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ABSTRACT

The dramatic implosion and regionalization of international trade during the 1930s has often been blamed on the trade and foreign exchange policies that emerged in the interwar period. We provide new evidence on the impact of trade and currency blocs on trade flows from 1928 - 1938 that suggests a blanket indictment of interwar trade policies and payments arrangements is not warranted. Discriminatory trade policies and international monetary arrangements had neither a uniformly favorable nor unfavorable implication for world trade; instead the balance of trade-creating and trade-diverting effects depended on the motivations of policymakers and hence on the structure of their policies. We find, for example, that British Commonwealth tariff preferences affected trade more significantly than the sterling-bloc currency area, but both promoted within-group trade without diverting trade away from non-members. Exchange controls and bilateral clearing arrangements enacted by German and Central and Eastern European countries, by contrast, dominated other commercial policies in altering trade patterns, but curtailed trade with non-members with no offsetting trade-creating effects. We also find support for Ragnar Nurkse's famous hypothesis that exchange-rate volatility in the interwar period diminished trade. Our results speak to the emerging regional trade and currency areas of today, such as the North American Free Trade Agreement and the EC's Single Market and European Monetary System, and suggest that their impact lies not in the regional or global character of the policy initiative, but in the structure and design of the underlying policies.

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> "We may characterize the change that occurred as a disintegration of world trade: while previously international settlement took place within a world-wide network of multilateral transactions, there was in the 'thirties a tendency to achieve settlement either in bilateral exchange between two countries, or within the limited range of countries attached to each other by political or other ties."
>
> Folke Hilgerdt (1942, pp. 90-91)

I. Introduction

The early 1930s witnessed an astonishing implosion of international trade. Between 1929 and 1932 the value of world trade in current U.S. dollars fell by a full 50 percent. Though deflation contributed to the collapse, even at constant prices the volume of world trade in 1932 was nearly 30 percent below its 1929 level. As late as 1938, trade volume was still barely 90 percent of 1929, despite the more than complete recovery of global production of primary products and manufactured goods.[1]

Superimposed on this decline in volume was a dramatic shift in the direction and pattern of trade. The traditional network of multilateral settlements was supplanted by a set of compartmentalized trade flows. Trade was channelled into self-contained regional and colonial blocs such as the British Commonwealth, a group of European gold standard countries centered around France, a Central European trade bloc linked to Germany, and -- arguably -- a group of Western Hemisphere countries trading with the United States.

The causes of this unprecedented transformation remain incompletely understood. Most attempts at explanation start with three factors. The first is changes in incomes and production. The post-1929 decline in output inevitably triggered a decline in trade. It is even conceivable, as

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[1] World primary production and industrial production were 7 percent and 11 percent above 1929 levels, respectively. Lamartine Yates (1959, chapter 2) analyzes the implications of the use of different deflators for intertemporal comparisons of trade volumes. Statistics in this paragraph are computed from League of Nations (1939), as are other figures in the remainder of this introduction for which specific references are not provided.

Woytinsky and Woytinsky (1955) suggest, that different income elasticities of import demand in different countries were responsible for changes in the direction of trade. Since different countries began recovering from the Great Depression at different dates, trade among some partners could have revived more quickly than others. Moreover, with populations rising between 1929 and 1938, per capita incomes lagged behind aggregate national incomes. Countries with high per-capita incomes typically engage in extensive intra-industry trade in the products of their respective manufacturing industries; hence lagging per-capita incomes may have depressed trade among advanced countries -- within Europe, for example -- relative to trade between countries with different resource endowments -- such as European countries and their colonies.

A second factor profoundly affecting trade in the 1930s was commercial policies. The post-1929 slump in output and employment intensified protectionism worldwide. The Smoot-Hawley Tariff adopted by the United States in 1930 was only the earliest and most prominent of the commercial restrictions imposed in response to the Depression. Dozens of countries raised their tariffs in Smoot-Hawley's wake. In addition to restricting the volume of trade, tariffs and tariff preferences were used to encourage trade with certain partners. The Ottawa Agreements of 1932 established preferences within the British Commonwealth. Germany made aggressive use of discriminatory trade policies to create a sphere of economic influence. The United States extended preferential trade treatment to certain countries under the provisions of the Reciprocal Trade Agreements Act of 1934. Tariffs were supplemented by import quotas and licenses, which many countries used to favor imports from some sources over others. Thus, restrictive commercial policies and trade discrimination may explain not just part of the contraction of trade, but account for its regionalization as well.

The third likely influence was domestic and international monetary policies. Many countries, starting in 1931, abandoned the gold standard and devalued their currencies, although

others stubbornly defended their gold parities. The exports of European countries devaluing their currencies and improving their competitive positions rose more rapidly than those of countries remaining on gold.[2] What is less clear is whether the stability of exchange rates, as opposed to their level, influenced the volume and direction of trade. Did countries which stabilized their bilateral exchange rates, through adherence to the gold standard or through other means, trade increasingly with one another? Can exchange rate stability within the sterling area help to explain the tendency for Britain to concentrate its trade within the Commonwealth, for example? Similarly, can the maintenance of exchange rate stability among the countries of the gold bloc account for the importance of intra-gold bloc trade?

