

TRADE LIBERALIZATION
AND UKRAINIAN
HOUSEHOLDS: TARIFF
PASS-THROUGH AND
CONSUMPTION EFFECT

by

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Abstract

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The current study attempts to investigate the mechanism of how import tariffs are transmitted to domestic prices on the household level and estimate the consumption effect of the Ukrainian trade liberalization process over the last nine years. Moreover, we endeavor to predict the consumption effect in case of the Customs Union accession of Ukraine and the subsequent import tariffs increase.

The empirical results show statistically significant evidence of the imperfect pass-through of import tariffs. Furthermore, we reveal 4% positive consumption effect of the preceding trade liberalization initiatives and predict 7% negative effect in case of the Customs Union accession. In terms of the household differentiation, the study finds urban and high-expenditure households to benefit from the trade liberalization over the rural and low-expenditure ones.

TABLE OF CONTENTS

<i>Chapter 1: INTRODUCTION</i>	1
<i>Chapter 2: LITERATURE REVIEW</i>	4
<i>Chapter 3: METHODOLOGY</i>	9
3.1 Theoretical background	9
3.2 Empirical framework.....	10
<i>Chapter 4: DATA DESCRIPTION</i>	13
<i>Chapter 5: EMPIRICAL RESULTS</i>	15
5.1 Tariff pass-through	15
5.2 Consumption Effect estimation.....	16
5.3 Policy Experiment.....	18
<i>Chapter 6: CONCLUSIONS</i>	20
6.1 Limitations and further research	21
WORKS CITED	23
TABLES	24

LIST OF TABLES

<i>Number</i>	<i>Page</i>
Table 1. Step 1 Variables used and data sources	24
Table 2. Step 2 Variables used and data sources	24
Table 3. Descriptive statistics of the Step 1 dataset.....	25
Table 4. Descriptive statistics of the Step 2 dataset.....	26
Table 5. Tariff pass-through estimation regression results.....	28
Table 6. Average consumption effects by region.....	30
Table 7. Average consumption effect by residency type	30
Table 8. Average consumption effect by expenditure level	31
Table 9. Average consumption effect due to the Customs Union accession.....	31

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Chapter 1

INTRODUCTION

On May 2008 Ukraine became a 152nd member of the World Trade Organization. Since then, the majority of export/import tariffs, quotas and other regulations have been reconsidered. Even before the accession, there was a huge speculation among politicians and social scientists about the WTO membership of Ukraine since the very fact that the WTO changes actual pattern of trade raised serious doubts in the minds of a number of economists (Rose 2004). Four years have passed, and still, there is no definite answer. In 2012 Ukrainian authorities took course on the reconsideration of more than three hundred tariff lines, which caused concern among our European trade partners and USA.

Moreover, in 2012 European Union and Ukraine finished their negotiations on creating of Deep and Comprehensive Free Trade Agreement (DCFTA), which implies even broader trade liberalization. As was the case with the WTO accession, Europe-oriented specialists predict significant improvements for national our economy (Dabrowski 2012). For now, FTA-process has been suspended by European Union due to “political freedom issues” in Ukraine but still remains a possibility in the future. On the other hand, Ukraine is under political pressure from its Eastern trade partners which will presumably benefit from Ukraine’s accession to the Customs Union with Russia, Belarus and Kazakhstan.

In a complex set of these events, the actual effect of trade liberalization on Ukrainian households has never been distinguished. The estimation of this effect is particularly important since the assumed positive correlation between trade liberalization and household’s welfare is still in doubt as country specific

conditions may lead to a significant variation in policy outcomes. While several authors find the evidence of reduced poverty (Marchand 2011), others report a substantial increase in income inequality (Nicita 2009). Moreover, as it is shown in Borraz (2012), two countries might experience almost opposite effects in terms of welfare improvement subjected to the same trade liberalization policy (Mercosur agreement). Withal, there is a noticeable gap in the literature exploring the mechanism of tariff changes impact on prices at the household level and corresponding expenditures redistribution among high- and low- income households.

Therefore, the aim of this study is to try to determine how the ongoing WTO accession process and other trade liberalization initiatives affect Ukrainian household's consumption patterns and welfare. We employ the two-step model to estimate the tariff pass-through and then derive the consumption effect for the considered groups of goods using Household Budget Survey, COMTRADE and Ukrainian Statistics Office data. We try to determine how tariffs influence prices and to which extent Ukrainian households are actually isolated from the trade reforms.

Therefore, this study has the following specific objectives: Firstly, we use the latest methodology (Porto (2006) in Marchand's (2011) variation) and household level data to determine how border prices are actually transmitted to consumers. Subsequently, we determine how the trade policy induced price changes affected people's welfare in Ukraine by estimating consumption effect for the households. Finally, we answer to the widely discussed and speculative question if consumers actually benefited from the trade liberalization process in Ukraine.

