The unp eceden ed u ge f p efe en ial   ade libe aliza i n ince W ld Wa ⋦   pu ed he e ical and empi ical   k n he ma e alike. The e ical e ea ch illu a ed unde hich c ndi i n p efe en ial   ade ag eemen   (TA) induce elfa e gain f   pa ici- pan .[1]   c n me ic   k c nfi med ha ec n mic and p li ical fundamen al de e mine p efe en ial   ade libe aliza i n h ugh TA membe hip ve y much al ng he line hy-

and f ecen empi ical e ea ch in in e na i nal ec n mic : fi he k n em-
pi ical e ima i n f gene al e uilib ium m del he e ade c exe bila e al a ell
a mul ila e al effec n ade and D[(ee a n and um 2002; Ande n and van
Winc p 2003; Ande n 2009); ec nd e ea ch n ze in bila e al ade ma ice f
any yea ave age f yea ugge ing ha he ex en ive ma gin f bila e al ade h uld
be m deled explici ly in empi ical analy i (ee San Silva and Ten ey 2006; 2008;
and Helpman ✦ eli z and Rubin ein 2008); hi d he li e a u e n end gen u [TA
and hei cau al effec n ade fl (ee aie and e g and 2002; 2007; 2009).[2]
⟨ n e e ingly he e bvi u ly imp an h ee b die f k a e vi ually unc nnec ed

Thi pape ea [TA membe hip a an end gen u de e minan f bila e al ade
hile all ing f (nume u) ze bila e al ade fl in he empi ical m del and e-
pec ing b h he bila e al and mul ila e al effec f end gen u [TA n ade in he
uan ifica i n f[TA effec .⟨ n c n a p eceding k by a n and Tamu a (1994)
San Silva and Ten ey (2006 2008) and Helpman ✦ eli z and Rubin ein (2008) e
all (bina y) de e minan f exp be end gen u .⟨ n pa icula e ugge em-
pi ical m del ba ed n p eud -maximum likelih d e ima i n i h end gen u (bina y)
explana y va iable .

We apply he e m del a c - ec i nal da a- e f bila e al ade fl and hei
de e minan – am ng hem a bina y[TA membe hip indica – f he yea 2005 We
c mpu e cum [TA bila e al ade fl and c mpa e hem c un e fac ually p edic ed
ade fl in a ine [TA gene al e uilib ium, limina ing [TA educe ade fl
am ng membe di ec ly bu i en ail al indi ec effec n hi d c un ie h ugh he
impac f[TA n p duce p ice c n ume p ice and D[.

u finding may be umma ized a f ll . The e ul hed ligh n he p en ial

─────────────
[2]

bia e a   cia ed   i h he ign ance f he h ee men i ned i ue : gene al e uilib ium
(hi d-c un y) effec   f TA membe hip; ze   in   ade ma ice ; and he end genei y
 f TA . The bia e a e f diffe en magni ude h ugh F in ance a l g-linea m del
 f exp   hich ign e gene al e uilib ium effec   n p f he   he p blem lead   a
bia f -73 pe cen age p in   -66% ela ive   he p efe able   -pa   app ach
A ne-pa   i   n p eud -maximum likelih d (   ) m del hich di ega d n n-
and m elec i n in p i ive exp   and ea TA membe hip a ex gen u lead
    a bia f he impac f TA n membe ' ela ive   n nmembe ' ade by -56
pe cen age p in   -51% ela ive   a -pa   m del hich c pe i h all f he
men i ned p blem . A ne-pa m del hich ackn ledge end gen u TA membe hip
bu di ega d he p blem f an exce ive numbe f ze   in he da a lead   a d n a d
bia f he TA effec by ab u -11 pe cen age p in . A c mpa ed   he e bia e i
i le ha mful   ign e ha TA membe hip effec a e he e gen u due   he
va ia i n in m -fav ed na i n a iff a e. F in ance ign ing he e gene u a iff
in he p efe able   -pa TA m del lead   a d n a d bia f he TA-induced effec
 f le han ne-fif h f a pe cen age p in .