Of course, staying on the gold standard was not the only alternative to adjusting the exchange rate. Another option was to impose exchange controls, nominally stabilizing the exchange rate, but (unlike the gold standard system) impeding the free access to foreign exchange and hence to imports. The use of such controls and their selective administration could have exercised a powerful influence over the volume and direction of trade. The imposition of exchange controls by countries of Central and Eastern Europe and their reliance on clearing arrangements, for example, could have been responsible for the growing regionalization of their trade.[3]

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[2] This point was first emphasized by Eichengreen and Sachs (1985), who concentrated on Western Europe, and subsequently verified for a larger samples of countries by Campa (1990) and Eichengreen (1991). League of Nations (1935, pp. 61-62) similarly notes the importance of this factor for a wider sample of countries.

[3] See Neal (1979) for a discussion of clearing arrangements. Exchange controls and clearing arrangements resemble financial restrictions in some respects but commercial policies in others. Thus, it is not obvious whether they fall within our second or third categories of explanation. The International Monetary Fund (in its Annual Report on Exchange Controls and Exchange Restrictions) treats exchange controls separately from trade policies. In the remainder of this paper we follow this convention and discuss exchange controls and clearing arrangements as a form of financial-cum-monetary policy.

Thus, several explanations for observed shifts in trade in the 1930s exist: income changes, commercial policies, international monetary arrangements -- any or all of these could have been responsible. Unfortunately, the literature has been uninformative about which factors were most important in affecting interwar trade flows.

In this paper we provide new evidence on the effects of regional commercial and financial arrangements on the world trading system of the 1930s. In contrast to the negative assessments that dominate the literature, we find that discriminatory trade policies and international monetary arrangements had neither uniformly favorable nor unfavorable implications for the trading system.[4] Some regional arrangements were trade creating and others trade diverting; the balance of effects depended on the motivations of policymakers and hence on the structure of their policies.[5] Some regional arrangements worked by lowering trade barriers and encouraging financial links among the participants without hampering trade and payments with non-member countries. This was true, for example, of the Ottawa Agreements of 1932 and subsequent Commonwealth preferences. In contrast, other initiatives to promote regional links were trade diverting due to their reliance on heightened barriers to imports and impediments to financial relations with the rest of the world. This was true of German commercial and financial policies, for example.

Neither does a clear ranking emerge as to the relative importance of trade and exchange rate policies. In some instances, commercial policies were more important in reshaping the pattern of trade, while in others international monetary arrangements played the dominant role. Commonwealth trade preferences appear to have altered the pattern of trade more dramatically

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[4] Our quantitative evidence reinforces a qualitative analysis reaching essentially the same conclusion in Irwin (1993).

[5] For convenience, here and in what follows "regional arrangements" is used as shorthand for the entire list of regional and colonial arrangements discussed above.

than the monetary arrangements of the sterling area, for example. In contrast, the impact on trade of the commercial policies pursued by Germany and the Eastern European countries in its sphere of influence were effectively dominated by their monetary and financial arrangements, notably exchange controls and clearing arrangements.

Finally, we report evidence supporting Ragnar Nurkse's (1944) conjecture that exchange rate variability depressed the volume of trade in the 1930s. These results speak to the recent debate over the role of the gold standard in the Great Depression. Temin (1989) and Eichengreen (1992) argue that only after cutting loose from the gold standard constraint was it possible to pursue reflationary policies that would initiate economic recovery from the Depression and hence revive trade. In contrast, an older literature represented by Kindleberger (1973) emphasized the exchange-rate instability and disruptions to international transactions that followed the abandonment of gold. We find some evidence consistent with this latter view, albeit only for the first half of the 1930s.

The remainder of the paper is organized as follows. Section II reviews the main changes in trading patterns we seek to explain. Section III describes our data and methodology. Section IV presents the results, while Section V describes the light they shed on current debates over the implications of regional trade preferences and exchange-rate arrangements for the multilateral system of trade and payments today.

II. Changes in the Pattern and Structure of Trade in the 1930s

One of the most widely reprinted diagrams in all of economics is "The Contracting Spiral of World Trade," first published by the Osterreichischen Institutes fur Konjunkturforschung in 1933.[6] (See Figure 1.) It shows the dollar value of world trade spiralling downward without interruption from early 1929 through mid-1933. The contraction of trade far exceeded the contemporaneous decline in production. Real GNP in major industrialized economies fell by 17.7 percent over this period while export volume declined 35.3 percent and import volume dropped 23.5 percent.[7] The contrast between trade and output trends grows even more pronounced following the initiation of recovery from the Depression. Though output expanded vigorously from 1933 through 1937 and declined only marginally in 1938, the value and volume of trade recovered much more slowly. From 1932 to 1938, GNP rose 28.8 percent in the industrialized countries, while export volume increased 23.5 percent and import volume a mere 13.7 percent.

