A Quantitative Assessment of the Proposed China-Georgia Free Trade Agreement

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Abstract: This paper discusses the proposed China-Georgia free trade agreement and provides quantitative estimates of its economic effects. The proposed free trade agreement would more than double trade flows between China and Georgia over a time horizon of ten to fifteen years, and would increase Georgian GDP per capita by about 1.5 percent. Chinese exports to Georgia would increase by about 20 to 30 percent, and Chinese GDP per capita would remain virtually unchanged. While these estimates have to be treated with extreme caution, they should serve as a motivation to continue negotiations on the free trade agreement.

I. Introduction

Liu Junzhou from Guangdong province might have been the first Chinese investor in Georgia. Migrating to Adjara in 1890 he is credited with having introduced tea to Georgia, as the founder of the first tea plantation in the country (Zhou, 2012). Economic linkages between Georgia (respectively the Georgian SSR) and China were very weak during Soviet times and throughout the 1990s, but experienced strong growth, from a low base, in the 2000s. Today, China is one of the most important foreign investors in Georgia and one of Georgia's most important trade partners. The future of China-Georgia economic relations is promising, as Georgia is a key partner for China's "One Belt, One Road" initiative, in particular for the land based Silk Road Economic Belt component. Launched in 2013, this initiative envisions connecting the major economies of Europe and Asia through trade, investment, and infrastructure. It is before this background that a free trade agreement between China and Georgia has been proposed, and is currently negotiated between the two governments.

This paper will discuss the proposed free trade agreement and will provide quantitative estimates of its economic effects on the Georgian and Chinese economy. It is not the first paper on the proposed China-Georgia free trade agreement, as the Chinese and Georgian government commissioned a feasibility study, which was jointly prepared by a Chinese university and a Georgian consulting company (see PMCG and UIBE, 2015). This study focuses on the current legal and institutional environment underpinning trade and investment between China and Georgia. It also provides quantitative estimates from a computable general equilibrium model (CGE), based on the Global Trade Analysis Project (GTAP).

The feasibility study finds only a modest impact of the proposed free trade agreement, with Georgian exports increasing by about thirty percent, corresponding to about 25 million US$. The effect on GDP is even smaller, with Georgian GDP increasing by 0.05 percent, corresponding to 7.5 million US$, and Chinese GDP increasing by negligible 0.0001 percent, corresponding to about 5 million US$. Even accounting for the fact that CGE

models tend to underestimate the impact of free trade agreements, this is a very modest impact, standing in stark contrast to the findings of this paper.

This paper improves upon the feasibility study in several ways. It is an independent study, with a focus on the economics of the free trade agreement, as opposed to the legal and institutional aspects. Its quantitative estimates are based on an econometric model, and not a CGE model. Leaving aside the question which model type is more suitable to estimate the impact of trade agreements,[1] the CGE approach chosen by the feasibility study is problematic for two reasons. First, even the newest iteration of GTAP has only data from 2001. Given the structural changes the Georgian economy has experienced since the 2001 Rose Revolution, a CGE model based on a 2001 base year is unlikely to accurately predict the impact of the free trade agreement. Second, the feasibility study does not take into account reductions of non-tariff barriers, and the changes to economic policy and economic structure induced by the trade agreement. These reductions and changes are quantitatively important, but are difficult to measure directly. In contrast, the econometric approach of this paper, by construction, takes these reductions into account.

Predicting the impact of future trade agreements pushes modern economics and quantitative modelling to its limits. Any modelling exercise suffers not only from data availability issues and the inherent limitations of economic models, but also from the long time horizons involved, the difficulty of quantifying reductions in non-tariff barriers, and the difficulty of predicting changes to policy and economic structure induced by the trade agreement. Thus neither the results of the feasibility study nor the results of this paper should be taken as precise and accurate predictions.

The quantitative estimates on the impact of the proposed China-Georgia free trade agreement provided in this paper are based on the gravity model, adapted from the model in Fuenfzig (2015). Gravity model models are widely used in the literature to assess the impact of trade agreements, both ex-ante and ex-post. Gravity models have the advantage

[1] For discussion and comparisons of gravity and CGE models in the analysis of trade agreements, see Piermartini and The (2005) or Ivus and Strong (2007).

of being able to take into account not only tariff reductions, but also reductions in non-tariff barriers, and changes to economic policy and economic structure induced by the trade agreement.

