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IMPACT ASSESSMENT OF A POTENTIAL FREE TRADE AGREEMENT BETWEEN UKRAINE AND TURKEY

NON-TECHNICAL SUMMARY

USAID - COMPETITIVE ECONOMY PROGRAM
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DISCLAIMER: The authors' views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

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USAID Competitive Economy Program (CEP) promotes a strong, diverse, and open economy of Ukraine by enhancing the business environment for small and medium enterprises (SMEs), improving competitiveness in promising industries, and enabling Ukrainian companies to benefit from international trade.

This Research Conducted by:



EXECUTIVE SUMMARY

We estimate that successful implementation of deep integration in the Ukraine-Turkey FTA (along with tariff elimination) would yield significant annual increases in real household incomes of Ukraine equal to 2.72 percent per annum.

The reduction of time in trade costs (or Trade Facilitation Measures) are among the most important reforms. The reduction of the time costs of trade would contribute 1.22 percent of real household income annually to the gains and is the largest component of the gains from the FTA. The time cost of trade is especially important for the food sector. Since Turkey is already a member of the European Union's "Common Transit System," to fully capitalize on the improved market access and increased trade offered by the FTA, Ukraine would benefit from its intended accession to this Common Transit System that includes as a component the New Computerized Transit System (NCTS).

Economy-wide output will increase but sector impacts are diverse. If all reforms are implemented reciprocally between Turkey and Ukraine, we estimate that real GDP would increase by 2.72 percent annually. Impacts across sectors are diverse. The four sectors with the largest increase in output are: dairy products, other food products, fruits and vegetables, and fats and oils. The sectors that are estimated to contract output the most are: electronic components, electric equipment and motors, wearing apparel, manufacture of machinery, manufacture of electric motors and equipment, and computer programming. Due to the very rapid growth of the computer programming sector in recent years, it should continue to grow for reasons independent of the Ukraine-Turkey FTA.

The annual gains would increase to 4.76 percent of household real income if, in addition to the Ukraine-Turkey FTA being implemented, the ad valorem equivalents of non-discriminatory barriers to investment in business services were reduced by 25 percent. Non-discriminatory barriers in business services are barriers that apply to both Ukrainian investors and to FDI. This is an additional annual increase of 2.04 percent of real household income due to increases in FDI and Ukrainian investment in business services. These results highlight the importance of continuing the momentum of reform in business services, not just for foreign investors, but also for Ukrainian investors in business services. The

large gains from the reduction of barriers to investment in business services are derived in significant part from our innovative model that incorporates endogenous productivity effects from additional varieties of goods or services supplied in imperfectly competitive sectors.

The estimated gains from the FTA compared to the social adjustment costs of labor are extremely high at more than 100 to 1. A social safety net is the optimal policy to alleviate the burden of adjustment on the most vulnerable of society. If no effective social safety net is in place, then sequential liberalization would reduce or eliminate most of the adjustment costs. The estimates of the reduced gains from sequential liberalization show very substantial losses in agriculture and food, significant losses in steel, but small losses in wearing apparel.

Our central model incorporates foreign direct investment and the considerable evidence of productivity gains from additional varieties of business services and goods supplied under conditions of imperfect competition. A conventional perfect competition model ignores these effects. The estimated gains are between 157 and 214 percent higher in the central model of this study compared to a perfect competition model.

The project has produced three studies of the ad valorem equivalents of barriers to trade which should facilitate subsequent trade policy analysis of Ukraine. These are: Kosse and Kravchuk (2020a) for the AVEs of both discriminatory and non-discriminatory barriers to foreign providers of services; Olekseyuk, Tarr and Movchan (2020) for AVEs of time in trade costs of Ukraine; and Movchan and Tarr (2020) for AVEs of non-tariff barriers in goods. Kosse and Kravchuk (2020b) have also produced estimates of the shares of the market captured by firms from the eight regions of our model.

The project has produced and 85-sector input output table for Ukraine. This expands on the 42-sector table publicly available prior to this project and it has also added a decomposition of labor into skilled and unskilled, multiple external regions and provides extensive data on taxes at the sector level. This dataset is documented in Movchan *et al.* (2020b).

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Abbreviations

AVE	ad valorem equivalent of a non-tariff barrier
DCFTA	Deep and Comprehensive Free Trade Agreement
EU	European Union
FDI	foreign direct investment
FTA	free trade agreement
FTR	region or group of countries with which Ukraine has a FTA
GATS	General Agreement on Trade in Services
MFN	most favored nation
NCTS	new computerized transit system
PTA	preferential trade agreement
SPS	sanitary and phyto-sanitary measures
TBTs	technical barriers to trade
USA	United States of America
WTO	World Trade Organization

1. Introduction

Ukraine and Turkey are negotiating a modern Free Trade Agreement (FTA). Modern FTAs go beyond narrow agreements on tariffs to include several aspects such as agreements on services including foreign direct investment (FDI) rights, non-tariff measures on goods, and measures that reduce the costs of transporting goods among the partners. When agreements include these kinds of additional components, they are referred to as “deep” agreements. Virtually all preferential trade agreements of the European Union and the United States are deep agreements, including the DCFTA between the European Union and Ukraine.

The Ukraine-Turkey FTA, in addition to tariffs, will impact:

- (i) non-tariff barriers on goods;
- (ii) barriers that increase the time costs of trade; and
- (iii) barriers on foreign providers of business services, including foreign direct investment (FDI).

As we explain in Box 1, deep integration is an important part of preferential trade agreements since there is considerable evidence that non-tariff trade costs are a greater obstacle to trade than tariffs for most countries. Arvis *et al.*, (2016, 469) estimate that two countries that are both members of a preferential trade agreement experience trade costs that are about 16 percent lower than countries that are not members. Mattoo *et al.*, (2017) find that the deep provisions of PTAs induce more trade creation than tariffs and that the deepening of PTAs does not appear to come at the expense of reduced trade with third countries.

To assess the Ukraine-Turkey Free Trade Agreement, the project develops a modern 45-sector small open economy computable general equilibrium model of Ukraine with seven external regions. The regions of the model are Ukraine, Turkey, the European Union, the Russian Federation, the United States, China, a region that includes the countries with which Ukraine has a FTA, and an aggregate Rest of the World. The report is non-technical summary of the full report by Movchan, Rutherford, Tarr and Yonezawa (2020a). Much more detailed results (both at the sector level and for aggregate variables) and documentation of the model is available there.

Box 1:**Non-tariff Trade Costs are a Larger Barrier to Trade than Tariffs in Most Countries**

Deep integration is an important part of preferential trade agreements since there is considerable evidence that trade costs other than tariffs are a greater obstacle to trade than tariffs for most countries.

Time in Trade Costs. Hummels and Schaur (2013) show the costs of the time it takes to ship products internationally are greater than tariffs as an obstacle to trade for most countries. Measures to reduce these costs are called trade facilitation.

Non-Tariff Barriers on Goods. International estimates, Kee et al., (2009), including for Ukraine, have shown that the ad valorem equivalents of non-tariff barriers on goods are also typically larger than tariffs. The data show that while old-style non-tariff barriers on imports of goods, such as quotas, bans, and restrictive licensing have very substantially declined in international trade, product regulations and standards known as Sanitary and Phyto-Sanitary (SPS) regulations and Technical Barriers to Trade (TBTs) have significantly risen in importance as barriers to trade (Cadot and Gourdon, 2014).

Barriers to Foreign Direct Investment (FDI) in Services. Jafari and Tarr (2015) have also estimated that the ad valorem equivalents of “behind the border” barriers against FDI in services are a significant barrier to trade in most countries of the world, with ad valorem equivalents of services barriers usually higher than average tariffs.

In order to assess the deep integration aspects of the Ukraine-Turkey FTA, in addition to tariffs, the model also incorporates the ad valorem equivalents (AVEs) of:

- (i) non-tariff barriers on goods in both Ukraine and Turkey;
- (ii) barriers that increase the time costs of trade on imports and exports between Ukraine and all seven external regions; and
- (iii) barriers on foreign direct investment (FDI) and cross-border business services in Ukraine and Turkey.

Box 2:**What is an Ad Valorem Equivalent (AVE) of a Trade Barrier?**

Barriers come in many forms. Take the example of the time in trade barrier on imports from Turkey as an example. Suppose an imported product from Turkey sells for 1,000 UAH in Kyiv. If trucks must queue at the border for days or ships must queue in the harbor for days prior to unloading, capital and labor is used during that queuing by the trucking or shipping company. Shipping companies will require the manufacturer of the products to pay for these costs. In addition, longer delivery times will result in goods that may arrive spoiled or of less value to the buyer. Further, in order to deliver the goods, it is possible that unofficial payments must be made somewhere in route. Then the firms manufacturing the products will require higher prices for their products to cover these costs. As an example, these costs could be:

Cost to manufacture the product in foreign country	500 UAH
Insurance and documentation costs	100 UAH
Shipping Costs with efficient shipping services	100 UAH
Additional Shipping Costs due to barriers that cause delays	150 UAH
Additional production costs to compensate for lost value of product	125 UAH
Costs of unofficial payments	75 UAH
Total Costs to the Ukrainian buyer	1,000 UAH

The first three lines are costs that are not caused by barriers. The next three lines are costs that are due to the barriers. Then the AVE is:

$$\text{Ad Valorem Equivalent of the Barriers} = [150 + 125 + 75]/1,000 = 300/1,000 = 30\%.$$

There are two important extensions of the usual modeling features for this kind of analysis:

- (i) the central model goes beyond traditional perfect competition models to include foreign direct investment in business services; and
- (ii) the model includes some goods and services sectors that are modeled as imperfectly competitive.

These important extensions allow us to endogenously estimate the productivity effects of trade and FDI liberalization from additional varieties of

goods or services. We illustrate below from our results how additional varieties of imperfectly supplied business services in imperfectly competitive sectors lower the quality-adjusted costs of these services to their users and raise the productivity of firms using these goods or services.

