OSW | CENTRE FOR EASTERN STUDIES
OŚRODEK STUDIÓW WSCHODNICH im. Marka Karpia

Econometric forecasting of migrant stocks from Eastern European Countries in the EU Members States

Wadim Strielkowski, Faculty of Social Sciences, Charles University (Prague)
Marta Jaroszewicz, Centre for Eastern Studies (OSW)

Outline:

- Basic motivation
- Background and data description
- Model details and results
- Forecasting of migration
- Conclusion

Basic motivation

- Elaborate econometric model forecasting migrant stocks from Eastern Europe in the EU MS based on economic and demographic data
- Verify mathematical correctness of elaborated model and test cointegration of explanatory variables using panel data
- Using elaborated model perform estimates on migrant stocks dynamics from Ukraine, Belarus and Moldova in the EU, present three scenarios of possible developments till 2050
- Estimating migrant stocks dynamics from Ukraine, Belarus and Moldova in the Russian Federation; present three scenarios of possible developments till 2050

Novelty of the research

- One of the main outcomes of the project co-funded by the International Visegrad Fund and the Centre of Eastern Studies.
- Based on the data derived mainly from Eurostat, a detailed econometric model fulfilling the criteria of scientific integrity and practical utility was designed and executed.
- Based on this model, the estimates on migrant stock's dynamics were performed and three scenarios of possible developments till 2050 were presented.
- To our best knowledge, no similar analysis or projections have ever been conducted. This research builds on similar studies predicting Central European migrations to the EU before and after 2004.

Expertise in predicting migration

- Glazar, O., Strielkowski, W. (2012). *Turkish migration in Europe An economic analysis of possible EU accession on migration flows.* Charles University in Prague, Faculty of Social Sciences, 116 pp. ISBN 978-80-87404-16-4

- Strielkowski, W., Glazar, O. (2010). Turkey and the European Union: possible incidence of the EU accession on migration flows. *Prague Economic Papers*, 2010(3), pp. 218-235, ISSN 1210-0455. (Indexed in WoS, IF 0.561) http://vse.cz/pep/373

- Strielkowski, W., Šárková, K., Żornaczuk, T. (2013). EU Enlargement and Migration: Scenarios of Croatian Accession. *Romanian Journal of European Affairs,* Vol. 13, Issue 3, pp. 53-63. ISSN 1841-4273. (Indexed in Scopus, SJR 0.1) http://rjea.ier.ro/sites/rjea.ier.ro/files/articole/RJEA_2013_vol13_no3_sept_art4.pdf

- Strielkowski, W., Glazar, O. (2014). Turkish migration in Europe: EU accession and migration flows. *Migration Letters,* 11(2), pp. 245-257. ISSN 1741-8984. (Indexed in Scopus, SJR 0.1) http://tplondon.com/journal/index.php/ml/article/view/275

- Strielkowski, W., Glazar, O., Ducháč, T. (2014). Economic implications of Turkish migration in Europe: lessons learned from Polish EU Accession. *Journal of Economic Cooperation and Development,* 35(2), pp. 91-120. ISSN 0252 - 953X. (Indexed in Scopus, SJR 0.13) http://www.sesric.org/jecd/jecd_articles/ART13052702-abstract.pdf

The data

- The most notorious problem with estimation of migrations is the lack of appropriate data
- Correlation and testing co-integration of the data
- Data used in this paper are the panel data of the stocks of migrants from EEC (Belarus, Moldova and Ukraine) as a % of home populationare in the 27 EU MS and Norway for the period of 2008 to 2012

The model

- The model is based on a human capital approach that deal with investment in human capital and expected future income (see Boeri and Brücker, 2000; Alvarez-Plata, Brücker and Siliverstovs, 2003).

- People make expectations regarding the future income in the target (host) country and source (home) country. The differences in incomes in the target and source countries in the past influence expectations about the future possible difference in incomes and the income a migrant can obtain in the host country.

