

THE RELATIONSHIP BETWEEN LABOR

TURNOVER AND NON-WAGE BENEFITS:

EVIDENCE FROM UKRAINIAN FIRMS

by

Dzmitry Sidarau

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Abstract

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Head of the State Examination Committee: Mr. Serhiy Korablin,
Economist, National Bank of Ukraine

In this paper I study the relation between labor turnover in Ukrainian industrial enterprises and non-wage benefits. The ULFS enterprise level panel questionnaire for 6 time periods of 1993 - 2003 is used. I focus on the panel aspect of my data and follow a fixed set of firms over time. After estimation using Tobit model with Fixed Effect for 2 different groups (administrative workers, regular workers). I found clear evidence that using non-wage benefits can reduce labor turnover rates.

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GLOSSARY

Non-wage benefits are also called **fringe benefits** and **perks** and can be defined as different non-wage compensations usually provided by employer to employees. Non-wage benefits can be treated both as complements to wage if they are an addition to wages or substitutes if they are referred to 'salary sacrifice' agreement.

Labor Turnover rate is the characteristic of a given company or industry which indicate the rate in percentage at which an employer **loses staff**.

Chapter 1

INTRODUCTION

Almost every firm provides of non-wage and fringe benefits. This practice of providing non-wage benefits also existed in former Soviet Union countries. Soviet economy firms were obliged to provide different kinds of benefits such as housing, daycare services and medical facilities etc. After the restructuring of the Ukrainian economy in the mid 1990s many firms continue providing benefits to support their workers. According the law social assets were transferred to municipal structures but firms had found other forms to support employees. The same is true for neighbors countries like Belarus and Ukraine (see Haaparanta et al.,2003, Juurikala and Lazareva, 2006).

In this thesis I test whether non-wage benefits are useful tool to reduce turnover of labor force and to attach employees to a company. For my analysis, I use the ULFS data set (Questionnaire for Labor flexibility Study at Industrial Enterprises) which includes a set of enterprise level data of 92 firms for the period of 1993-2003.

This research differs in several aspects from previous studies. I use firm level data which helps me to capture the dependence between firm level non-wages benefits and the incentives to quit. In this way, I analyze this relationship from another side than it has been done so far like in studies as Juurikala and Lazareva (2006) on RLMS(Russian Longitudinal Monitoring Survey) for Russia and Oyer (2006) on NLSY (National Longitudinal Survey of Youth) for USA which focus on the individual level data. My study focuses on the problem of labor turn over from the side of employers (and labor policy makers in enterprises). As far as I am

aware, this is also the first study that focuses on the use and consequences of non-wage benefits in Ukraine.

In the chapter 2 there is literature review in that described modern view on non-wage benefits and labor turn over and summarized previous studies results. It helps to be acknowledged with last view on relation between non-wage benefits and labor turnover rate. Chapter 3 contains Data description and Methodology. There can be found description of data sources, variables, evolution of variables and different descriptive statistics. In Methodology part of the chapter can be found model with description and economical reasoning of including given groups of variables. Chapter 4 shows Empirical results of estimation model for two categories of employees – Administrative and Regular workers. There can be found numerical explanation of coefficients of the regression as influence on dependent variable. In the last Chapter 5: Conclusions was summarized results and stylized fact of using non-wage benefits and relation between non-wage benefits and labor turnover rate.

Chapter 2

LITERATURE REVIEW

Current study aims to assess the relationship between non-wage benefits and labor force turnover. There is a huge amount of literature that tries to cover different aspects of this topic. Among them we can mention studies by *Rice* (1966), *Atrostic* (1982), *Woodbury* (1983), *Dye and Antle* (1984), *Woodbury and Hamermesh* (1992), *Olson* (2002), *Haaparanta et al.* (2003), *Juurikala and Lazareva* (2006) and *Oyer* (2006). The above mentioned studies include both theoretical and empirical ones, which somehow touches different issues concerning non-wage benefits and labor-force turnover.

We present literature review in the following way. Firstly, we present overview of the studies that discuss labor force turnover issues. Then we turn to the discussion of the research that aims to find the importance and role of non-wage benefits in the remuneration of the employees; and at the end, we focus on the relationship between non-wage benefits and labor force turnover.

LABOR TURNOVER

Claudio Lucifora (1998) focused on the impact of unions on labor turnover rate of firms. In this paper author made an attempts to explore effect of Trade Union on labor turnover. He used data on Italian labor market to study accessions and separations rates within establishment. He found that Italian trade unions have succeeded in reducing turnover.

Another study by Sousa-Poza and Sousa-Poza (2007) analyzes the effect of job satisfaction on labor turnover by gender. They use Swiss Household Panel data. They found that job satisfaction is a very good indicator of future quits. Authors

also conclude that there is satisfaction paradox that is women has less incentives to leave company if they not satisfied and satisfied at work more than men.

STYLIZED FACTS OF USING NON-WAGE BENEFITS

From *Rice* (1966) we know that he use framework that concentrate on base of efficiency wage models and count bulk of non-wage benefits as wage supplements. He used such concepts to show that company can provide workers with benefits and receive effect of economies of scale. That is important stylized fact that was first time discussed by this author. His study motivates other researchers to conduct other studies and make investigation in this field.

Important question that arise after researches found that non-wage benefits are more than useful and important is whether wage and non-wage benefits are substitutes or not. In studies of *Woodbury* (1983) and *Olson* (2002) they found that fringe benefits such life insurance and health benefits can be easily substituted with wage. But they capture fact that company which promote such benefits also promote lower wage to employees. But large companies can receive effect economies of scale and can promote life insurance by lower costs. Also they found that employee evaluate retirement benefits more that other non-wage benefits as life insurance and health benefits.

Another way to think about non-wage benefits is count it as tax shield. *Woodbury* and *Hamermesh* (1992) found that demand for benefits is elastic to income with respect to income tax. They studied wage of the faculties from 1960s-1990s and describe that using benefits rise compensation received by faculties not only by adding benefits value to the wage but also by reducing tax income. This study shows important role of non-wage benefits for employees.

Many researches thought about evolution of non-wage benefits. There is not a single answer on question whether usage of non-wage benefits increasing over time or not. Some researchers argue that it increase over time like *Oyer* (2006) but others (like *Juurikkala* and *Lazareva* (2006)) claims that using non-wage benefits depends on the level of development of social services markets. Thus level of usage non-wage benefits should decrease for transition countries over time. Main reason is development of public service sector. Now companies in transitional countries promote benefits as additional to wage not as substitute.

Juurikkala and *Lazareva* (2006) using data on manufacturing firms in Russia for 2003 assess the relationship between non-wage benefits from the one hand and labor market tightness (which shows how hard it is for the employer to fill an available position) and availability of appropriate social infrastructure from the other hand. The authors use share of the non-wage benefits in the total employee's remuneration as dependent variable and tightness of the labor market and infrastructure index as explanatory variables. These variables are constructed separately for four different groups of employers. Implementing both tobit and pooled regression analysis the authors argue that there is strong positive association between labor turnover and non-wage benefits. This effect is found for both high- and low-skilled workers and means that if the tightness of labor market increases, the share of the non-wage benefits in total employee's compensation also increases. After incorporating the social infrastructure index in the regression analysis, it is shown that share of non-wage benefits decreases in the presence of availability of better infrastructure. There is also one more interesting finding in this paper that relates to the effect of wages on non-wage benefits. This study provides evidence that wage actually does not related to the non-wage benefits, which is a contradictory argument to the previous research by *Olson* (2002).

THE RELATIONSHIP BETWEEN LABOR TURNOVER AND NON-WAGE BENEFITS

“The idea that non-wage benefits can be used by firms to reduce labor turnover is hardly new” (Juurikkala and Lazareva, 2006).

Rice (1966) also highlights that wage supplements can be used for reducing labor turnover costs associated with labor turnover rate. Also *Woodbury* (1983) and *Olson* (2002) found that retirement benefits are huge part of non-wage benefits and in large companies employees can minimize associated costs they conclude that benefits can be used as pretty effective mechanism to reduce labor turnover costs.

Juurikkala and Lazareva (2006) in their recent research concentrate on the relationship between non-wage benefits, such as housing or day care for the employees, and labor turnover. This study utilized firm-level survey data for 2003 year covering medium and large establishments for 40 different regions in Russia. In order to investigate the association between non-wage benefits and labor turnover, the authors implement simple OLS regression using four different measures of turnover as dependent variable (hiring rate, separation rate, quit rate, turnover rate, and churning rate) and share of non-wage benefits in the whole compensation package of the employee as explanatory variable. The results of this study suggest a strong negative relation between provision of the non-wage benefits and four labor turnover measures for the industrial firms in Russia. This effect is somewhat confirmed while using RLMS data for the period 2000-2002. In this case the authors use random effects probit model and find significant effect for the high-skilled workers and insignificant for other groups of workers.

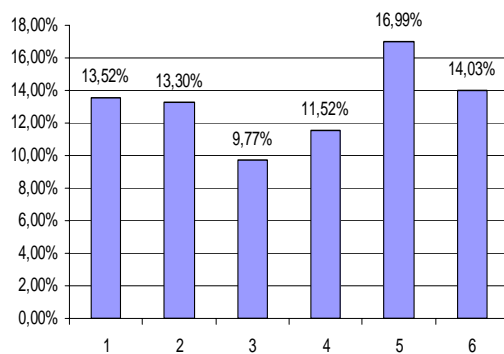
DATA DESCRIPTION AND METHODOLOGY

In this research I use data from the ULFS survey. The ULFS survey has been held 6 times: 1993-1994, 1994-1995, 1997-1998, 1999-2000, 2000-2001, 2002-2003.

