Supplemental Analyses Packet:

To Accompany "Does Issue Linkage Work? Evidence from European Alliance Negotiations, 1860 to 1945"

1 Matching Results for 1860 to 1913 and 1919 to 1945

I am also concerned that the positive results may be driven by my decision to test the entire 1860 to 1945 time period. Specifically, one could argue that the international environment during the war years of 1914 to 1919 and 1939 through 1945 and during the interwar years of 1919 to 1939 were dramatically and substantively different from those during the the period of 1860 to 1913.

It is also commonly recognized that the beginning of World War I marked the end of this first "golden age" of economic globalization and the beginning of the inter-war period of economic crisis.[1] The early part of the post-World War I time period was dominated by the post-war recessions within the belligerent powers, while the 1930s experienced a sharp decline in international trade due to the global Great Depression. The global international trade system then broke into various trade blocs and was mared by the imposition of retaliatory tariffs, sparked by the implementation of the Smoot-Hawley Tariff by the United States in 1930. Consequently, one should conduct separate analysis on the 1860 to 1913 and 1919 to 1939 time periods.

The below table shows the average treatment effect when I conduct matching only on those observations from 1860 to 1913 time period and only those observations from the 1919 to 1939 time period. It should be noted that since each time period has a relatively small sample size, I conduct this analysis using the unrestricted sample (meaning it is not restricted to just negotiations over offensive/defensive alliances).[2] The table reveals two important observations. First, it shows that the effect of trade linkage on the probability of negotiation agreement is positive and statistically significant for both the 1860 to 1913 and 1919 to 1939 time periods. Second, the effect for the 1919 to 1939 time period is substantially smaller (0.15) than for the 1860 to 1913 time period (0.56). Therefore, it does appear that considering the 1860 to 1945 time period in its entirety masks the rather large positive effect found in the earlier portion of this time period and the more modest effect found in the later portion of this time period. However, considering the 1860 to 1945 time period in its entirety does not drive the estimated positive effect of issue linkage.

[1] Pahre 2008, p. 14. See, for example, Eichengreen 1996; Bordo, Eichengreen, and Irwin 1999, and Oatley 2004

[2] Results from conducting matching on the restricted samples are substantively the same.

Table 1: Effect of Economic Linkage on Alliance Formation - Time Sensitivity

Time Period	ATE	Lower Bound .95 CI	Upper Bound .95 CI	Observations
1860 to 1913	0.56	0.47	0.66	101
1919 to 1939	0.15	0.08	0.22	87

2 Results contingent on 1860 starting year?

Building from the previous analysis, one might be concerned that my results for the 1860 to 1913 time period are contingent on using 1860 as a start year for my analysis. To address this concern, table 5 shows the average treatment effect when I allow the beginning point of the 1860 to 1913 time period to move back 5 years at a time.

Table 5 reveals two important observations. First, it shows that the positive effect of trade linkage on the probability of negotiation agreement from 1860 to 1913 is not dependent on the 1860 cutoff. Second, the sudden change that occurs once the time is taken back to 1845 suggests that it was perhaps the British unilateral free trade policy, not the adoption of the Cobden-Chevalier trade pact, that constituted the major "break point" for the international system.

Table 2: Effect of Economic Linkage on Alliance Formation - Time Sensitivity

Time Period	ATE	Lower Bound .95 CI	Upper Bound .95 CI	Observations
1860 to 1913	0.57	0.47	0.66	99
1855 to 1913	0.56	0.47	0.65	105
1850 to 1913	0.55	0.47	0.64	120
1845 to 1913	0.23	-0.06	0.51	136

3 Probit Results for 1860 to 1945 time period

The main text showed results matching algorithms. Though I view matching as the most method given my data, I offer here results from probit analysis. Due to small sample size for the sub-periods, I must conduct the probit analysis over the entire 1860 to 1945 time period (in order to have enough power and to avoid perfect separation in the data). The results are shown in table A1. One can see that the coefficient is positive and significant at the 0.10 confidence level. Subtantively, the marginal effect of a trade provision is 0.30 (it increases the probability of agreement by 30 percentage points).

Table 3: Probit Results, 1860 to 1945

Variable	Coefficient
ECON	1.12*
	(0.59)
ally	-0.55***
	(0.18)
jdem	0.09
	(0.31)
min mil	0.06
	(0.16)
min dist	-0.27
	(0.19)
peak year	-0.10
	(0.19)
N	-0.19
	(0.17)
buffer	-0.01
	(0.19)
prior negotiation	-1.07***
	(0.19)
Constant	1.86***
	(0.48)
No.	256.00

* p<0.10, ** p<0.05, *** p<0.01

4 Genetic Matching Algorithm on 1860 to 1945 time period

To illustrate that my results are not driven by the propensity score matching algorithm, I conduct analysis using genetic matching[3]. Genetic matching uses a search algorithm to iteratively check and improve covariate balance, and it is a generalization of propensity score and Mahalanobis Distance (MD) matching.[4] Specifically, rather than minimizing a single metric, such as the MD metric, the algorithm searches amongst a range of metrics to find the particular distance measure which optimizes post-matching covariate balance. Each potential distance metric considered corresponds to a particular assignment of weights, W, for all matching variables. The algorithm weights each variable according to its relative importance for achieving the best overall balance.

Column 1 of Table A.2 reports the results from a difference of means test after genetic matching was used to achieve balance on the entire 1860 to 1945 time period. The estimated effect of 0.33 is smaller than the estimated effect of 0.36 when applying the Abadie and Imbens algorithm to the restricted sample, but larger than the than the effect of 0.28 estimated when applying the Abadie and Imbens algorithm to the unrestricted sample (or 0.30 from the probit model estimated in Appendix A).

Table 4: Genetic Matching Results, 1860 to 1945

	Genetic Matching
ATE	0.33
p-value	0.00
N	235

[3]Diamond and Sekhon 2008

[4]Rosenbaum and Rubin 1985.

5 Matching Results for 1815 to 1859 time period

Below are the results for the 1815 to 1859 time period. One can see that though the effect of trade linkage offers is negative for the 1815 to 1859 time period (decreases the probability of agreement by nearly 51 percentage points), the 95 percent confidence intervals are quite large and include zero. Thus, the effect is not statistically distinguishable from zero. Moreover, I was not able to achieve covariate balance for this sample of data.

What explains the statistically insignificant negative effect for trade linkage between 1815 and 1859? Is it due to (1) the trade linkage offers being truly meaningless during the 1815 to 1859 time period, (2) the negative effect of mercantilist trade demands being offset by the positive effect of trade cooperation offers by, for example, German states seeking to join the *Zollverein* customs union, (3) trade demands actually having a negative effect on the probability of agreement, but the effect is measured with a great deal of error, or (4) trade linkage offers being negatively associated with the probability of alliance agreement because they were only used in negotiations that were unlikely to succceed in the first place? Space constraints prohibit this article from exploring which of these is the true explanation for the null effect. However, understanding exactly why issue linkage does not appear to increase the probability of agreement during the 1815 to 1859 time period could greatly enhance our knowledge of when linkage offers are likely to work.

Table 5: Effect of Trade Linkage on Alliance Formation

Time Period	Effect of Trade Linkage	Lower Bound .95 CI	Upper Bound .95 CI	Observations
1815 to 1859	-0.51	-1.40	0.38	74

Match On: Military Size, Buffer, Contiguity, Crisis Period, Democracy, Offensive & Defensive alliances, prior negotiation