- Country's GDP per capita serves as a proxy for individuals' incomes both in source and target countries (the selection of is justified by the limited data sources available). Average employment rate in target and source countries is taken as a proxy for labour market conditions.

The model

Simple error correction model (a dynamic model in which the movement of the variables in any period is related to the previous period's gap from long-run equilibrium):

$$\Delta m_{fh,t} = \beta_1 * \Delta ln\,(w_{f,t} / w_{h,t}) + \beta_2 * \Delta ln\,(w_{h,t}) + \beta_3 * \Delta ln\,(e_{h,t}) + \beta_4 * \Delta ln\,(e_{f,t}) ++ \beta_5 * ln\,(w_{f,t-1} / w_{h,t-1}) + \beta_6 * ln\,(w_{h,t-1}) + \beta_7 * ln\,(e_{h,t-1}) + \beta_8 * ln\,(e_{f,t-1}) + \beta_9 * (m_{fh,t-1}) + \beta_{10} * DummyF + \varepsilon_t$$

- dependent variable - the stocks of migrants from Eastern European countries *f* as a % of home population *h*
- $w_{f,t}/w_{h,t}$ foreign to home country income difference
- $w_{h,t}$ home country income
- $e_{f,t}$ employment rate in country *f*
- $e_{h,t}$ country of origin employment rate
- $m_{fh,t-1}$ lagged migrants stock of country *h* and target country *f*
- DummyF dummy variable for the free movement of persons
- t, t-1 denotes time periods

Testing the data

- To form the error correction model, one needs to prove that all the variables have to be cointegrated to form a dynamic long-term equilibrium.

- To fulfill this condition the variables there should exist a unit root and there is a linear combination of those variables that is stationary.

- To form a cointegrated set our data have to pass two stage process: to assure that all variables are non-stationary (integrated of same order) using panel data unit root test and testing that the combination of variables are stationary.

- We employ the panel cointegration tests developed recently and are mainly based on the classical Engle Granger (1987) cointegration test.

* see Alvarez-Plata, Brücker, and Siliverstovs (2003)

Final model

Employment rate in the country of origin (domestic income) had to be eliminated due to the fact that it proved to be insignificant in all estimates (was redundant since the null hypothesis of insignificancy of beta was not rejected). The final model can thus be presented in the following way:

$$\Delta m_{fht} = a_h + \beta_1 ln\,(w_{ft} / w_{ht}) + \beta_2 ln\,(w_{ht}) + \beta_3 ln\,(e_{ft}) + \beta_4\,(m_{fh,t-1}) + \beta_5\,(m_{fh,t-2}) + \beta_6 * DummyF + Z_{fh}\gamma + \varepsilon_t$$

m_{fht} - the dependent variable representing the stocks of migrants from source country *h* living in target country *f* as a % of source country population *h*.

- w_{ht} – country of origin income level
- w_{ft}/w_{ht} – foreign to home country income difference
- e_{ft} – employment rate in country *f*
- $m_{fh,t-1}$ – lagged migrants stock of home country h in country *f*
- $m_{fh,t-2}$ – lagged migrants stock of home country h in country *f*
- Z_{fh} – vector of time-invariant variables which affect the migration between two countries, such as geographical proximity and language.
- DummyF – Free movement of persons

Model implications

- It should be emphasised that Poland and other Central European states and Bulgaria and Romania where offered genuine free movement of people only when they joined the EU, while free access for their citizens to the labour markets of all Member States was guaranteed a few years later.

- Application of this dummy (free movement of people) - we intended to test whether and to what extent such a deep liberalisation of mobility may influence the migrant stock dynamics.

- Subtle liberalisation of mobility rules as visa liberalisation cannot be introduced successfully into an econometric forecast model. We did not possess comprehensive uniform statistical data (including historical data) back from the 1990s when EU MS lifted the visa regime for the Central European states nor for the Western Balkan states who obtained a visa free regime in 2009-2010

Simulation of migration

- The shock which simulates the free movement of people in the EU for the nationals of the three respective states has been set to occur in the year 2015.

