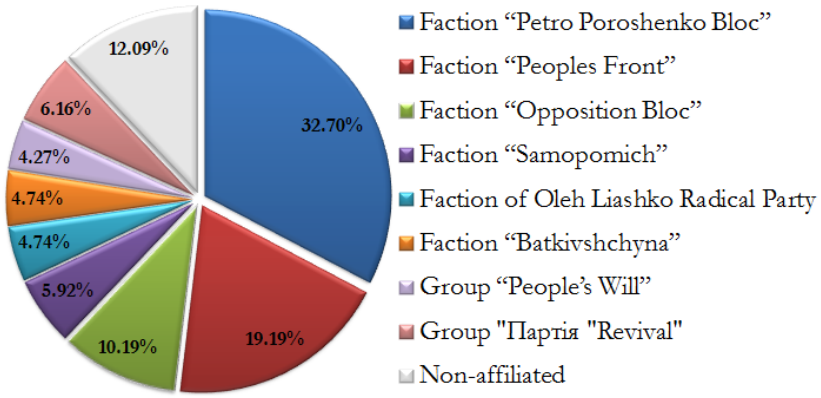

Figure 2. The deputies' factions and groups of the VIII convocation of the Verkhovna Rada of Ukraine represented in percentage.

The dependent variable in my analysis is the deputy's loyalty to the faction which he/she belongs to. It is constructed for each deputy using the roll call votes. Each result of a vote can one of five possibilities: "yes", "no", "abstention", "didn't vote" and "absent". "Didn't vote" and "absent" takes approximately 41% (Table A1) of all voting results, that is why, we cannot ignore them.

Figure 3 describes the average personal loyalty by factions and groups. It shows that there are three factions with the highest average loyalty: "People's front" (69%), "Samopomich" (69%) and "Oleg Liashko Radical Party" (68%).

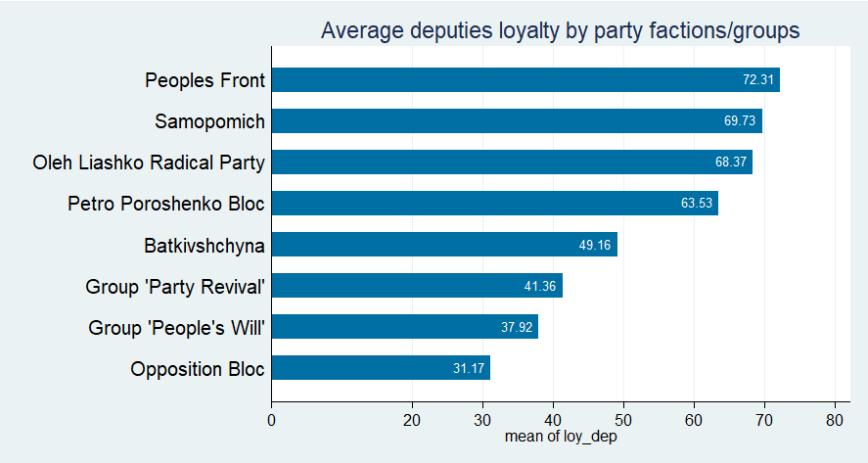

Figure 3. The Average personal loyalty of the deputy to the faction/group she is in

The set of independent variables includes the dummy variable of the mandate type and activity in the parliament, as well as different control variables described further. The summary statistics is presented in Table 4.

Table 4. The summary statistics of variables

Variable	Obs	Mean	Std. Dev.	Min	Max
loy_dep	371	58.804	18.993	5.7	90.840
cohesionpartyai	371	58.393	9.166	41	68.901
pr	422	0.531	0.500	0	1
activity	422	41.552	59.307	0	448
knopkodavstvo	422	-0.934	16.271	-76	85
switch	422	0.024	0.152	0	1
factionsize	371	80.536	48.982	18	138
convocations	412	1.811	1.291	1	8
fb	422	0.685	0.465	0	1
female	422	0.123	0.329	0	1
age	422	46.851	9.727	27	84
land	422	0.547	0.498	0	1
liabilities1kUAH	413	7164.515	77152.52	0	1486655
familywealth1kUAH	413	27164.44	82651.79	0	1290905
property_m2	413	519.804	1732.067	0	2301.445

The "switch" is a dummy variable equal to 1 if the deputy changes the faction/group during the period under investigation and 0 otherwise. The one exception is for group "Party Revival", which have changes in the name twice from the "Group of Economic Development" to the "Revival" and then to the "Party of Revival". That is why, all members of the group have at least three "switches". Therefore, for the group "Party Revival" the "switch" takes 1 if a number of factions is greater than 3. The statistics show that this convocation is not characterized by frequent switching as documented for earlier convocations by Thames (2007).