In this study I will focus on the panel aspect of my data. There is, I will follow a fixed set of firms over time. Following a fixed set of firms over time is important because it assures that the researchers that observed changes is not a consequence of a changing sample. Of course, disadvantage is that it is not representative sample for all firms.

The Endogenous variable 'Rate of turnover' was received as a ratio of Number of quits in the current period to the Total number of employees in the current period. Evaluation of this variable is presented on the next Figure.

Figure 1: Rate of turnover over time



The first two periods (1993-1994, 1994-1995) shows a mean rate of turnover. In 3 and 4 period (1997-1998, 1999-2000) there is decline in the rate labor turnover comparable to 2 previous periods. This fact might be mainly explained by the high level of unemployment in this period which lead to workers not having attractive outside offers. After recovering from the recession there was significant increase in labor turnover rate during the 5th and 6th periods (2000-2001, 2002-2003). Another interesting fact about the labor turnover rate variable contains some very high values close to 0,9 that means that 90% workers quitted company this year¹.

Table 1: Variable definitions, rate of turnover as dependent variable

Dependent Variable		
RateOfTurnover	Rate of labor turnover	[0,0.9]
Characteristics of firm		
Id	Unique number of a enterprise	92 dummy variables for firms
Period	Number of survey conducted by particular year 1993-1994, 1994-1995, 1997-1998, 1999-2000, 2000-2001, 2002-2003	(1,2,3,4,5,6)
Region	Dummies for regions	6 regions: Donetsk, Lviv, Mykolaiv, Kyiv city, Kyiv region, Kharkiv
Industrial sector	Dummies for industrial sector	15 industry sectors: Electroenergetics, Fuel industry, Ferrous industry Mechanical, Engineering and metal working, Non-ferrous metallurgy, Chemical and petrochemical industry,

¹ This could be due to poor data entry (typing misprints) or to higher values can be explained by transition period characterised by high unemployment and number of contraction workplaces due to increase efficiency or remodelling enterprises. But this not a serious problem due to that only a few observations have value close to 1.

		Wood and paper products, Building materials, Glass and china-faience, Light industry, Food processing Flour-grinding, cereals, Medicine Printing, Other
Property form	Different types of property form of given enterprises	4 types: State, open joint stock, closed joint stock, private enterprise
Stock share	Percentage of shares, belonging to the workers, if joint stock	[0;1]
Assets	Fixed assets, evaluated in current year	Million UAH
Exported sales	Share of sales in current year for foreign market	[0;1]
Change in sales	Logarithm of the ratio of sales in previous and current period	
Employment	Number of employed in current year (the same as number of workers)	Person
Women share	Share of women	[0;1]
Short timed	Share of workers, working short-time	[0;1]
Vacancy	Vacancies – number of workers ratio	[0;1]
Bonus share	Bonuses – wage ratio	[0;1]
Number released employees	Number of workers released, being employees	Person
Number released unskilled	Number of workers released, being unskilled workers	Person
Employment changes	Expected employment change (2 dummies)	[0,1]
Fewer workers	Produce same output with fewer workers	[0,1]
Difficulty	Presence of difficulty to pay wages in last 12month	[0,1]
Sales increase	During last 2 years sales have increased	[0,1]
Social policy	Development of social policy belongs to both (trade union and administration)	[0,1]
Output norm	Collective agreement covers output norm	[0,1]
Subcontract -	Main type of subcontract: Production	[0,1])

equipment	of technological equipment	
Sex-preference (workers)	Sex preference for production/Workers (2 dummies)	[0,1]
Sex-preference (employees)	Sex preference for production/Employees (2 dummies)	[0,1]
Trade union	Share of workers, belonging to the trade union	[0;1]
Contract	Share of employed contract workers	[0;1]
Wage	Earnings of workers averaged over firm	UAH
Benefits promoted by firm to 3 types of workers: non-regular workers, regular workers and employees (administrative staff)		
Paid vacation	Company paid for 3-4 week vacation	[0,1] *
Additional vacation	Additional paid vacation provided by firm	[0,1]
Rest houses	Availability to workers visit sanatoriums, resorts and rest houses full or partially covered by firm	[0,1]
Sickness benefit	Company pay for time when employees temporary unable to work by health reasons	[0,1]
Paid health services	Medical insurance and some health care paid by firm	[0,1]
Subsidized rent	Company pay a part of the regular payment for rented car or apartment	[0,1]
Subsidies for kinder gardens	Company pay a part of the regular payment for kinder garden	[0,1]
Bonuses	Different type of bonuses(monthly premium, gifts etc.)	[0,1]
Profit sharing	Additional salary paid by	[0,1]
Loans	Possibility to take preferential loan from company	[0,1]
Retiring assistance	Assistance in accommodation search and covering associated cost	[0,1]
Supplementary pension	Possibility to receive additional pension form company funds	[0,1]
Possibility for training	Possibility to take trainings during employment	[0,1]
Interest-free loans	Possibility to take interest-free loan from company	[0,1]
Subsidy for canteen or benefit for meal	Possibility to take additional money for lunches or meal coupons	[0,1]
Subsidized	Possibility to receive subsidies on buying consumer goods	[0,1]

consumer goods		
Transport subsidies	Possibility to receive subsidies on using public transports	[0,1]

Table 1 contains data for 92 firms that participate in each of 6 survey and use hence 552 observations. In the next table there are descriptive statistics for given variables set. It shows main statistics such mean, standard deviation, min and max for each variable in the set.

Table 2: Variables in panel data set contains data over 92 firms, 6 observations for each firm and 552 total observations.

Variable	Obs	Mean	Std. Dev.	Min	Max
rateofturnover	552	.1285395	.1253617	0	.9123541
Partshares	552	.2156884	.3311382	0	1
Logfixedasset	551	11.15128	2.199793	4.60517	15.92201
Exprotshare	552	.1235326	.2169965	0	1
sales	548	8.347203	2.410086	2.302585	13.75605
saleschange	547	-.1428046	.4897158	-2.22386	2.92797
numworkers	552	1133.219	1898.014	5	12314
womenshare	552	.4892374	.1873263	0	.9438202
Shorttimers	552	.1274157	.2860724	0	1
Vacancies	552	.0317626	.0796975	0	.9402985
employmentincrease	552	.0978261	.2973488	0	1
Employmentdecrease	552	.2536232	.4354791	0	1
fewerworkers	552	.3695652	.4831248	0	1
sales2yinc	552	.4583333	.4987128	0	1
sexprefworkersw	552	.0380435	.1914748	0	1
sexprefworkersm	552	.2663043	.4424262	0	1
sexprefemployeesm	552	.1014493	.3021966	0	1
sexprefemployeesw	552	.0398551	.1957961	0	1
Unionshare	552	.8881159	.2754598	0	1
contractworkers	552	.6231884	.4850266	0	1
Wage	552	299.8756	390.4942	2.84	3199.599
Releasedemployees	552	6.554348	18.01574	0	133
releasedunskilled	552	8.271739	21.08367	0	175
Socpolicy	552	.5797101	.4940531	0	1
Outputnorm	552	.6304348	.4831248	0	1
subtechequip	552	.0036232	.0601383	0	1
bonusshare	552	.3688923	.299556	0	1

(1,0) indicates the dummy variable (1 – if the characteristic is available, 0 – if not)

In the ULFS survey participants answered questions about using given types of benefits that are shown in Table 3.

Table 3: Question: What non-wage benefits enterprises promote to their employees

#	Type of Benefits
1.	Paid vacation
2.	Additional vacation
3.	Rest houses
4.	Paid health services
5.	Subsidised rent
6.	Subsidies for kinder gardens
7.	Bonuses
8.	Profit sharing
9.	Loans
10.	Retiring assistance
11.	Supplementary pension
12.	Possibility for training
13.	Interest-free loans
14.	Subsidy for canteen or benefit for meal
15.	Subsidised consumer goods
16.	Transport subsidies

Those 5 types of answers for each of 16 types of non-wage benefits were possible:

1. Yes – it means that company promotes this benefit for particular group of workers permanently during current period.

2. No – it means that company does not promote this benefit for particular group of workers during current period.
3. Occasionally – it means that company promote this benefit for particular group of workers on non-regular base during current period
4. N/A – it means that answer for this question for particular benefit for particular type of employees is not available for different reasons.
5. Do not know – it means that company representatives don't know information about whether company promote this benefits for particular group of workers permanently during current period or not.