    The emainde f he pape i   ganized a f ll . The nex ec i n b iefly in duce
he bila e al ade fl m del e ill ely up n Sec i n 3 p in   u he e p blem i h
he implemen a i n f ha m del in applied   k a ge ed   a d he analy i f TA
membe hip effec n ade. Sec i n 4 de c ibe   he pecifica i n and da a Sec i n
5 in duce he m deling   a egy   ve c me he e b acle by ea ing ze   ade
fl   implici ly and p e en   he c e p nding e ima i n e ul . Sec i n 6 de ive
a ze -infla ed g avi y e ua i n lay u   u he ec n me ic   -pa m del and give he
e ima i n e ul   he e f Sec i n 7 c mpu e he impac f TA membe hip a   b e ved
in he yea 2005   a i ua i n i h u   any TA membe hip in he ame yea . The la
 ec i n c nclude   i h a umma y f he m   imp an finding .

Anders n and van Winc p (2003) de ive a gene al ep e en a i n f bila e al agg ega e n minal ade fl   in ne   ade he y m del i h ne ec   and   c un ie . F in ance uch m del include he ne   f Ande n (1979)   ugman (1980) i h l ve- f-va ie y p efe ence à la Dixi and S igli z (1977). Thei f ame   k can be b iefly in duced a f ll .   e u den e n minal exp   f c un y   c un y (i h   1   ) by   and efe   ade c   a cia ed i h exp   f m c un y   a . Finally u e   and   f c un y ' c un y ' and   ld D (al expendi u e) e pec ively. Then n minal bila e al exp   a e de e mined a

$$\underline{\quad}^1 \quad \Pi \quad^1 \quad^1 \tag{1}$$

he e i he ela ici y f ub i u i n am ng p duc (va ian) and Π a e -called   (R) e m f exp e and imp e   e pec ively.   R e m eflec mul ila e al (n n-linea ly eigh ed) ade c   fi m f an exp   ing c un y and c n ume in an imp   ing c un y a e faced i h   mpi ically he e   R- e m a e n b e ved bu   hey can be eadily de ived a   lu i n f he f ll ing e f 2 e ua i n [3]

$$\Pi^1 \quad \sum_{,1} (^1 \quad^1 \quad) ; \quad^1 \quad \sum_{,1} (^1 \quad \Pi \quad^1 \quad) \tag{2}$$

The   uc u al ep e en a i n f he m del b ing ab u a ub an ial advan age   ve he educed-f m (i; j

...]   ...] ." Since pill ve effec f m ne c un y-
pai   he a e a he ve y hea   f he ma e   a full acc un   f he impac   f ade
c   TA membe hip n exp   in gene al e uilib ium need   e pec hei effec
 n all va iable n he igh -hand ide f (1): n ade c   a uch ( ) n exp   e D
( ) imp   e D ( ) and   ld D ( )   e pec ively (ince hey a e a func i n
 f ade fl) and n he exp   e and imp   e • R e m (Π and)   e pec ively.
N ice ha   he di ec effec   f ade c   a e gene ally dampened by he • R e m a
illu   a ed in Ande   n and van Winc   p (2003).

Since di ec mea u e f ade f ic i n   a e ypically n   available ne u e p xy
va iable   he e f The bila e al di ance be een c un ie' capi al (   ) a c m-
m n in e na i nal b de indica   (   ) and a c mm n fficial language indica
(   ) a e ypical example. ∽ n m   empi ical m del f bila e al ade fl   ade
p licy i acc un ed f   a an elemen f   by including an indica   va iable f p efe -
en ial ade ag eemen membe hip (   ). The c mm nly ad p ed a ump i n ab u
 he ela i n hip be een   and he e p xy va iable i

$$1 \quad \exp(\,_1 \ln \quad\quad + \,_2 \quad\quad + \,_3 \quad\quad + \; + \quad) \qquad (3)$$

Sub i u ing (3) in   (1)   e b ain he mul iplica ive m del

$$\exp(\quad + \quad\quad + \; + \quad) \qquad\qquad (4)$$

he e   (1 ln   ) i a vec   c n aining a c n an and all   ade c
    ade facili a ing va iable excep   . ene ally bina y va iable   uch a
en e a   hey a e in   and c n inu u va iable   uch a   en e in l g a in (3).
• e ve   ($_0$ $_1$ $_2$) i a vec   f c efficien c e p nding   he elemen in
    .   ln(Π