Independent variable "pr" is a dummy variable for proportional representation that takes 1 if a deputy is elected under proportional representation (224 obs.) and 0 if he is elected as an SMD - the single member district (198 obs.).

The variable "activity" shows how many inquiries submitted by the deputy to the president of Ukraine, chairman of the Verkhovna Rada of Ukraine, heads of committees of the VRU, the Cabinet of Ministers of Ukraine, heads of ministries and departments of Ukraine, to the Prosecutor General of Ukraine and to the local authorities. On average, on deputy made around 40 requests over the studied period. As Figure 4 shows on average SMD deputies are twice more active than the PR deputies (57 requests versus 28 requests, respectively).

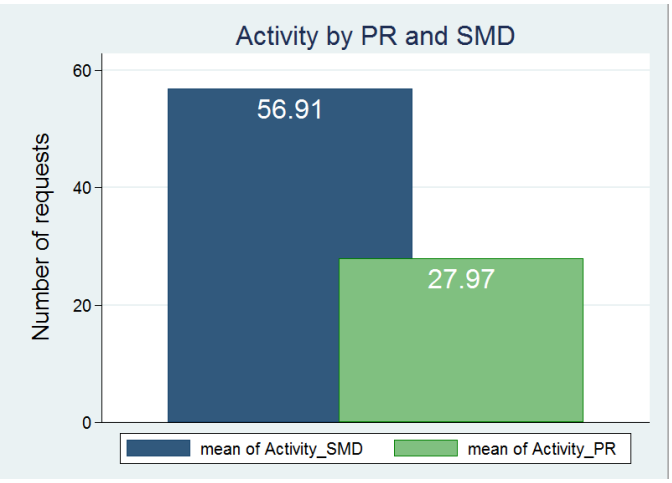

Figure 4. Activity comparison between PR and SMD

By factions/groups, the biggest average activity is of the "Petro Poroshenko Bloc" faction (47) and the "Opposition Bloc" faction (38) (Figure 5). According to the t-test (Appendix, Table A2), the differences are statistically significant.