Superimposed on the downward spiral and anemic recovery of trade was a sharp tendency toward regionalization. Between 1928 and 1938 the share of British exports destined for the Commonwealth rose from 44.4 percent to 49.9 percent, while its share of imports from those countries jumped from 30.2 to 41.9 percent.[8] France's trade with its colonies and protectorates

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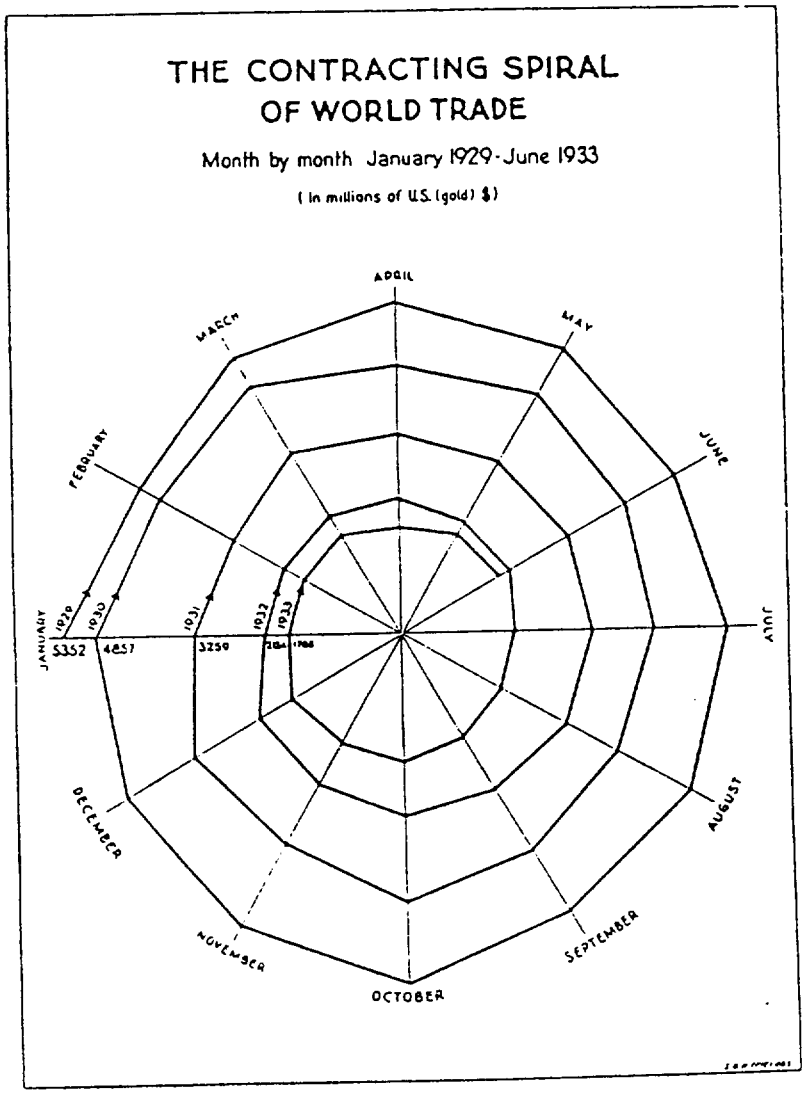
[6] The diagram was immediately republished by the League of Nations in its Economic Survey for 1932-33, p. 9. It appears in policy studies such as Woytinsky and Woytinsky (1952), historical monographs such as Kindleberger (1973), and textbooks such as Sachs and Larrain (1992) and Burda and Wyplosz (1993).

[7] These figures -- and those cited later in this paragraph -- are taken from Maddison (1989b), p. 57. Calculations by the Economic Intelligence Service of the League of Nations indicate that the volume of trade fell by 27 per cent between 1929 and 1932, a period over which industrial production fell by 30 percent, primary production by a relatively modest 8 per cent. This estimate of the change in trade volumes is from League of Nations (1933), p. 212.

[8] Data from this paragraph taken from the League of Nations, Survey of World Trade, 1938, pp. 34-35.

Figure 1



Note. — Cf. Monatsberichte des Österreichischen Institutes für Konjunkturforschung Nr. 4, 1933, p. 63.

rose from 12.0 to 27.1 percent of imports over this same period, and from 18.8 to 27.5 percent of its exports. Germany's trade with six Southeastern European states (Bulgaria, Greece, Hungary, Romania, Turkey, and Yugoslavia) and Latin America increased from 16.7 percent to 27.6 percent of imports, and from 12.8 percent to 24.7 percent of exports.[9] Japan's trade with Korea, Formosa, and Manchuria rose from 14.2 to 39.0 percent of imports and from 18.3 to 41.0 percent of exports.

Commercial policies and exchange rate arrangements were the obvious source of these adaptations. For example, the Ottawa Agreements negotiated between Britain and the Dominions in 1932 aimed to stimulate Commonwealth trade by exchanging tariff preferences. Britain's goal at Ottawa was to secure market access for her exports. In return for preferential treatment by the Dominions and India, Britain agreed to admit many of their exports duty-free and to discriminate against competing exports from foreign countries. Gordon (1941, p. 221) reports calculations suggesting that the share of British imports from foreign countries entering duty-free declined as a result from 30 percent prior to Ottawa to 25 percent immediately thereafter.[10] McDougall and Hutt (1954) estimate that the average rate of tariff preference on Commonwealth imports from the U.K. rose from 6 percent in 1929 to 10-11 percent in 1937, and on U.K. imports from the Commonwealth from 2-3 to 10-12 pereent. Still, authors such as Schlote (1952) and Thorbecke (1960) are skeptical that imperial preference was primarily responsible for the growth of intra-Commonwealth trade; both suggest that the trend was already evident earlier, reflecting growing complementarities between the British economy and the rest of the Empire as well as diplomatic and political understandings cultivated over many years.