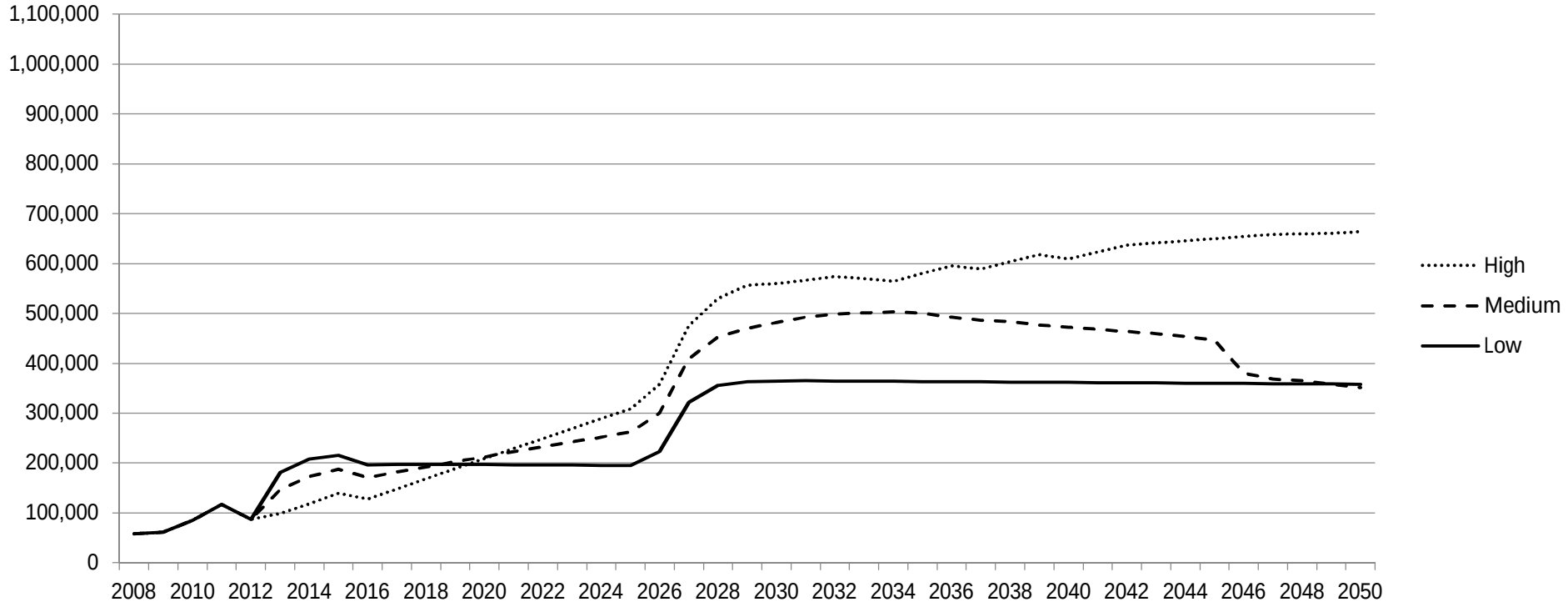
- The size and duration of the shock is derived from the situation in Poland, Bulgaria and Romania after their accession to the EU, which eliminated barriers to mobility to the ‘old’ EU MS.

- The results of the shock are recorded in the model one year after the free movements restrictions were abolished (there is a lag before the data on the stocks of migrants are collected and analyzed).