Thi e ea ch hu a umed ha TA membe hip f ne c un y-pai nly affec hi pai ' bila e al exp bu n h e f he c un y-pai . The la e fea u e i a dd i h b h in ui i n and uc u al m del uch a he ne f Ande

va iable   cap u ing p li ical affini ie   impedimen   bila e al   ade libe aliza i n;
c un y ize and ela ive fac   end   men ; and p xie f   icebe g   ade c   . We cla -
 ify   c un ie a bel nging   a c mm n[TA if hey a e ac ive ince 2005   ea lie
a n ified   he W ld T ade   ganiza i n. The da a a e augmen ed and c   ec ed by
u ing inf ma i n f m[TA ec e a ia   eb-page and hey a e c mpiled   b ain a
bina y dummy va iable eflec ing[TA membe hip f   he yea 2005. The h ee e   f
ex gen u va iable c n ain he f ll   ing elemen :

[-

c un ie have a c mm n language and ze el e (AN); an indica va iable hich i e ne if c un ie a e l ca ed a he ame c n inen and ze el e (NT); an indica va iable hich i e ne if ne f c un ie had been a c l ny f he he in he pa and ze el e (N); an indica va iable hich i e ne if ne f c un ie had been a c l ny f he he af e he yea 1945 and ze el e (R); an indica va iable hich i e ne if ne f c un ie had a c mm n c l nize in he pa and ze el e (•); an indica- va iable hich i e ne if ne c un y a pa f he he in he pa and ze el e (S TR). All f he men i ned ade c indica a e aken f m he ge g aphical da aba e p vided by he en e d' ude pec ive e d nf ma i n n e na i nale ( ). The li f va iable in aie and e g and (2004) did n in-clude (c un y dummie and) DI ST^2 AN N R •

S TR . We nly include a ub e f he e va iable in he exp u c me e ua i n ince he he ne d n di play a ignifican di ec impac n exp .[12]

n me f he ec n me ic m del applied he e elec i n in p i ive exp ha a cha ic c mp nen and i he i e de e mined by a func i n f a c mple e e f exp e and imp e dummy va iable and he f ll ing e f eg e : he TA indica va iable; l g bila e al di ance be een c un ie ' capi al (DI ST); he af emen i ned c mm n language indica (AN); and an indica va iable hich i e ne if c un ie have a c mm n land b de and ze el e (RD).[13] When-eve b h elec i n in p i ive exp and in TA a e pecified in he men i ned ay e m del he p ce e a a ecu ive biva ia e p bi m del

Finally in u applica i n e include he f ll ing ade c va iable in in he n minal exp u c me e ua i n (5): DI ST RD and AN . he i e n mi-

___
12

nal exp   a e a func i n f a c mple e e f exp   e and imp   e dummy va iable . [14]
and f (p en ially end gen u)ᴾTA . Da a n bila e al exp   in n minal . S d lla
a e c llec ed f m he ni ed Na i n' W ld T ade Da aba e.

Table 1

Table 1 umma ize mean   and a d devia i n minimum and maximum f he di -
ibu i n f he dependen and independen va iable empl yed in he e ima ed m del .
He e e uld like   empha ize ha ab u 37 pe cen   f he cell f he bila e al ex-
p   ma ix a e ze and ab u 22 pe cen   f he 15 750 c un y-pai in u da a- e
a e membe   f a c mm n ᴾTA.

F an a e men f he effec   f ᴾTA membe hip n ade fl   i i nece a y
  b ain c n i en e ima e f he unkn n pa ame e vec   and he ᴾTA pa ame e
  f in e e . H eve   d e nly efec di ec effec   f ᴾTA membe hip n exp   .
T uan ify   al effec – hich al acc un f feedback ac   c un ie c n i en i h
gene al e uilib ium – e need   c mpu e c un e fac ual exp   i h u ᴾTA membe -
hip. The la e al acc un f   he impac f ᴾTA membe hip n D and• R e m
a explained in Sec i n 2 We   ill uan ify he impac   f ᴾTA membe hip by c mpa -
ing p edic ed exp   f ᴾTA in ide   i h ᴾTA a f 2005 ela ive   u ide   i h
p edic ed ela ive ade fl   in a c un e fac ual cena i   i h u any ᴾTA . While hi
end i exemplified in Sec i n 7 u bjec ive in he ub e uen ec i n i   c n i en ly
e ima e   and .