The results show statistically significant evidences of the imperfect pass-through. Moreover, pass-through elasticity coefficient is found to be low comparing with the corresponding studies in the other countries. This fact is explained by a number market imperfections and the nature of Ukrainian

trade liberalization. The consumption effect associated with the trade liberalization initiatives is predicted to be nearly 4% which lead us to the conclusion that average Ukrainian household does not largely benefit from the trade liberalization initiatives of the last nine years.

This study is structured as follows. In Chapter 2 we consider the influential literature on the topic. Chapter 3 provides both theoretical background and an empirical strategy for our research. Chapter 4 is devoted to the data description. Chapter 5 discusses the results of the study while Chapter 6 provides the main conclusions and our suggestions for the further research.

Chapter 2

LITERATURE REVIEW

In this section I will cover the most substantial body of literature on the welfare and distributional effects of trade liberalization and will trace the evolutionary changes of methodological approaches on this matter. There is no extensive literature on this topic, especially when it comes to the case of Ukraine and other transition countries. Most of the modern studies are based upon general equilibrium model and household level data analysis.

One of the first approaches to connect the commodity price policy changes and household's consumption patterns is suggested by Deaton (1989). The author uses household survey data in order to investigate distributional effects of the rice price increase in Thailand. A non-parametric estimation approach is applied to explore the relation of price changes and household's consumption to production patterns in the context of household's income and geographical differentiation. In this seminal paper Deaton claims that there is a strong areas beneficial effect in poor and rural Thailand.

The recent papers on the topic attempt to relax some of the previous assumptions and apply new methods building upon Deaton's work. Thereby, Friedman and Levinsohn (2001) provide methodology to evaluate Indonesian crisis impact on household's welfare using Deaton's suggestions on elasticity estimation, which involve only household's cross-sectional information. The authors report that poor households need to earn less to support the preceding level of consumption.

In another extension of Deaton's model, Porto (2006) develops a two-step model to connect tariff changes and households welfare through consumption and labor impacts. The first step is to determine how trade

policies affect prices. The second is to compute compensating variations since prices and, in their turn, affect households as consumers. Following Deaton (1989) he estimates average welfare effects along per capita income distribution to measure consumption effect of traded goods. The main advantage of the approach is that it sets up a general equilibrium model and takes into account some additional factors, such as non-traded goods). Therefore, the application of this methodology allows the author to make general conclusions about trade liberalization effects on welfare. In the study exploring Mercosur free-trade agreement effects in Argentina he discovers that poor- and middle- income families benefited over the rich from the reform. Consequently, Porto concludes that such trade agreements could positively influence poverty. However, the results of the model rely heavily on both traded and non-traded goods price elasticity's and tariff pass-through to domestic prices, which are hardly observable characteristics as is mentioned in Goldberg (2007). Moreover, the main shortcoming of Porto's model is the unit pass-through elasticity assumption which is unrealistic under the imperfect competition and large country case (Marchand, 2011). That is to say, that in real life the tariff change is unlikely to transmit to domestic prices completely.

Despite all the disadvantages and difficulties in application, the original model developed by Porto (2006) is still popular. The latest research using his approach is done by Borraz (2012). This study is of a particular interest since it compares Mercosur policy effects in Paraguay and Uruguay. Empirical results of the research confirm that trade liberalization effects vary between income groups and geographical locations, but the most important finding is that the effect is the opposite for these two countries. While Uruguay clearly benefits from trade in terms of poverty reduction, Paraguay does not seem to show any positive changes. This fact leads authors to a valuable conclusion that trade agreements may not necessarily imply welfare-improving consequences.

An alternative methodology of trade policy impact estimation is provided by Topalova (2010). The main idea of her approach is to compare wage and income effects in different country areas. The author assumes that regions, which are relatively more liberalized in terms of trade, should experience income inequality reduction and increase in wages. However, empirical results do not confirm a significant reallocation of factors and poverty reduction even for the areas which are directly affected by the policies. Although Topalova revealed strong connections between belonging to a certain occupational group and trade liberalization benefits, the overall effect is not explained.

The later work by Nicita (2009) further improves Porto's model by developing an imperfect tariff pass-through estimation model. Using this extended approach, the author studies Mexican trade liberalization. Nicita claims that tariffs reduction effects vary by region and distance to the United States border. This assumption is rather plausible since the US is the main trade partner for Mexico. The author concludes that high income households gained relatively more than other groups (low and average income). Also, Mexican states, which are situated near the United States border, are proved to have higher pass-through elasticity's. Nicita concludes that despite overall benefits for the economy, the social inequality in the country has actually increased as a result of North American Free Trade Agreement.