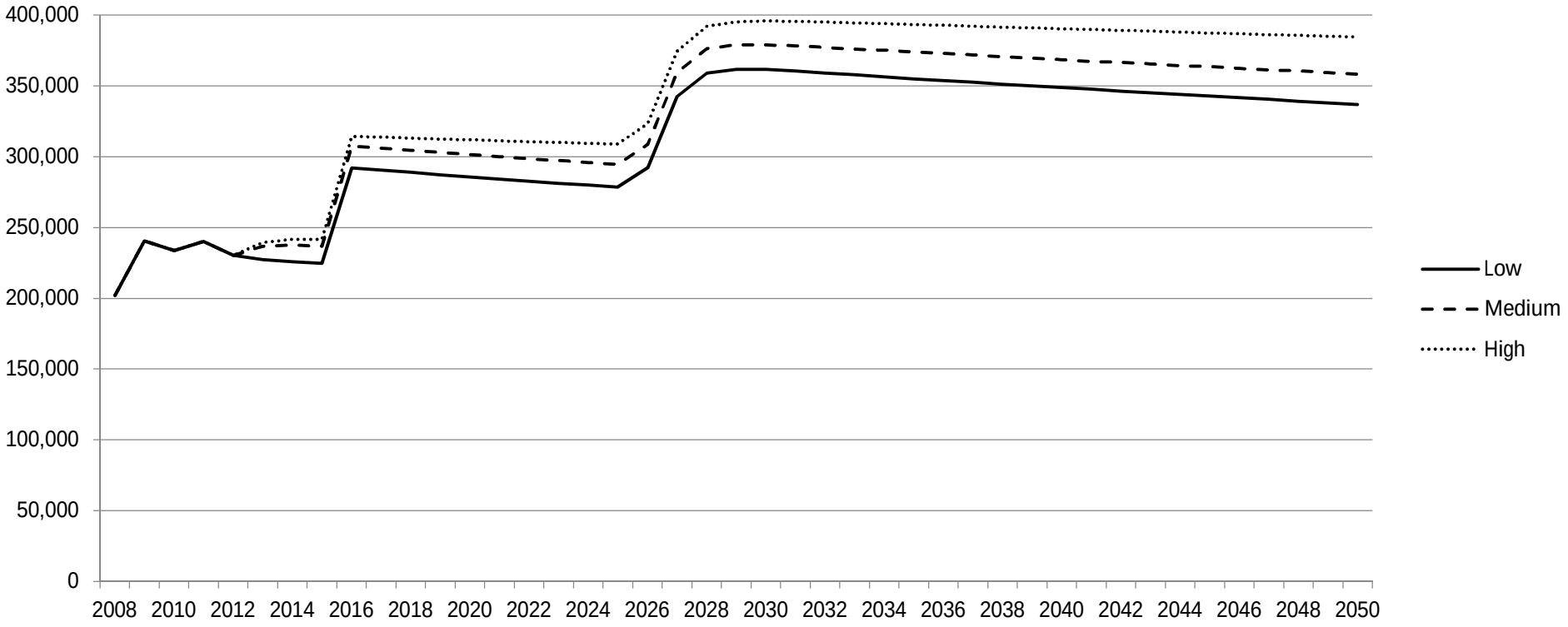
Scenarios of migration

Low	Medium	High
Unemployment = average of 2008-2012 observations	Unemployment = average of 2008-2012 observations + 0.5%	Unemployment = average of 2008-2012 observations + 2%
1% GDP growth Eastern Europe, 4% GDP growth EU MS	0% GDP growth Eastern Europe, 2% GDP growth EU MS	-2% GDP decline Eastern Europe, 0% GDP growth EU MS