[14]

11

Since he pa ame e f in e e in m del (5) a e and e m and can be c n ide ed a nui ance pa ame e f m an ec n me ic p in f vie . The m del be e ima ed hu ep e en a - ay c un y- pecific effec m del he e and ub ume he effec f D and R e m bu may depend n he c un y- pecific fac a ell The app p ia e ec n me ic me h d be u ed depend n he a ump i n n he ela- i n hip be een ( ) and he eg e and . f ( ) e e independen f and and m effec e ima i n uld be c n i en and efficien . H eve a independence i p ecluded by he unde lying ec n mic m del hich ugge ha and depend n and

e imae ˆ. ing he e in (8) f e p imize ve and . A a c n e uence f applying - ep p cedu e ec nd- ep anda d e have be adju ed acc un f he va iance f fi - ep e imae.[18]

i he aim f hi ec i n apply he af emen i ned me h d e ima e he pa- ame e needed infe he impac f end gen u [TA membe hip n exp hile all ing f ze exp in he da a-gene a ing p ce . n hi

The e ul in Table 2 ugge   he f ll ing c nclu i n. Fi   f all a   he di cu -
 i n bel   indica e   elec i n in ⌐TA ba ed n b e vable i p i ive   b e ved
fac   ai ing he p babili y f j ining a⌐TA al   have a   ade-inc ea ing effec . Hence
 pa icula ly h e c un y-pai   hich di play a high level f g d   ade fl   any ay
  elec in ⌐TA . N ice ha hi e ul i c n i en   i h he hyp he i in aie and
  e g   and (2004) acc ding   hich ⌐TA exhibi he highe   elfa e gain in c un ie
  he e bila e al   ade fl   uld be (and a e) la ge

  Sec nd   he e i evidence f   elec i n n un b e vable .   nd genei y f⌐TA can be
 a e ed by a imple - e   n ̂ an e ima e f he (caled) c ela i n be een ⌐TA
 and he   cha ic e   in he exp . ⪦ f⌐TA i ex gen u   he c ela i n mu be
 ze   ha he null hyp he i   0 p vide a valid e f ex geneiy. We find ha
 ̂ i nega ive and ignifican in he⌐⌐•   m del   hu ejec ing ex geneiy f⌐TA .[20] A
 nega ive   indica e ha un b e vable (i e. fac   he han he ec n mic and p li ic
 de e minan hich e include in u m del) fav ing he c ea i n f a⌐TA n ave age
 c me al ng i h un b e vable ha have a nega ive impac n bila e al ade. Thi
 nega ive elf- elec i n ba ed n un b e vable lead   a d n a d bia in he e ima ed
 pa ame e : The p in e ima e f ⌐TA inc ea e a   e aband n he a ump i n f
⌐TA   be ex gen u . Thi i ue f   S ⌐⌐•   and N S N   u p i ingly he
 maj diffe ence ac   c lumn f ⌐⌐•   and N S e ima e e pec ively a i e f   he
 pa ame e   f⌐TA . The emaining pa ame e a e fai ly imila ac   he c lumn .
 H eve   he e ima e diffe ela ively a kly be een⌐⌐•   and N S e he e e
 kn ha ⌐⌐•   i p efe able ve N S acc ding   he di cu i n in San Silva and
 Ten ey   (2006) and Sec i n 5.1 ab ve

  The e ul f m he p bi e ima i n f   he educed f m e ua i n f⌐TA ugge
  he f ll ing c nclu i n. The p li ical va iable u n u   be imp an f   he deci i n

Am ng he effec   f cul u al ge g aphical and p li ical indica   va iable   he ne   f c mm n language AN   and   N   a e   a i ically in ignifican . The effec   f AN   n   TA membe hip in 1998 in   agee' (2003) applica i n   a p i ive and ignifican .   h   N   and AN   e e ab en f m aie and e g   and' (2004) m del . H eve   e find   a i ically ignifican effec   f a p i ive influence if c un ie a e n he ame c n inen   NT (c n i en   i h aie and e g   and 2004) if hey had a c mm n c l nize   •   if ne f hem   a a c l ny f he   he af e 1945   R

f   ze   ade fl   in he de e mini ic pa   f he m del We   ill d

imila   ela i n hip a   he ne u ed bef e

$$(\qquad \mathbb{I} \quad 1) \quad \Psi \qquad (18)$$

he e   and Ψ a e anal g u   he exp e i n in (9). H eve n e ha a hi
func i nal f m i n   a umed   h ld f p i ive exp e   nly and n f all b e -
va i n a in (8)-(9) he pa ame e   and in (18) d n   den e he ame uan i ie
a in he m del f Sec i n 5.