We find that a free trade agreement between China and Georgia would double exports from Georgia to China, with little trade being diverted from other countries. This estimate implies a cumulative increase of GDP per capita by about 1.5 percent for Georgia. Chinese exports to Georgia increase by only about 20 to 30 percent, with virtually no trade diversion or changes to GDP per capita for China. These estimates are based on the implicit assumption that the China-Georgia free trade agreement will be comparable in scope and depth to existing free trade agreements.

The remainder of the paper proceeds as follows. Section II describes current trade and investment flows between China and Georgia, and describes existing trade barriers between the two countries. Section III describes the methodology and the data used, and section IV discusses the results of the econometric analysis. The paper concludes with recommendations for the current negotiations between the two governments.

II. Economic Linkages between China and Georgia

Current trade between China and Georgia is unbalanced, with Georgian imports from China far exceeding exports to China. It is likely that import figures (and to a lesser extent export figures) are slightly inflated due to re-exports of Chinese merchandise via Georgia not being properly recorded. The overwhelming majority of Georgia's exports to China fall into the ores and metal sector. Agricultural and food products are also of importance, with all other sectors, including the service sector, being negligible. The structure of Georgia's trade with China is roughly similar, at least at broad product categories, to Georgia's overall trade structure with the rest of the world. At a more detailed level, within broad sectors, important exports to China are copper waste and scrap, refined copper and copper alloys, gold, and wine. There is no publicly available data on Chinese FDI in Georgia by sector, but anecdotal evidence suggests that most of Chinese FDI is focused

on mining, timber, energy and real estate, with one investor, the Hualing group, being the largest foreign investor in Georgia.

Table 1: China-Georgia Trade (in Million US$)

	2005	2010	2011	2012	2013	2014	2015
Exports to China	5.6	29.6	30.4	28.1	34.8	90.8	128.5
Rank	23	15	14	16	17	8	6
Imports from China	48.0	359.2	558.4	653.5	667.7	810.6	654.0
Rank	15	4	4	3	2	2	2
FDI from China	5.7	-7.9	9.6	36.1	89.9	217.9	57.6
Rank	13	n/a	22	8	3	3	6
Exports to China:							
Ores and Metals	4.5	19.1	26.0	19.9	28.9	85.0	n.a.
Agriculture/Food	1.1	4.9	2.7	5.0	4.7	5.1	n.a.
Manufactures		0.4	0.2	1.1	0.4	0.3	n.a.

Note: Including SAR Hong Kong and SAR Macau, but not Chinese Taipei, Source: World Bank WITS

Chinese exports to Georgia face very low applied and most-favored nation (MFN) tariffs. Most tariff lines are zero, no tariff rate is exceeding twelve percent, and the share of tariff lines with international peaks is zero. Average and weighted average tariffs are roughly around one percent, with the exception of agriculture, where China faces a simple and weighted average tariff rate of around six percent. At the same time there is considerable tariff overhang, as Georgia's bound tariffs – while low by international standards - are relatively high compared to applied and MFN tariffs.[2] This suggests that one possible motivation for China to enter a free trade agreement with Georgia is to reduce trade policy uncertainty.

Georgia's main exports to China – ores and metals – face very low applied tariff rates, while Georgia's agricultural and manufacturing exports face relatively high tariffs. Still, given the preponderance of ores and metals in Georgia's export bundle to China the tariff

[2] That a small country such as Georgia choose a large tariff overhang is also suggested by the theory of optimal tariff bindings, see Beshkar, Bond and Rho (2015).

burden faced by current exports is very low. There is also little trade policy uncertainty, as tariff overhang on the Chinese side is minimal.