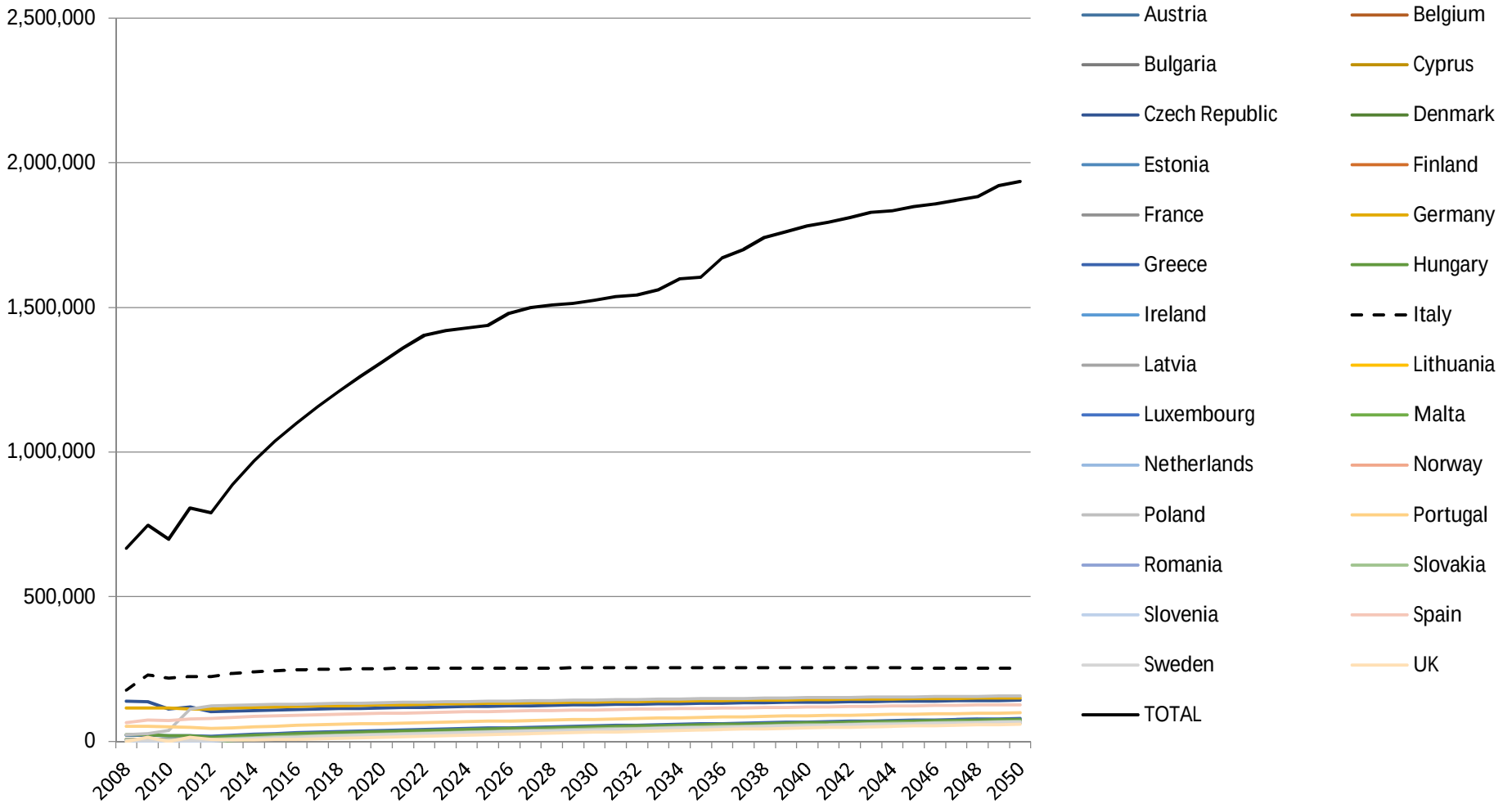
Total Belarusian resident stocks 2008-2050 - 3 scenarios, 27 EU countries and Norway, impact of visa abolition in 2015