e u n   u n   he fi pa f he m del he p babili y f c un y   e ve
c un y via exp   a all. F   hi pu p e   he m del f $\mathbb{I}$ a defined by e ua i n
(11) i   an la ed in a   cha ic p ce

$$\mathbb{I} \quad \begin{cases} 1 & \text{if} \\ \\ \end{cases}$$

he e Φ_2

ive e   a he level f he u c me ua i n and i   ef mula i n   a mul iplica ive

e   e up i n   ivial a   ac abili y f he m del elie pa ially   n he addi ivi y

a ump i n The   -pa m del   n he   he hand a   een ab ve lend i elf ea ily

   a gene aliza i n   i h a c mm n end gen u   bina y va iable in b   h pa .   lea ly

he e ea n a e n   ub an ive bu   hey h uld n   be d   nplayed ei he   e pecially

in la ge- cale applica i n a   he p e en   ne. [23]

and f he   ading v lume

a   e e u n   he independence a   ump i n ab u   he   pa   f he m del Thi
migh   und   nge han   ha i   eally i .   h uld be   e ed ha   he independence
f he   deci i n in he   -pa   m del i   i e – in u
pecifica i n – af e c n   lling f   ec n mic de e minan   and any imp   e   exp   e
pecific he e   genei y.   n   he end   he he   elec i n in   ade i   end gen u   ade
v lume i an empi ical ma e dependen   n da a and pecifica i n We e   ed   im'
(2006) m del   empi ically e   he hyp he i f ex gen u   elec i n in   u m del. The
f mal e   failed   ejec   he c ndi i nal independence f he deci i n   ade f m he
ading v lume. [25]

The ef e   f ll   a   -pa   app ach may   ell be defendend n he g und f he
c llec ive f ce f he ab ve a gumen   a   ell a   n he ab ence f c mpelling empi ical
evidence f   ignifican c ela i n be een he pa   f he m del in u applica i n. T
be clea   e a e n a guing again   he u e f elec i n m del in   ade in gene al n
a e e ugge ing ha   -pa   m del   h uld al ay   be p efe ed f   e ima ing   ade
m del . N ne hele   in he p e en c n ex i d e eem   be he be e ch ice

n hi   ub ec i n   e umma ize he pa ame e   e ima e f m   FP.   and N S m del
de c ibed in Sec i n 6.2 Simila   Table 2 Table 4   umma ize   he pa ame e e ima e
f f u al e na ive m del f n minal bila e al exp   in . S d lla   ( ). Again eve y
pai f c lumn give   he pa ame e f he f u c va ia e f in e e in he exp   u -

c me e ua i n – F_{TA}, F_{ST}, RD, and AN. e n e di ingui h be een he p ce gene a ing ze ve u p i ive exp and he ne gene a ing al e na ive p i ive value f exp . The f me hu dle p ce i cap u ed by a p bi m del f II a explained in Sec i n 6.2 hile he la e i e ima ed via $P_{\bullet}$. The fi pai f c lumn c lumn f u give he pa ame e i h b h $P_P_{\bullet}$ and N_S hen ea ing F_{TA} a ex gen u. n he ec nd pai f c lumn c lumn five even e ea F_{TA} a end gen u. The e e a ume ha he p ce e de e mining F_{TA} and II may be cap u ed by a ecu ive biva ia e p bi m del f b h $P_P_{\bullet}$ and N_S

Table 4

Simila he e ul in Table 2 e find ha he p in e ima e f F_{TA} inc ea e a e aband n he a ump i n f F_{TA} be ex gen u. Again hi e ul h ld ue f b h $P_P_{\bullet}$ and N_S. The p in e ima e f he ne-pa and -pa m del a e ela ively imila each he in b ad e m. H eve me diffe ence emain ugge ing ha ze exp a e n gene a ed in ufficien magni ude by he $P_P_{\bullet}$ N S an de e ec-pa g