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[9] German imports from Balkan and Mediterranean countries alone rose from 10.9 to 20.2 percent of total German imports between 1929 and 1938. Basch (1941), p. 38.

[10] See also Richardson (1936), p. 128.

The pattern and causes of Continental European regionalism were more complex. One Continental bloc was comprised of countries of Central and South-Eastern Europe with increasingly rigid trade ties to Germany. Countries such as Austria, Hungary, Poland and Yugoslavia were tied to Germany and to one another by a web of bilateral agreements (the so-called Schacht agreements). Germany traded access to its market in return for these countries directing toward it an increasing share of their exports of essential foodstuffs and raw materials there. Germany similarly used its market power and political leverage to induce Greece and Turkey to shift a growing share of their exports to the Reich bloc.[11]

Intra-regional trade among Scandinavia and the Benelux countries increased as they sought to reduce their commercial dependence on Germany. The Olso Convention concluded in December 1930 liberalized their trade with one another. But the members soon found themselves split between two currency areas -- the gold bloc and the sterling area -- a fact which is said to have undermined the effectiveness of their agreement.[12] In June 1932, Holland, Belgium and Luxembourg adopted the Ouchy Convention for lowering tariffs and quotas on one another's exports. This, however, was still-born; it was formally abandoned in the course of the World Economic Conference of 1933. Italy negotiated bilateral preference agreements with Austria and Hungary (the so-called Brocchi Agreements of 1931-32 and Rome Agreements of 1934).[13] The participants in each of these agreements adopted commercial preferences designed to channel trade toward one another.

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[11] How much market power Germany in fact possessed is a disputed issue. See Milward (1981) for a review of the relevant literature and Kitson (1992) for a recent assessment.

[12] Condliffe (1940), p. 307. We return to this issue below.

[13] To our knowledge, their impact on trade has never been studied. In a rare assessment, Gordon (1941, p. 452) asserts that "the effects of the Rome Agreements. . . were not as favorable as had been anticipated."

Whether U.S. trade policies led to growing regionalism is difficult to say. Although the Smoot-Hawley tariff was largely nondiscriminatory, it was rolled back not by a general reduction in U.S. tariffs but by bilateral agreements reached under the provisions of the Reciprocal Trade Agreements Act of 1934. During the first three years of that Act, the U.S. concluded trade liberalization agreements with 17 countries, the majority of which were in the Western Hemisphere.[14] In the next three years, six agreements were concluded or expanded, half of which involved Western Hemisphere countries.[15] Although it is tempting to characterize this as leading to the emergence of a U.S.-centered trade bloc, Thorbecke (1960) shows that the share of the trade of Western Hemisphere countries remaining within the region rose significantly only after World War II.

Changes in international monetary and exchange-rate arrangements may have also contributed to the trend toward regionalization. Following Britain's devaluation in September 1931, countries which had traditionally borrowed there and held their international reserves in London pegged their currencies to sterling. Some like India were compelled to do so, but others opted to participate voluntarily.[16] This gave rise to the sterling area, a zone of exchange-rate stability and convertibility thought to have encouraged trade among participants.[17] The sterling area and the British Commonwealth were not the same: Canada, Newfoundland, and British Honduras belonged to the Commonwealth but not the sterling area, while Denmark, Norway, Sweden, Portugal, and other non-Commonwealth countries joined the sterling area.

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[14] The 17 countries were Canada, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Cuba, Haiti, Colombia, Brazil, France, Belgium/Luxembourg, the Netherlands, Sweden, Finland and Switzerland.

[15] The agreement with Canada was expanded, while new agreements were concluded with Ecuador, Venezuela, the U.K., Czechoslovakia and Turkey.

[16] A comprehensive history of the sterling area is Drummond (1972).

[17] For an extensive discussion of this possibility, see Meyer (1952), chapter 2.

Other countries restricted credit as necessary to defend their gold standard parities, and hence suffered a prolonged slump in production and trade. A few gold standard countries, France, Belgium, Switzerland and the Netherlands, maintained exchange-rate stability vis-a-vis one another through the middle of the 1930s, which may have also worked to stimulate trade among them. At the same time they were forced to adopt increasing restrictive tariffs and import quotas to defend their overvalued exchange rates.[18] In addition, gold bloc countries often applied differential surtaxes (or "exchange-dumping duties") against countries devaluing their currencies, which tended to channel their trade toward fellow gold-bloc members. Some members of this group, notably France and the Netherlands, utilized quotas as well as import tariffs. They extended quota rights differentially to foreign suppliers as a way of securing market access for their exports.