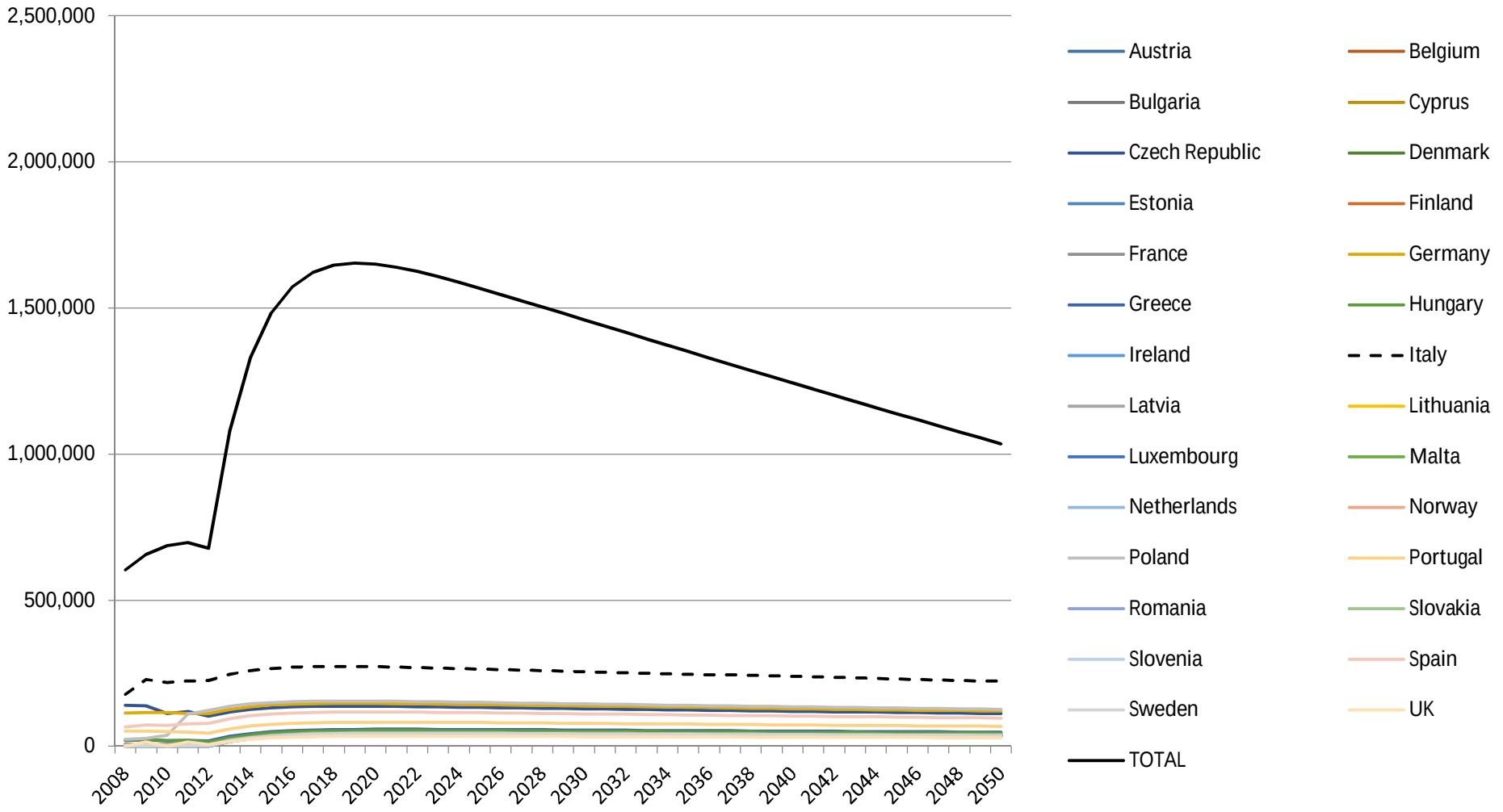
Total Moldavian resident stocks 2008-2050 - 3 scenarios, 27 EU countries and Norway, impact of visa abolition in 2015