hich i eflec ed in he ve e ima i n f he impac f▐TA n he deci i n ade hen neglec ing end genei y. A a ma e f fac, he e ul in Table 4 ugge ha af e c n lling f end genei y ▐TA membe hip ha an impac n he in en ive ma gin bu d e n ignifican ly affec he ex en ive ma gin f ade. Such a e ul c uld f in ance be b ugh ab u by a ld i h ufficien ly high ma ke - pecific fixed en y c hich a e unaffec ed by ▐TA f ma i n he ea ma ginal delive y c a e l e ed by ▐TA membe hip. N e ha he fac ha he e ima ed c ela i n a e f diffe en ign i pe fec ly c mpa ible i h he gene al pecifica i n f he m del. The diffe en ly igned c ela i n ugge ha af e c n lling f ec n mic and p li ical de e minan ex en ive and in en ive ma gin f exp appea be d iven by he e gene u fac . en u ing bey nd ha p in uld be pu ely pecula ive ha e have leave i a ha .

Table 5

Table 5 umma ize he e ul f he biva ia e p bi e ima i n f he ▐TA e ua i n nly. < u n u ha he c efficien e ima e a e ve y imila he ne b ained f m he univa ia e p bi e ima e in Table 3. The pa ame e e ima e f in e e hich c e p nd he ex en ive ma gin f exp e ua i n a e ep ed in Table 4.

We ill illu a e he imp ance f c n ide ing b h elf- elec i n in ▐TA and ze exp fl by mean f c un e fac ual analy i. < n pa icula e ill c mpu e he impac f▐TA membe hip a b e ved in he yea 2005 a i ua i n i h u any▐TA

estimates of Abadie and Gamben (2006) for the year 2000; implying an effect of about 97%) and 2.36 (using the same approach for the year 1990). While these estimates lie in a similar range as the ones reported in previous work and take non-linear effects of trade costs into possible determinants of FTA formation into account, they do not consider non-linear general equilibrium effects of FTAs on exports. Baier and Bergstrand (2007) acknowledge general equilibrium effects with panel data but assume that FTA membership is exogenous. However, the average treatment effects from their preferred model are still very close to the conditional endogenous treatment effects in their more recent paper, amounting to 0.62 (implying an effect of about 86%) and 0.54 (implying an effect of about 72%). Relative to Baier and Bergstrand's average (2003) estimated FTA-effect on trade seem extremely large: they amount in between almost 300 percent and 800 percent! However, these estimates do not account for fixed country effects in both the outcome equation of trade value and the FTA equation.

Unlike previous work our quantification of FTA effects on trade allows to respect general equilibrium effects, account for the differential impact of FTAs on the extensive and intensive margin of exports, and treat FTAs endogenously. Finally we will also infer the importance of something that did not surface in the debate about FTA effects on trade yet: that most-favored nation tariffs are the general equilibrium FTA membership does not bring about identical tariffs reduction across country-pairs (see Anderson and van Wincoop 2002 for a treatment of tariff effects in their general equilibrium model).

Starting points of the quantification are the parameter estimates summarized in Table 2 and 4. Note that so far we did not need rely on any specific underlying model to estimate equation leading to the econometric specification of the parameter estimates. This is perfectly consistent with a wide range of recent international trade models.[26] Specifically it captures new trade theory models with love-of-variety preferences and hom geneous firms à la Krugman (1980) the Anderson and van Wincoop (2003) exchange economy the Helpman, Melitz and Rubinstein (2008) model allowing for firm heter-

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genei y and ze   ade fl   he   a n and   um (2002) Rica dian m del and he

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al e he e gene u a iff and (in Table 6b).

Table 6a and 6b

n a nu hell he figu e in he able ugge he f ll ing c nclu i n. Fi ade am ng⎰ TA membe inc ea e due p efe en ial a iff ab li i n F in ance he ⎰⎰. m del hich a ume ex gen u⎰ TA f ma i n n pecific p ce f he ex en- ive ma gin exp and n he e gene u a iff effec n ade and D⎰ in he uppe lef c ne f he able p in an inc ea e in n minal exp am ng⎰ TA membe ela- ive n nmembe by 54% ela ive an e uilib ium i h u any⎰ TA . Thi i eflec ed in he numbe hich i given in he u e lef c lumn a he p f Table 6a labeled ' ". The ⎰⎰. -ba ed effec i ab u 45 pe cen age p in highe i h end gen u⎰ TA f ma i n (ab u 99% highe exp am ng⎰ TA membe ela ive n nmembe han i h u ⎰ TA ; ee he e ul in he hi d c lumn a he p f Table 6a). gn ing he he e - genei y f a iff b ing ab u a negligible bia in u applica i n [30] T ee he la e c mpa e he e ul a he p f Table 6a i h he c e p nding ne in Table 6b.