Being one of the latest works on the topic, Marchand (2011) conducts a trade liberalization impact research for India relying on the methods by Porto (2006) and Nicita (2009). One of the main improvements in the Marchand's work is the consumption effects estimation, which links tariff reduction and expenditure share of a given commodity. Intuitively, tariff reductions would affect highly demanded goods more heavily in terms of prices. In his analysis, Marchand founds that poor families benefited from liberalization more as opposed to Nicita who claims pro-medium household effect. As well, the

author confirms previously made assumptions that pass-through elasticity differs within the country from region to region. It's worth noticing that urban areas are found to be more influenced by trade liberalization than rural.

In one of the few papers on transition countries, Rutherford et al (2005) employ computable general equilibrium model and micro-level data to investigate income and distributional effects for Russian households due to WTO accession. The author's estimated that all types of households will benefit from trade liberalization through FDI barriers abolition effects and endogenous productivity increase from tariff reduction.

Some important information on income distribution in Ukraine is given in Bruck et al. (2007). Although the authors find decreasing income inequality, there is a significant spatial differentiation across households: urban area dwellers are usually richer than rural ones. Moreover, Eastern region households are found to gain more during transition than their fellow citizen. These findings correlate with the above results and provide us with some valuable context for consumption effect estimation.

In summary, we can say that the majority of recent researchers report that tariff changes have heterogeneous effects on households in terms of their income level and geographical location. Moreover, the assumption of imperfect tariff pass-through is confirmed for all country-cases. Therefore, we can make two important conclusions:

1. Due to the imperfect tariffs pass-through households do not experience a full effect of trade liberalization.
2. Trade liberalization does not necessarily lead to valuable welfare improvements in general.

This study extends and complements the previous researches by investigating the two above conclusions in relation to Ukrainian trade liberalization process

while employing micro-level expenditure data from Household Budget Surveys.

The Ukrainian case is of a particular interest because the major financial crisis hit Ukraine the same year the country joined the WTO. Until today, Ukrainian imports are growing faster than exports while exports represent 50% of the national GDP. Banking sector is still weak although oriented to consumer credit and real estate. We track how prices are transmitted to local markets in case of relatively small tariff reduction in the context of transition economy and widespread customs corruption. Moreover, we try to estimate how complex and largely politically driven trade liberalization process influences households' consumption patterns.

Chapter 3

METHODOLOGY

3.1 Theoretical background

The main theoretical approach follows Porto (2006). We consider a small open economy where household's indirect utility is based on two main factors: income and goods consumption (both traded and non-traded).

$$u_h = f_h(y_h, p_T, p_{NT}), \quad (1)$$

where y_h stands for households income, p_T and p_{NT} are prices of traded and non-traded goods.

Totally differentiating and dividing by y_h the above function, we receive:

$$\frac{du_h}{y_h} = \theta_w^h \frac{dw_h}{w_h} - \sum_{NT} \theta_{NT}^h \frac{dp_{NT}}{p_{NT}} - \sum_T \theta_T^h \frac{dp_T}{p_T} \quad (2)$$

The first and the second term represent wage income and consumption of non-traded goods correspondingly. However, in this work we consider the last term, which stands for consumption effect of traded goods. $\theta_T^h = \frac{p_T c_T^h}{y_h}$ is the share of income spent on traded goods. Therefore, the effect of price change (due to reconsidered trade policies) on household's welfare depends on the exposure of this particular good (group of goods) in household's budget (Marchand, 2011). Moreover, we expect the market imperfections to influence the price transmission process, i.e. we assume imperfect pass-through.

Earlier we stated that Ukraine is considered to be a small open economy. Thus, the domestic price can be presented as a function of world prices, tariffs, exchange rate to liquid currencies and some other trade costs.

$$p_{d,t} = \varphi(p_{w,t}, \tau_t, e_t, TC) \quad (3)$$

Considering these factors we can estimate the consumption effect of trade liberalization adjusted for price transmission imperfections by employing the following empirical strategy.

3.2 Empirical framework

Step 1 Computation of the impact of tariff changes on average domestic prices for different groups of goods, i.e. pass-through elasticity. At this step we are going to depart from macro models of pass-through elasticity estimation considered in the literature above and use the micro-level approach to get more accurate results.

Originally, the literature treats domestic prices as a dependent variable while tariffs, world prices and commodity group dummies are explanatory variables. However, official commodity level prices data is unreachable. Therefore, we proxy prices with a Consumer Price Index as the level of prices indicator and take differences on the right side to account for this modification.