A third group of countries, made up of the debtors of Central and Southeastern Europe, also maintained their official gold standard parities, but supported them with exchange restrictions, not with import tariffs and quotas. Unilateral exchange controls imposed in the summer and fall of 1931 were soon supplanted by bilateral clearing and payments agreements. As early as November 1931, a conference of the Danubian countries in Prague held under the auspices of the Bank for International Settlements led to the negotiation of clearing agreements

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[18] See Eichengreen (1992), chapter 12. As the League of Nations put the point, "Countries with overvalued currencies and consequently high price-levels. . . resorted to increasingly stringent measured aimed at restricting imports and encouraging exports. In the 'gold bloc' recourse was mainly had to an extensive system of import quotas and export bounties. . ." Cited in Woytinsky and Woytinsky (1955), p. 294. Once these countries abandoned gold convertibility in 1935-36 and allowed their overvalued exchange rates to depreciate, their more draconian trade restrictions could be relaxed. But one gold bloc member, France, suffered continued balance of payments weakness attributable to the stance of domestic policy, and by 1938 had restored tariffs and quotas to the levels prevailing before 1936.

among pairs of exchange-control countries in Central and Southeastern Europe designed to facilitate trade without requiring settlement in international reserves.[19]

Few countries linked their currencies to the dollar as tightly as the members of the sterling area pegged to the pound and the gold bloc currencies were linked to one another. The formal dollar bloc included only the U.S., the Philippines, Cuba and Central America, although countries such as Canada and Argentina followed the dollar at a distance.

The combined result of these changes was a rapid reorientation of trade: the traditional pattern of multilateral settlements was submersed beneath a web of bilateral and regional commercial and monetary arrangements. But no consensus exists about the relative importance of trade blocs and currency areas in bringing about these changes. Did discriminatory trade blocs cause the shifts in the pattern of world trade, or can they be dismissed as unimportant? Did the sterling area and other currency arrangements have only a minor impact on the pattern of trade, or were payments arrangements, as others argue, highly influential? In the remainder of this paper we seek to determine the extent to which trade blocs and currency arrangements were responsible for the changing pattern of world trade.

III. Data and Specification

A standard empirical framework for investigating the pattern of trade is the gravity model. This model, which dates from Linneman (1966), relates the value of bilateral flows to national income, population, distance, and contiguity. Anderson (1979) and Bergstrand (1985) have shown that the gravity equation can be derived as a reduced form of a broad class of

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[19] For details see League of Nations (1935).

structural models. In applications to contemporary data, such equations have proven successful in predicting the pattern of trade and assessing the effects of commercial policies.

While studies differ in their precise specification, one standard version, used for example in Frankel and Wei (1992) and Eichengreen (1993), takes the form:

$$TRADE_{ij} =$$

$$\beta_0 + \beta_1 (GNP_i \cdot GNP_j) + \beta_2 ([GNP_i/POP_i] \cdot [GNP_j/POP_j]) + \beta_3 DIST_{ij} + \beta_4 CONT + u_{ij}.$$

$TRADE_{ij}$ is the nominal value of bilateral trade between countries i and j, $GNP_i \cdot GNP_j$ is the product of the two countries' nominal national incomes, $[GNP_i/POP_i] \cdot [GNP_j/GNP_j]$ is the product of the two countries' per capita national incomes (also in nominal terms), $DIST_{ij}$ is the distance between the economic centers of gravity of the two countries (measured in miles or kilometers), and CONT is a dummy variable indicating whether or not the two countries are contiguous. Dummy variables representing commercial policies (such as regional trade arrangements or currency blocs) can be introduced and analyzed for their impact on trade.

Most previous studies specify the gravity equation in double-log form (expressing the dependent variable and all independent variables in logs) and estimate it by ordinary least squares. This permits coefficients to be interpreted as elasticities but omits country pairs for which the reported value of bilateral trade is zero. This is undesirable insofar as these observations contain information on reasons why low levels of trade are sometimes observed -- because low incomes and long distances render limited quantities of potential trade uneconomical, for instance. This is particularly an issue in the interwar period when many countries and regions did not trade extensively.

A solution to this problem is to forgo the double-log specification for a semi-log form in which TRADE is expressed in levels while independent variables appear in logs. While this allows one to utilize the information contained in the observations for which the observed value of trade is zero, OLS is no longer the appropriate estimator. Since the dependent variable is truncated at zero, estimation by OLS will produce biased results and may predict negative trade flows. The appropriate estimator is Tobit, as employed by Havrylyshyn and Pritchett (1991). The analogy between the gravity equation and the standard Tobit model is straightforward: countries first determine whether to trade with one another, and if they do the value of trade is determined by their economic characteristics.

The sample of countries is necessarily confined to those for which there exist estimates of national income. We assembled data for 34 countries, or 560 bilateral trade flows.[20] The source for trade flows is Annex III of Folke Hilgerdt's study The Network of World Trade (published by the League of Nations in 1942), which contains country data for world bilateral trade in 1928, 1935, and 1938. (Trade, expressed in millions U.S. dollars, is the sum of export and imports.) Nominal national income data, the sources of which are described in the data appendix, were converted to millions of U.S. dollars using the exchange rates in Annex IV of the Network.[21] The distance variable is the straightline distance (in kilometers) between the economic center of gravity of the respective countries, as originally presented in Linneman

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[20] The 34 sample countries are: the United States, Canada, Cuba, Guatemala, Mexico, Brazil, India, the Netherlands Indies (Indonesia), Japan-Taiwan-Korea, Austria, Belgium, Czechoslovakia, France, Germany, Italy, the Netherlands, Sweden, Switzerland, Bulgaria, Denmark, Finland, Greece, Hungary, Norway, Poland, Portugal, Romania, Spain, the Soviet Union, Ireland, the United Kingdom, Australia, New Zealand, and South Africa.

[21] The sources for population (in thousands) are also described in the appendix.

(1966).[22] The dummy variables representing commercial policies and currency blocs will be discussed as they are introduced.