deling he p ce f end gen u elec i n in p i ive exp epa a e f m he n n-linea p ce f p i ive exp i ela ively imp an. ai e he p edic ed effec f⎰ TA f ma i n i h end gen u⎰ TA n in ide ' ade ela ive he c un y-pai – in he p efe ed⎰⎰. m del in he even h c lumn f Table 6a by ab u 11 pe cen age p in f m ab u 99% 110% f he ave age⎰ TA-induced effec n exp f 110% ab u 10 pe cen a e c n ibu ed by he ex en ive ma gin hile he e i due he in en ive ma gin. n gene al he c n ibu i n he ave age⎰ TA-induced effec n

• ... e ve. Table 6a and 6b indica e ha a f cu n FTA effec n ade fl
– a had been d ne in m f he p evi u k n end gen u FTA effec n ade
fl – c nceal he izable va ia i n effec ac c un y pai .[32] T ee hi c n ide
he bl c f e ul in he l e pa f Table 6a and 6b. The e e ep f u
m men f he di ibu i n f he pe cen age change f bila e al exp b h f FTA
membe (a he cen e f each able) a ell a f n n-membe (a he ve y b m f
each able): he mean he anda d devia i n he minimum and he maximum effec f
each m del.[33] bvi u ly m f he m del di play a anda d devia i n f effec i hin
he g up f FTA membe and n n-membe hich exceed he ave age effec . The
va ia i n in he effec i en i ely due he elevance f he e genei y ac c un ie in
gene al e uilib ium. Hence he unde lying he e ical m del ugge ha he ea men
effec f FTA membe hip i inhe en ly he e gene u . The e ul even p in nega ive
effec f m he imul ane u implemen a i n f FTA in he ld ec n my n me FTA
membe (acc uing hi d c un y effec f f eign FTA). Simila ly he e a e even
FTA n n-membe hich gain f m he imul ane u implemen a i n f f eign FTA .
FTA membe face p i ive and FTA n n-membe nega ive effec f TA f ma i n n
ade fl nly n .

Al ge he he e finding ugge ha he empi ical m del .38668( )-406.962(6)-25323(i)-1.42378

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 nly ne   he he). Sec nd he p p ed m del all   f e ima i n f effec   hich
fully acc un f   gene al e uilib ium effec   f TA membe hip a   cia ed i h D
 e p n e   membe hip and ul ima ely he e gene u   ea men effec   f TA f ma-
i n. F   in ance   ecen ly p p ed mic -ec n me ic me h d (uch a p pen i y
c e ma ching   i ching eg e i n) did n   ha e hi fea u e.

Thi pape p p e n n-linea ec n me ic echni ue f   he analy i   f ade p licy
effec   n bila e al ade fl   hich ub ume h ee fea u e : h

aie Sc   . and effey H.   e g   and (2009)   ima ing he effec   f f ee   ade
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Table 3: ⸮ bi e ima i n e ul f educed f m e ua i n f ⸮ TA

	eff	S d e .
D RA	0.0059	0.0030
D RA ^{2}	-0.0001	0.0000
⸮ • ⸮	-0.1083	0.0133
⸮ • ⸮ ^{2}	0.0011	0.0001
A T	0.0737	0.0155
A T ^{2}	-0.0007	0.0002
⸮ ST		

Table 4:   ima i n e ul f   -pa   g avi y m del f   ade

(1)	x gen u ▌ TA			nd gen u ▌ TA		
	(𝕀 1) iv. bi	(𝕀 1)	N S	(𝕀 1) iv. bi	(𝕀 1)	N S
	(2)	(3)	(4)	(5)	(6)	(7)
▌ TA	0.3647	0.4789	0.6215	-0.0879	0.7690	0.8789
	(0.0555)	(0.0626)	(0.1001)	(0.1116)	(0.1243)	(0.2049)
ℤ ST	-1.1950	-0.7023	0.5921	-1.2736	-0.6269	-0.5603
	(0.0384)	(0.0296)	(0.0755)	(0.0410)	(0.0417)	(0.0569)
RD	-0.4388	0.6589	-0.6262	-0.3120	0.6563	0.5642
	(0.1681)	(0.0632)	(0.0398)	(0.1679)	(0.0619)	(0.0714)
AN	0.6415	0.2164	0.2531	0.6180	0.2464	0.2846
	(0.0629)	(0.0644)	(0.0815)	(0.0627)	(0.0620)	(0.0801)
^	–	–	–	0.3012	–	–
				(0.0637)		
^	–	–	–	–	-0.2028	-0.1754
				–	(0.0843)	(0.1271)
Numbe f b e va i n	13500	9891	9891	15750	9891	9891
Numbe f c un ie	126	126	126	126	126	126