Table 2: Chinese Tariff Rates on Imports from Georgia (in percentage terms, for 2014)

	Simple Average	Weighted Average	Minimum Rate	Maximum Rate
Ores and Metals				
Effectively Applied	1.4	0.0	0.0	7.0
Most Favored Nation	1.4	1.2	0.0	7.0
Bound Tariff	2.8	0.0	0.0	7.0
Agriculture				
Effectively Applied	16.9	14.2	0.0	40.0
Most Favored Nation	16.9	14.2	0.0	40.0
Bound Tariff	16.9	14.2	0.0	40.0
Manufacturing				
Effectively Applied	8.1	12.2	0.0	35.0
Most Favored Nation	8.1	12.2	0.0	35.0
Bound Tariff	8.4	12.3	0.0	35.0

Source: UNCTAD-TRAINS

All this does not imply that Georgia could not gain from further tariff reductions, either within the framework of the WTO or the proposed China-Georgia free trade agreement. In particular, Chinese tariff rates on categories in which Georgia has large exports to countries other than China can be relatively high. This includes beverages with a tariff rate of twenty percent and live animals with a tariff rate of ten percent. It is unclear to what extent high Chinese tariff rates or other factors such as transportation costs or lack of market demand are responsible for low exports to China in these categories.

China also imposes a range of non-tariff barriers. Some of these, in particular anti-dumping measures and countervailing duties do not apply to Georgian exports. More important are sanitary, phytosanitary and technical barriers, which concern a significant range of product categories, but are difficult to quantify. Econometric estimates by Kee et al. (2009) suggest

that non-tariff barriers imposed by China are slightly above non-tariff barriers of developed countries, but are on par with developing country non-tariff barriers, on average. Non-tariff barriers tend to affect both fixed and variable trade costs, and depending on the relative magnitudes will affect trade mainly via the extensive or intensive margin.

Table 3: Chinese Tariff Rates on the ten most important Exports from Georgia, for 2014 (in million US$ respectively in percent)

HS Code	Commodity	Trade Value	Tariff Rate	Notes
310230	Fertilizers	137.61	1.0	
300490	Pharmaceutical	73.42	3.0 - 6.0	
610990	Apparel	35.38	1.0 / 14.0	
010229	Live bovine animals	30.07	10.0	
220210	Beverages, spirits and vinegar	28.43	20.0	
010410	Live sheep and goats	21.04	0.0 – 10.0	
100199	Wheat and meslin	12.08	1.0 / 65.0	quota regime
401110	New pneumatic tyres	11.29	10.0	
300420	Pharmaceutical	9.70	6.0	
100590	Maize (corn)	6.81	1.0 / 65.0	quota regime

Note: Excluding exports of motor vehicles, ores and metals, Source: UNCTAD-TRAINS

Both China and Georgia are members of the World Trade Organization. No disputes have ever been filed between the two countries or included both countries. Both are also signatories of the General Agreement on Trade in Services (GATS), with minimal Article II (MFN) Exemptions. China and Georgia also signed a Bilateral Investment Treaty (BIT) in 1995. As a first generation treaty, it is relatively general and vague, and provides only for an ad hoc tribunal to settle disputes, outside the realm of institutional arbitration.

This leaves a wide range of options for the proposed free trade agreement between China and Georgia, from a mere free trade agreement offering tariff concessions to a deep free agreement reducing tariffs and non-tariff barriers to trade in goods and services, harmonizing standards and regulations and facilitating bilateral investments. The former should be of little interest to China, given that Georgia has already low tariff rates across the board, but is of more interest to Georgia, given that some of its actual and potential

exports face high Chinese tariff rates. A deep free trade agreement, in contrast, offers promises to both countries. In the best case, a deep free trade agreement would be transformative, with Georgia becoming a hub for trade, investment and infrastructure linking China and Europe, leveraging Georgia's geographical location and the existing Deep and Comprehensive Free Trade Agreement (DCFTA) between Georgia and the European Union. Unfortunately, it is exactly this transformative potential that makes it difficult to accurately predict the impact of the proposed free trade agreement.

III. Methodology

The estimation procedure closely follows Egger et al. (2011), building on the work of Anderson and van Wincoop (2003), Baier and Bergstrand (2009), and Egger and Larch (2011). Egger et al. (2011) derive a structural gravity equation from a standard new trade theory model, and addresses the issues of the endogeneity of free trade agreements, zero trade flows, heteroscedasticity, and the general equilibrium effects of trade agreements. The structural gravity equation takes the form

$$\ln X_{ij} = \begin{cases} Z'_{ij}\beta + \gamma FTA_{ij} + \Omega_i + \mathrm{P}_j \\ 0 \end{cases},$$