IV. Econometric Results and Interpretation

The gravity equation discussed in the previous section was estimated for each sample year. For ease of comparison with other studies, the coefficients are expressed in elasticity form (i.e., the estimated coefficients have been divided by the mean value of TRADE before being reported in the tables below).

Table 1 presents basic estimates for 1928, 1935, and 1938. The sum of the coefficients on income and income per capita is 1.37 in 1928, leading trade to fall off more rapidly than income in the downturn. That sum declines to 0.92 in 1935, meaning that trade rises less quickly (or only as quickly) as income in the recovery. Together this explains in an accounting sense the lower trade-to-income ratios in 1938 than 1928, although it is possible that the appearance of a structural shift in the income elasticity of trade is merely picking up the effects of omitted variables like trade and exchange-rate policies that are themselves correlated with incomes. We return to this point below.

Distance has a smaller impact in 1935 and 1938 than in 1928. While this might conceivably reflect declining transportation costs, the more plausible interpretation, given the size of the change in the coefficient, is that commercial policies increasingly overrode the effects of geography. Contiguity also has an important, independent effect encouraging trade; it too exhibits a smaller coefficient in the 1930s.

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[22] We are indebted to Lant Pritchett for making this data available to us.

Table 1 (b) presents OLS estimates from the same sample (excluding observations for which bilateral trade is zero) to allow comparison with these Tobit estimates and with results from other studies. The coefficient on national incomes is slightly lower in the OLS estimates, while the coefficient on per capita national incomes is roughly one-half the size of the Tobit estimate. Contiguity appears to be less important, a result which emerges because the sample -- by construction -- excludes distant countries that do not trade with one another, mainly industrialized countries in Europe and poorer developing countries elsewhere.

Our OLS estimates facilitate comparison with estimates for later time periods. The coefficient on per capita national income is somewhat smaller for the interwar period than in estimates for the 1950s in Eichengreen (1992). This implies that intra-industry trade among countries of comparable income levels was not as important before World War II as after. It is consistent with W. Arthur Lewis's (1949) description of pre-World War I and interwar trade as primarily an exchange of manufactured goods and raw materials between industrial and tropical countries. In the post-World War II period, in contrast, one would expect to see a significant increase in intra-industry trade. Yet the OLS coefficients on national income, per-capita national income, and distance for 1928 are strikingly similar in magnitude to Frankel and Wei's (1992) findings for 1980 and 1985 (all these coefficients fall noticeably in 1935 and 1938).

Table 2 introduces variables representing the principal trade blocs of the 1930s, the British Commonwealth and the German sphere of influence.[23] Pairs of dummy variables capture their impact on the pattern of world trade. The first captures the within-group effect, taking a value of unity if both countries are associated with a particular trade bloc. This

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[23] In our sample, the Commonwealth consists of the United Kingdom, Ireland, Canada, India, Australia, New Zealand, and South Africa. The German sphere of influence consists of Germany, Austria, Czechoslovakia, Hungary, Romania, Bulgaria, Greece, and Brazil.

Table 1

Determinants of Trade in the Interwar Period

Exclusive of Trade Blocs

Variable	1928	1935	1938
Constant	-8.24 (8.00)	-7.55 (7.73)	-8.15 (8.07)
National Incomes	0.95 (18.84)	0.71 (15.67)	0.74 (15.65)
Per Capita Incomes	0.42 (5.57)	0.21 (3.15)	0.24 (3.88)
Distance	-0.61 (6.94)	-0.28 (3.21)	-0.28 (3.36)
Contiguous	1.44 (3.99)	1.08 (3.21)	1.18 (3.45)
n	560	560	560
S.E.	2.073	1.076	1.293

Notes: All equations are estimated by Tobit. Independent variable is imports plus exports. All trade and income variables are expressed in millions of U.S. dollars, using conversion factor described in the text. t-statistics are in parenthesis.

Table 1b

Determinants of Trade in the Interwar Period

Exclusive of Trade Blocs

Variable	1928	1935	1938
Constant	-4.38 (6.73)	-4.49 (6.88)	-4.97 (7.83)
National Incomes	0.74 (22.50)	0.62 (19.52)	0.66 (21.42)
Per Capita Incomes	0.21 (4.21)	0.12 (2.49)	0.11 (2.73)
Distance	-0.56 (9.94)	-0.38 (6.75)	-0.41 (7.76)
Contiguous	0.51 (2.31)	0.47 (2.17)	0.34 (1.60)
n	418	426	432
S.E.	3.083	2.532	2.582

Notes: All equations are estimated by OLS. Independent variable is imports plus exports. All trade and income variables are expressed in millions of U.S. dollars, using conversion factor described in the text. t-statistics are in parenthesis.

coefficient indicates whether or not these countries tended to trade more with one another as a result of bloc membership. The second, capturing the external effect, takes the value of unity if one or the other country, but not both, is a member of the Commonwealth or the German bloc. This coefficient indicates whether the arrangement in question diverted trade away from the rest of the world. The exponential of these coefficients yield the impact of these policies on trade in percentage terms.