Notes:

Table 5:   iva ia e p bi e ima i n e ul f ⸙ TA

Table 6a: un e fac ual e ul   h m gen u   a iff a e

	One-pa m del				T -pa m del			
	x gen u TA		nd gen u TA		x gen u TA		nd gen u TA	
	...	N S	...	N S	...	N S	...	N S
A ve age pe cen age inc ea e f ade fl f TA membe in exce f n n-membe	54.27	74.33	98.66	120.10	63.01	83.98	110.07	129.45
Δ am ng TA membe in %:								
mean	20.0853	27.4616	34.3624	42.1099	18.3858	25.3532	31.9194	38.4637
d dev.	20.8203	28.7353	37.1613	45.9208	19.1919	26.7205	34.7583	42.1930
min	-31.0661	-38.0643	-45.2417	-50.1009	-30.7348	-37.9412	-45.3082	-49.7424
max	89.0851	128.2430	174.0078	222.9863	82.1443	115.3547	156.3760	189.3391
# f TA membe pai i h								
p i ive effec	2734	2735	2710	2713	2784	2781	2764	2761
nega ive effec	240	239	264	261	240	243	260	263
Δ am ng TA n n-membe in %:								
mean	-8.4788	-10.4377	-12.8658	-14.2747	-8.5206	-10.5419	-13.0371	-14.3023
d dev.	11.0091	13.4688	16.1528	17.8867	10.9200	13.4392	16.1881	17.7507
min	-53.9526	-62.8453	-71.2951	-76.0053	-53.4747	-62.6759	-71.3592	-75.6461
max	13.5321	18.6218	21.9596	27.1705	11.6169	14.6234	17.9313	19.9144
# f TA n n-membe pai i h								
p i ive effec	648	637	585	576	566	560	511	513
nega ive effec	6224	6235	6287	6296	6256	6262	6311	6309

Notes:

X

X

X

Table 6b: ...counterfactual results, heterogeneous tariff changes

	One-part model				Two-part model			
	Exogenous RTA		Endogenous RTA		Exogenous RTA		Endogenous RTA	
	Φ	NLS	Φ	NLS	Φ	NLS	Φ	NLS
Average percentage increase of trade flows								
of RTA members in excess of non-members	54.17	74.19	98.52	119.93	62.87	83.80	109.88	129.24
Δ among RTA members in %:								
mean	19.7942	27.0693	33.9699	41.6003	18.0771	24.9497	31.5141	37.9557
std. dev.	20.9280	28.7512	37.1605	45.8032	19.3134	26.7589	34.7823	42.1189
min	-31.6092	-38.3996	-45.5465	-50.4034	-31.3305	-38.2633	-45.6025	-50.0361
max	87.9299	126.3383	171.8040	219.7474	79.8197	112.5929	153.5508	188.1116
# of RTA members pairs with								
positive effect	2726	2723	2710	2715	2777	2774	2761	2759
negative effect	248	251	264	259	247	250	263	265
Δ among RTA non-members in %:								
mean	-8.5979	-10.5893	-13.0031	-14.4396	-8.6385	-10.6909	-13.1720	-14.4632
std. dev.	11.1147	13.5771	16.2462	17.9829	11.0350	13.5559	16.2894	17.8548
min	-54.1725	-63.0465	-71.4552	-76.1490	-53.7025	-62.8824	-71.5227	-75.7942
max	13.3921	18.1760	21.5421	26.4472	11.0525	13.9861	17.2845	19.2018
# of RTA non-members pairs with								
positive effect	637	624	574	576	561	550	500	510
negative effect	6235	6248	6298	6296	6261	6272	6322	6312

Notes:
X