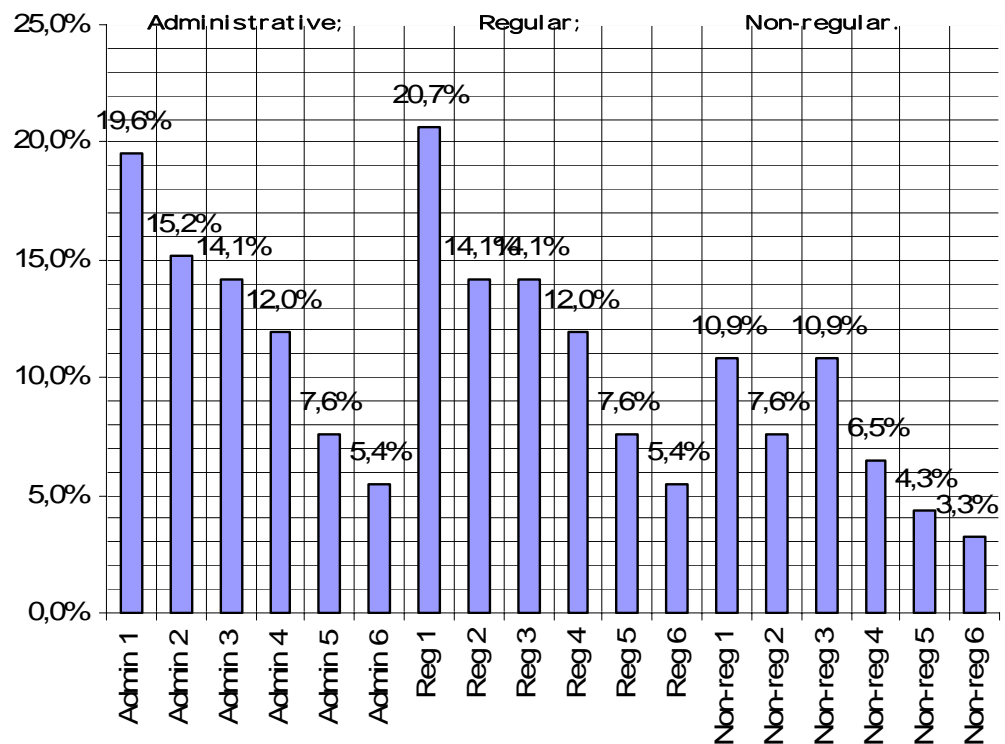
For estimation and to reduce classification errors, we make a simplification of answers on this question to 2 answer from 5 - yes or no. Answer 1 – “Yes” and 3 – “Occasionally” are translated into 1 – that mean that benefit was at least occasionally promoted to their workers. Other answers(2, 4. and 5) can be treated as No because answer 2 means “No”, also answer 4 – “N/A” and 5 – “Do not know” with high probability mean that particular company do not promote such benefit for this type of employees. It is important to know which type of benefits more widely utilize by firms. In Appendix 2 was shown distribution of preferences of the firms on promoting particular benefit, for example 70% means that 70% companies promote such benefit to their employees.

We find that popularity of non-wage benefits among 92 firms by 1993-2003 changes over time. Some benefits became less popular over time, some remained at same level of popularity (see Appendix 1 for Administrative, Appendix 2 for Regular and Appendix 3 for Non-Regular employees). Below are described some of the benefits that became less popular over time:

- Transport subsidies
- Loans
- Subsidies for kinder gardens
- Subsidized rent
- Bonuses
- Subsidized consumer goods

Other 10 benefits were used in observed period time with different level of popularity. There is no clear pattern in the evolution of those benefits.

Figure 2: Evolution of Transport subsidies benefit over time by 3 types of workers



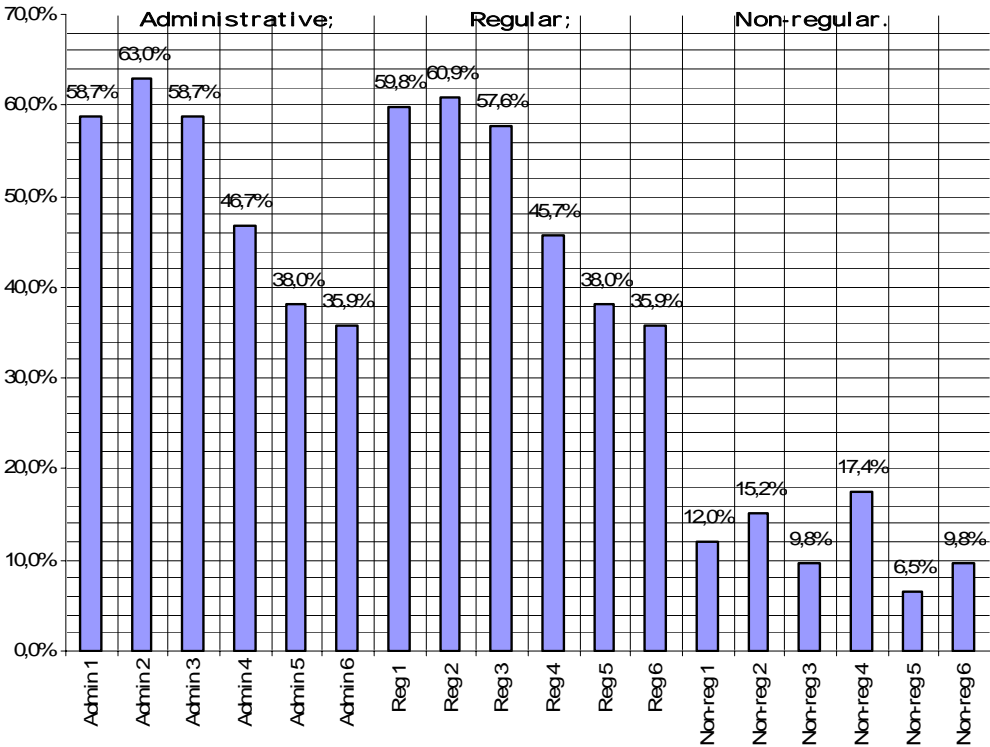
Providing this benefit enterprises promote to their employees additional money to cover transport expenses and reimburse costs or provide tickets to public

transport. Some large enterprises that locate out of town provide for free transportation from city to enterprise location.

The graph shows strict decline in average using transport subsidies as promoted non-wage benefit for all type of workers. There is strong evidence of declining in usage this benefit for Administrative and Regular employees and less evident for Non-regular due to low initial amount of such benefit promoted for Non-regular employees.

There are 3 groups of employees: Administrative, Regular and Non-Regular. Administrative employees can be treated as white-collar, Regular as blue-collar and Non-Regular as part timers and seasonal workers.

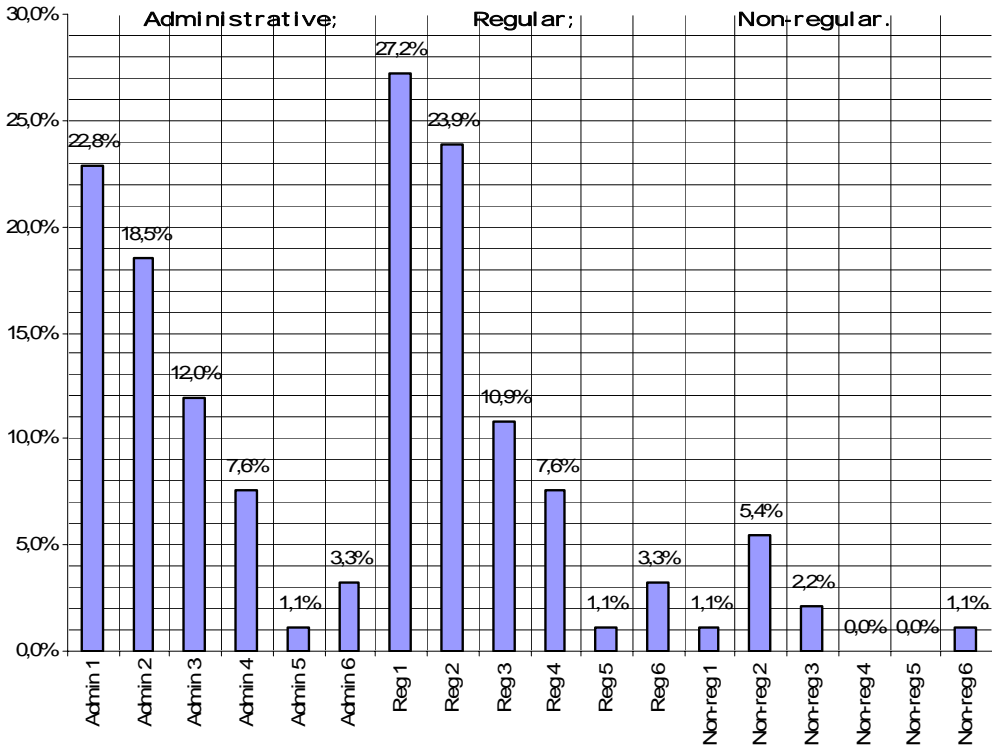
Figure 3: Evolution of Loans benefit over time by 3 types of workers



This variable means that enterprises promote to their employees special loans for apartment, consumer spending and etc from their own funds by low interest rates or pay a partial amount of interest payments for those loans that had taken by their employees from banks.

The graph shows small increasing from first to second period but after there are strict decline in average using loans as promoted non-wage benefit for Administrative and Regular employees. But for Non-regular employees it shows that this benefit was promoted in average by 11-12% companies with some fluctuations around during 6 periods.