The results in Table 2 indicate that members of the Commonwealth already traded heavily with one another in 1928, in fact eight-times more than might be expected given their other economic attributes. This suggests that the prevalence of Commonwealth trade arose from more than the Ottawa tariff preferences alone; it is likely that existing transportation links and direct investments account for this heavy trade. But the magnitude and significance of the Commonwealth effect increases in 1935 and again in 1938. The change in this coefficient between 1928 and 1935 and the average behavior of countries in the sample imply nearly a 150 percent increase in intra-Commonwealth trade as a result of the Ottawa preferences and other agreements in the early 1930s.[24] The coefficient on the dummy variable capturing the external effects of Commonwealth membership is insignificant in all three years, suggesting that Commonwealth preferences were trade creating and did not divert trade away from the rest of the world. This finding contradicts the assertion of Condliffe (1940) that Commonwealth preferences had a negative impact on the participating countries' trade with the rest of the world.

In contrast, and contrary to the assertions of Ellis (1941, p. 258 and passim), the members of the German bloc showed no significant tendency to trade unusually extensively

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[24] We show below that this estimate should be revised downward upon controlling for the independent effect of the sterling area on trade.

Table 2

Determinants of Trade in the Interwar Period

Variable	Inclusive of Trade Blocs					
	1928	1935	1938	1928	1935	1938
Constant	-7.97 (8.55)	-7.91 (8.45)	-8.79 (7.54)	-8.69 (8.39)	-8.21 (7.97)	-8.93 (8.48)
National Incomes	0.93 (20.52)	0.82 (18.76)	0.85 (15.73)	1.00 (19.88)	0.83 (17.51)	0.86 (17.41)
Per Capita Incomes	0.34 (4.69)	0.14 (2.11)	0.17 (2.32)	0.44 (5.67)	0.21 (2.91)	0.25 (3.78)
Distance	-0.65 (7.79)	-0.51 (5.99)	-0.49 (4.78)	-0.64 (7.28)	-0.42 (4.76)	-0.39 (3.89)
Contiguous	1.34 (4.14)	0.94 (2.94)	1.04 (2.67)	1.36 (3.77)	1.02 (2.89)	1.13 (3.22)
Within Commonwealth	2.23 (5.93)	3.22 (8.85)	3.85 (8.61)	--	--	--
Commonwealth Member	0.02 (0.11)	0.18 (1.10)	0.05 (0.24)	--	--	--
Within German Bloc	--	--	--	0.47 (1.21)	0.62 (1.64)	0.69 (1.86)
German Bloc Member	--	--	--	-0.19 (1.07)	-0.61 (3.61)	-0.57 (3.37)
n	560	560	560	560	560	560
S.E.	1.799	0.945	1.595	2.114	1.101	1.305

Notes: See Table 1.

with one another in any sample year. (In 1938, the coefficient indicating a country pair belonging to the bloc is positive and almost significant at the 5 percent level.) If their commercial arrangements mainly reflected the exercise of monopsony power by Germany, there would be no reason to expect them to have stimulated the volume of trade (as opposed to affecting the terms of trade). Basch (1941) argues that Germany's discriminatory commercial policies were not in fact designed to encourage trade with these countries, only to balance it while enhancing Germany's self-sufficiency in raw materials. The results in Table 2 are somewhat consistent with this view. It is also possible that this result reflects the tendency for exchange controls, which discouraged trade within the bloc as well as outside it, to neutralize the tendency for discriminatory commercial policies to encourage trade with Germany. Yet German commercial policies apparently entailed significant trade diversion, stifling trade with non-bloc countries because after 1928 the external effect of the German bloc becomes negative and statistically significant. In 1935 and 1938 the coefficient on the dummy variable for cases where only one of a pair of countries was a member of the German bloc, indicating that membership on average reduced trade with the rest of the world by 45 percent. (The impact of exchange controls will be examined shortly and will revise these findings.)

These results have three noteworthy implications. First, they suggest that the two most prominent commercial blocs of the 1930s affected the pattern of trade in different ways. The Commonwealth promoted intra-bloc trade without discouraging trade with the rest of the world, while the German bloc not only failed to stimulate intra-bloc trade but curtailed member-country trade with other countries. Second, the results continue to indicate a decline in the income elasticity of trade (the sum of the coefficients on national incomes and per capita incomes) between 1928 and 1935/38, even after controlling for variations in commercial policies. Third, the prevalence of contradictions between our conclusions derived from