Resulting specification of Porto-Marchand model is as follows:

$$\ln CPI_{it} = \beta_0 + \beta_1 * \Delta \ln(1 + \tau_{it}) + \beta_2 * \Delta \ln(p_{it}^w) + \beta_3 * \gamma_k + \quad (4) \\ + \beta_4 * \eta_i + \varepsilon_{it},$$

where CPI_{it} is the consumer price index of the commodity group i' imported at period (year) t while p_{it}^w represent world prices. τ_{it} indicates tariff on the commodity group i imported at period (year) t . γ_k and η_i are vectors representing measurement unit and commodity group dummies correspondingly. Converting CPI in prices and presenting the right side without differences of the equation (4), we obtain:

$$\ln CPI_{it} = \beta_0 + \beta_1 * \ln\left(\frac{1+\tau_{it}}{1+\tau_{it-1}}\right) + \beta_2 * \ln\left(\frac{p_{it}^w}{p_{it-1}^w}\right) + \beta_3 * \gamma_k + \beta_4 * \eta_i + \varepsilon_{it} \quad (5)$$

$$\ln CPI_{it} = \beta_0 + * \ln\left(\frac{1 + \tau_{it}}{1 + \tau_{it-1}}\right) + \beta_2 * \ln\left(\frac{p_{it}^w}{p_{it-1}^w}\right) + \beta_3 * \gamma_k + \beta_4 * \eta_i + \varepsilon_{it} \quad (6)$$

$$\ln\left(\frac{p_{it}}{p_{it-1}} - 1\right) = \beta_0 + \beta_1 * \ln\left(\frac{1 + \tau_{it}}{1 + \tau_{it-1}}\right) + \beta_2 * \ln\left(\frac{p_{it}^w}{p_{it-1}^w}\right) + \beta_3 * \gamma_k + \beta_4 * \eta_i + \varepsilon_{it} \quad (7)$$

Therefore, β_1 represents the expected relative increase in prices due to rise in tariffs, which stands for tariff pass-through elasticity.

Step 2 In our model, an impact on welfare is determined by the consumption effect. The consumption effect estimation follows Porto's (2006) model in Marchand's (2011) variation:

$$CE_h = -\sum_{it} \theta_{it}^h * dp_{it} = -\sum_{it} \theta_{it}^h * \Delta\tau_{it} * \beta_1, \quad (8)$$

¹ For the explanation on i please see Data description section

Where θ_i^h is expenditure shares of traded groups of goods in a household's budget. dp_i goes for change in tariffs multiplied by pass-through elasticity (β_1).

World prices in our model are exogenous since Ukraine is assumed to be a small economy in our model. Therefore, simultaneity and endogeneity biases of world prices are not expected. However, we might expect unobserved endogeneity since political interest, large trade players lobbying and other unobserved factors may influence tariffs, which might lead to overestimation of the pass-through effect. Tariffs are endogeneously set and influenced by various unobserved and complex factors (Grossman 1994) which are not modeled in this particular study. Thus, we assume tariffs to be exogenous.

Chapter 4

DATA DESCRIPTION

This study mainly uses three sources of data: Consumer Price Index data, which is provided by Ukrainian Statistics Office, UN COMTRADE data on world trade flows and tariffs and Ukrainian Household Budget Survey 2002-2011. CPI dataset contains the information on goods commonly used by the majority of households, which are actively traded: primarily food products, apparel and domestic compliances. We have chosen these particular groups of goods since they are the basis of the general consumption basket and can be easily corresponded to the household expenditure data from the Household Budget Survey. In addition, HBS provides us with necessary demographic data, such as residency and different household characteristics. World prices and correspondent import tariffs are obtained from the UN COMTRADE database.

The dataset for Step 1 was built in the following manner: We augment COMTRADE “world price and tariff” data presented in Harmonization System Codes nomenclature with the correspondent CPIs published by the Ukrainian Statistics Office (see Table 1). Average prices were calculated as a ratio of trade value in thousands of dollars and quantity of units of the goods traded. Moreover, we included the commodity group and commodity unit dummies to control for categorical effects. The descriptive statistics is presented in Table 3 in detail.

Composing the dataset for the Step 2 estimations we combined the expenditure share data with the tariff reductions for every commodity group considered in the study and the pass-through elasticity calculated at the previous step (see Table 2).

For the expenditure share data we used Household Budget Survey conducted in 2011 since it contains the representative information on the expenditures concerning the majority of commodity groups, which are commonly consumed by an average Ukrainian household. As it is evidential from the expenditure shares data (see Table 4), an average Ukrainian household spend the significant part of its income on food products and apparel. Nearly 25% of respondents report a purchase of household appliances while only a few families from 10 thousands report a vehicle purchase. Other expenses are due utility payments and some non-traded goods, which are not considered in this study. Therefore, the average expenditure share value reported in Table 4 show that we account for more than half of every household's expenditures which represent the main part of expenses associated with traded goods.

Tariff reduction data are aggregated and calculated manually from the first dataset, which contains COMTARDE data on tariffs. The reduction in tariff variable is calculated as the difference between average tariffs in 2003 and 2011 for every commodity group considered.

