

Online Appendix For:

Regional International Organizations and Individual Immigration Attitudes: Results from Finite Mixture Models

In this online appendix, we first present the full Likelihood and Log-likelihood functions for the MiOP and MiOPC models. We then describe the operationalizations of the variables that we include in our OP, MiOP and MiOPC models of *immigration support*. Following these descriptions, we extract and discuss the marginal effect(s) of *education* \times *gdp* on *immigration support* for the models presented in Table 1 of our main paper.

(Log-)likelihood Function of MiOP(C) models

Having described the MiOP and MiOPC models in the text, we first present the full Likelihood and log-Likelihood for the MiOP and MiOPC models. Specifically, let $\theta = (\gamma', \beta', \mu')'$ for the full MiOP model and let $\hat{\theta} = (\gamma', \beta', \mu', \rho_{\varepsilon u})'$ for the full MiOPC model. The likelihood of the MiOP model for an i.i.d. sample of $i \in \{1, 2, \dots, N\}$ observations is $\mathcal{L}(\theta) = \prod_{i=1}^N \prod_{j=0}^J [\Pr(y_i = j | \mathbf{x}_i, \mathbf{z}_i, \theta)]^{d_{ij}}$ which is fully defined by the following:

$$\begin{aligned} \mathcal{L}(\theta) &= \prod_{i=1}^N \prod_{j=0}^{m-1} [\Pr(s_i = 1) \Pr(\tilde{y}_i = j)]^{d_{ij}} \\ &\quad \times \prod_{i=1}^N \prod_{j=m}^m [\Pr(s_i = 0) + \Pr(s_i = 1) \Pr(\tilde{y}_i = j)]^{d_{ij}} \\ &\quad \times \prod_{i=1}^N \prod_{j>m}^J [\Pr(s_i = 1) \Pr(\tilde{y}_i = j)]^{d_{ij}} \end{aligned} \tag{1}$$

where m is the middle category of ordered dependent variable y and where $d_{ij} = 1$ if individual i chooses category j , or is $d_{ij} = 0$ otherwise. The likelihood function for the MiOPC model is $\mathcal{L}(\hat{\theta}) = \prod_{i=1}^N \prod_{j=0}^J [\Pr(y_i = j | \mathbf{x}_i, \mathbf{z}_i, \hat{\theta})]^{d_{ij}}$ which is fully defined as,

$$\begin{aligned}
\mathcal{L}(\hat{\theta}) &= \prod_{i=1}^N \prod_{j=0}^{m-1} [\Pr(s_i = 1, \tilde{y}_i = j)]^{d_{ij}} \\
&\times \prod_{i=1}^N \prod_{j=m}^m [\Pr(s_i = 0) + \Pr(s_i = 1, \tilde{y}_i = j)]^{d_{ij}} \\
&\times \prod_{i=1}^N \prod_{j>m}^J [\Pr(s_i = 1, \tilde{y}_i = j)]^{d_{ij}}
\end{aligned} \tag{2}$$

From (1), the log-likelihood function of the MiOP model is $\ell(\boldsymbol{\theta}) = \sum_{i=1}^N \sum_{j=0}^J d_{ij} \ln[\Pr(y_i = j | \mathbf{x}_i, \mathbf{z}_i, \boldsymbol{\theta})]$, where the outcome probabilities are given by (5) in the text. The log-likelihood function of the MiOPC model is $\ell(\hat{\boldsymbol{\theta}}) = \sum_{i=1}^N \sum_{j=0}^J d_{ij} \ln[\Pr(y_i = j | \mathbf{x}_i, \mathbf{z}_i, \hat{\boldsymbol{\theta}})]$, where the outcome probabilities are given by (6) in the text.