As such, our model is consistent with both economic theory and the substantial and growing empirical literature showing that foreign direct investment and the wide availability of business services results in total factor productivity gains to the manufacturing sector and the economy broadly. Among other studies, this has been shown in an excellent study using Ukrainian firm-level data by Shepotylo and Vakhitov (2015).¹ Further, in goods sectors our model is consistent with the extensive literature, beginning with Coe and Helpman (1995) that has shown that the purchase of intermediate inputs from industrialized countries is an important mechanism for the transmission of R&D and productivity growth in developing countries.

A discussion of the methodology and implications of this style of model has been included in the Handbook of Computable General Equilibrium Modeling, see Tarr (2013). This style of model has successfully passed peer-review examination in multiple international scientific journals and has been successfully employed in several transition countries neighboring Ukraine, as well as elsewhere. This includes applications in the Russian Federation by Rutherford and Tarr (2008); in Kazakhstan by Jensen and Tarr (2008); in Armenia by Jensen and Tarr (2012); and in Belarus by Balistreri, Olekseyuk and Tarr (2017). There have also been two previous applications in Ukraine by Copenhagen Economics *et al.* (2005) and by the Institute for Economic Research and Policy Forecasting (2011). In Table 1, we exhibit the key results from these studies and what they included.

¹ It has also been shown to be true in studies using firm level data in India, the Czech Republic, Chile and Indonesia. See Arnold et al. (2011) for the Czech Republic, Fernandes and Paunov (2012) for Chile, Arnold et al. (2015) for India and Duggan et al. (2013) for Indonesia. See Francois and Hoekman (2010) for a survey of the theory and more than a dozen empirical studies that support this finding.

Table 1: Key results from similar studies

Country	Policy	Percent change in real household income
Armenia	Impact of the DCFTA with the EU	1.4 percent
Belarus	WTO Accession	9.9 percent
Kazakhstan	WTO Accession	6.7 percent
Russian Federation	WTO Accession	7.3 percent
Ukraine	WTO Accession	5.2 percent
Ukraine	Impact of the DCFTA with the EU	4.3 percent

Policy implemented:

Armenia	Preferential tariff reduction; preferential reduction of services barriers, time in trade costs and standards harmonization.
Belarus	Discriminatory and non-discriminatory barriers in services are reduced; some increased market access; reduction of agricultural support; and reduction of barriers to cross-border services.
Kazakhstan	Tariffs are reduced; FDI barriers are reduced; some improved market access on exports; and restructuring of local content policies.
Russian Federation	Tariffs are reduced; FDI barriers are reduced; some improved market access on exports.
Ukraine	Tariffs are reduced, FDI barriers are reduced; some improved market access on exports.
Ukraine	Preferential tariff reduction, reduction in non-tariff barriers to trade

The estimated gains in the WTO accession studies are typically larger than the estimated gains in the studies on the DCFTA. This is primarily because WTO accession involves liberalization with respect to more than 160 countries, while the DCFTA involves liberalization with respect to the countries of the European Union only. The gains from trade and FDI liberalization are magnified when barriers are reduced between a wider set of countries.

2. Key results

2.1. Impact of a successful completion of the Ukraine-Turkey FTA

To capture the deep integration elements of the Ukraine-Turkey FTA, the report decomposes the potential reforms of the FTA into nine components. The nine components and the percent changes in the AVEs of the barriers that we assume as part of the Ukraine-Turkey FTA are as follows:

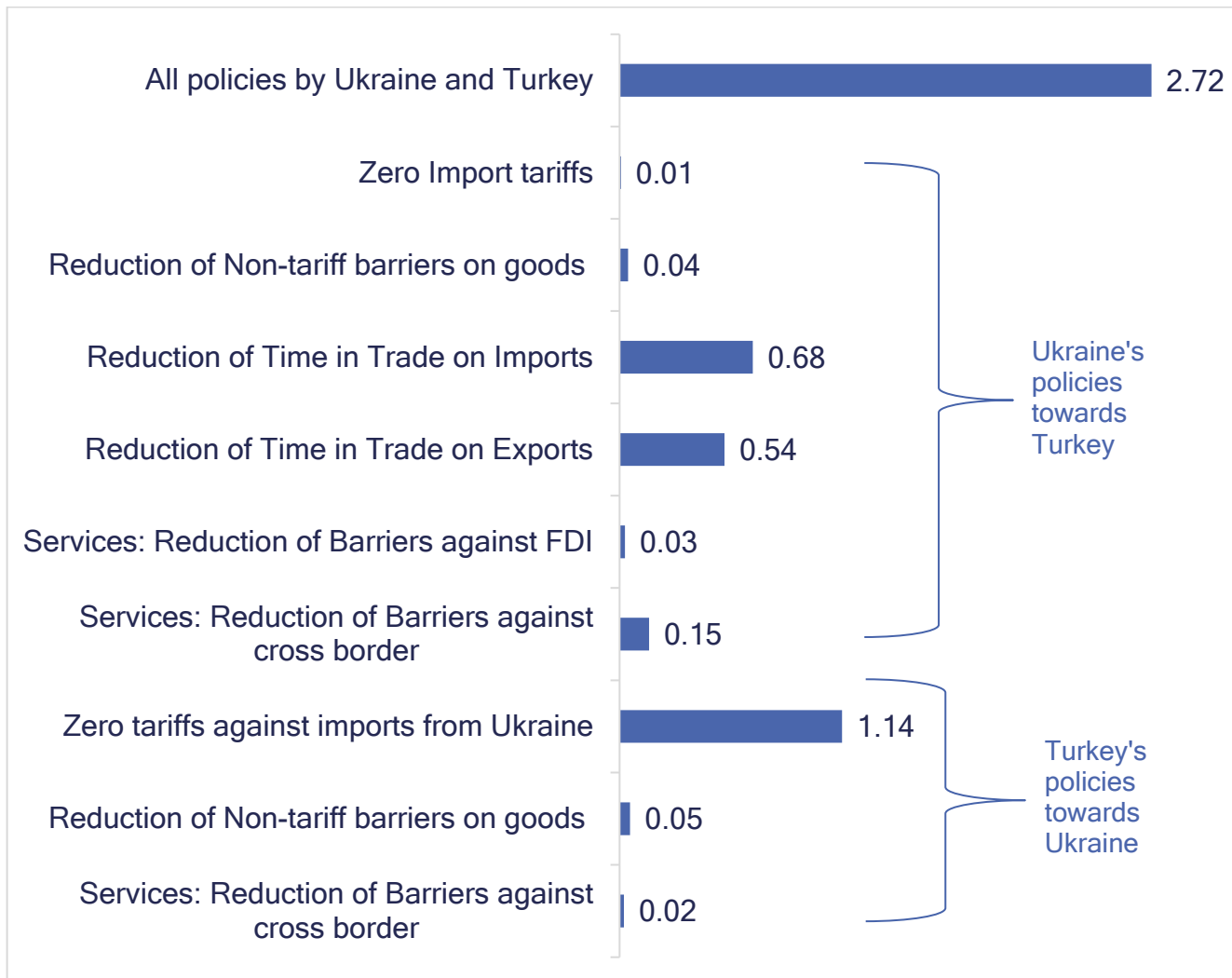
- (i) 20 percent reduction in AVEs of the time required to import goods into Ukraine from Turkey with a five percent cut in the AVEs for third countries;
- (ii) 20 percent reduction in AVEs of the time required to export goods from Ukraine to Turkey with a five percent cut in the AVEs for third countries;
- (iii) 20 percent reduction of Ukrainian AVEs of non-tariff barriers against imported goods from Turkey;
- (iv) 20 percent reduction of Turkish AVEs of its non-tariff barriers against Ukrainian goods destined for Turkey;
- (v) full elimination of tariffs by Ukraine on imports from Turkey;
- (vi) full elimination of tariffs by Turkey on imports from Ukraine;
- (vii) fifty percent reduction of the AVEs of Ukrainian barriers on foreign direct investment in business services by Turkish investors in Ukraine;
- (viii) fifty percent reduction of the AVEs of Ukrainian barriers on cross-border provision of services by Turkish providers of cross-border services;
- (ix) fifty percent reduction of the AVEs of Turkish barriers on cross-border provision of services by Ukrainian providers of cross-border services.

2.1.1 The Ukraine-Turkey FTA.


In the scenario called “FTA Central”, we evaluate the impacts on Ukraine of all nine components together. In order to assess which of the nine components of FTA Central are the most important to Ukraine, nine additional scenarios are executed. In these nine scenarios, each of the nine components of FTA Central is progressively executed independently, while the other reforms are unchanged. (Impacts on Turkey are not evaluated.)

In figure 1, we exhibit the results for the percent change in real household income for the ten scenarios.

FIGURE 1: Welfare gains of the FTA, percent change in real household income



Source: Model estimates.



The annual recurring gain to Ukraine from successful completion of the Ukraine-Turkey FTA would amount to 2.72 percent of Ukrainian real household income.

The estimate is that there would be an annual recurring gain to Ukraine of 2.72 percent of Ukrainian real household income from successful implementation of a Ukraine-Turkey FTA. This estimate is neither a growth rate nor a one-time gain. The welfare gains are presented as the change in real income of the representative Ukrainian household.² We discuss risks or caveats to these estimates at

the end of the summary report.

2.1.2 Reduction of Time in Trade Costs.

The reduction in time in trade costs constitute the largest share of the gains. The estimated gains are equal to 1.22 percent of the representative consumer's real income from the reduction of time in trade costs (0.68 percent from imports and 0.54 percent on exports).


Because reforms that reduce time in trade costs to partners inevitably spillover to third countries, at least partially, this is the one component of the FTA Central scenario that is not strictly preferential with Turkey. The five percent cut in the time in trade costs to third countries (with a 20 percent cut in trade with Turkey) partly explains the larger gains.

² In our model, this is equivalent to Hicksian equivalent variation as a percent of consumption.