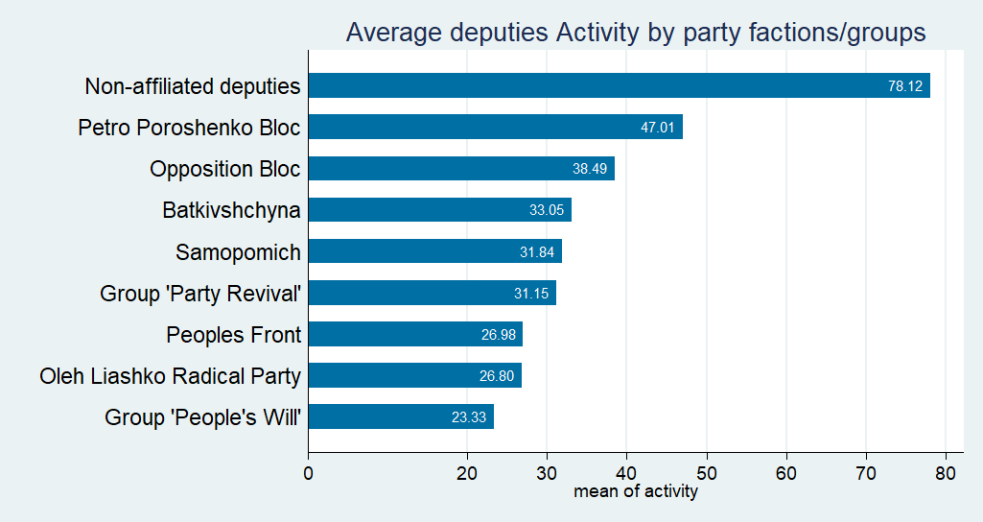

Figure 5. The average deputies' activity by party factions/groups

The variables describing presence in the parliament include variables calculated as a percentage of electronic ("preselecreg") and writing ("preswrreg") registrations and a composite variable, which equals to the difference between the results of electronic and the written registrations ("knopkodavstvo"). On average, MPs registered in both systems - the mean difference is near -0.93 (Table 4). In our empirical analysis I exclude deputies with the difference between the electronic and written registrations of more than 50, which means that his/her colleagues made half of the deputy's votes.

The variables "factionsize", "convocations" describes the size of the faction or group the deputy belongs to, and the number of parliament the member he/she has ever been.

I transform the continuous variable "number on party list" into categorical variable. The "listnum" is divided into five categories according to the position on the list: from 1 to 10, from 11 to 20, from 21 to 30, from 31 to 50 and over 50.

The "age" and "age2" variables are deputy's age and the squared age, respectively. The average age of a deputy in the Verkhovna Rada is 47 years. The youngest deputy is Aliona Koshelieva from "Oleh Liashko Radical Party" faction (27 years) and the two oldest deputies (both of age 84) are Yukhym Zviahilskyi from the faction "Opposition Bloc" and Yurii-Bohdan Shukhevych from the faction "Oleh Liashko Radical Party".

The "fb" variable is a dummy that equals to one if the deputy has a Facebook page and zero otherwise. Almost 68 percent of MPs have a FB page.

The deputy is a female if the dummy variable "female" is equal to one and a man otherwise. Ukrainian parliament is known for female underrepresentation, as women account only for mere 12 percent compared to the European average of 26 percent[5].

The set of variables from deputies' declarations include the following.

The variable "position" shows in which sector the MPs previous job positions belonged to. It consists from the following categories: parliament, politician, civil society, business, public sector and social and unemployment ("Don't work").

Binary variable "land" is equal to 1 the deputy or his close family owns a land plot and 0 otherwise. On average, more than 50 of MPs (or their close relatives) own a land plot.

The "property_m2" describes how much property he/she has and is measured in square meters. On average, deputies (including their family members ownership) have 500 square meters of real estate property.

[5] Source: Inter-Parliamentary Union (http://www.ipu.org/wmn-e/classif.htm)

The variable "liabilities1kUAH" describes the liabilities in the form of loans, mortgages, etc. the deputy and his/her spouse have (measured in thousands UAH).

The variable "familywealth1kUAH" is a variable describing the wealth of the deputy's family in thousands UAH and is constructed as a sum of the deputy's and his/her spouse's money in cash and on deposits. Further, I transform this variable into categorical variable with five categories, as the effect over the wealth range may be non-homogenous. The categories are: (1) less than 500k– the base category, (2) from 500k to 1 mln, (3) from 1 mln to 10 mln, (4) from 10mln to 100mln and (5) over 100 mln UAH. Out of deputies who submitted declarations (414 deputies out of 422), only around 6% report zero family wealth. In addition, more than 35% report family wealth above 1 mln UAH.

Table A3 in Appendix shows the correlation between main variables. We can see that correlation for majority of pairs is in appropriate borders - in absolute values less than 0.3. However, we observe relatively high correlation between age and number of convocations which is equal to 0.45 as well as family wealth and liabilities (0.70). The explanation for the first case is straightforward: a deputy of VRU can be a person older than 21 years and the more terms in the parliament a deputy serves the older he/she is. Hence, to avoid multicollinearity problem I will use either number of convocations or age. The correlation in the second case is not problematic as I use transformed categorical variables of wealth and liabilities.

Chapter 5

EMPIRICAL RESULTS

The empirical results are divided into three parts. The first part focuses on our basic OLS model estimation. The second one deals with an OLS model for the deputies, who were chosen under proportional representation system. The third part is dedicated to understanding of how the determinants of the party loyalty are change overtime. Table 5 presents the results of all models.