where X_{ij} denotes bilateral trade flows, Z_{ij} is a vector of all gravity variables, FTA_{ij} is a dummy that is one if both countries are in a free trade agreement, and Ω_i and P_j are multilateral resistance terms. Following Helpman, Melitz and Rubinstein (2008), this specification takes into account that for many country pairs trade will be zero. Bilateral trade costs are given by

$$(1-\sigma)\ln \tau_{ij} = \beta_0 \ln distance_{ij} + \cdots + \gamma FTA_{ij},$$

where σ is the elasticity of substitution and τ_{ij} are bilateral trade costs. The gravity variables are bilateral distance between countries, common colonial past (including having

been part of the Soviet Union), common language, common legal origins, common border, sectoral shares in total value added (to capture the effect of economic structure on trade), and the World Bank Doing Business subindex trading across borders. To capture the effect of trade agreements on trade costs, trade agreements that are already in force are also included. This specification captures not only tariff reductions, but also other implications of trade agreements, in particular reductions of non-tariff barriers, changes to economic policy and economic structure induced by the trade agreement.

Egger et al. (2011) solve for the extensive margin (the probability that trade flows are not zero) and the intensive margin (the value of trade flows), as a variation of the Heckman two-stage estimation procedure. The extensive margin is estimated as a probit model, with GDP per capita, legal origin and the World Bank Doing Business subindex on trading across borders as selection variables. The intensive margin is estimated as a gravity equation. To control for the log-concavity problem, the gravity equation is estimated with a Poisson pseudo-maximum likelihood estimator (PPML), as proposed by Santos Silva and Tenreyro (2006).

To control for endogeneity and general equilibrium effects, the estimation proceeds in three stages. Endogeneity is a potential issue as the error term might include unobserved barriers to trade, with these barriers potentially prompting countries to negotiate trade agreements. General equilibrium effects have to be taken into account, as trade agreements will not only affect trade flows, but also GDP and multilateral resistance,[3] which in turn will feed back into trade flows.

On the first stage both the gravity and the selection equation are estimated, while holding the effect of trade agreements constant, in order to control for endogeneity. The effect is fixed at the value of 236 percent found by Egger et al. (2011), hence implying that a free trade agreement will more than double trade flows, on average. As robustness check, alternative values from different papers have been used, ranging from 27 to 311 percent.

[3] Given the small size of Georgia changes to the multilateral resistance terms of other countries are likely to be negligible.

These alternative specifications yield essentially the same end results. The multilateral resistance terms are estimated as importer respectively exporter fixed effects. On the second stage the results of the first stage are used to compute counterfactual multilateral resistance terms and GDP for all countries in the sample, as in Egger and Larch (2011). Lastly, on the third stage the gravity equation and the selection equation are re-estimated using the counterfactual resistance terms and GDPs, with the dummy variable FTA_{ij} set to one for China and Georgia, and all countries that are part of a free trade agreement.

To assess the potential impact of structural and policy change induced specifally by trade agreements with China, we also estimate the gravity equations for two separate groups of countries. The first group includes all countries that have a free trade agreement with China, the second group includes all other countries. This methodology follows Shepotylo (2010), and is based on the assumption that structural or policy changes induced by the trade agreements are reflected in the gravity coefficients and not just the gravity variables.[4] This approach has its limitations. In particular, it implicitly assumes that the effect of having a free trade agreement with China is identical across the countries in the sub-sample. This is a strong assumption, which is only partially mitigated by controlling for country-specific characteristics such as economic structure.

Data on trade flows is taken from the UN Comtrade data base, data on distance, cultural and historical ties (i.e. common language, colonial ties, legal origin) from CEPII, on GDP from the World Bank World Development Indicators, and on sectoral shares from the UNIDO industrial data base. Data on free trade agreements is taken from the WTO Regional Trade Agreements database. The data covers 141 countries, with 2014 as base year for all data except sectoral shares. Owing to infrequent updates to the UNIDO industrial database, sectoral shares are based on data from 2012.

[4] For example, a trade agreement will lower trade costs, which will be directly reflected in the gravity variables. At the same time, the trade agreement might also induce structural change. But with a different sectoral composition, trade flows will exhibit a different sensitivity to trade costs, and hence the gravity coefficients will change.

