In order to analyse the differentiated effects of North-North, North-South and South-South PTAs, we extend both models to get estimates for each type of PTA. Our benchmark model is extended as follows:

Where ​ denotes the value of exports from country to country at time ; and are exporter-time and importer-time fixed effects, respectively; is a country-pair fixed effect; ​ and are the coefficients for the immediate and lagged effects of a North-North PTA (); ​​ and are the coefficients for the immediate and lagged effects of a North-South PTA (); ​​ and are the coefficients for the immediate and lagged effects of a South-South PTA (); is a set of time dummies accounting for international trade-specific effects at each time ; and is the error term.

Equation (2) also gets extended to capture the heterogeneous effects of the different types of PTAs as follows:

Where ​ denotes the value of exports from country to country at time ; and are exporter-time and importer-time fixed effects, respectively; is a country-pair fixed effect; The summations ​ denote the sum over different agreements for: and : Coefficients for the immediate and lagged effects of North-North PTAs ​(); and : Coefficients for the immediate and lagged effects of North-South PTAs (); and : Coefficients for the immediate and lagged effects of South-South PTAs (); is a set of time dummies accounting for trade-specific effects at each time ; and is the error term.

For both extended models we use the following variables: is a dummy variable that takes the value of 1 if the trade pair is North-North and part of a PTA at time , and 0 otherwise; is a dummy variable that takes the value of 1 if the trade pair is North-North and was part of a PTA at time *-5*, and 0 otherwise; is a dummy variable that takes the value of 1 if the trade pair is North-South and part of a PTA at time , and 0 otherwise; is a dummy variable that takes the value of 1 if the trade pair is North-South and was part of a PTA at time *-5*, and 0 otherwise; is a dummy variable that takes the value of 1 if the trade pair is South-South and part of a PTA at time , and 0 otherwise; is a dummy variable that takes the value of 1 if the trade pair is South-South and was part of a PTA at time *-5*, and 0 otherwise;

The extended models allow us to capture the differentiated effects of PTAs on bilateral exports depending on whether the pair country are two “North” countries (NN), a “North” and a “South” country (NS), or two “South” countries (SS).

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