5.1 Results of the basic OLS model

According to our results, such parliament-related characteristics of the deputy as the type of mandate, the size of the deputy's faction/group and the number of convocations he/she worked statistically significant determinants of the party loyalty. Personal characteristics such as financial wellbeing measured by family wealth as well as the last sector where MP worked before election and the availability of a Facebook account are also statistically significant determinants of the party loyalty. Overall, the model explains 34% of the variation in the party loyalty.

Table 5. OLS regressions

	OLS Coef./se	**OLS_ for_PR** Coef./se	**OLS_ period_1** Coef./se	**OLS_ period_2** Coef./se	**OLS_ period_3** Coef./se
Parliament characteristics					
pr	4.583** [1.887]		5.219** [2.186]	4.029* [2.088]	1.990 [2.080]
listnum (base= (10,20])					
[1;10]		-8.100** [3.686]			
[21;30]		1.784 [3.514]			
[31;50]		7.058* [3.967]			
over 50		11.335*** [4.026]			
activity	-0.002 [0.017]	-0.041 [0.041]	-0.020 [0.020]	-0.003 [0.019]	0.009 [0.019]
knopkodavstvo	0.076 [0.060]	0.028 [0.086]	-0.027 [0.068]	0.066 [0.066]	0.219*** [0.066]
switch	-7.504 [5.957]	8.275 [10.129]	-12.311 [7.785]	-8.648 [6.578]	-2.848 [6.566]
factionsize	0.094*** [0.018]	-0.017 [0.031]	0.011 [0.021]	0.153*** [0.020]	0.107*** [0.020]
convocations	-2.608*** [0.848]		-2.943*** [0.962]	-2.468*** [0.936]	-2.418** [0.934]

Table 5. OLS regressions - Continued

	OLS Coef./se	**OLS_ for_PR** Coef./se	**OLS_ period_1** Coef./se	**OLS_ period_2** Coef./se	**OLS_ period_3** Coef./se
Personal					
position (base= parliament)					
Business	5.607**	8.120***	7.754***	5.289*	3.622
	[2.511]	[2.974]	[2.907]	[2.779]	[2.767]
Civil society	-0.557	2.957	1.139	-1.243	-2.729
	[3.432]	[4.200]	[3.890]	[3.789]	[3.783]
Politician	7.506	10.276	5.366	9.680	4.403
	[5.897]	[6.378]	[7.059]	[6.509]	[6.500]
Public sector	5.350*	3.937	5.567*	5.927*	3.627
	[2.769]	[3.491]	[3.209]	[3.057]	[3.052]
Social	5.272	4.166	4.695	4.887	6.975
	[6.617]	[12.571]	[7.541]	[7.306]	[7.294]
Do not work	10.155	26.615*	9.547	14.591	6.217
	[11.875]	[13.991]	[13.392]	[13.108]	[13.090]
Demographic					
fb	5.711***	7.257***	6.674***	6.222***	4.395**
	[1.955]	[2.654]	[2.269]	[2.161]	[2.155]
female	-2.277	-0.556	-1.535	-0.300	-4.429
	[2.734]	[2.872]	[3.166]	[3.018]	[3.014]
age		2.115**			
		[1.022]			
age2		-0.023**			
		[0.010]			

Table 5. OLS regressions - Continued

	OLS Coef./se	**OLS_ for_PR** Coef./se	**OLS_ period_1** Coef./se	**OLS_ period_2** Coef./se	**OLS_ period_3** Coef./se
Financial wellbeing					
property_m2	0.000 [0.001]	0.001 [0.001]	0.001 [0.001]	0.000 [0.001]	-0.000 [0.001]
familywealth1kUAH (base= less500k)					
(500k;1mln]	-2.913 [4.045]	-0.381 [4.855]	-2.060 [4.763]	-2.162 [4.480]	-5.485 [4.458]
(1mln;10mln]	-3.666 [2.678]	-4.431 [3.574]	-4.257 [3.172]	-3.034 [2.981]	-4.706 [2.952]
(10mln;100mln]	-9.422*** [2.904]	-10.990*** [4.015]	-10.775*** [3.464]	-9.876*** [3.236]	-8.801*** [3.201]
over100mln	-16.048*** [4.426]	-22.260*** [8.281]	-16.778*** [5.084]	-17.537*** [4.908]	-13.372*** [4.879]
land	0.308 [1.771]	-1.697 [2.407]	-0.829 [2.044]	0.527 [1.957]	0.978 [1.952]
Constant	59.354*** [5.820]	64.743*** [7.605]	67.996*** [6.695]	56.122*** [6.522]	59.879*** [6.462]
Observations	359	209	341	358	359
Adjusted R-squared	0.331	0.282	0.285	0.353	0.242
Standard errors in parentheses: * p<0.10, ** p<0.05, *** p<0.01					