Box 3:

Sources of the Gains from Reduction in Time in Trade Costs

1. Part of the gains from the reduction in time in trade costs derive from the fact that they consume capital and labor in the home country or impose costs on the home country users of the products—these are referred to as the “rents” of the barriers. For example, if trucks are stalled at the border or ships wait in the harbor to unload, capital and labor resources are used. These costs are equal to the ad valorem equivalent of the time in trade costs of the imported product (from a country) times the benchmark value of the imports; plus the time in trade costs of the exported product (to a country) times the benchmark value of the exports. Reduction of the time in trade costs by 20 percent on trade with Turkey and by 5 percent for third countries, leads to freeing up of 20 percent of the capital and labor devoted to overcoming the time costs of trade with Turkey on both imports and exports and five percent of the capital and labor devoted to overcoming the time costs of trade with third countries on both imports and exports. To provide concrete values for these estimates, table 25 of the main report shows that the rents that are recaptured on imports as a percent of domestic consumption are 0.35 percent of the benchmark value of household consumption and on exports they are 0.30 percent of the benchmark value of household consumption. These are referred to as “rectangles” of gains for each good because they are equal to the percent reduction in the AVE of the time in trade cost of the good times the value of the initial trade in the good.
2. In addition, the reduction of the time costs of trade results in an increase in the returns to exporting relative to domestic sales and a decrease in the cost of imports relative to domestic production. As consumers and firms reallocate sales and expenditure more toward exports and imports, this results in efficiency gains, referred to as “triangles” of efficiency gains from increased trade. Table 11 of the main report shows that aggregate exports increase due to the reduction in time in trade costs on exports by about 0.5 percent and by 0.8 percent due to time in trade cost reduction on imports. The depreciation of the real exchange rate from the reduction in the time in trade cost on imports leads to the expansion of exports.
3. The above two impacts occur in both purely perfectly competitive models and in our central model with imperfect competition. But a third and final component of the gains is due to our imperfect competition model. Additional varieties of goods, from both Ukrainian and foreign sources, lead to a reduction of the quality adjusted price of goods. This increases the real income of households directly and indirectly because it increases the productivity of Ukrainian firms that use goods whose price has declined, which leads to a further reduction in prices to households.



The reduction in time in trade costs constitute the largest share of the gains. The estimated gains are equal to 1.22 percent of the representative consumer's real income.

The time cost of trade is especially important for the food sector. Since Turkey is already a member of the European Union's "Common Transit System," to fully capitalize on the improved market access and increased trade offered by the FTA, Ukraine would benefit from its intended accession to the Common Transit System that includes as a component the New Computerized Transit System (NCTS).

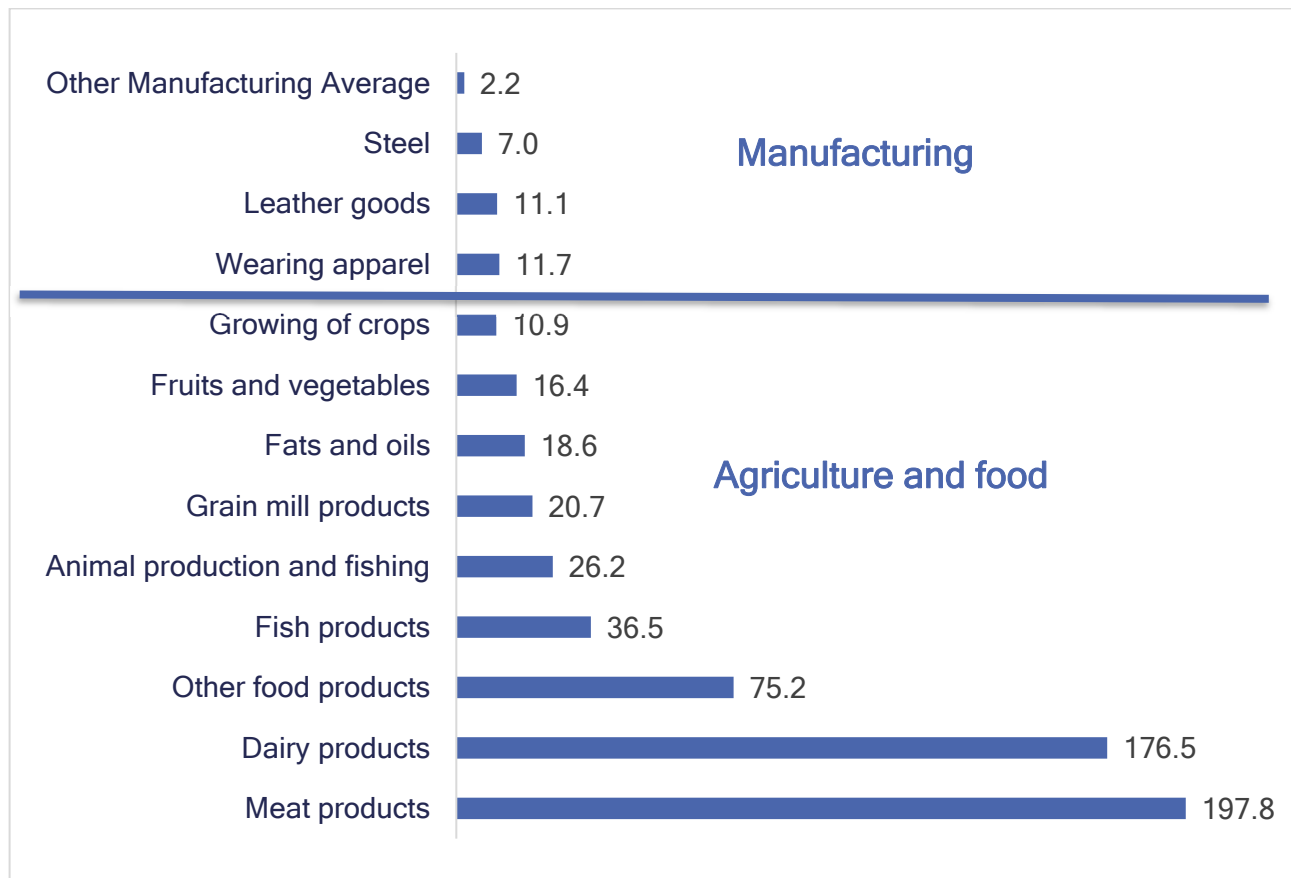
These estimates are possible due to a new and unique dataset of time in trade costs constructed for this project for Ukraine of the number of days in transit from Ukraine to 182 countries of the world. Combined with the dataset of Hummels and Schauer (2013) for the costs of one day of time in trade that vary by product, we generate estimates of the time in trade that vary by product and by the regions of our model. In the case of Turkey, which is relatively close compared with the USA or China, the AVEs tend to be small, since the number of days in transit is considerably less than for the USA or China. See Movchan *et al.* (2020a, table 10) for the estimates and Olekseyuk, Tarr and Movchan (2020) for the documentation.

2.1.3 Elimination of Tariffs Between Ukraine and Turkey.

We decompose reciprocal elimination of tariffs between Turkey and Ukraine into its two components: Turkey's elimination of tariffs against Ukrainian exports to Turkey and Ukraine's elimination of tariffs against imports from Turkey.

On the one hand, Ukraine is estimated to gain 1.14 percent of real household income from the elimination of tariffs against Ukrainian exporters. That is, improved market access that Ukrainian exporters obtain in the Turkish market from Turkey's preferential elimination of its own substantial tariffs leads to substantial gains to Ukrainian exporters.

Figure 2: Turkey's tariffs on Ukrainian exports in percent



Source: WITS

As Figure 2 shows, there are several agricultural and food products where Turkey's tariffs on the product mix of Ukraine's exports are extraordinarily high, especially on the mix of products exported by Ukraine to Turkey. The very high tariffs are: meat (198 percent); dairy (176 percent); and other food products (75 percent).³

On the other hand, Turkey's tariffs on Ukrainian exports of manufactured goods are only an average 2.2 percent apart from textiles, (11.7 percent), leather products (11.1 percent) and steel (7 percent). The stark contrast in Turkey's tariff on agriculture and food products compared to agriculture is partly explained by the fact that Turkey is in a Customs Union with the European Union on

³ On these product groups, Turkey's most favored nation (MFN) tariff is considerably lower, reflecting that the products Ukraine exports to Turkey within these product categories is on products with higher tariffs within the group..



Improved market access to Turkey thanks to the preferential elimination of high Turkish tariffs leads to substantial gains to Ukrainian exporters.

manufactured goods. But agriculture and food tariffs are not unified between Turkey and the European Union.

If Turkey were to eliminate its agriculture and food tariffs against Ukrainian exports, Ukrainian producers would obtain higher prices for their products in Turkey, contributing to larger Ukrainian incomes. We estimate in Movchan *et al.* (2020a) that Ukraine would

substantially expand its exports in these sectors due to Turkish tariff removal: the estimated export expansion from the removal of Turkish tariffs is: meat (74 percent); dairy (154 percent); and other food products (48 percent).

On the other hand, we do estimate very small gains to Ukraine from the preferential reduction of its own tariffs on imports from Turkey. This is because preferential liberalization of tariffs is not free trade. It involves gains from the expansion of trade with the preferred trade partner (known as trade creation), but typically leads to a contraction of trade with excluded partners who face increased competition from the preferred trade partner. The loss of trade with the third country trade partners is known as trade diversion and this leads to a welfare loss that can be approximated by the lost tariff revenue for the lost trade with third countries. Movchan *et al.* (2020a) estimate that Ukraine's preferential elimination of tariffs against Turkey would lead to a reduction of imports from third countries by 0.4 percent and a loss of tariff revenue of 1.3 percent. The quantitative assessment from the model is that the gains from Ukrainian unilateral preferential tariff elimination toward Turkey lead to very small gains in welfare. But reciprocal preferential tariff elimination with Turkey would result in gains due to the improved market access in Turkey for Ukrainian exporters.

2.1.4 Reduction of Non-Tariff Barriers on Goods.

The estimates are that the gains from the reciprocal reduction of non-tariff measures on goods between Turkey and Ukraine are equal to 0.09 percent of consumption. These gains are approximately evenly divided between:

- (i) gains from Ukrainian preferential reduction of non-tariff measures against imports of Turkish goods (0.04 percent of real household income); and
- (ii) improved market access for Ukrainian exports in Turkey from the reduction by Turkey of its non-tariff measures against Ukrainian exports of goods (0.05 percent gain in real household income).