IV. Results

Table 4 reports the parameter estimates. The first two columns report estimates for the baseline estimation that makes no difference between countries that have and countries that do not have a free trade agreement with China. The third and fourth column report estimates for the intensive margin separately for countries with respectively without a free agreement with China. Not reported in the table are the extensive margin for the grouped regression, and the robustness checks with alternative values for the effect of free trade agreements.

Table 4: Parameter Estimates

	Intensive Margin	**Extensive Margin**	**Intensive Margin, FTA with China**	**Intensive Margin, No FTA with China**
FTA	0.85	0.02	0.91	0.81
ln Distance	-1.16	-0.91	-1.01	-0.93
	(0.05)	(0.04)	(0.06)	(0.04)
Land Border	0.31	-0.93	0.41	0.45
	(0.02)	(0.18)	(0.06)	(0.07)
Language	0.11	0.11	0.08	0.15
	(0.02)	(0.06)	(0.03)	(0.03)
Colonial Origin	0.36	0.22	0.28	0.33
	(0.04)	(0.06)	(0.06)	(0.05)
Observations	19734	19734	16499	3235

Note: All specifications include separate fixed effects for exporting and importing countries. Cluster robust standard errors are reported in parentheses. No standard errors are reported for FTA, as the value was fixed at the value of other studies.

The parameter estimates are broadly in line with the gravity literature. In particular, we find that before taking into account general equilibrium effects free trade agreements increase trade flows substantially, by almost one hundred percent. There is no statistically significant difference between the effect of free trade agreements on trade flows between countries in and countries not in a free trade agreement with China, implying that trade

agreements with China do not lead to structural or policy changes different than the changes induced by trade agreements with other countries.

The parameter estimates can be used to compute counterfactual GDP, prices and hence real GDP per capita, using the functional relationship between trade costs, multilateral resistance terms, and prices and GDP in Egger and Larch (2011). These effects only materialize in the long-run, after about ten to fifteen years (Baier and Bergstrand, 2007).

While changes to trade flows and GDP per capita are reported as precise estimates, this should not be construed as offering anything but rough estimates of the possible effect of a China-Georgia free trade agreement. In particular, these estimates are based on the implicit assumption that in the ten to fifteen years it takes for the full effect to materialize, neither the Georgian nor the Chinese economy will experience any significant changes, such as new free trade agreements, changes to the trajectory of GDP growth, changes in technology that reduce trade costs, among many other possible changes.

Table 5: Predicated Changes to Trade Flows and GDP per capita, in percent

	Bilateral Exports	Other Exports	Real GDP per capita
China			
benchmark	24.7	0.0	0.0
without selection	18.3	0.0	0.0
grouped	31.5	0.0	0.0
Georgia			
benchmark	109.0	-8.4	1.4
without selection	68.3	-4.5	1.6
grouped	94.0	-6.6	1.1

Note: Other exports are total exports to all other trade partners, and indicate the extent of trade diversion.

Irrespective of the specification, a free trade agreement between China and Georgia is predicted to double exports from Georgia to China, and to lead to a cumulative increase of GDP per capita by about 1.5 percent. Assuming a fifteen year time horizon this would correspond to an average annual increase of Georgian exports to China of about five

percent. Assuming a shorter time horizon of only ten years this would correspond to an average annual increase of around eight percent. There is little trade diversion, as exports to other countries only slightly fall.

Chinese exports to Georgia increase by only about 20 to 30 percent, with virtually no trade diversion or changes to real GDP per capita. For Georgia there is a significant difference between the specification with and the specification without the selection equation. This indicates that a significant part of the increase in Georgian exports in China is along the extensive margin, that is, Georgia diversifies its exports to China.

These estimates exceed the CGE estimates of the feasibility study by almost an order of magnitude. There are several explanations. One, by construction the CGE model of the feasibility study focuses on tariff reductions alone, ignoring reductions in non-tariff barriers that are either negotiated or implied by the free trade agreement. Second, the CGE model ignores structural change, both the structural change that has taken place since the 2001 base year of the underlying input-output table, and future structural change induced by the trade agreement.