A deputy who is not the first time in the parliament seems to be about 2.6% less loyal than a newcomer is. In addition, the results show that the previous position in the public and business sectors increases the loyalty by about 5% and 6% correspondingly, compared to a deputy who worked in the parliament area. A deputy with a Facebook account votes with party's majority on average 6% more than the one without an account. The size of the deputy's faction/group is also

important determinant of the party discipline. Extra 10 members in the faction increase a party discipline by about 1%.

Richer deputies (with family wealth over 10 million UAH in cash and on deposit) are about 13% less loyal than the deputies with the family wealth less than half a million UAH.

According to the results, party loyalty does not seem to be related to how active deputies are in the parliament (measured by number of requests). Also, there are no statistically significant gender differences in party loyalty. Moreover, differently from the previous study by Herron (2002) switchers do not seem to be different in terms of party loyalty from non-switchers.

Unconditional party loyalty (regardless of the personal and other characteristics) is almost 59 percent.

5.2 Results of the OLS model for PR

This model is used to investigate if the position on the party list has effect on the deputy's loyalty for the deputies elected under the proportional representation.

According to the findings, the closer to the end of the list the deputy is the more loyal to the faction/group he/she is. Moreover, the deputies at the top positions (1 to 10) seem to be 8% less loyal compared to the deputies with the numbers from 11 to 20 (base category). Deputy who has the number from 31 to 50 and above 50 is about 7% and 11% more loyal, correspondingly. These findings are consistent with the earlier work of Herron (2002).

Similar to the model in the previous section the following factors seem to have an effect on the party loyalty: the financial wellbeing, the previous position before, a

Facebook account and age of the deputy. A deputy with the family wealth over one million of hryvnias compared to the less wealthy, is near 16% less loyal to the deputy's faction/group. If deputy's previous position was in the business area or he/she was unemployed on average such deputy votes with party majority 8.12% and 26.6%, respectively more than the base category (work in parliament). Each additional year of life increases deputy's loyalty to his/her faction/group by 2.11% but at decreasing rate. As expected, unconditional party loyalty is higher for PR deputies (64%).

Other factors, like deputies number of requests (activity), gender and changing factions are not associated with the party loyalty.

5.3 Party loyalty over time

Next, we investigate how party loyalty changes over the convocation. We obtain the following results.

The type of mandate is statistically significant only during the first period and increases the loyalty by 4.8%. The effect vanishes as the term in the parliament shortens.

The one-point difference between the results of electronic and written registration of the deputy attendance in the third period is associated with an increase in party loyalty by nearly 0.2%. It may suggest that 'knopkodavstvo' is more common in this period. The size of the deputy's faction/group is important for the second and third periods and increases the loyalty by 0.15% and 0.10%, correspondingly.

According to the results, each additional previous convocation is associated with a decline in a deputy's loyalty by 2.94% in the first period, 2.46% and 2.42% in the second and third periods. A deputy who worked in the business sector prior to the

elections is 7.75% more loyal in the first period and is 5.29% more loyal in the second period, than the one who has previous experience in parliament (which is consistent with the positive sign on the number of convocations in the parliament). During the first and the second period, deputies coming from public sector show higher loyalty (by 5.57% and by 5.93%) to his/her faction/group than deputies who worked in the parliament before.

The deputy's popularity measured by the usage of the Facebook page increases the deputy's loyalty on the decreasing rate over time (by 6.67%, 6.22%, and 4.4%).