The main reason that the gains are not large is that the estimates of the ad valorem equivalents of the non-tariff measures in both Turkey and Ukraine are small. See Box 4 for Ukraine. Turkey has also harmonized its product safety regulations and standards with the European Union on manufactured goods, although not yet on agricultural goods.

Box 4:

Significant Reduction in the Cost of Ukrainian Non-Tariff Measures on Goods since Independence

As with other WTO members, the use of overt command and control non-tariff barriers such as quotas, import bans or licenses have largely vanished in Ukraine, except on WTO allowed products, like arms or hazardous materials. It took Ukraine about 25 years to arrive at a modern market-based system of product safety regulations and standards that do not discriminate against imports or do not hinder Ukrainian business. The product regulation and standards regime for safety have very much evolved for the better. Initially the product safety regime was inherited from the Soviet Union. It attempted to control quality, not only safety, by regulating production processes. While it was an effective regime for product safety, it was a highly costly regime that prevented firms from adapting to new market conditions or reducing the cost of production. Improvements were made with WTO accession, and, more rapidly and significantly, under the DCFTA. Ukraine is now well on its way to harmonizing its product safety regulations and standards to the modern market-based system of the European Union. These changes are reflected in the estimates of Movchan and Tarr (2020) that this study used to estimate the AVEs of non-tariff measures for Ukraine.

Source: Movchan and Tarr (2020). Available as Appendix B of Movchan et al. (2020a).

2.1.5 Preferential Reduction of Barriers in Business Services.

The impact of fifty percent preferential reduction toward Turkey of Ukrainian discriminatory barriers against FDI in services results in only 0.03 percent gain in Ukrainian real household income. These estimated gains are rather small compared with the results of the studies cited in Table 1 for liberalization of barriers against FDI in services, especially in the WTO accession studies. The reason is that our estimates for this project of foreign ownership of the business services sectors in Ukraine by Kosse and Kravchuk (2020b) show that Turkey's market share of Ukrainian business services is less than one-half of one percent in all our business services sectors except for telecommunication and air transport services. (Turkey's market share is 12 and 11 percent in these two sectors.) So percentage changes from such a small base do not significantly impact Ukrainian welfare. In the case of WTO accession studies, all WTO member countries receive an improvement in their FDI opportunities so the impacts are larger. Further, Kosse and Kravchuk (2020a) have estimated that the ad valorem equivalents of the Ukraine's discriminatory barriers against FDI in business services. In telecommunications the AVE is relatively small at 2.5 percent. Only in air transport services is the estimated ad valorem equivalent of the barriers high and Turkey has a significant market share of the Ukrainian market.

Reduction by Ukraine of discriminatory barriers against cross-border services results in estimated gains of 0.15 percent of real household income. Ukrainian cross-border imports of business services from Turkey represent only four-tenths of one percent of total Ukrainian imports.⁴ Consequently, the estimated economy-wide gains from reduction of the AVEs of these barriers are not large.

⁴ Calculated from data in table 4 of the main report.

2.2. Reduction of Non-Discriminatory Barriers to Investment in Business Services for both Ukrainian Firms and FDI from all Regions

Non-discriminatory regulatory barriers in Ukraine are barriers faced by both Ukrainian nationals as well as all foreigners in the Ukrainian market. In these scenarios we evaluate the impact of a 25 percent reduction of Ukrainian non-discriminatory barriers to investment in business services (that is, reducing regulatory barriers that impact both Ukrainian and all foreign investors).


Box 5:

How Additional Varieties of Business Services Increase Productivity and Household Real Incomes

Consider the case of reduction of non-discriminatory regulatory barriers in business services. This increases profitability for the provision of business services in Ukraine, thereby inducing new entry by service providers who wish to establish a domestic presence in Ukraine - by both Ukrainian firms and foreign firms through FDI. The entry continues until zero “economic” profits for firms are restored. Ukrainian businesses will then have improved access to business services in areas like telecommunication, financial services and transportation services. The additional service varieties in the business services sectors lower the cost of doing business and result in a productivity improvement for firms that use these services. Consequently, more output is produced and available for household consumption, thereby increasing household real incomes. The additional varieties also directly increase consumer welfare, since consumers have more choices available and can optimize their expenditures among the varieties. These gains from additional varieties are known as the Dixit-Stiglitz variety externality, an effect that is missing in models of perfect competition and is the source of the difference between our central model and the model of perfect competition with which we compare below. In the scenario where we only reduce non-discriminatory services barriers, we estimate that the number of varieties increases between 1.3 and 4.0 percent, depending on the sector. In the scenario where we combine FTA central with non-discriminatory reduction of services barriers, we estimate that the number of varieties increases in all of the business services sectors, with the range of increase between 2.6 and 5.0 percent, depending on the sector.

As with time in trade costs, we assume that it takes domestic capital and labor to overcome the costs of the barriers against foreign providers of services, both those that supply the domestic markets through FDI and also through cross-border services. The capital and labor that becomes available due to those recaptured rents from reducing the regulatory barriers on all suppliers of services contributes to greater output and real income in Ukraine.

We evaluate this policy change first to identify where the largest gains can be made by Ukrainian policymakers in the sphere of business services policies. In addition, in negotiations such as WTO accession and services commitments for WTO members under the “GATS,” barriers that are non-discriminatory are included as part of the negotiations.⁵ It is possible that a focus on business services in the FTA with Turkey will encourage policy-makers to review barriers to services that are non-discriminatory and reduce non-discriminatory barriers in business services.

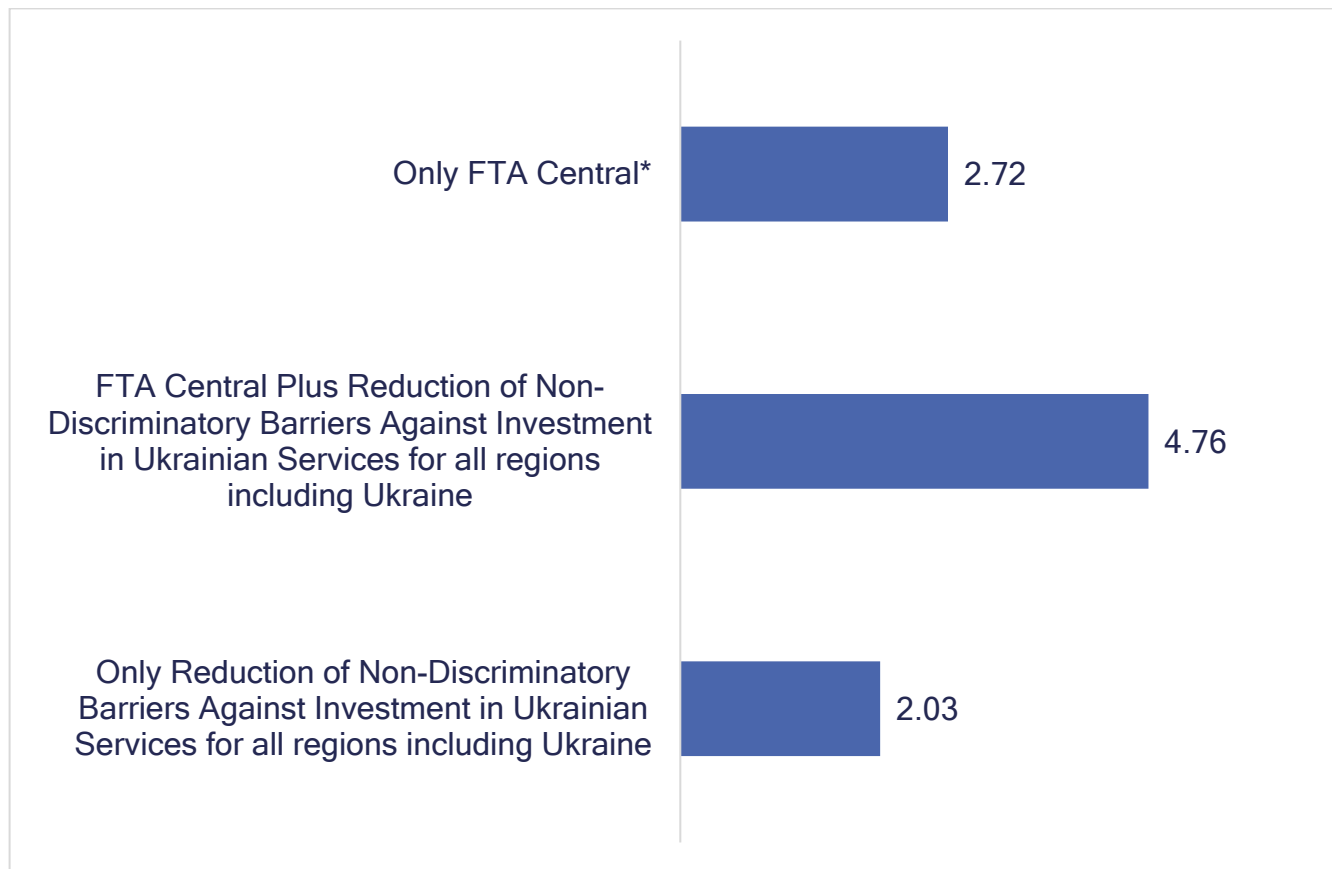


Reduction of non-tariff barriers to investment in business services for all partners would substantially amplify the welfare gains.

We show in figure 3 that Ukraine would gain an estimated 2.03 percent of annual real household income per year from a 25 percent reduction of Ukrainian non-discriminatory barriers to investment in business services. The impacts of the FTA with Turkey are estimated to provide gains of 2.72 percent of annual real household income; but combined with a 25

percent reduction of Ukrainian non-discriminatory barriers to investment in business services the gains would increase to 4.76 percent of real household income. Clearly, this is a very substantial potential addition to the gains and considerably larger than preferential reduction of barriers to FDI from Turkey alone.

⁵ The WTO Guidelines Scheduling Services Commitments notes that non-discriminatory measures that limit market access of WTO members fall under the purview of the GATS scheduling negotiations. In particular, World Trade Organization (2001, p.4) states “all measures falling under any of the categories listed in Article XVI:2 must be scheduled, whether or not such measures are discriminatory.”