Chapter 5

EMPIRICAL RESULTS

5.1 Tariff pass-through

After applying the methodology discussed above we have come to the following conclusion: the trade policy changes are not perfectly transmitted to the domestic level prices. Following Nicita (2009) and Marchand (2011) we found statistically significant evidences of the imperfect tariff pass-through (see Table 5).

The first two specifications show both statistically and economically significant results, which are comparable with other author's findings in terms of the effect direction, its magnitude and the model's predictability. We estimated that doubling up the tariff would lead to the expected 14% increase in CPI, which means the increase in prices. Therefore, the 100% reduction in tariff might lead to lowering the prices by nearly 14%. On the other hand, the border price annual fluctuations do not significantly influence CPI (see Table 5).

The results are relatively low comparing with the findings in other countries. Such small pass-through elasticity could be explained by the nature of Ukrainian trade liberalization. In 2002, import tariffs on the main commodity groups, which are commonly used by households, were already lower than pre-liberalization tariffs in countries considered in the literature (India, Mexico, and Argentina). Moreover, the reduction in given Ukrainian import tariffs was not significantly large. Therefore, we might observe a "menu price" effect, which in our case means that the magnitude of tariff cost reduction was not sufficient to affect domestic prices significantly. The second main

reason for relatively low tariff pass-through elasticity is that Ukrainian market is imperfect and characterized by a number of shadow factors connected with trade such as customs corruption. These facts lead us to the important conclusion that trade liberalization initiatives in Ukraine over the last eight years does not largely affect domestic level prices.

5.2 Consumption Effect Estimation

In this section we consider the consumption effect of trade liberalization on Ukrainian households across different regions of the country. We do not allow for substitution between commodities and assume that the consumption basket is fixed.

Hereby, we calculate the consumption effect of every commodity group to estimate its impact on every household's consumption pattern. Each commodity group varies by the tariff reduction amount and its share in the total expenditure of any given household in the survey. The total consumption effect is presented as the sum of all commodity-level consumption effects and then aggregated across households. Moreover, we differentiate the consumption effect across Ukrainian regions and households residential type.

In the third and the fourth column of Table 6 we report the average consumption effects differentiated by regions and in total. In the third column we represent the results assuming the imperfect tariff pass-through. The pass-through elasticity is equated to the value we estimated earlier in Step1 ($\beta_1 = 0.14$).

The results show a relatively small consumption effect. An average increase in consumption of traded goods we associate with trade liberalization initiatives over the last eight years equals to 4% approximately. The small variation across regions can be explained by the fact we use the same pass-through

elasticity coefficient for all regional estimations. Obviously, employing region-level pass-through elasticity estimators would give us more accurate and diverse results concerning regional consumption effects. Unfortunately, the reliable regional level price data for Ukraine is unreachable. Nevertheless, it would not have a significant impact on the direction and magnitude of the country-level consumption effect.

Relaxing the imperfect pass-through assumption and setting the corresponding coefficient to unity, we obtain much more impressive results. Obviously, perfect tariff pass-through is unrealistic under competitive markets (Nicita 2009). Therefore, we found that expected 27% average increase in consumption of traded goods could be evidential in the absence of market imperfections and implicit corruption costs.

Differentiating the consumption effect across residential types (Table 7) we observe the consumption effect is relatively higher in big cities than in small towns and villages. It means that urban households benefited over the rural ones which confirms findings in other countries (Porto 2009, Marchand 2011, Nicita 2009).

Further, we differentiated households by the level of total per capita expenditures on traded goods (Table 8). Although reliable predictions on the magnitude of the consumption effect depending on the household income level are complicated, we can discuss how the effect changes along different expenditure levels. Considering Household Budget Survey, we decided to employ the expenditure data for this particular type of differentiation for the following reason: due to high income taxes, Ukrainian households tend to conceal the true level of income, which makes the income data somewhat inappropriate. Obviously, the same logic might be applicable for the expenditure data and yet we expect its figures to be more reliable.

The results presented in Table 8 show that the size of consumption effect rises with the total per capita annual expenditures. It means that presumably richer households (ones that demonstrate high expenditure levels) tend to spend more on the commodity groups considered in this study thus benefiting from the trade liberalization over the poor households.

Such observations cause concern about the reliability and representativeness of the Household Budget Survey. Normally richer households tend to save and invest large shares of their income while the poorer ones spend the most of their income on food and other necessities. The commodity groups considered in our study does not include luxury goods and large investments (real estate, deposits etc.), though we still observe richer households to spend larger shares of their income on the main commodities (such as food) than the poor ones. It could be explained by the two main factors: Firstly, data might be not representative due to the insignificant number of high-income households in the survey. The second argument is that the households do not report their true expenditures confirming our previous assumption.