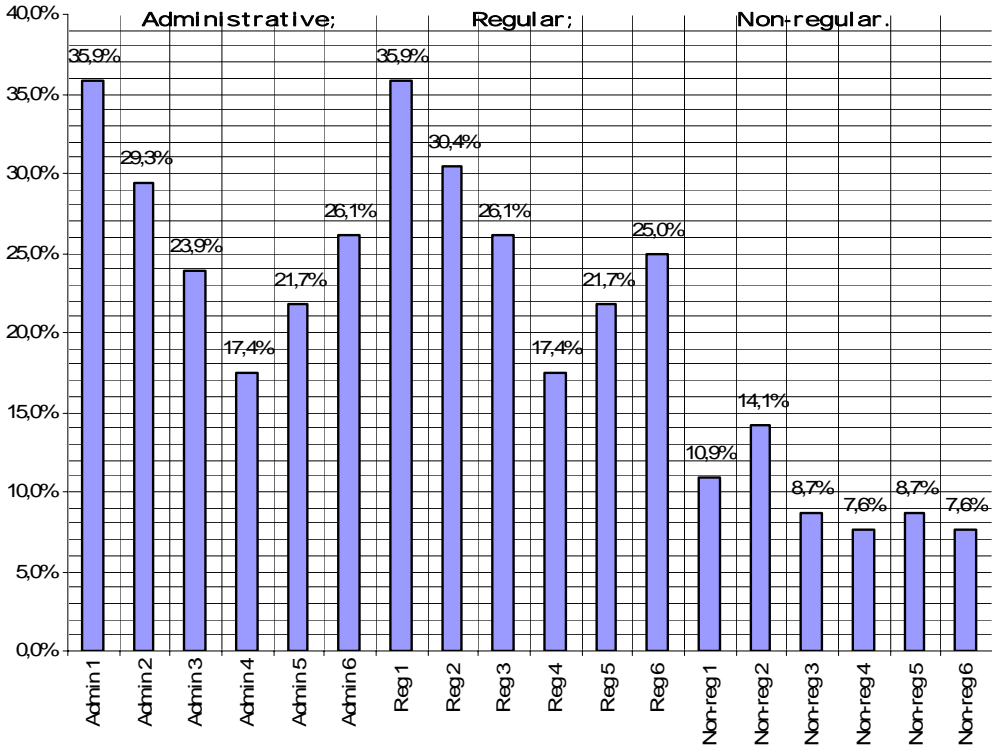
Figure 4: Evolution of subsidies for kinder gardens benefit over time by 3 types of workers



Meaning of this variable is that enterprises promote to their employees additional money for covering costs of kinder garden service or some large enterprises have their own kinder gardens and cover partially or at full amount expenses on supporting such service on permanent base for their employees.

On the graph we can see strict decline in average using this subsidy as promoted non-wage benefit for Administrative and Regular employees. Number of companies that promote this benefit was dropped during 10 years from 1993-2003 more than in 20 times. For Non-regular data shows that this particular group of employees almost does not receive such benefit.

Figure 5: Evolution of subsidized rent benefit over time by 3 types of workers

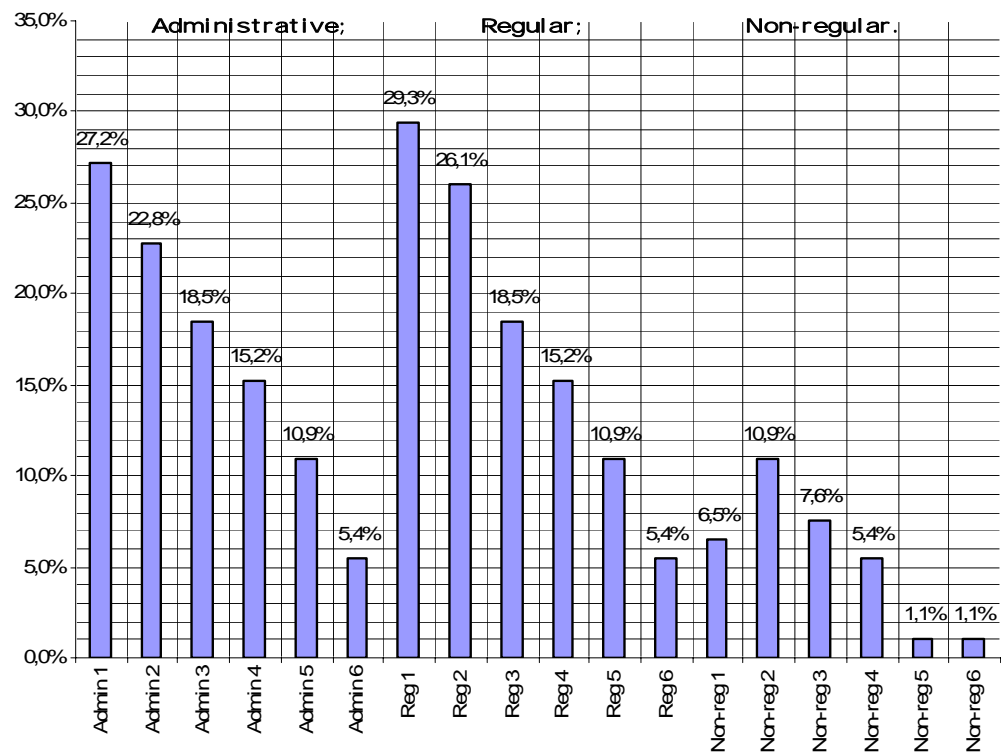


The variable subsidized rent benefit means that enterprises promote to their employees additional money for covering costs renting apartments during their

work for enterprise. Also it is possible situation that enterprises may have their own dormitories and promote to live there to their workers for relatively small costs.

The graph shows decline from 35,9% to 17,4% in average during 1993-2000 and after moderate increase in usage such benefit during 2000-2003 till 26,1%. For Non-regular usage is growing from 10,9% to 14,1% in first 2 periods and after decrease to steady level around 8% through last 4 periods.

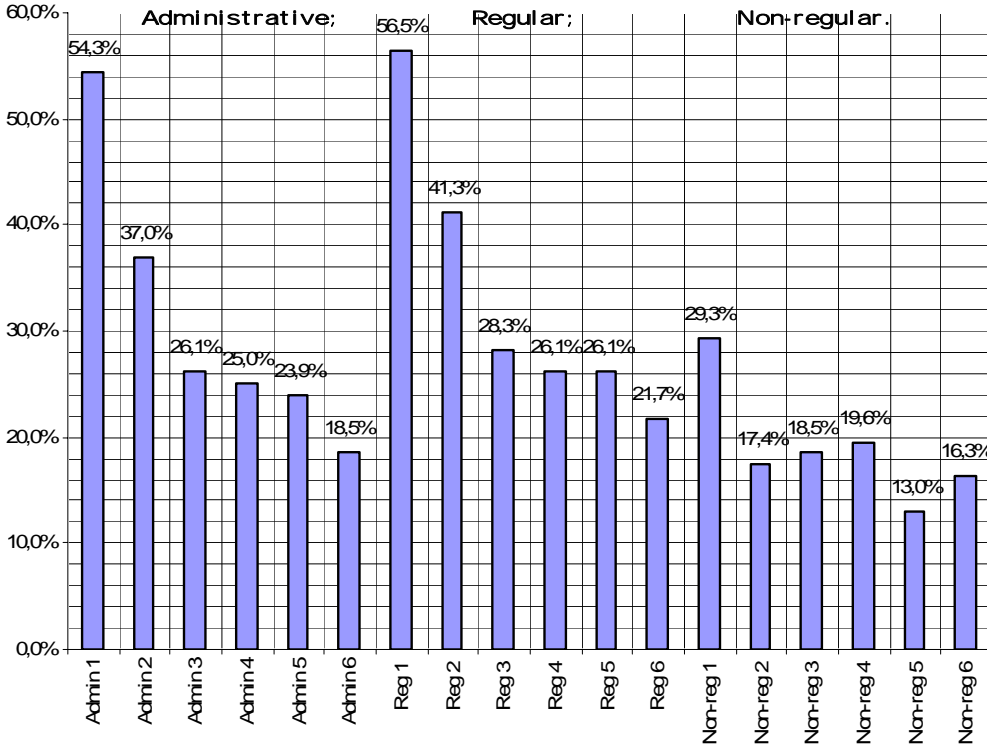
Figure 5: Evolution of bonuses benefit over time by 3 types of workers



Bonuses benefit usually is some amount of money that employees receive at the end of the month or at the end of the year. It can be as a fixed amount of money and as percentage share of month or year salary. It can depend from employee performance and from performance of enterprise during last month or last year.

According the Figure provision of bonuses benefit was reduced by 5 times during 10 years of conducting survey for Administrative and Regular types of workers. For Non-regular employees was observed increase in using benefits in two first period up to 10,9% but during last 4 periods willingness to promote this benefit was reduced to 1,1%. It drop by 10 times through the last 4 periods.

Figure 5: Evolution of subsidized consumer goods benefit over time by 3 types of workers



Subsidized consumer good benefit is some amount of subsidies for employees on buying consumer goods. It can be different variety of goods for example housewares, fridges, furniture, or motorcycles.

On the graph can be seen clear decline in using subsidized consumer goods as non-wage benefit for Administrative and Regular types of workers. For Non-regular workers amount of companies promoted such benefits float from 13% to

19% through last 5 periods after steady decline in second period from 29,9 to 17,4.