Figure 3: Non-Discriminatory Reduction of Investment Barriers

Source: Model estimates

The intuition for this result is that the reduction of non-discriminatory regulatory barriers in business services applies to all suppliers of business services in Ukraine, both foreign and domestic. This is different from the preferential liberalization limited to Turkey, where only two sectors were significantly impacted due to low Turkish market shares in Ukraine. With non-discriminatory barriers, 100 percent of the market is impacted.

Box 6:**How Interindustry Linkages and Productivity Gains from Additional Varieties Induce Output Increases**

Consider the scenario where we reduce the ad valorem equivalents of the non-discriminatory barriers against investment and FDI in business services, without changing any of the barriers impacting the goods sectors. Because of the reduction in the barriers to investment in services, the prices of most business services fall in both the perfect competition model and our central model with imperfect competition. But the prices fall by more in the imperfect competition model due to the fact that additional varieties are available and the price that is relevant to users is adjusted for the quality. (This quality adjustment to the price is only present in the imperfect competition model). For example, the price declines in percent that we estimate in the imperfect (perfect) competition models, respectively, in this scenario are: land transport services -7.2 (-4.7); telecommunications -2.6 (-0.8); insurance -3.8 (-1.5); banking -1.4 (-0.7); and legal and professional services -1.1 (-0.8).

Despite the fact that there is no reform impacting the goods sectors in this scenario, the output of almost all the goods sectors increases. In the perfect competition model, the output of 32 of 36 goods sectors expands --between 0.1 percent and 7.9 percent, depending on the sector, with two sectors showing no change in output. The output expansion of the goods sectors in the perfect competition model is due to the decline in the price of business services inputs in the production of goods. Goods sector output also increases since consumers have additional income to spend and increase final demand for goods. These impacts on goods sectors are the interindustry linkage effects and they are present in the perfect competition model.

In the imperfect competition model, the interindustry linkage effects are also present, but they are magnified in comparison with the perfect competition model due to the larger price declines in the imperfect competition model. Further, when input prices fall in imperfectly competitive goods sectors, this will induce expansion and additional varieties of these goods. That implies lower prices for users of these goods that then interacts with all sectors with feedback effects that typically expand output further. Some examples of the output change in percent that we estimate in the imperfect (perfect) competition models, respectively are: processed fruits and vegetables 4.7 (1.6); other foods 1.8 (0.9); pharmaceuticals 1.5 (0.6); fish products 1.8 (1.1); paper products 1.2 (0.6); and chemical products 2.1 (1.2).

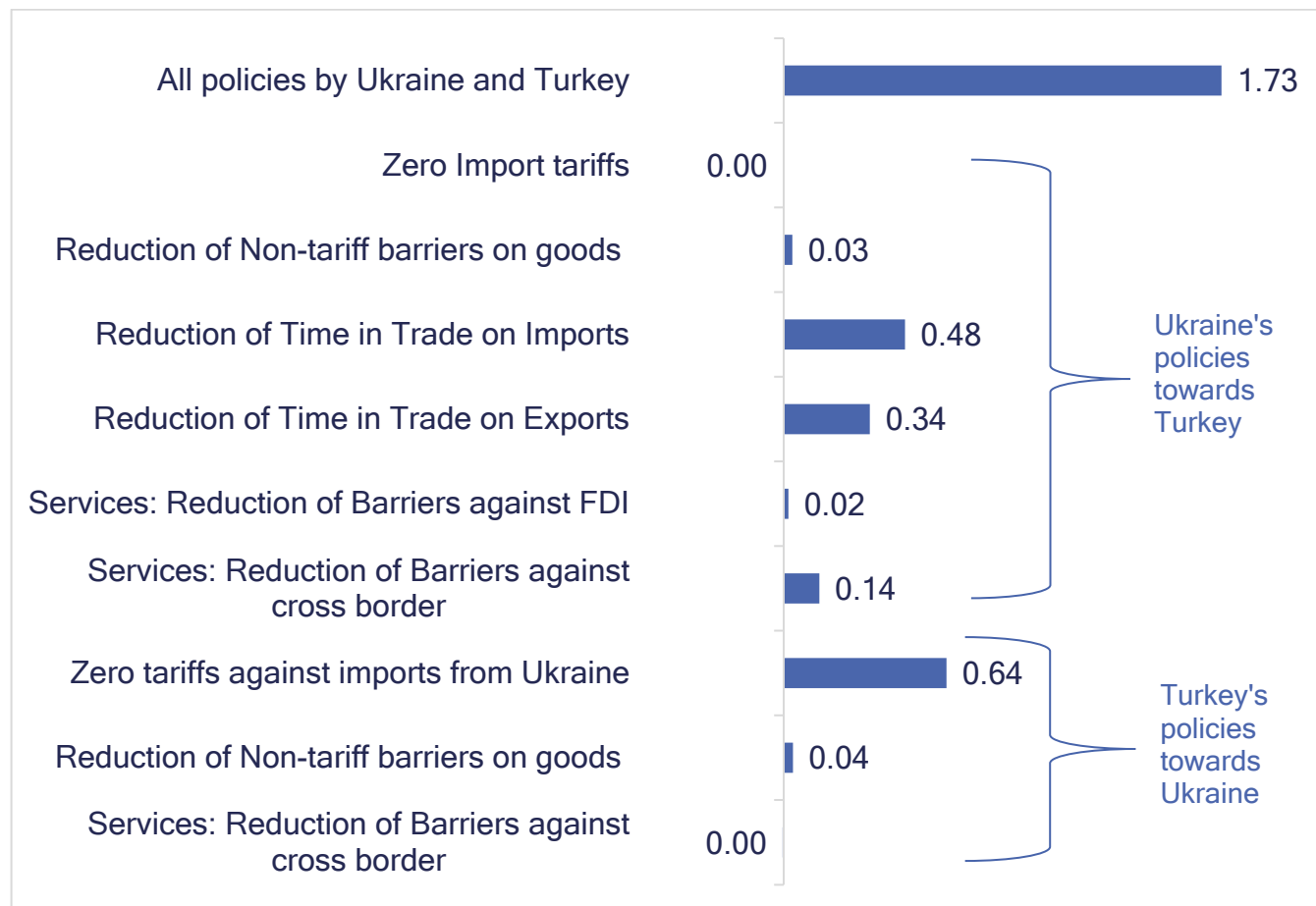
Source: Movchan et al. (2020a).

3. Sensitivity to Model Assumptions

3.1. Comparison with a Perfect Competition Model.

In order to assess the impact of our model that incorporates endogenous productivity effects from additional varieties in imperfectly competitive goods and services sectors, we evaluate the impact of the Ukraine-Turkey FTA in a perfect competition model. The results are in Figure 4.

Figure 4: Perfect Competition Assessment of a Ukraine-Turkey FTA and its components

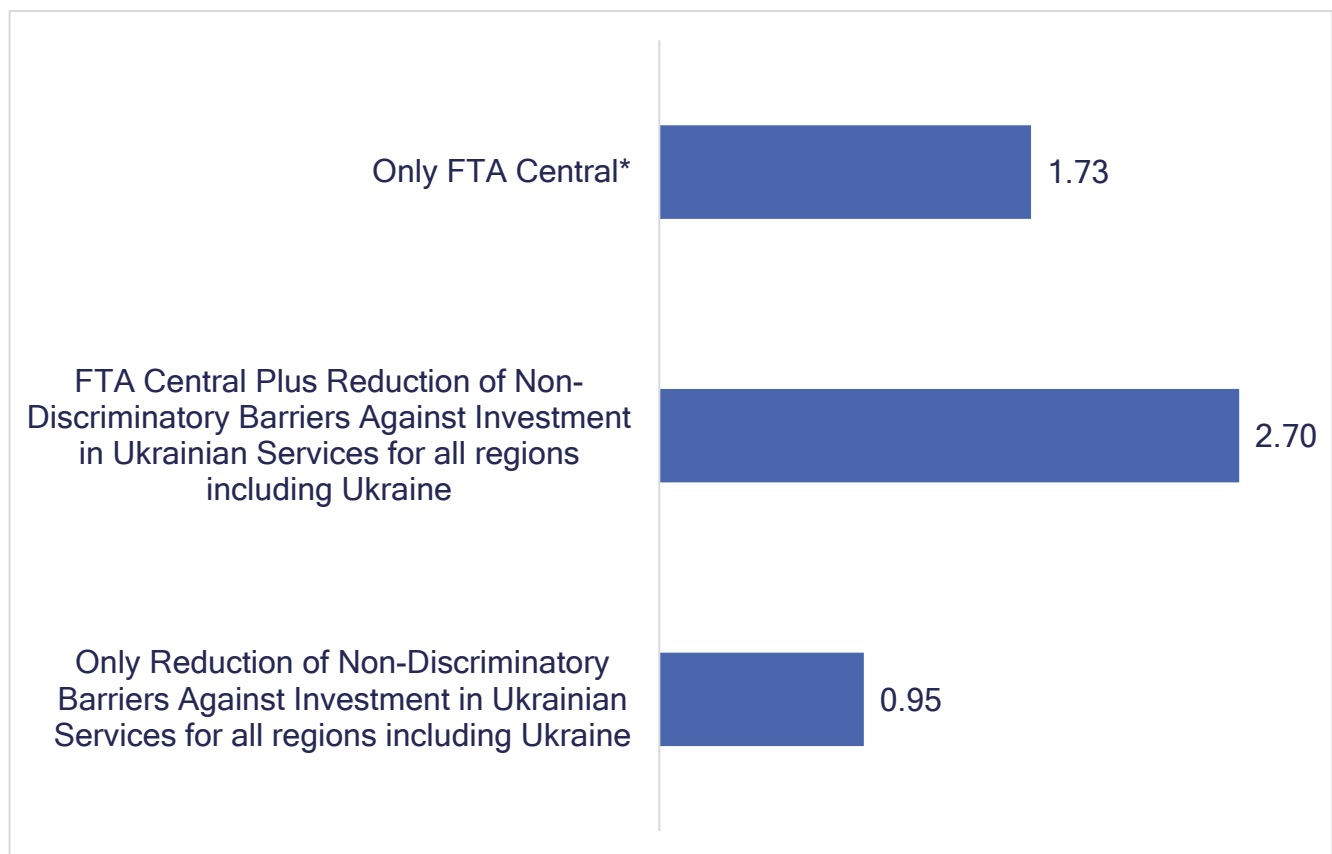


Source: Movchan *et al.* (2020a).