Importantly, the estimation is agnostic about the actual content of the proposed China-Georgia free trade agreement and implicitly assumes that the free trade agreement and its economic effects will be similar to the average existing free trade agreement. This assumption is driven by the fact that at the moment the scope and depth of the proposed free trade agreement is completely unknown. Even if it would be known, it is difficult to rank and distinguish free trade agreements according to their depth, and to thus estimate the effects of different scopes and depths of free trade agreements. It is also not an unreasonable assumption, as even in a best case scenario the proposed free trade agreement is unlikely to be as deep as the DCFTA with the European Union or some of the larger and deeper free trade agreements such as NAFTA or the Eurasian Union. At the same time, the free trade agreement is also not likely to be as shallow as some of the older free trade agreements, such as the Georgia-Turkmenistan free trade agreement.

One stated objective of the proposed free trade agreement between China and Georgia is to leverage Georgia's location between Europe and China and the existing DCFTA with the European Union. The estimations implicitly take into account the potential role of Georgia as a transit and processing hub, in as much as other countries are in a similar position. As the effect of trade agreements is taken to be the average over existing free trade agreements, the gravity estimates are underestimates if the proposed free trade agreement will focus on those areas that would further facilitate the transformation of Georgia to a transit and processing hub between China and Europe.

While both free trade agreements would reduce tariff and non-tariff barriers to exports to Europe respectively China, country of origin rules greatly limit the extent to which this dual preferential market access can be used to re-export goods from China to Europe. In contrast, processing of Chinese intermediate inputs in Georgia for export to the European Union would in principle be in compliance with country of origin rules. For this to happen, the proposed trade agreement has to be careful about country of origin rules, should contain investment provisions facilitating Chinese FDI in Georgia, and should coordinate trade facilitation measures with the provisions of the DCFTA.

Left for future research are several issues that were not addressed in this paper. We did not address the effect of the proposed free trade agreement on trade in services and on foreign direct investment, as the available data is very limited. We also did not address the effect of the trade agreement on individual sectors. Estimating changes to trade flows for individual sectors is computationally demanding (and impossible for 141 countries) and requires a modification of the theoretical model underpinning the gravity equation. In particular, the few papers that attempt to estimate a multi-sector gravity equation assume away structural change induced by the trade agreement (Caliendo and Parro, 2015). This assumption is already problematic for mature, developed economies. It is unreasonable for Georgia, and assumes away one important channel through which trade agreements foster Georgia's economic development.

On the other side, one of the advantages of our estimation strategy is that it includes not only tariff reductions, but also reductions in non-tariff barriers and the effect of changes in economic policy and economic structure induced by the free trade agreements. At the same time this is also a limitation, as it is not possible to disentangle these various channels and identify the contributions of tariff reductions, reductions in non-tariff barriers, policy changes, and structural change to the increase in trade flows and GDP.

V. Conclusions

Negotiations on the proposed China-Georgia free trade agreement have just begun. This paper hopes to inform these negotiations by providing rigorous quantitative estimates of the economic effects of the proposed free trade agreement. We find that the proposed free trade agreement will have strong effects on bilateral trade between China and Georgia, with minimal trade diversion, and a sizable impact on Georgian GDP per capita. A key feature of the econometric analysis is that it implicitly assumes that the proposed free trade agreement will be similar in scope and depth to other, existing free trade agreements. Should the proposed China-Georgia free trade agreement be deeper than the average existing trade agreement, these quantitative estimates will likely be underestimates.

In consequence, the goal should be a free trade agreement that goes beyond mere tariff reductions. In particular, the free trade agreement should facilitate trade by reducing non-tariff barriers, harmonizing country of origin rules with the country of origin rules in the DCFTA with the European Union, and should coordinate trade facilitation measures with the WTO trade facilitation agreement and the trade facilitation measures in the DCFTA. To facilitate Chinese FDI the free trade agreement should also update the existing Bilateral Investment Treaty between China and Georgia, by providing deeper investment provisions. The focus should be on reducing barriers to cross-border investment, while avoiding dispute settlement mechanisms that will lead to undue litigation.

The negotiations on the free trade agreement are not a means to an end. Rather, they create a collegial dialogue between China and Georgia, in various formats, from discussions among experts at a technical level to discussions among senior government officials. While the free trade agreement can potentially codify a wide range of issues, establishing a good working relationship would allow to address any issues that might arise in the future, and are not codified or have been anticipated.