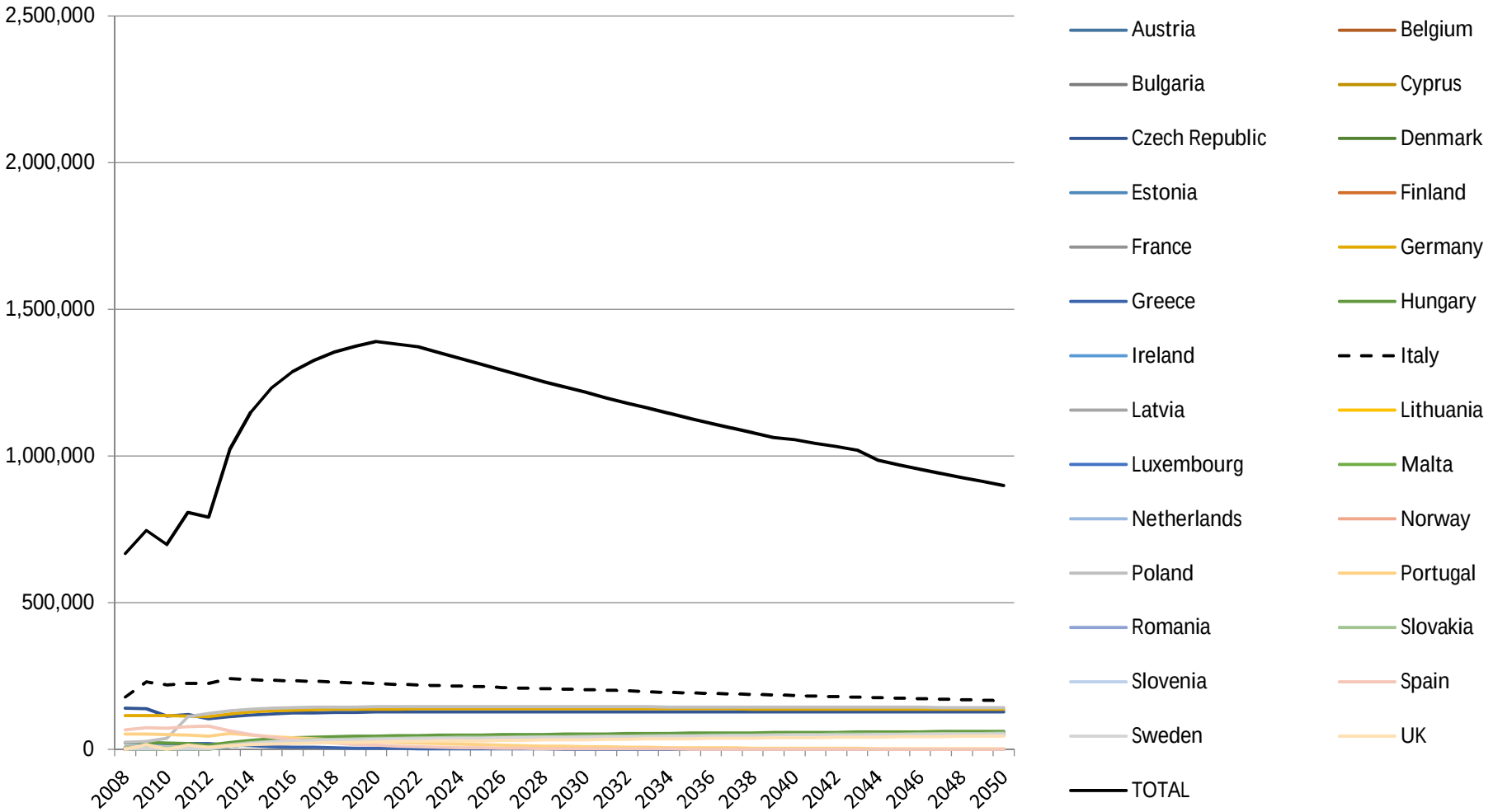
Ukrainian migrants stock – high scenario