To analyse turnover researchers often use the Tobit regression model. It is appropriate because the value of the dependent variable spread between 0 and 1 as ratio between number of quits measured as number of employees who quit company current year and total amount of workers who worked in the company in the end of current year. Using Tobit regression model it becomes possible to capture influence of non-wage benefits on the labor turnover rate. For this estimation Tobit regression may provide better results than simple OLS because OLS may provide biased results because my dependent variable is truncated below and above. The dependent variable can receive only positive value from 0 to 1. That is why I decided to apply Tobit truncation model to estimate my regression.

According recent studies FE MLE models have problem of incidentalness of parameters (see Wooldridge, 2002). But in studies made by other author who tested truncated Tobit on Monte Carlo experiments was found evidence that MLE FE estimators have very small bias in the slope coefficients (see Greene, 2004) if the number of time observations is sizeable. For this research are used 6 periods and as mentioned above possible there is small bias.

In next chapter can be found comparison between Tobit, Tobit with Random Effect, Tobit with Fixed Effect (LSDV), OLS with Fixed Effect, OLS with Random Effect.

For estimation will be using following general model:

$$T = X_i\beta + B_i\gamma + \phi_i + u_i, \text{ where}$$

X_i is vector of characteristics of the firm,

B_i is vector of 16 benefits,

ϕ_i is vector of dummy variables for 92 firms,

u_i is vector of residuals.

Variables can be divided on several categories:

- General variables. They provides general description of the enterprises (region, industry, property form, women share, sex preferences, share of workers, belonging to the trade union).
- Accounting characteristics. These variables includes accountant characteristics of a firm or payments to workers (fixed assets, sales, wage, bonus share).
- Efficiency characteristics. They indicate relative efficiency (wage in production, innovation).
- Dynamic changes – They provide information about changes over time (changes in sales)
- Personnel category. Describe personnel movements and types of settlement (employment, vacancies, part-time, short-time).
- Released workers – Number of workers, released (employees, unskilled workers)
- Miscellaneous – other variables (difficulty to pay wages, development of social policy etc.)

Controlling for general variables allow excluding the part of turnover, which does not depend on firm performance. For example people usually want to receive job

offer in capital rather than anywhere else, so expected rate of turnover in Lviv or Kharkiv going to be higher than in Kiev.

Women possibly have higher probability to be released by some different reasons than men. Including women share and sex preferences covers these psychological and discriminative aspects of turnover. And trade union can provide additional guarantees to its members do not be released, thus it also affects turnover rate.

From accounting point of view companies going to retain their personnel from leaving and that is why provide additional payments, like percentage of sales, higher wage and some bonuses. Also some people have preferences to work in large company, which can increase turnover from small to large companies.

If the company somehow demonstrate its weakness, then people going to worry for their future and leave the company for more stable. Also low efficiency can be a sign of recession or poor economic situation and result in a significantly increasing labor turnover rate.

Different types of personnel has different reasons to leave the company. Part-time worker has no restrictions and can leave the company at any moment, when he/she has not assigned for a job. In the same time short-timers usually are trainees who going to continue working in the same company or have restrictions to leave during certain period of time. That is why we control types of personnel.

Sometimes firm enforce to leave a head or leader of department, which leads to voluntary departure his/her colleagues. Also retiring of low-skilled or unskilled workers may increase duties and responsibilities of other workers, which results in uncomfortable working conditions and higher turnover rate.

If enterprise think that work can been done with smaller number of workers, than other workers do their work inefficiently or this enterprise has higher turnover rate in case of labor hoarding in enterprise.

Development of social policy, which involves representatives from trade union, leads to better working condition and should decrease rate of turnover.

If collective agreement covers output norms, than it makes additional pressure on workers and may lead to voluntary leaving from the company.

Doing some specific types of job, cooperating with subcontractors to produce technological equipment should strengthen workers desire to work further in the same company. Subcontracts can be considered as orders from external company. Because companies which have subcontracts is very stable and since such contracts are paid well workers have much lower incentives to leave such companies.

Chapter 4

EMPIRICAL FINDINGS

As was mentioned in the data description and the methodology part, Tobit is best estimation technique in my case. I estimated five different regression to check the robustness of my findings: OLS with fixed effects, OLS with random effects, Tobit, Tobit with fixed effect (LSDV), Tobit with random effects

I tested for multicollinearity (see Appendix 7) but this did not turn out to be an issue. Tests show that no severe multicollinearity exists among the different benefit variables because the correlation between those variables is low (see Appendix 4 for administrative and Appendix 5 for regular employees). I also conducted Principal Component Analysis (PCA) but the first component explains only on 15,63%. That is why PCA is not appropriate technique to work with benefit variables(see Appendix 6). Thus using all 16 benefits as dummy variable is possible and allow me to study influence of particular benefits on the labor turnover rate. Result for administrative workers are shown in the Table 3. I multiplied coefficients by 100 to make interpretation easier. That is why coefficients mean percentage change instead of change in share.

Table 4: Results of estimation 5 different regression forms for Administrative workers

ADMINISTRATIVE	Tobit FE	Tobit	Tobit RE	OLS FE	OLS RE
chemical and petrochemical industry	20,57 (4,64)	7,01 (2,68)	7,39 (2,61)	14,20 (2,44)	7,35 (2,59)
building materials industry	4,88 (2,02)	6,26 (2,46)	6,20 (2,31)	4,53 (1,18)	6,10 (2,26)
close joint stock enterprise	4,23 (2,97)	3,16 (2,18)	3,27 (2,15)	4,34 (2,04)	3,11 (2,04)
open joint stock enterprise	3,16 (2,73)	3,92 (3,3)	3,95 (3,2)	3,32 (2,01)	3,71 (3)
Share of exported sales	15,28 (5,93)	10,86 (4,46)	11,71 (4,55)	16,39 (4,98)	11,69 (4,61)

Share of short-timed workers	-0,00329 (-2,23)	-0,00394 (-2,61)	-0,00379 (-2,48)	-0,00281 (-1,6)	-0,00376(- 2,47)
Share of vacancies	0,01435 (3,11)	0,01567 (3,17)	0,01511 (3,1)	0,01291 (2,54)	0,01506 (3,11)
Number of workers	-0,00172 (-5,65)	-0,0017 (-5,26)	-0,00171 (-5,08)	-0,00182 (-3,56)	-0,00173 (-5,14)
Number of workerrs released, being employes	0,09285 (3,33)	0,09814 (3,31)	0,09948 (3,36)	0,09872 (3,08)	0,09592 (3,27)
Number of workerrs released, being unskilled	0,08149 (3,39)	0,08027 (3,16)	0,07707 (3,03)	0,07122 (2,58)	0,0779 (3,09)
Presence of difficulty to pay wages in last 12month	3,74 (3,72)	3,56 (3,38)	3,39 (3,13)	2,78872 (2,13)	3,26121 (3,03)
Development of social policy belongs to both (trade union and administration)	-2,56 (-2,54)	-2,77 (-2,59)	-2,69 (-2,55)	-2,43998 (-2,22)	-2,66469 (-2,54)
Collective agreement covers output norm	2,91 (2,78)	1,99 (1,84)	1,93 (1,74)	1,68 (1,26)	1,82 (1,64)
Main type of subcontract: Production of technological equipment	-18,34 (-1,89)	-23,78 (-2,44)	-22,80 (-2,36)	-13,24 (-1,46)	-17,82 (-2,05)
Benefit for administrative workers: Loans	-4,33 (-3,27)	-4,73 (-3,41)	-4,81 (-3,37)	-5,07 (-2,91)	-5,04 (-3,55)
id21,id25,id74,id90,id91,id98,id 135,id137, id193, id263, id329, id354,id369	significant				
Constant term	10,12 (5,54)	11,79 (6,33)	11,81 (6,15)	11,78 (5,21)	12,40 (6,5)

In the Table 4 are shown estimation results of 5 regression form for regular workers. Coefficients are close with results for administrative workers. There was found significance of dummy variable for enterprises with following IDs: id21, id25, id74, id90, id91, id98, id135, id137, id193, id263, id329, id354, id369. Those significant dummies are the same in regression for both type of workers. Loans are preferable benefit for both type and promoting it to employees reduce labor turnover rate for both groups but to a different extent. For administrative workers providing this benefit reduces labor turnover on -4,33% and on -5,45% for Regular workers. As was expected by Methodology introducing benefits should reduce turnover and the coefficients should be negative and significant according to main hypothesis.