5.3 Policy experiment

One of the main alternatives of current Ukrainian trade politics is the accession to Russia-Kazakhstan-Belarus Customs Union. The Union generally imposes relatively higher import tariffs to non-members, which causes the negative consumption effect in the acceding country. We decided to model the expected consumption effect of Ukrainian CU accession given the previously calculated tariff pass-through elasticity ($\beta_1 = 0.14$). Unfortunately, we cannot perfectly model the tariff pass-through of such trade policy change per se since the future trade data are unavailable.

The results (Table 9) show that the rise in tariffs due to the CU accession will lead to the expected 7% negative effect on consumption given the pass-through elasticity calculated. As can be seen from the table above, the effect

will be more imposing for big cities and presumably richer households. Though, there is no great variation of the effect between high- and low-expenditure households. Moreover, we should note that the noticeable tariff rise considered will result in significant price adjustment subsequently increasing pass-through elasticity. Therefore, a real negative consumption effect is expected to be even higher.

Chapter 6

CONCLUSIONS

In this thesis we consider import tariffs reduction transmission to consumer-level prices and corresponding changes in the Ukrainian households' consumption patterns.

We employ the detailed UN international trade data and information on prices provided by the National Statistics Office to estimate the ratio at which border prices correspond to household-level prices. We consider 19 commodity groups, which account for the main part of the expenditures of an average Ukrainian household. We found statistically significant evidence of the imperfect tariff pass-through. The resulting elasticity is relatively low comparing with findings in other countries. We assume the reasons to be market imperfections, implicit trade costs including customs corruption along with the insignificant reduction in tariffs per se. Therefore, domestic prices in Ukraine are not largely influenced by trade liberalization initiatives of the last nine years.

The Household Budget Surveys 2003-2011 provide us with the necessary expenditure and demographical data to analyze the consumption effect of the Ukrainian trade liberalization. We found nearly 4% increase in consumption associated with the tariffs reduction and predict 7% decrease in consumption in case of the Customs Union accession. The results are economically significant though relatively small comparing to other authors findings.

The main reason for that is rather low pass-through elasticity. Moreover, urban households are found to be more sensitive to the trade policy changes than the rural ones. Finally, we estimated high-expenditure households to

benefit from trade liberalization over the low-expenditure ones. Though, we assume these results to be doubtful due to the nature of the data.

Our policy experiment predicts 7% negative effect in case of accession to the Customs Union with Russia, Belarus and Kazakhstan. Moreover, we predict the given effect to be relatively more substantial for the urban areas than for the rural ones. These results confirm our previous conclusions that the urban areas in Ukraine are more sensitive to the trade policy changes in general. In terms of the expenditure level distribution, the effect is found to be almost the same for all expenditure-level groups. We observe that the consumption effect differences tend to mitigate with the increase in magnitude of the trade policy changes. Thus, the significant increase in tariffs due to the Customs Union accession may cause the inequality among households to rise.

Therefore, we claim to confirm our starting hypothesis that due to various market imperfections and shadow factors along with the nature of trade liberalization itself, an average Ukrainian household does not largely benefit from the preceding trade liberalization process in terms of traded goods consumption.

6.1 Limitations and further research

The main shortcoming of the present research is the Ukrainian price data limitations. Even after long negotiations, the Statistics Office refused to provide us with the commodity-level domestic prices. Moreover, they collect regional-level prices only for a very limited number of goods, which makes it impossible to differentiate pass-through elasticity coefficient across regions. On the other hand, the literature provides statistically significant evidences and strong argumentation of pass-through elasticity to vary across regions of the country (Nicita 2009, Marchand 2011). Such differentiation would enable us to get more accurate and diverse results of the consumption effect

estimation by using almost the same methodology, empirical mechanism and technical procedure.

It is also worth noting that the existence of reliable while significantly large Budget Survey would allow the researches to obtain much proper differentiation of the effect between rich and poor households.

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TABLES

Table 1. Variables used and data sources for Step 1 estimation

CPI of commodity group i in year t	Tariff for commodity group i in year t	World prices	Other controls
Average consumer price indices are reported by the Ukrainian Statistics Office	Tariffs for the chosen commodity groups are obtained from UN COMTRADE datasets	World prices on various groups of goods are presented in UN COMTRADE datasets	We introduce additional controls for the first regression such as exchange rates aggregated by year and industry specific trends

Table 2. Step 2 Variables used and data sources for Step 2 estimation

Expenditure share of commodity group i	β_1 (pass-through elasticity calculated in the previous step)	Change in tariffs for commodity group i between year t and first year of observations
Calculated from the Household Budget Survey Data as a group's share of total expenditures	Calculated at Step 1	Derived from Step 1 Dataset