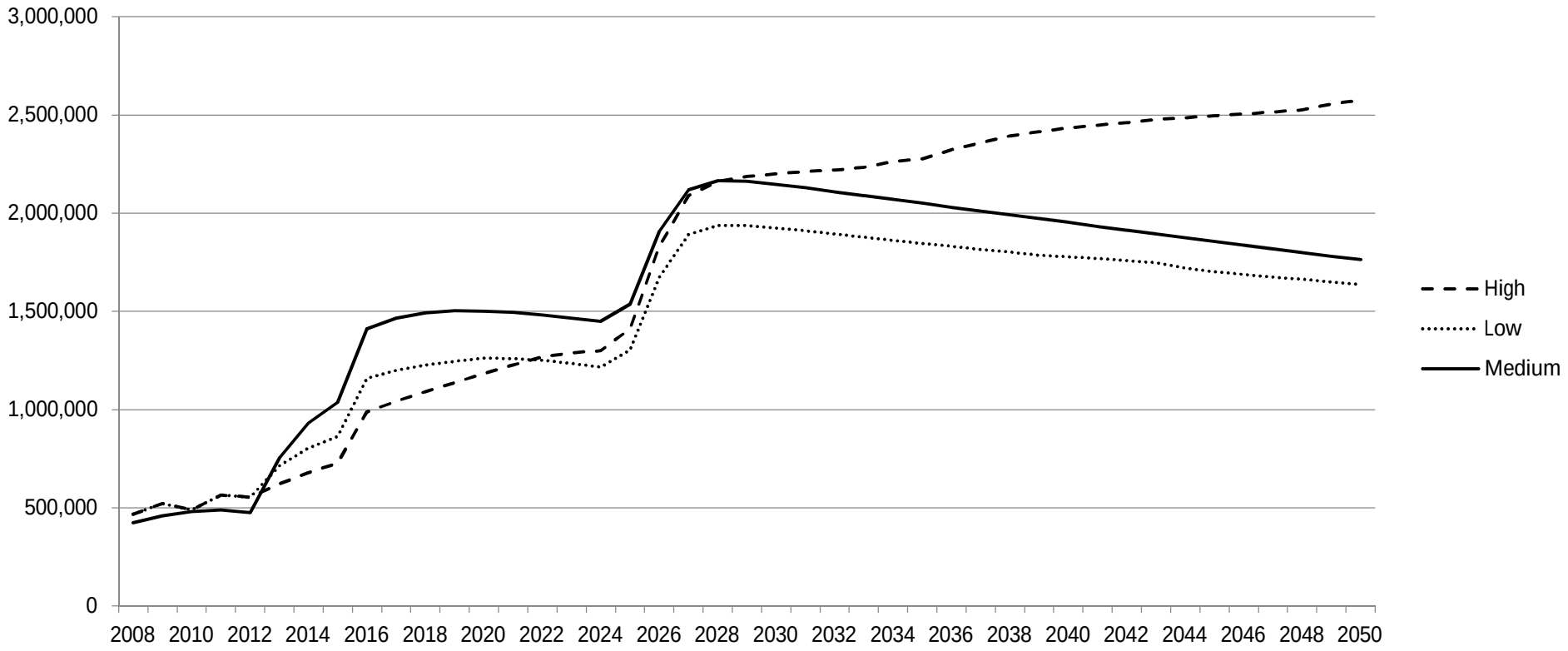
Ukrainian migrants stock – medium scenario



Ukrainian migrants stock – low scenario



Total Ukrainian resident stocks 2008-2050 - 3 scenarios, 27 EU countries and Norway, impact of visa abolition in 2015



Main conclusions

- Hypothetical visa abolition for the EEC is not going to significantly increase the stocks of migrants from these countries in the EU MS.

- The results of the forecasts for all the states may amount to around 50,000 individuals over a two-year perspective for both Belarus and Moldova (taken separately) and around 200,000-300,000 for Ukraine.

- In the longer term (up to 2050) the overall stocks in the EU from those three states may oscillate between 1.5-3.5 million migrants, depending on the economic performance of both the destination locations and the countries of origin.

- However, it should be emphasized that the forecasts do not need to come true, they only model the potential migration dynamics under different scenarios of economic development.

OSW | CENTRE FOR EASTERN STUDIES
OŚRODEK STUDIÓW WSCHODNICH im. Marka Karpia

Thank you for your attention!

Q&A

Note: The full report “Forecasting migration between the EU, V4 and Eastern Europe: impact of visa abolition” can be found at: http://www.osw.waw.pl/sites/default/files/migration_report.pdf