Table 5: Results of estimation 5 different regression forms for Regular workers

REGULAR	Tobit FE	Tobit	Tobit RE	OLS FE	OLS RE
chemical and petrochemical industry	20,68 (4,69)	7,31 (2,8)	7,68 (2,72)	14,30 (2,46)	7,65 (2,7)
building materials industry	4,81 (2)	6,31 (2,48)	6,26 (2,34)	4,65 (1,21)	6,15 (2,29)
Close joint stock enterprise	4,20 (2,93)	3,16 (2,19)	3,27 (2,16)	4,32 (2,03)	3,12 (2,05)
Open joint stock enterprise	3,19 (2,75)	3,90 (3,29)	3,92 (3,19)	3,34 (2,03)	3,68 (2,99)
Share of exported sales	15,05 (5,86)	10,97 (4,51)	11,79 (4,6)	16,35 (4,98)	11,77 (4,65)
Share of short-timed workers	-0,00309 (-2,11)	-0,00395 (-2,63)	-0,00381 (-2,5)	-0,00282 (-1,61)	-0,00378 (-2,48)
Share of vacancies	0,01455 (3,17)	0,01574 (3,2)	0,0152 (3,13)	0,01302 (2,56)	0,01513 (3,14)
Number of workers	-0,00175 (-5,75)	-0,00171 (-5,32)	-0,00172 (-5,13)	-0,00182 (-3,57)	-0,00175 (-5,19)
Number of workerrs released, being employes	0,09553 (3,43)	0,09881 (3,34)	0,10016 (3,39)	0,0996 (3,11)	0,09665 (3,3)
Number of workerrs released, being unskilled	0,08246 (3,44)	0,08013 (3,16)	0,07706 (3,04)	0,07123 (2,58)	0,07784 (3,09)
Presence of difficulty to pay wages in last 12month	3,72 (3,71)	3,54 (3,37)	3,37 (3,14)	2,81 (2,16)	3,24 (3,03)
Development of social policy belongs to both (trade union and administration)	-2,79 (-2,76)	-2,83 (-2,65)	-2,75 (-2,61)	-2,49 (-2,27)	-2,72 (-2,61)
Collective agreement covers output norm	2,84 (2,69)	1,97 (1,82)	1,91 (1,72)	1,66 (1,24)	1,80 (1,62)
Main type of subcontract: Production of technological equipment	-18,65 (-1,94)	-24,00 (-2,47)	-23,08 (-2,4)	-13,79 (-1,53)	-18,14 (-2,09)
Benefit for regular workers: Loans	-5,45 (-3,95)	-5,25 (-3,75)	-5,32 (-3,71)	-5,54 (-3,14)	-5,56 (-3,89)
id21, id25, id74, id90, id91, id98, id135, id137, id193, id263, id329, id354, id369	significant				
_cons	11,44 (6,02)	12,30 (6,57)	12,31 (6,39)	12,21 (5,36)	12,90 (6,73)

In the Table 5 are shown estimation results of 2 regressions for regular and administrative employees. Those regression were estimated by Tobit with Fixed

Effect. I put it together in one table to make easier visual comparison of coefficients for administrative and regular employees.

Table 6: Results of estimation 2 regressions for Administrative and Regular workers

NAME OF VARIABLES	ADMINI-STRATIVE	REGULAR
chemical and petrochemical industry	20,57 (4,64)	20,68 (4,69)
building materials industry	4,88 (2,02)	4,81 (2)
close joint stock enterprise	4,23 (2,97)	4,20 (2,93)
open joint stock enterprise	3,16 (2,73)	3,19 (2,75)
Share of exported sales	15,28 (5,93)	15,05 (5,86)
Share of short-timed workers	-0,00329 (-2,23)	-0,00309 (-2,11)
Share of vacancies	0,01435 (3,11)	0,01455 (3,17)
Number of workers	-0,00172 (-5,65)	-0,00175 (-5,75)
Number of workerrs released, being employes	0,09285 (3,33)	0,09553 (3,43)
Number of workerrs released, being unskilled	0,08149 (3,39)	0,08246 (3,44)
Presence of difficulty to pay wages in last 12month	3,74 (3,72)	3,72 (3,71)
Development of social policy belongs to both (trade union and administration)	-2,56 (-2,54)	-2,79 (-2,76)
Collective agreement covers output norm	2,91 (2,78)	2,84 (2,69)
Main type of subcontract: Production of technological equipment	-18,34 (-1,89)	-18,65 (-1,94)
Benefit for administrative workers: Loans	-4,33 (-3,27)	-5,45 (-3,95)
id21,id25,id74,id90,id91,id98,id135,id137, id193, id263, id329, id354,id369	significant	significant
Constant term	10,12 (5,54)	11,44 (6,02)

From results we can see that coefficients before explanatory variables for administrative and regular workers are quite similar, so we can interpret them

simultaneously. The only important difference is influence on labor turnover rate by Loans benefit. I found that there is a higher turnover rate, by about 20.6-20.7 % than on average in chemical and petrochemical industry sector. In building materials industry enterprises have turnover rate higher on 4.8-4.9% than on average in other omitted industrial sectors. Higher turnover rate in those 2 industry sectors could be explained by hard working conditions and unhealthy environment.

We observe that on average in close joint stock enterprises rate of turnover is higher on 4.2% and in open joint stock enterprises rate of turnover is higher on 3.2% than in other enterprises. Higher turnover rate in joint stock enterprises can be explained by higher required performance and higher control from the side of shareholders and top management comparatively to state owned enterprises. Each additional percent of exported good increase turnover rate on 0.15%, mainly because it increases possibility to switch current employer to foreign company. If company increase export share in production that usually means that company increase number of representatives working abroad but still pay lower wage to them or receiving necessary experience in working with foreigners and after quits this company and apply for work abroad.

Presence of short-timed workers, number of vacancies and number of workers economically insignificant and do not affect the turnover rate.

For enterprises that had difficulty to pay wages last 12 month turnover rate is higher than in companies without such problem on 3.7%. This fact is very natural, because workers prefer to receive regular wages that is why difficulty to paying wages worries them encourage them to change workplace.

Very interesting fact is that if in the development of social policy participate trade union and administration leads to decreasing of turnover rate on 2.6% in average,

because in this case social policy takes into account propositions of both sides – employer and employees. It reduces working conflicts and increase satisfaction from working activity that has influence on labor turnover. But if collective agreement covers output norms, then turnover rate increasing on 2.9%, which shows, that such restriction creates additional pressure on workers, possible their salaries highly depends from their performance thus imposing norms may lead to increasing labor turnover. For the enterprises which main type of subcontracts is production of technological equipment turnover rate lower on 18.34%.

The main result after studying influence of 16 benefits is that was found clear evidence that provision non-wage benefits reduce labor turnover rate. But from all 16 benefits significant is only Loans benefit. This benefit means that enterprise provides to their employees special loans from their own funds by low interest rates or pay a partial amount of interest payments for those loans that had taken by their employees. I found that provision of Loans benefit decrease turnover rate of administrative workers by 4.3% and 5.4% of turnover rate of regular workers.

CONCLUSIONS

This paper provides an analysis of relation between non-wage benefits and the labor turnover rate of 92 Ukrainian enterprises over 6 time periods between 1993 and 2003. A panel data set was formed on the basis of the ULFS questionnaire. We find clear evidence of a negative effect of using non-wage benefits on labor turnover rate. The dummy for Loans benefit was found to be negative and statistically and economical significant for all types of workers:

- Administrative
- Regular

As was mentioned before, in general the use of non-wage benefits has been decreasing over the ten years from 1993 to 2003. It can be explained by overall development social services markets during that period.

Similar study was made by Juurikala and Lazareva (2006) on RLMS(Russian Longitudinal Monitoring Survey) for Russia. In the study authors conclude that regression results suggest that the increasing amount of social services in total compensation lowers the labor turnover. They test the negative relationship between non-wage benefits provision and labor turnover on individual-level data from RLMS. They run random effects panel probit for the three years of data (2000–2002) to estimate probability that a person quits the firm in the next year separately for the four groups of employees. I found that the most appropriate technique is Tobit with fixed effect. It differ from regression form that used Juurikala and Lazareva due to we used different data.

Juurikala and Lazareva found that benefits are only significant for high-skilled blue-collar workers. They explain this result according theory that the most difficult to replace high-skilled blue-collar workers. That is why benefits play important role in reducing labor turnover. For blue-collar workers benefits has positive and significant coefficient. After they conclude that in regions with well-developed social infrastructure non-wage benefits do not reduce labor turnover rate but do well in infrastructure-poor regions. In my study I found that there is clear evidence for both blue-collar workers and white-collar workers.