While the benefits of the proposed free trade agreement are substantial, they pale in comparison the benefits from further integration with the European Union or further regional integration in the South Caucasus and its immediate neighborhood. The China-Georgia free trade agreement is thus an important, but not the most important project.

VI. Bibliography

Anderson, James, and Eric van Wincoop (2003). “Gravity with Gravitas: A Solution to the Border Puzzle,” *American Economic Review* 93(1): 170-192.

Baier, Scott L., and Jeffrey H. Bergstrand (2007). “Do Free Trade Agreements actually Increase Members’ International Trade?,” *Journal of International Economics* 71(1): 72-95.

Baier, Scott L., and Jeffrey H. Bergstrand (2009). “Bonus vetus OLS: A Simple Method for Approximating International Trade-Cost Effects using the Gravity Equation,” *Journal of International Economics* 77(1): 77-85.

Beshkar, Mostafa, Eric Bond, and Youngwoo Rho (2015). “Tariff Binding and Overhang: Theory and Evidence,” *Journal of International Economics* 97(1), 1-13.

Caliendo, Lorenzo, and Fernando Parro (2015). “Estimates of the Trade and Welfare Effects of NAFTA,” *Review of Economic Studies* 82(1): 1-44.

Egger, Peter, and Mario Larch (2011). “An Assessment of the Europe Agreements’ Effects on Bilateral Trade, GDP, and Welfare,” *European Economic Review* 55(2): 263-279.

Egger, Peter, Mario Larch, Kevin Staub and Rainer Winkelmann (2011). “The Trade Effects of Endogenous Preferential Trade Agreements,” *American Economic Journal: Economic Policy* 3(3): 113-143.

Fuenfzig, Michael (2015). “Georgia’s Trade Policy Choices: A Quantitative Assessment”, *International School of Economics*, Tbilisi, Georgia.

Helpman, Elhanan, Marc Melitz and Yona Rubinstein (2008). “Estimating Trade Flows: Trading Partners and Trading Volumes," *Quarterly Journal of Economics* 123(2): 441-487.

Ivus, Olena, and Aaron Strong (2007). “Modeling Approaches to the Analysis of Trade Policy: Computable General Equilibrium and Gravity Models,” in: Handbook on International Trade Policy, edited by William A. Kerr and James D. Gaisford, Elgar Publishers.

Kee, Hiau Looi, Alessandro Nicita, and Marcelo Olarreaga (2009). "Estimating trade restrictiveness indices,” *Economic Journal* 119(534), 172-199.

Piermartini, Roberta, and Robert Teh (2005). “Demystifying Modelling Methods for Trade Policy,” *WTO Discussion Paper* No. 10, Geneva, Switzerland.

PMCG and UIBE (2015). “Joint Feasibility Study on China-Georgia Possible Free Trade Agreement,” Mimeo.

Santos Silva, J.M.C., and Silvana Tenreyro (2006), "The Log of Gravity," Review of Economics and Statistics 88(4): 641-658.

Shepotylo, Oleksandr (2010). “A Gravity Model of Net Benefits of EU Membership: The Case of Ukraine,” *Journal of Economic Integration* 25(4), 676-702.

Zhou, Jiayi (2012). “Chinese in Georgia,” *European Centre for Minority Issues Working Paper* #54, Tbilisi, Georgia.

Appendix: Data Sources

Table 6: Gravity Variables

Variable Name	Variable Type	Description	Source
Exports		exports by sector at the HS two-digit level, in US$	UN Comtrade
GDP		origin and destination country GDP, in current US$	World Bank WDI
Distance		distance between the weighted average of the largest cities	CEPII
Land Border	Dummy variable	one if countries share a land border	CEPII
FTA	Dummy variable	one if countries are part of a free trade agreement	WTO RTA
Language	Dummy variable	one if countries share the same language	CEPII
Colony	Dummy variable	one if countries have colonial ties/were once in the same country	CEPII
Sectoral share		Sectoral share in value -added	UNIDO
GDP per capita	Selection variable	origin country GDP per capita, in US$	World Bank WDI
Legal origin	Selection variable	one if countries share the same legal origin	CEPII
Doing Business index	Selection variable	Trading across borders index	World Bank