The results in figure 4 are directly comparable to the results in figure 1. The only difference in the model is that the results in figure 4 are in a purely perfectly competitive model. Comparing figure 4 and figure 1, we see that the aggregate

annual welfare gains are 1.73 percent of real household income in the perfectly competitive model but are equal to 2.72 percent in the model with imperfective competition. That is, the monopolistic competition model shows welfare gains that are 157 percent of the estimates in the perfect competition model. Figure 4 also shows that a narrow tariff only FTA in the perfect competition model would result in gains of only 0.64 percent of real household income, deriving entirely from improved market access to Turkish markets.

Figure 5: Perfect Competition model assessment of Real Household Income Impacts from a Reduction of Non-Discriminatory Barriers to Investment in Business Services to Ukraine and all external Regions



Source: Movchan et al. (2020a).

Figure 5 shows that, in the perfect competition model, if we combine a 25 percent reduction on non-discriminatory barriers to Ukrainian investment and FDI in business services from all regions with the FTA, the annual estimated gains are 2.7 percent of real household income. The same scenario in the model with monopolistic competition results in estimated gains of 4.76 percent of real

household income. In this case, the imperfect competition model shows welfare gains that are 176 percent of the estimates in the perfect competition model.

If we focus on the reform of the reduction in non-discriminatory barriers in business services alone, the imperfect competition model shows annual welfare gains of 2.03 percent of household income compared to 0.95 in the perfect competition model. That is, our central model produces welfare gains that are 214 percent of the estimates in the perfect competition model. The reason that the ratio of the gains increases when we include reform on non-discriminatory barriers to investment is that in these cases, we focus on reforms that significantly impact the flow of FDI and Ukrainian investment and thus the gains from additional varieties.

3.2. Spillovers or Wider Liberalization

3.2.1 Conceptual Issues on Wider Liberalization and Spillovers.

The combined 2019 GDP of Ukraine and Turkey is 913.2 billion US dollars. This was only 1.0 percent of the world GDP in 2019 of 87.8 trillion US dollars.⁶ Thus, the combined Ukraine-Turkey market is not a large market in comparison to the world market. Economic theory indicates that there should be gains from integrating into the world trading environment, something that leaders in Ukraine have recognized by Ukraine's competitive admission to the WTO and its DCFTA with the European Union and other free trade agreements. In this section, we evaluate the benefits to Ukraine of further extending their liberalization efforts to the wider world market, especially the deep integration aspects.

Baldwin (2014) has argued that compared to regional preferences regarding tariffs, the deep integration aspects of 21st century regional agreements are relatively difficult to limit to partners to the agreement; and, global value chain considerations lead to a "multilateralization" of some of the deep integration aspects of 21st century regional agreements. That is, "spillovers" of regional preferences will convey to third countries. Regarding preferential liberalization of barriers against foreign investors in services, Fink and Jansen

⁶ In 2019, World Bank data indicates that the GDPs of Ukraine and Turkey were (in millions of US dollars) 159 for Ukraine and 754 for Turkey. See <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?view=map>.

(2009) and Fink and Molinuevo (2007) argue that it is an unsettled question of how feasible it is to exclude third countries from preferential liberalization in services and that, in practice, some spillovers have occurred.⁷

3.2.2 Aggregate Spillover or Wider Liberalization Results.

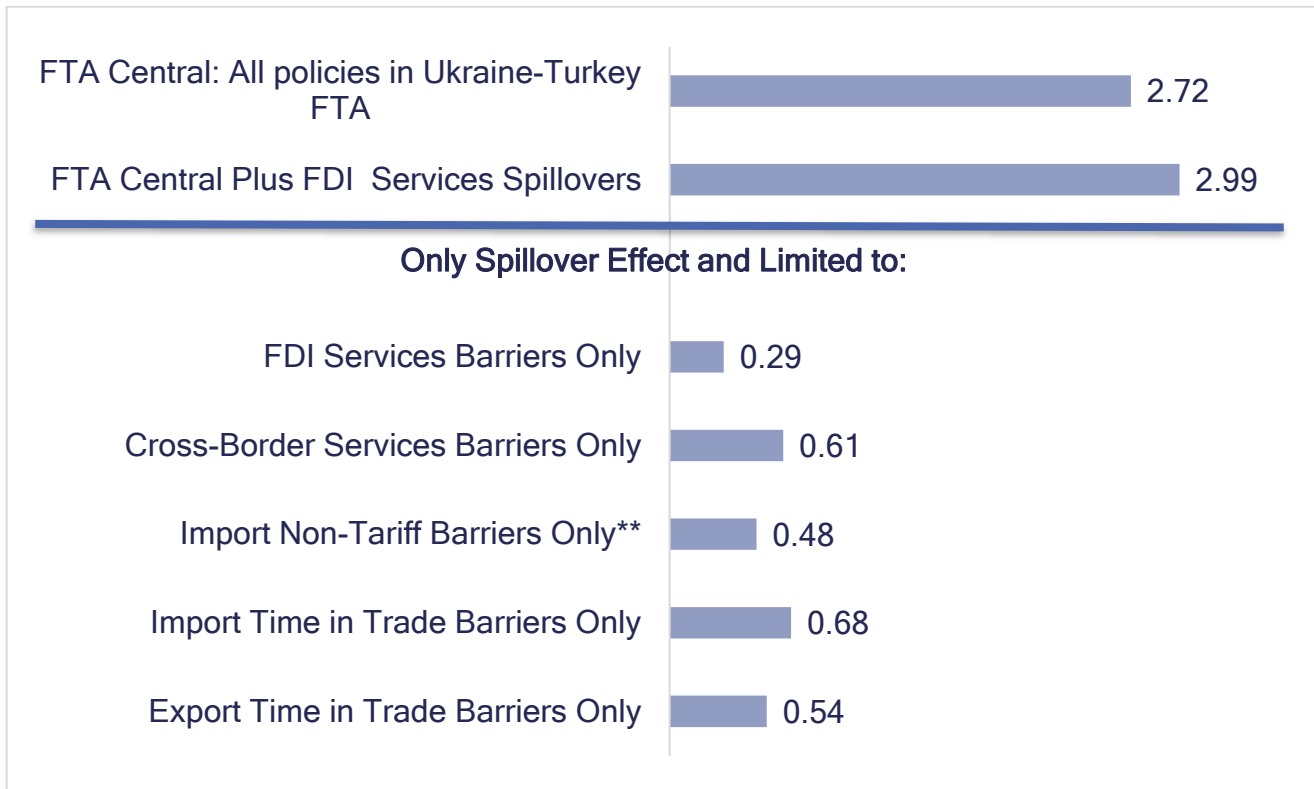
In this section we estimate the impacts of spillovers or wider liberalization to all third countries, i.e., to all external regions other than Turkey. In our scenarios with spillovers, we continue to take the same reduction in the AVEs of the barriers with respect to Turkey as we do in the FTA Central scenario. But we extend part, but not all, of the reductions in the AVEs of the barriers to the other regions of the model. In this manner we assess the impact of combining the reforms of the FTA with extensions to third countries. The extension of the reforms may arise either through unintended extensions, legal requirements to extend the reforms or intentional liberalization. We evaluate the impact of spillovers in five reforms plus the reduction of barriers to FDI in business services together with the FTA. These results are summarized in figure 6.

With spillovers in services, either through FDI or cross-border, we allow a 25 percent reduction in the ad valorem equivalents of the barriers against service providers in the regions outside of Turkey. That is, we take a 25 percent reduction in the AVEs of the barriers in services with respect to the EU, China, USA, Russia, the Free Trade Region and the Rest of the World. With time in trade costs, we allow a five percent reduction to regions other than Turkey. (This is the same as the FTA Central scenario for time in trade.) Finally, regarding non-tariff measures, we allow a ten percent reduction in the ad valorem equivalents to all third countries or regions except the European Union. The European Union is excluded

⁷ If the preferential agreement grants equivalent rights to third country firms located in the partner region, the preferential arrangement becomes somewhat multilateral. The rules of origin would impact how multilateral the preferential liberalization becomes. What rules of origin apply in practice is an unsettled question both in the literature and in practice. Fink and Jansen (2009) note that typically, FTAs require that enterprises eligible for the agreement's preference are incorporated under the laws of one of the partner countries. Further, to qualify for preferences, the enterprise must have "substantial business activities" within the region. This indicates that preferences do not extend to enterprises located in third countries if they are not incorporated with substantial business interests in the region. As an example of these principles, Fink and Molinuevo (2007) note that in East Asia non-parties can benefit from the preferences provided in the FTA, as long as they establish a juridical person in one of the FTA member countries and are commercially active in that country. But again, the preferences for non-parties are enterprise specific and do not extend to enterprises without a commercial preference with substantial business interest.

from the spillovers in non-tariff measures because under the terms of the DCFTA between Ukraine and the EU, Ukraine is harmonizing its standards and regulations to the system of the EU.

Figure 6: Impact of Reduction of Discriminatory Barriers against FDI in Services and Deeper Liberalization or Spillovers* to all External Regions (the Whole World) Plus Ukraine-Turkey FTA



Source: Movchan et al. (2020a).

Notes: *Spillovers do not include the reduction of non-discriminatory barriers against investment in business services;

**The EU is excluded from spillovers on non-tariff barriers due to harmonization under the DCFTA.

Scenarios definitions:

FDI in Services: 50% reduction of AVEs on Turkey; 25% from other regions.
Cross-Border services: 50% reduction of AVEs on Turkey, 25% from other regions.
Non-Tariff Barriers for goods: 20% reduction of AVEs for Turkey, 10% for other regions.**
Time in Trade Costs for Imports: 20% reduction of AVEs for Turkey, 5% for other regions.
Time in Trade Costs for Exports: 20% reduction of AVEs for Turkey, 5% for other regions.