Table 3. Descriptive statistics of the Step 1 dataset

Variable	Obs	Mean	Std. Dev.	Min	Max
Year	2988	2007	2.795181	2003	2011
Trade value	2988	10378	57508.34	.027	2081010
Quantity	2988	5827149	3.40e+07	1	1.40e+09
CPI	2988	105.985	13.93714	55.9	187.3
Tariff	2988	0.088	.0694961	0	1.2285
Average price	2988	0.440	3.557707	0.0000456	88.98499
Dummies					
Wheat flour	2988	0,001	0,031	0	1
Pasta	2988	0,005	0,070	0	1
Meat	2988	0,029	0,167	0	1
Fish	2988	0,097	0,296	0	1
Milk	2988	0,009	0,096	0	1
Cheese	2988	0,007	0,083	0	1
Eggs	2988	0,008	0,092	0	1
Butter	2988	0,001	0,031	0	1
Edible oils	2988	0,049	0,217	0	1
Edible animal fats	2988	0,006	0,079	0	1
Fruits	2988	0,068	0,251	0	1
Vegetables	2988	0,045	0,208	0	1
Sugar	2988	0,017	0,129	0	1
Confectionaries	2988	0,009	0,097	0	1
Coffee and tea	2988	0,016	0,126	0	1
Water, juices and soft drinks	2988	0,022	0,147	0	1
Alcohol	2988	0,015	0,124	0	1
Tobacco	2988	0,007	0,087	0	1
Apparel for man	2988	0,054	0,227	0	1
Apparel for woman	2988	0,095	0,293	0	1
Footwear	2988	0,061	0,24	0	1
Furniture	2988	0,068	0,252	0	1
Household textiles	2988	0,126	0,332	0	1
Item	2988	0,019	0,138	0	1
Area	2988	0,573	0,494	0	1

Table 4. Descriptive statistics of the Step 2 dataset

Variable	Observations	Mean	Std. Dev.	Min	Max
Total expenditures	10641	30730,32	19794,31	1445,675	218505,6
Total expenditure share of the commodity groups considered	10641	0.514	0.13	0.044	0.858
Tariff reductions					
Meat	10641	1,15	0	1,15	1,15
Fish	10641	1,04	0	1,04	1,04
Milk, eggs and cheese	10641	-1,08	0	-1,08	-1,08
Edible oils and fats	10641	-1,03	0	-1,03	-1,03
Fruits	10641	1,06	0	1,06	1,06
Vegetables	10641	1,02	0	1,02	1,02
Sugar and confectioneries	10641	1,19	0	1,19	1,19
Coffee, tea and cocoa	10641	-1,03	0	-1,03	-1,03
Mineral water and soft drinks	10641	1,14	0	1,14	1,14
Alcohol beverages	10641	1,15	0	1,15	1,15
Tobacco	10641	1,01	0	1,01	1,01
Apparel	10641	1,02	0	1,02	1,02
Footwear	10641	1,08	0	1,08	1,08
Furniture and floor coverings	10641	1,09	0	1,09	1,09
Household textile	10641	1,01	0	1,01	1,01
Household appliances	10641	1,06	0	1,06	1,06
Audiovisual, photography devices and data processing hardware	10641	1,05	0	1,05	1,05
Automobiles	10641	1,05	0	1,05	1,05
Motorcycles and bicycles	10641	1,01	0	1,01	1,01
Expenditures by commodity group (in HRN)					
	Observations	Mean	St.Dev.	Min	Max
Alcohol	6974	789	942,5284	19,5	10251,15
Tobacco	4174	1785	1507,868	22,75	17797

Table 4-Continued.

Expenditures by commodity group (in HRN)	Observations	Mean	St.Dev.	Min	Max
Apparel	9564	1515	1663,728	2	25610,32
Footwear	9389	932	900,807	4	11457,2
Furniture and floor coverings	1801	1311	2072,349	5	23000
Household textile	3132	252	281,9446	2	3500
Household appliances	2474	1095	1618,957	6	13100
Audiovisual, photography devices and data processing hardware	1312	1443	2151,79	4,65	14000
Meat	10503	3689	3119,037	30,355	41048,48
Fish	10472	1122	939,2929	5,97	9233,5
Milk, eggs and cheese	10207	2091	1568,02	7,8	16409,45
Edible oils and fats	10611	1625	978,4411	15,6	9517,85
Fruits	10105	1173	1188,867	6,5	15429,66
Vegetables	10444	1583	1400,769	6,11	16458,13
Sugar and confectioneries	10606	1501	1162,286	18,2	12851,55
Coffee, tea and cocoa	9895	740	657,2951	6,695	6521,125
Mineral water and soft drinks	8393	323	388,3229	3,6	4992,13
Automobiles	32	27681	28097,2	1700	112500
Motorcycles	17	3239	2278,932	220	7300
Bicycles	129	621	934,8874	7	8000