The effect of the family wellbeing on the loyalty is significant for category over ten million UAH but tends to decrease over time (about 13.76%, 13.71% and 11.09%, respectively).

Unconditional party loyalty seems to vary over time as well: while in the early period it is equal to 68%, it declines to 56% and 60%, correspondingly.

Chapter 6

CONCLUSIONS

The purpose of this study is to investigate the main determinants of the MPs loyalty to the faction/party the member he/she belongs when voting on economic laws in the Verkhovna Rada of Ukraine. Party discipline is especially important when parliament has to vote on many important reform issues and coalition parties do not have supermajority. Like any company, a party or a faction should function as a single organism and only in that case we will have chances for some economic stability and economic growth.

In addition, I expand the Hix Agreement index which measures party cohesion to incorporate two voting options: "Did not vote" and "Absent". The original Hix index developed for European Parliament would lose near half of voting results of Ukrainian MPs who often choose these two options strategically. This extended index can be used in the further research of the party loyalty for other countries with the same voting rules.

In 2019 Ukraine will have new elections to the parliament. The necessity electoral reform has been under discussion for a long time. What system should Ukraine have, single-mandate, proportional representation or continue with the current mixed system? According to the results of my thesis, it seems that under proportional representation system the deputies are more loyal to their political groups and hence the adoption of the new legislation might be more efficient. Second, the results show that there are differences in voting behavior of the MPs over duration of the convocation. While party loyalty is rather high at the

beginning, as time passes, the MPs become less disciplined and party cohesion decreases. In this light, it might be better to put more important laws under consideration in the first sessions to ensure their smooth passage through the parliament.

The further research in this area can explore in more details other determinants of the deputies' loyalty in Ukraine. In particular, the research can look closer at the usage of social networks by Ukraine's MPs and content analysis of their posts and electronic news to investigate how the social activity influences deputy's voting patterns on legislation related to economic issues and reforms. Such research might be able to provide answers about creating more effective rules for the functioning of the VRU to ensure timely voting and approval of the reform laws.

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APPENDIX

Table A1. Distribution of votes across categories.

yes	53.03%
no	1.58%
abstain	4.52%
did not vote	19.57%
absent	21.29%

Table A2. Two-sample t test with equal variances

Group	Observations	Mean	Standard error	Standard deviation
0	56.914	5.483	77.148	46.102
1	27.973	2.100	31.427	23.835
combined	41.552	2.887	59.307	35.877
diff	28.941	5.617		17.900

Reject the hypothesis, that the mean difference is more or not equal zero.

Cannot reject the hypothesis, that the mean difference is less than zero.

Table A3. Correlation matrix'

	loy_dep	pr	Activity	knopkodavstvo	switch	factionsize	convocations	fb	female	age	land	liab-s	familywealth1kUAH	Property_m2
loy_dep	1													
pr	0.141	1												
activity	0.055	-0.208	1											
knopkodavstvo	-0.097	-0.106	-0.045	1										
switch	-0.022	-0.043	0.077	0.109	1									
factionsize	0.328	-0.081	0.137	-0.106	0.069	1								
convocations	-0.406	-0.034	-0.091	0.123	-0.060	-0.248	1							
fb	0.255	0.015	0.187	-0.068	0.035	0.105	-0.274	1						
female	0.033	0.278	-0.029	-0.025	-0.004	0.000	-0.014	0.127	1					
age	-0.217	-0.118	-0.100	-0.026	-0.078	-0.033	0.451	-0.279	-0.073	1				
land	0.001	-0.057	-0.019	-0.021	0.002	0.038	0.026	-0.004	0.007	0.189	1			
liabilities1kUAH	-0.056	0.034	-0.041	-0.102	-0.015	0.010	-0.026	0.041	-0.020	-0.002	-0.045	1		
familywealthUAH	-0.213	-0.103	-0.040	0.015	-0.028	-0.074	0.124	-0.037	-0.066	0.053	0.022	0.743	1	
property_m2	-0.104	-0.090	-0.047	0.070	-0.028	-0.029	0.142	-0.134	-0.007	0.119	0.200	0.016	0.161	1