Compared to FTA Central, the wider liberalization of FDI, cross-border services and non-tariff barriers contributes an additional 1.38 percent to Ukrainian real household income. We explicitly evaluate FDI liberalization together with FTA Central and find that the gains increase to 2.99 percent of real household income. These results show the importance of wider liberalization.

3.3. Impact of the Rent Capture Assumption

In our central scenarios, we assume that it: takes capital and labor to overcome the barriers; the rents from the barriers are “dissipated”; and the rents are recaptured by the domestic economy in the central scenarios.⁸ It is possible, however, that some of the barriers do not cause rents to be dissipated or are not captured by foreigners, but instead generate rents that are captured by domestic agents in our initial equilibrium. If so, then the rents that are captured initially by domestic agents would not be available as a net welfare gain to the domestic economy since they are already part of the income of domestic agents. When the barriers are eliminated, the domestic agents who captured the rents lose those rents, but the resources become available to the general population, for no net welfare gain in a representative agent model. In this case, efficiency gains from removal of the barriers will remain, but the welfare gains should be smaller when there are no rents available to be captured by domestic agents.

In the case of time in trade costs, however, there is a strong presumption in the theory and empirical work that these barriers involve real resource costs, i.e., the rents are dissipated. Thus, we continue to assume that ad valorem equivalents of the time in trade barriers are dissipated. We also assume that Ukrainian agents do not capture the rents of Turkish non-tariff barriers, either on goods or on cross-border services. We calculate that what remains in the benchmark are rents equal 0.13 of real household consumption.

Movchan *et al.* (2020a) estimate that with domestic rent capture in the benchmark equilibrium, the welfare gain from the FTA decreases to 2.55 percent of real household consumption from 2.72 percent in our FTA Central scenario.

⁸ An equivalent assumption for the analysis would be that the rents are captured by foreign agents. The latter could occur if licenses for imports are awarded to foreigners, as with the Multi-Fiber Agreement (MFA) in textiles and apparel or as the United States did with voluntary export restraints on products such as on autos and steel before these instruments were outlawed by the WTO.

Compared to the FTA, the lower estimated gains are because the household does not gain the “rectangle” of rents equal to 0.13 percent of household income, plus with lower incomes there are fewer varieties and reallocation choices available accounting for an additional loss of 0.04 percent real household income.

3.4. Distribution Issues: Impact of the Trade Reforms on Ukrainian and Foreign Owners of Sector-Specific Capital.

Heretofore, we have assumed that Ukrainians own the sector-specific capital in Ukrainian firms, but foreigners own the sector-specific capital in multinational firms operating in Ukraine. The estimated changes in real household income is positive in all but one of our policy scenarios. Real household income derives from returns to factors of production, so it is not surprising that Movchan *et al.* (2020a) report nonnegative returns to our mobile factors of production and the weighted-average percentage change in the returns to sector-specific capital in Ukrainian firms across all sectors is positive in 18 of the 19 scenarios and is zero in the scenario isolated the spillover to all FDI firms.

To investigate the worst-case scenario of an adverse impact on individual households from sector-specific capital ownership, we consider the scenario where we reduce the discriminatory FDI barriers to all external regions. The reform induces an increase in multinational entry into Ukraine. Due to increased competition, there is a decline in demand for domestic varieties due to the increased competition. This decline in demand may be offset in some cases due to an increase in demand for the sector from a general expansion of the economy and the reduced composite price of the sector. But our results show a decline in the demand for sector-specific capital in six of the eight Ukrainian monopolistically competitive business services firms. The declines are less than five percent except for substantially larger estimated declines in Ukrainian returns to sector-specific capital in the air transport and water transport sectors.⁹ The estimated AVEs of discriminatory barriers against FDI are dramatically higher in these two sectors, which explains the larger estimated declines in their returns to sector-specific capital.

⁹The percentage change in the returns to Ukrainian sector-specific capital in these sectors is: wholesale and retail trade (0.5); land transport (0.6); water transport (-96.4); air transport (-97.6); telecommunications (-3.3); insurance (-1.4); banking (-4.3); legal and other professional services (-0.1).

4. Adjusting to Trade Liberalization: International Evidence, Policies and Estimates for Ukraine

4.1. International Evidence of Adjustment Costs and Recommended Mitigation Strategies.

Matusz and Tarr (2000) summarize the evidence on adjustment costs of trade liberalization and find that adjustment costs for society as a whole are dramatically smaller than the welfare gains. Nonetheless, adjustment costs of trade liberalization are an important concern of policymakers. Policymakers often receive strong lobbying from those who suffer or fear adjustment costs from trade liberalization, while those who gain are more diverse or may not realize they will gain from trade liberalization; so the gainers typically do not lobby for liberalization or lobby much less vigorously. Further, policymakers are often concerned about the impact on the poorest members of society who might be employed in sectors that are not internationally competitive and then suffer adjustment costs that they can ill afford.

The evidence from empirical studies worldwide, summarized by Matusz and Tarr (2000), has shown that the adjustment costs of trade liberalization for low wage workers, who tend to be the most vulnerable, are negligible. Using data for the United States, Jacobsen (1978) found that two years after involuntarily displacement, workers in low wage industries actually earned more income than their non-displaced counterparts in the original industry.

CAN SEQUENTIAL
LIBERALIZATION REDUCE OR
EVEN ELIMINATE INVOLUNTARY
DISPLACEMENT?

Winters and Takacs (1991) estimate that the removal of quantitative import restrictions on British footwear imports would displace 1,064 workers in the industry. But their data show that 16.9 percent of workers in British footwear depart voluntarily each year. They calculate that this implies that the reduction in demand for labor in the British footwear industry from removing the import restrictions could be accommodated within 21 weeks without any involuntary displacement.

Moreover, he found that six years after displacement, earnings losses had vanished for all industries, not just for low wage industries. Similarly, Orazem, Vodopivec, and Wu (1995) found that more than two-thirds of displaced Slovenian workers who found new jobs actually earned wages higher than their pre-displacement wages. On the other hand, Jacobson, et al. (1993), Rama and Maclsaac (1996) and Tansel (1996) have found that workers who earn wages that are greater than the wages of workers with comparable mobile skills in the general workforce (for example, due to union wage premia, or sector-specific human capital, or work in the central bank or state owned enterprises) experience sustained income losses after displacement.

The World Bank's Sourcebook for Poverty Reduction Strategies addressed these issues, especially for the most vulnerable in society, in its chapter entitled "Trade Policy Reform and Poverty Alleviation." See Hoekman, Michalopoulos, Schiff and Tarr (2002). They recommend as a first best solution for displacement due to a trade shock the establishment of a social safety net to assist the most vulnerable with adjustment to shocks of various types, not only trade shocks.¹⁰ In many developing countries, however, there is no effective social safety net in place. In the absence of an effective social safety net, the recommended solution is a phased reduction of liberalization over a period of time, say 2-5 years. In this manner, estimates show that the normal voluntary departure from the industry will very substantially reduce adjustment costs of labor and may be sufficient to accommodate the negative demand shock to labor with little or no adjustment costs.¹¹

Earlier results have shown that while regional liberalization provides a smaller benefit-cost ratio from trade liberalization, there are lower adjustment costs of regional liberalization. These lower adjustment costs explain some of the appeal of regional liberalization to policy-makers, despite the usually larger net gains of broader unilateral or multilateral liberalization.¹²

¹⁰ See also Michalopolous, Schiff and Tarr (2002).

¹¹ See the sidebar above for the Winters and Takacs (1991) study.

¹² See, for example, Balistreri, Tarr and Yonezawa (2015).

4.2. Estimates of Adjustment Costs and Benefit-Cost Ratios for Ukraine.

We estimate the adjustment costs and benefit-cost ratios of three scenarios:

- (i) the Ukraine-Turkey FTA;
- (ii) the Ukraine-Turkey FTA plus liberalization of FDI barriers against all FDI; and
- (iii) the Ukraine-Turkey FTA plus deeper domestic regulatory reform in services to reduce non-discriminatory investment barriers to both Ukrainian and foreign investors in services in Ukraine.

In all three cases, we compare the adjustment costs to the welfare gains.

To put these data for our calculation in context, the Ukrainian State Statistical Service (Ukrstat) reports the unemployment rate in Ukraine was 8.8% in 2018 and 8.2% in 2019.¹³ We quantify the adjustment costs estimate for Ukraine, by adopting the unemployed resources measure of the social costs of adjustment of a trade policy change.¹⁴ Given our single household model, we take an average duration of unemployment measure across all workers. Our method ignores diverse impacts across households, such as more adverse impacts on owners of sector-specific factors in declining sectors.

Details of the model for the estimation of adjustment costs is in the Box 7.

¹³ See: http://ukrstat.gov.ua/operativ/operativ2007/rp/ean/ean_e/osp_rik_10-19e.xls

¹⁴ For an explanation of the methodology, see Morkre and Tarr (1980, chapter 3).

Box 7:**Model to Estimate the Adjustment Costs of Labor due to the FTA and Related Reforms**

Let w = the annual wages, including taxes paid by labor; L = the total labor force; ΔL = the number of workers who are displaced by the trade policy change; $\beta = \Delta L/L$ = the share of the labor force that is displaced by the trade policy change; μ = the share of one year that a displaced worker is unemployed; and X = the value of the loss of output due to the displacement of ΔL workers. Then, if the value of the marginal product of

labor is equal to wages $p\left(\frac{\partial Y}{\partial L}\right) = w$, we have that X is given by equation (1)

$$p\left(\frac{\partial Y}{\partial L}\right) \times \Delta L \times \mu = w \times \Delta L \times \mu = X \quad (1)$$

According to the Ukrainian State Statistical Service statistics, in 2018: (i) compensation to employees (including the taxes on the payments to labor) was 41.3 percent of GDP;¹ and (ii) the average duration of unemployment in Ukraine was six months, i.e., $\mu = 0.5$ years.¹ Then

$$wL = p\left(\frac{\partial Y}{\partial L}\right)L = .413 \times GDP \quad \text{and} \quad p\left(\frac{\partial Y}{\partial L}\right) = .413 \times \frac{GDP}{L} \quad (2)$$

Substitute for $p\left(\frac{\partial Y}{\partial L}\right)$ from equation (2), use $\mu = 0.5$ in (1) and divide both sides by

GDP. We have that the social costs of adjustment as a share of GDP are shown by equation (3):

$$(.413) \times \frac{\Delta L}{L} \times 0.5 = (.413) \times \beta \times 0.5 = \frac{X}{GDP} \quad (3)$$

Source: The authors. See Morkre and Tarr (1980) for a further discussion.