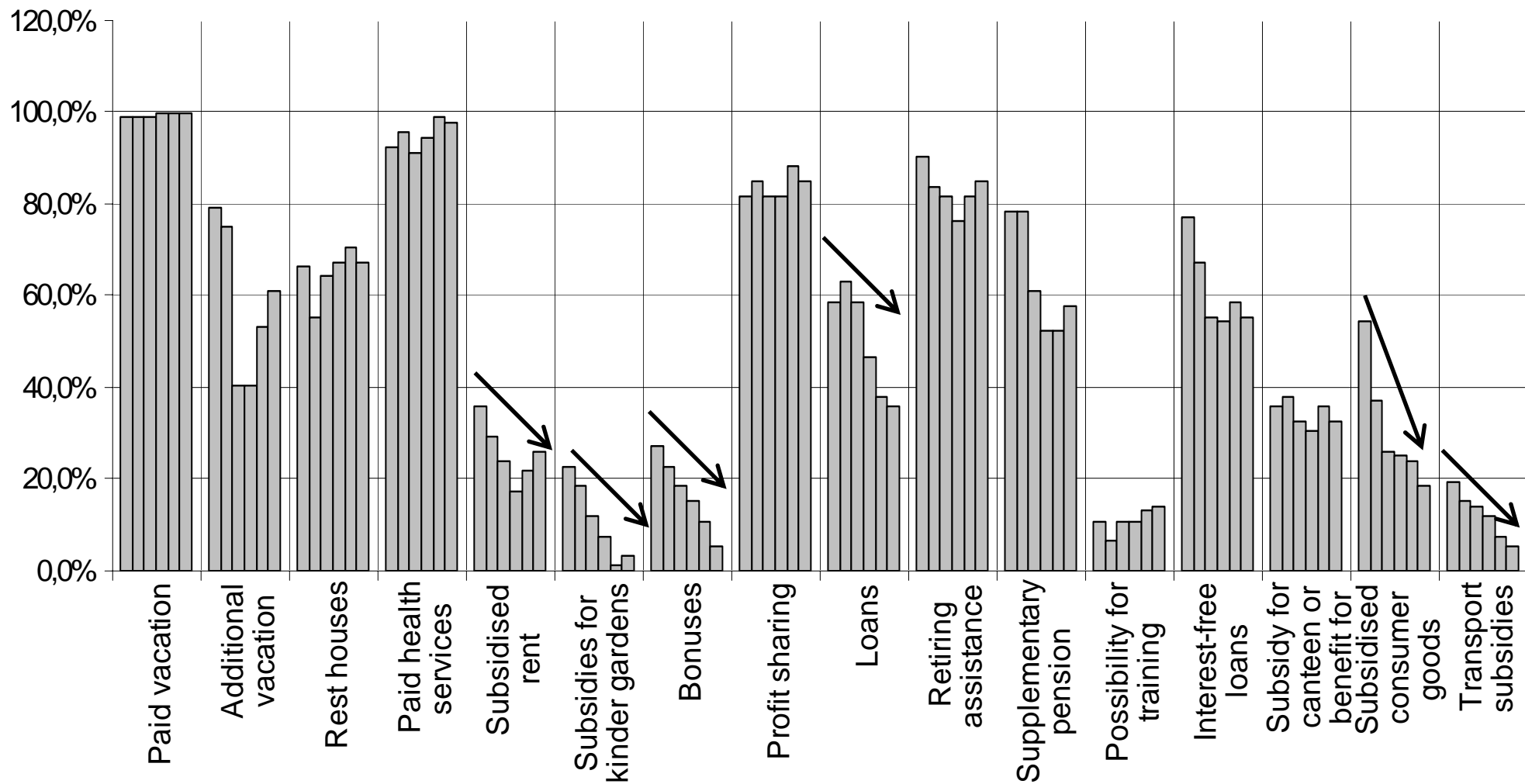
The results of this research can be used by Human Resources Departments as effective solution to reduce labor turnover rate. Companies should add benefits that reduced labor turnover rate such as Loans benefit. I found that providing non-wage benefit such as Loans decreased over time but my findings tell that using this benefit helps to significantly reduce labor turnover rate. That is why practice of using Loans benefits can be extended to receive lower turnover rate by Ukrainian enterprises.

In this field there are a number of other interesting studies that could be promoted for research studies on such topic using cross-section data or conduct similar research on individual level data for Ukraine.

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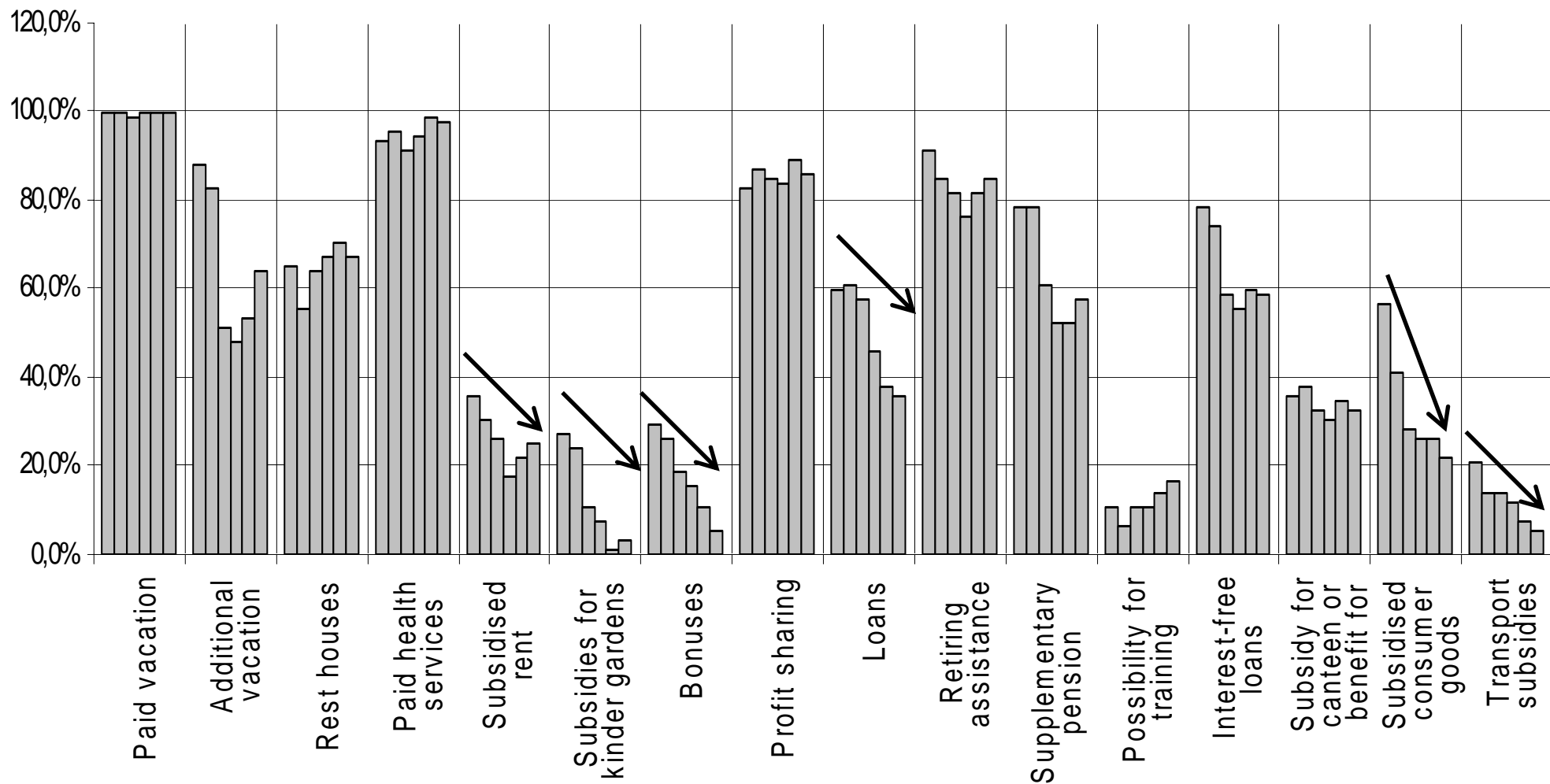
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Changes in using benefits by years, Ukraine 1993-2003 for Administrative employees