Operationalization of Variables:

- *Immigration Support*: Coded 1: Reduced a lot, 2: Reduced a lot, 3: Remain the same as is 4: Increased a little and 5: Increased a lot, in response to the question, “Do you think the number of immigrants to (R’s country) nowadays should be...” (ISSP, 1995).
- *Age*: An individual’s reported age in years (ISSP, 1995)
- *Male*: Binary, equal to one if an individual reported their gender as male, and 0 for female (ISSP, 1995)
- *Parents’ Foreign Citizenship*: Coded 1 if both parents are citizens of respondent’s country, 2 if only the mother or father is a citizen, and 3 if neither parent is a citizen (ISSP, 1995)
- *Education*: An individual’s reported years of formal schooling, capped at 20 years (i.e. all individuals with more than 20 years of formal schooling are assigned a value of 20) (ISSP, 1995)
- *GDP*: Natural log of per capita GDP in 1995 (World Bank, 1995)

- *Party Affiliation with the Right*: Coded 1: far left, 2: center left, 3: center, 4: right, 5: far right (ISSP, 1995)
- *Regional IO Awareness*: Coded: 1: Nothing at all, 2: Not Much, 3: Quite a bit, 4: A lot, in response to the question “How much have you heard or read about (appropriate association for your continent/subcontinent - EU, NAFTA etc.)?” (ISSP, 1995)
- *National Economic Attachment*: Coded 1: very willing, 2: fairly willing, 3: neither willing nor unwilling, 4: Fairly unwilling, 5: Very unwilling, in response to the question “If you could improve your work or living conditions, how willing or unwilling would you be to move outside (R’s country)”? (ISSP, 1995)
- *Center Party Identification*: 1 for individuals whom report their party affiliation to be center, and zero otherwise (ISSP, 1995)

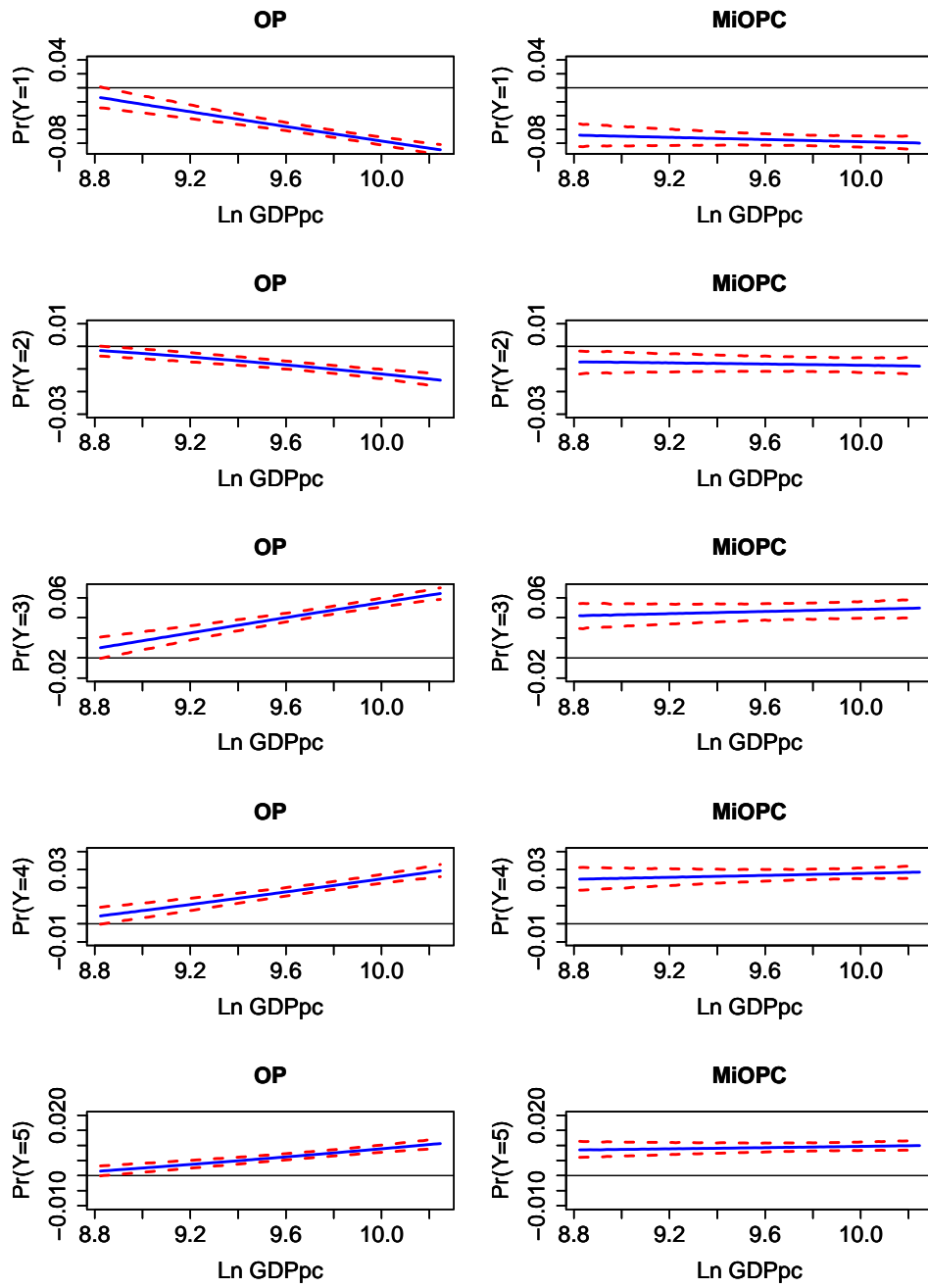
Marginal Effects:

In order to fully assess Table 1’s OP, MiOP, and MiOPC coefficient estimates of *education* \times *gdp*, and their composite terms, we next extract and present the marginal effect of a 12-to-15.5 change in *education* years¹—evaluated across the entire range of *gdp*—on each predicted outcome of *immigration support*. To do so, we hold all other outcome and inflation stage variables to their means or modes, and use parametric bootstraps to recover and plot the 90% confidence intervals to each predicted probability ($m = 5,000$). Given that the resultant MiOP and MiOPC marginal effects results are relatively comparable, we only plot and compare the OP and MiOPC results below. Figure 1 specifically presents the marginal effects of this 12-to-15.5 change in *education*—across the entire range of *gdp* (i.e. along the x-axis)—on the probability of observing each outcome of *immigration support* (on the y-axis, with each row in Figure 1 corresponding to a different $y = 1 : 5$ outcome), separately for the OP model (column 1) and the MiOPC model (column 2).

Beginning first with the OP results in Figure 1, we find here that the estimated effect of a typical increase in *education* generally decreases opposition to immigration (rows 1-2) and

¹That is, we increase *education* by this yearly amount within the outcome stage of the OP, MiOP, and MiOPC models, and also in the inflation stage of the MiOP(C) models. This change corresponds to a change in *education* from approximately the mean of *education* to one standard deviation above its mean.

Figure 1: Marginal Effect of Change in Education, Across Sample Range of GDP



increases indifference towards, and support for, immigration (rows 3-5). Following these effects across the range of *gdp*, we find that *gdp* magnifies the size of *education*'s estimated effects: higher levels of national income ensure that increases in education have a much stronger pro-immigration effect. The MiOPC model results in Figure 1, on the other hand, suggest that once face-saving don't knows have been accounted for, *education* and *gdp* no longer have an interactive effect: the effects of *education* on each of the five potential outcomes of *immigration support* neither increase nor decrease when one moves across the entire range of *gdp*. Nevertheless, the unconditional effects of a 12-to-15.5 change in *education* appear to be positive and statistically significant for the MiOPC model in Figure 1, as this increase in years of education is consistently associated with a decrease in the probability of an individual providing an anti-immigration response (columns 1-2) and is associated with an increase in the probability of an individual providing a status quo, or pro-immigration response (columns 3-5).

References

ISSP. 1995. "National-Identity Data Set." International Social Survey Program.

World Bank. 1995. "World Development Indicators." World Bank: Washington, D.C.