The equation for the estimation of adjustment costs is:

$$(.413) \times \frac{\Delta L}{L} \times 0.5 = (.413) \times \beta \times 0.5 = \frac{X}{GDP}$$

= *Labor Adjustment Costs as a percent of GDP*,

where from the Ukrainian State Statistical Service 0.413 is labor's share of GDP;¹⁵ the average duration of unemployment in Ukraine was six months, i.e., one-half a year or 0.5 years;¹⁶ and $\Delta L/L = \beta$ is the share of the labor force this is displaced due to the trade reform.

Regarding $\Delta L/L$, in our model simulations, we estimate the number of workers that must change jobs by sector and skill type. We calculate equation (3) for Ukraine for our principal scenarios. Taking a weighted average across all sectors and skill types of labor for Ukraine, we estimate that:

in the Ukraine-Turkey FTA Central scenario, about 1.19 percent of labor must change jobs;

about 1.38 percent of labor must change jobs when we add non-discriminatory services liberalization to the FTA; and

about 1.21 percent of labor must change jobs when we add FDI spillovers to the world to the FTA.¹⁷

Converting percentages to shares for the estimating equation, we have: $\Delta L/L = 0.0119$ for the Ukraine-Turkey FTA; $\Delta L/L = .0138$ for the scenario that adds the reduction of non-discriminatory barriers against investment in Ukrainian services sectors to the Ukraine-Turkey FTA; and $\Delta L/L = .0121$ for the scenario where FDI spillovers to the world are added to the Ukraine-Turkey FTA.

¹⁵ See: http://ukrstat.gov.ua/operativ/operativ2005/vvp/vvp_ric/vvp_kd10-18.xlsx.

¹⁶ See table 5.20 in Statistical Publication of the State Statistic Service of Ukraine "Economic Activity of the Population of Ukraine_2018". Available at: http://www.ukrstat.gov.ua/druk/publicat/kat_u/2019/zb/07/zb_EAN_2018.pdf.

¹⁷ These values are shown in the main report in tables 11, 12 and 27, respectively.

Table 2: Adjustment Costs and Benefit-Cost Ratios

	FTA with Turkey	FTA plus reduction of non-discriminatory regulatory barriers in business services	FTA plus reduction of barriers against FDI in business services
1. Adjustment Costs as % of GDP	0.246	0.285	0.250
2. Equivalent Variation (EV) as % of consumption*	2.72	4.76	2.99
3. Equivalent Variation (EV) as % of GDP	1.88	3.28	2.06
4. Present Value of EV as % of benchmark GDP**	28.7	50.1	31.5
5. Benefit-Cost Ratio (row 4 divided by row 1)	116.9	175.9	126.0

Source: Authors' calculations.

Notes: *Equivalent Variation as a percent of consumption equals the percent change in real household income.

**Seven percent discount factor into the infinite future. Row 4 = (Row 3)*[1.07/.07].

The social costs of adjustment, as a percent of GDP, are presented in row 1 of table 5. In the case of the FTA, the adjustment costs are one-quarter on one percent of GDP. Equivalent variation estimates as a percent of consumption and of GDP are taken from Movchan and Tarr (2020a, tables 11, 12 and 27) and presented in rows 2 and 3 of table 5. Equivalent variation as a percent of consumption is equal to the percent change in real household income. For row 4 of table 5, we recognize that adjustment costs are a once and for all cost, whereas the gains from the trade policy change continue into the indefinite future. Taking the present value of the gains into the infinite future with a seven percent discount rate for future gains, the gains from our three principal scenarios, as a percent of GDP, are shown in row 4 of table 5. Then, the ratio of the real household income gains to the adjustment costs of the policy changes are shown in row 5 as:

Ukraine-Turkey FTA = 116.9

Ukraine-Turkey FTA plus reduction on non-discriminatory barriers against investment in Ukrainian services = 175.9

Ukraine-Turkey FTA plus FDI spillovers to the World = 126.0

These estimated values are extremely high by the standards of the usual benefit-cost analysis. If benefit-cost analysis is done for a project like building a road or bridge, a value greater than one shows a net benefit and is needed to justify the project. However, experience has shown that benefit-cost ratios in international trade analysis are typically much higher.

5. Conclusions and Caveats

5.1. Conclusions

We estimate that successful inclusion of deep integration in the Ukraine-Turkey FTA (along with tariff elimination) would yield significant annual increases in real household incomes of Ukraine by 2.72 percent per annum.

The reduction of time in trade costs (or Trade Facilitation Measures) are among the most important reforms. The reduction of the time costs of trade would contribute 1.22 percent of real household income annually to the gains and is the largest component of the gains from the FTA. The time cost of trade is especially important for the food sector. Since Turkey is already a member of the European Union's "Common Transit System," to fully capitalize on the improved market access and increased trade offered by the FTA, Ukraine would benefit from its intended accession to this Common Transit System that includes as a component the New Computerized Transit System (NCTS).

Economy-wide output will increase but sector impacts are diverse. If all tariffs are removed reciprocally between Turkey and Ukraine, we estimate that real GDP would increase by 2.12 percent. Impacts across sectors are diverse. The four sectors with the largest increase in output are: dairy products, other food products, fruits and vegetables and fats and oils. The sectors that are estimated to contract output the most are: electronic components, electric equipment and motors, wearing apparel, manufacture of machinery, and manufacture of electric motors and equipment and computer programming. Due to the very rapid growth of the computer programming sector in recent years, it should continue to grow for reasons independent of the Ukraine-Turkey FTA.

Non-discriminatory barriers in business services are barriers that apply to both Ukrainian investors and to FDI. **The annual gains would increase to 4.76 percent of household real income if, in addition to the Ukraine-Turkey FTA being implemented, the ad valorem equivalents of non-discriminatory barriers to investment in business services were reduced by 25 percent.** This is an additional annual increase of 2.04 percent of real household income due to increases in FDI

and Ukrainian investment in business services. These results highlight the importance of continuing the momentum of reform in business services, not just for foreign investors, but also for Ukrainian investors in business services. The large gains from the reduction of barriers to investment in business services are derived in significant part from our innovative model that incorporates endogenous productivity effects from additional varieties of goods or services supplied in imperfectly competitive sectors.

The estimated gains from the FTA compared to the social adjustment costs of labor are extremely high at more than 100 to 1. A social safety net is the optimal policy to alleviate the burden of adjustment on the most vulnerable of society. If the social safety is insufficient, then sequential liberalization would reduce or eliminate most of the adjustment costs.

Estimated gains from a conventional perfect competition model are significantly smaller and without deep integration as well. The estimated gains are between 157 and 214 percent higher in the central model of this study compared to a perfect competition model.

The project has produced three studies of the ad valorem equivalents of barriers to trade which should facilitate subsequent trade policy analysis of Ukraine. These are: Kosse and Kravchuk (2020a) for the AVEs of both discriminatory and non-discriminatory barriers to foreign providers of services; Olekseyuk, Tarr and Movchan (2020) for AVEs of time in trade costs of Ukraine; and Movchan and Tarr (2020) for AVEs of non-tariff barriers in goods. Kosse and Kravchuk (2020b) have also produced estimates of the shares of the market captures by firms from the eight regions of our model.

The project has produced and 85-sector input output table for Ukraine. This expands on the 42-sector table publicly available prior to this project and it has incorporated a decomposition of labor into skilled and unskilled, multiple external regions and provides extensive data on taxes at the sector level. This dataset is documented in Movchan et al. (2020b).

5.2. Caveats or Risks

We discuss three principal caveats or risks regarding the estimates. The title of this report, “Impact Assessment of a Successfully Implemented Potential Free Trade Agreement between Ukraine and Turkey,” highlights two of them.

Successful Conclusion of the Agreement. The Ukraine-Turkey FTA remains under negotiation. We have estimated a modern free trade agreement that includes “deep” integration in addition to tariff elimination by both parties in our central scenario. It remains to be seen how much of the deep reforms will be agreed, such as mutual acceptance of certificates of product conformity and measures to reduce time in trade costs. On the positive side, regarding time in trade, Ukraine could capitalize on the market opportunities afforded by the agreement independently of what is agreed on trade facilitation within the framework of the FTA. A considerable portion of the important time in trade cost reductions could be achieved by Ukraine by signing on to the European Union’s “Common Transit System.”

Successful Implementation of the Agreement. Even if Ukraine’s trade negotiators succeed in bringing home a deep agreement with few important exclusions, successful implementation may be challenging. Vested interests in either Ukraine or Turkey could lobby to resist reforms. A basis for optimism, however, is that Ukraine has shown that in recent years it is capable of making major transformative changes to its trade regime as part of its implementation of the DCFTA with the European Union. Access to Turkey’s agriculture and food markets, however, may be challenging.

Parameter Specification in the Model. The model requires a large number of parameters. The authors have employed the best estimates available from the literature and developed improved estimates of key AVEs for Ukraine. Nonetheless, the estimates are subject to a margin of error. Movchan et al. (2020a) have quantified that margin of error by undertaking piecemeal sensitivity analysis. This analysis quantifies how the estimates vary with the parameters. The range of the estimates for the annual gains in Ukrainian real household income from the Ukraine-Turkey FTA is from 2.42 percent to 4.00 percent. With a central value of 2.72 percent gain in real household income, this preserves the principal story line of the report of significant gains from a successfully

implemented potential FTA. In the case of the Ukraine-Turkey FTA plus non-discriminatory liberalization of barriers against service providers in business services, the estimated gains in the sensitivity analysis range from 4.00 to 5.81 percent increase in real household income. While this represents a larger margin of error than in FTA central, with a gain in real household income of 2.72 percent in FTA central, the conclusion that this wider liberalization of business services would significantly contribute to welfare is preserved for any estimate within that range.

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