Table 5. Tariff pass-through estimation regression results

VARIABLES	(1)	(2)	(3)
		log of CPI	
Commodity group dummy	Yes	Yes	No
Measurement unit dummy	No	Yes	Yes
Delta log of world price	8.65e-05 (0.00215)	0.000102 (0.00215)	0.000531 (0.00233)
Delta log of tariff	0.139* (0.0825)	0.136^ (0.0826)	0.0488 (0.0868)
Wheat flour	0.0118 (0.0836)	0.0118 (0.0836)	
Pasta	-0.0322 (0.0582)	-0.0322 (0.0582)	
Meat	-0.0590 (0.0500)	-0.0590 (0.0500)	
Fish	-0.0613 (0.0503)	-0.0613 (0.0503)	
Milk	0.0225 (0.0545)	0.0225 (0.0545)	
Cheese	0.0386 (0.0418)	0.0386 (0.0418)	
Eggs	-0.0666 (0.0465)	-0.0666 (0.0465)	
Butter	0.0418 (0.0835)	0.0418 (0.0836)	
Edible oils	-0.0206 (0.0508)	-0.0206 (0.0508)	
Edible animal fats	0.166*** (0.0500)	0.166*** (0.0500)	
Fruits	0.0234 (0.0505)	0.0234 (0.0505)	
Vegetables	0.191*** (0.0508)	0.191*** (0.0508)	
Sugar	0.145*** (0.0524)	0.145*** (0.0524)	
Confectionaries	-0.0419 (0.0543)	-0.0419 (0.0543)	
Coffee and Tea	-0.0810 (0.0525)	-0.0810 (0.0526)	
Water, Juices and Soft Drinks	-0.0751 (0.0519)	-0.0805 (0.0523)	

Table 5-Continued.

VARIABLES	(1)	(2)	(3)
		Log of CPI	
Alcohol	-0.0343 (0.0528)	-0.0642 (0.0647)	
Tobacco	-0.0183 (0.0555)	-0.0184 (0.0555)	
Apparel for man	0.140*** (0.0507)	0.140*** (0.0516)	
Apparel for woman	0.142*** (0.0503)	0.142*** (0.0513)	
Footwear	0.137*** (0.0506)	0.138*** (0.0513)	
Furniture	-0.127** (0.0505)	-0.127** (0.0512)	
Household textiles	0.133*** (0.0502)	0.133*** (0.0502)	
Household appliances	0.139*** (0.0503)	0.140*** (0.0510)	
Vehicles	-0.118** (0.0516)	-0.118** (0.0525)	
Audiovisual and Data processing devices	0.175*** (0.0506)	0.175*** (0.0510)	
Item		0.0292 (0.0383)	0.0993*** (0.0172)
Area		0.000505 (0.00980)	0.0564*** (0.00475)
Constant	4.762*** (0.0499)	4.762*** (0.0508)	4.621*** (0.00372)
Observations	2,988	2,988	2,988
R-squared	0.203	0.204	0.050
Standard errors in parentheses			
*** p<0.01, ** p<0.05, *			
p<0.1, ^p<0.11			

Table 6. Average consumption effects by region

Region	Average Consumption Effect	
	Imperfect tariff pass-through	Perfect tariff pass-through
Total	0.037	0.27
Kyiv(region)	0.034	0.24
Kyiv(city)	0.038	0.28
Donetsk	0.041	0.29
Dnipropetrovs'k	0.037	0.26
Odessa	0.042	0.3
Crimea	0.04	0.29
Lviv	0.039	0.29
Ivano-Frankivs'k	0.038	0.27
Poltava	0.036	0.26

Table 7. Average consumption effect by residency type

Household's residential type	Average Consumption Effect	
	Imperfect tariff pass-through	Perfect tariff pass-through
Big city	0.04	0.29
Small town	0.036	0.26
Village	0.033	0.24

Table 8. Average consumption effect by expenditure level

Average Consumption Effect			
Household's expenditure level in 20-quntiles	Mean annual expenditures on traded goods(in HRN)	Imperfect tariff pass-through	Perfect tariff pass-through
1(Top 20%)	70815	0.044	0.31
2	41060	0.042	0.3
3	29765	0.039	0.28
4	21067	0.034	0.24
5(Bottom 20%)	12504	0.024	0.17

Table 9. Average consumption effect due to Customs Union accession

Average Consumption Effect		
Household's residential type	Imperfect tariff pass-through	Perfect tariff pass-through
Total	-0,067	-0,48
Big city	-0,074	-0,53
Small town	-0,072	-0,51
Village	-0,054	-0,39

Expenditure level in 20-quntiles	Imperfect tariff pass-through	Perfect tariff pass-through
Top 20%	-0,067	-0,48
Bottom 20%	-0.064	-0.46