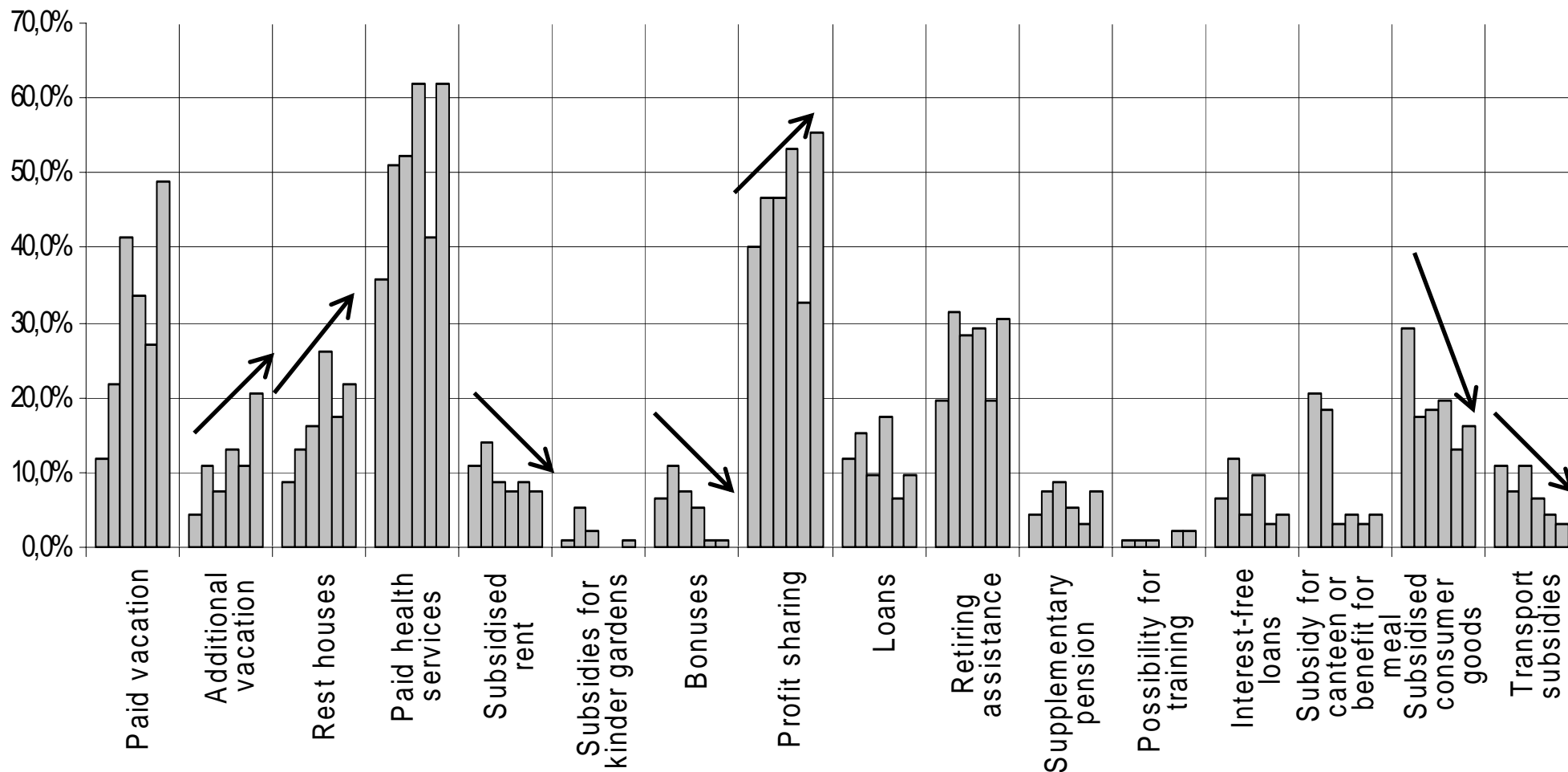


ULFS survey, 1993-2003.

Changes in using benefits by years, Ukraine 1993-2003 for Regular employees



Changes in using benefits by years, Ukraine 1993-2003 for Non-Regular employees



APPENDIX 4:

Correlation between variables that contain benefits dummies for administrative employees

Administrative workers	Paid vacation	Additional vacation	Rest houses	Paid health services	Subsidised rent	Subsidies for kinder gardens	Bonuses	Profit sharing	Loans	Retiring assistance	Supplementary pension	Possibility for training	Interest-free loans	Subsidy for canteen or benefit for meal	Subsidised consumer goods	Transport subsidies
Paid vacation	1,000															
Additional vacation	0,087	1,000														
Rest houses	0,101	0,128	1,000													
Paid health services	0,098	0,131	0,187	1,000												
Subsidised rent	-0,069	0,121	0,195	0,095	1,000											
Subsidies for kinder gardens	0,026	0,060	0,133	0,025	0,181	1,000										
Bonuses	0,033	0,054	0,184	0,034	0,215	0,219	1,000									
Profit sharing	0,168	0,143	0,172	0,241	0,103	0,060	0,040	1,000								
Loans	0,025	0,095	0,071	0,076	0,189	0,208	0,057	0,149	1,000							
Retiring assistance	0,032	0,163	0,216	0,277	0,178	0,081	0,060	0,492	0,214	1,000						
Supplementary pension	0,046	0,168	0,129	0,001	0,088	0,134	0,079	0,152	0,059	0,244	1,000					
Possibility for training	0,026	0,112	0,185	0,000	0,083	0,063	0,028	0,140	0,016	0,098	0,161	1,000				
Interest-free loans	-0,008	0,173	0,359	0,096	0,194	0,121	0,165	0,234	0,126	0,314	0,221	0,125	1,000			
Benefit for meal	0,001	0,032	0,134	0,022	0,065	0,067	-0,026	0,132	0,185	0,215	0,218	0,062	0,266	1,000		
Subsidised consumer goods	-0,004	0,144	0,092	0,024	0,155	0,057	0,039	0,114	0,068	0,125	0,126	0,115	0,198	0,164	1,000	
Transport subsidies	0,028	0,039	0,135	0,034	0,107	0,153	0,054	0,061	0,098	0,111	0,080	0,026	0,184	0,264	0,228	1,000

APPENDIX 5:

Correlation between variables that contain benefits dummies for regular employees

Regular workers	Paid vacation	Additional vacation	Rest houses	Paid health services	Subsidised rent	Subsidies for kinder gardens	Bonuses	Profit sharing	Loans	Retiring assistance	Supplementary pension	Possibility for training	Interest-free loans	Subsidy for canteen or benefit for meal	Subsidised consumer goods	Transport subsidies
Paid vacation	1,000															
Additional vacation	-0,032	1,000														
Rest houses	0,058	0,083	1,000													
Paid health services	-0,010	0,103	0,178	1,000												
Subsidised rent	0,025	0,130	0,193	0,113	1,000											
Subsidies for kinder gardens	0,016	0,094	0,125	0,031	0,192	1,000										
Bonuses	0,020	0,074	0,179	-0,010	0,246	0,276	1,000									
Profit sharing	0,104	0,103	0,205	0,224	0,069	0,107	0,041	1,000								
Loans	0,042	0,078	0,075	0,050	0,178	0,201	0,065	0,121	1,000							
Retiring assistance	-0,019	0,156	0,223	0,291	0,155	0,109	0,053	0,437	0,220	1,000						
Supplementary pension	0,056	0,196	0,134	0,026	0,094	0,137	0,076	0,134	0,066	0,244	1,000					
Possibility for training	0,015	0,115	0,194	0,000	0,056	0,036	0,026	0,133	0,014	0,101	0,159	1,000				
Interest-free loans	0,057	0,140	0,355	0,048	0,195	0,154	0,196	0,239	0,108	0,324	0,205	0,106	1,000			
Benefit for meal	0,031	0,006	0,126	0,034	0,078	0,068	-0,031	0,111	0,189	0,209	0,223	0,050	0,275	1,000		
Subsidised consumer goods	-0,060	0,131	0,083	0,012	0,158	0,097	0,088	0,073	0,074	0,141	0,141	0,116	0,200	0,149	1,000	
Transport subsidies	0,016	0,002	0,125	0,031	0,104	0,111	0,044	0,060	0,102	0,109	0,080	0,036	0,177	0,266	0,226	1,000

Principal component analyses

Principal components/correlation

Number of obs = 552
 Number of comp. = 16
 Trace = 16
 Rho = 1.0000

Rotation: (unrotated = principal)

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	2.50085	1.08028	<u>0.1563</u>	0.1563
Comp2	1.42057	.125013	0.0888	0.2451
Comp3	1.29556	.134764	0.0810	0.3261
Comp4	1.16079	.0348535	0.0725	0.3986
Comp5	1.12594	.0775331	0.0704	0.4690
Comp6	1.04841	.102127	0.0655	0.5345
Comp7	.946278	.0652559	0.0591	0.5936
Comp8	.881022	.0177818	0.0551	0.6487
Comp9	.86324	.0451016	0.0540	0.7027
Comp10	.818139	.0636167	0.0511	0.7538
Comp11	.754522	.0280536	0.0472	0.8010
Comp12	.726468	.0719412	0.0454	0.8464
Comp13	.654527	.00993145	0.0409	0.8873
Comp14	.644596	.0408269	0.0403	0.9276
Comp15	.603769	.0484367	0.0377	0.9653
Comp16	.555332	.	0.0347	1.0000

APPENDIX 7:

Correlation between variables that statistically significant except benefits dummies

	chemical and petrochemical industry	building materials industry	close joint stock enterprise	open joint stock enterprise	Share of exported sales	Share of short-timed workers	Share of vacancies	Number of workers	Number of workerrs released, being employes	Number of workerrs released, being unskilled	Presence of difficulty to pay wages in last 12month	Development of social policy belongs to both (trade union and administration)	Collective agreement covers output norm	Main type of subcontract: Production of technological equipment
chemical and petrochemical industry	1													
building materials industry	-0,0455	1												
close joint stock enterprise	-0,1094	0,175	1											
open joint stock enterprise	-0,0183	-0,0734	-0,3974	1										
Share of exported sales	0,0412	-0,1047	0,0964	0,0202	1									
Share of short-timed workers	0,0749	-0,0454	-0,0806	0,0314	0,108	1								
Share of vacancies	0,025	-0,0446	-0,0539	0,0496	0,107	-0,0075	1							
Number of workers	0,0314	-0,0369	-0,136	0,1169	0,2114	0,089	0,4529	1						
Number of workerrs released, being employes	-0,0006	-0,0357	-0,0463	-0,0293	0,0496	0,0759	0,0783	0,2152	1					
Number of workerrs released, being unskilled	0,0803	-0,0428	-0,1301	0,1142	0,0694	0,0861	0,0534	0,2605	0,1635	1				
Presence of difficulty to pay wages in last 12month	0,0324	0,068	-0,0833	-0,0299	0,0064	0,0916	-0,0831	0,0381	0,1111	0,0358	1			
Development of social policy belongs to both (trade union and administration)	-0,0344	0,0016	0,0843	0,144	0,0103	0,0854	0,0866	0,0527	0,0234	0,0601	0,0637	1		
Collective agreement covers output norm	0,0344	0,0344	-0,0508	-0,1047	0,0372	0,1465	0,0639	0,0793	0,0847	-0,0329	0,0336	0,1008	1	
Main type of subcontract: Production of technological equipment	-0,0929	-0,0395	-0,0782	0,0394	-0,0967	-0,1218	0,0028	-0,1495	-0,0541	-0,0878	-0,0426	0,0326	-0,1027	1