Table 3

Determinants of Trade in the Interwar Period

Inclusive of Currency Blocs

Variable	1928	1935	1938	1928	1935	1938	1928	1935	1938
Constant	-7.58	-9.83	-8.96	-8.50	-7.48	-8.07	-8.31	-8.33	-8.89
	(7.55)	(8.98)	(9.29)	(8.95)	(7.52)	(7.89)	(8.29)	(7.67)	(7.90)
National Incomes	0.84	0.91	0.79	0.97	0.72	0.76	1.03	0.89	0.91
	(17.34)	(17.54)	(17.26)	(21.52)	(16.24)	(16.32)	(21.87)	(17.42)	(17.02)
Per Capita Incomes	0.33	0.15	0.14	0.42	0.23	0.25	0.42	0.23	0.25
	(4.33)	(1.94)	(2.17)	(6.29)	(3.35)	(4.11)	(5.65)	(2.99)	(3.52)
Distance	-0.53	-0.46	-0.35	-0.61	-0.31	-0.31	-0.74	-0.52	-0.50
	(6.23)	(4.96)	(4.37)	(7.45)	(3.56)	(3.64)	(8.32)	(5.32)	(5.17)
Contiguous	1.43	1.01	1.13	1.48	1.06	1.16	1.49	1.08	1.20
	(4.12)	(2.73)	(3.49)	(4.61)	(3.16)	(3.43)	(4.24)	(2.86)	(3.13)
Sterling Area	0.82	1.36	1.59	--	--	--	--	--	--
	(3.97)	(4.71)	(6.34)						
Sterling Area Member	-0.06	0.18	0.12	--	--	--	--	--	--
	(0.33)	(0.95)	(0.76)						
Gold Bloc	--	--	--	-0.42	0.16	-0.04	--	--	--
				(0.91)	(0.32)	(0.08)			
Gold Bloc Member	--	--	--	0.11	-0.20	-0.22	--	--	--
				(0.68)	(1.20)	(1.27)			
Exchange Controls	--	--	--	--	--	--	-0.25	0.33	0.02
							(0.49)	(0.61)	(0.04)
Exchange Control Member	--	--	--	--	--	--	-0.66	-1.01	-0.94
							(3.75)	(5.28)	(4.89)
n	560	560	560	560	560	560	560	560	560
S.E.	2.083	1.249	1.151	1.731	1.042	1.245	2.021	1.252	1.517

Notes: See Table 1.

multivariate analysis of trade flows and those of previous investigators relying on basic statistics underscores the hazards of using simple correlations to draw inferences about the impact of policy.

Our conclusion about the contrasting effects of the Commonwealth and German trade blocs is provisional, however, because currency and trade blocs had overlapping membership, potentially allowing our trade-bloc variables to pick up their effects. Table 3 therefore examines the impact of currency blocs. The first three columns find a tendency in 1928, before the formal establishment of the sterling area, for its eventual members to trade unusually extensively with one another -- but also shows that this tendency was subsequently reinforced. Exchange rate stability within the area could have promoted trade, but still more important may have been that these countries depreciated their currencies against gold early in the 1930s and suffered less of an economic contraction -- and in some cases, enjoyed an earlier recovery. (The separate effects of exchange rate stability will be examined shortly.) The dummy for trade between members of the sterling area and the rest of the world is insignificant for all years, suggesting no trade diverting effects.

Gold bloc countries showed no measurable tendency to trade unusually heavily with one another in 1928, 1935 or 1938 once one controls for their observable economic characteristics. Although the coefficient on bloc membership is slightly negative in 1935 and 1938, it is insignificant and thus provides no evidence that adherence to the gold standard tended to divert trade away from the rest of the world. This may indicate that the "exchange-rate dumping" measures taken by the gold-bloc countries against others that depreciated their currencies had only minor trade-diverting effects. On the other hand, this absence of an apparent effect may in fact reflect the offsetting influence of exchange-rate stability (which encourages trade); we explore this possibility when considering the effects of exchange rate variability below.

Given the stifling impact on trade of exchange controls, one might expect that countries imposing them would not have traded unusually heavily with one another. Each country independently imposed these measures for balance-of-payments purposes with no within-group preferences or discrimination. However, a strong trade-discouraging effect is evident in 1935, indicating that the value of bilateral trade between exchange control and other countries was substantially lower than would be expected given their other economic characteristics and the average behavior of countries in the sample. This diversionary effect is still present in 1938, although the coefficient is smaller than in 1935, reflecting the gradual relaxation of exchange restrictions. Importantly, however, this effect is already present in 1928 even though extensive exchange control had yet to be introduced, suggesting that countries which opted for this alternative in the 1930s had previously used other measures to limit the volume of their international trade. Note, however, that the intensity of their application rises after 1928 as there is a statistically significant increase in the coefficient.

What of the relative importance of trade and currency blocs? Given the overlapping membership of these two arrangements, those results are uninformative about which was more important. Tables 4 and 5 report equations including measures of both commercial and financial policies. In 1928, there was a distinct tendency for Commonwealth countries to trade unusually heavily with one another. As yet, their eventual propensity to join the sterling area, plausibly, has no discernible impact on their trade. By 1935, however, the Commonwealth and sterling area both significantly altered the pattern of trade. Note that the estimated change in trade volumes after 1928 due to the operation of commercial preferences associated with the Commonwealth membership is reduced somewhat relative to the estimates presented in Table 2. The effect of the Commonwealth and sterling area variables both grow even more pronounced in 1938. That the coefficients increase in magnitude and significance indicates, for this group

Table 4

Commonwealth Preferences versus the Sterling Area

Variable	1928	1935	1938
Constant	-8.11 (8.22)	-8.44 (7.44)	-8.49 (7.26)
National Incomes	0.94 (19.96)	0.84 (16.32)	0.79 (14.66)
Per Capita Incomes	0.33 (4.56)	0.12 (1.55)	0.12 (1.70)
Distance	-0.65 (7.81)	-0.51 (5.25)	-0.41 (4.32)
Contiguous	1.31 (4.04)	0.88 (2.34)	1.09 (2.95)
Within Commonwealth	2.03 (5.03)	2.76 (6.18)	3.28 (7.17)
Commonwealth Member	-0.03 (0.16)	0.05 (0.22)	-0.11 (0.50)
Within Sterling Area	0.36 (1.23)	0.57 (1.82)	0.88 (2.77)
Sterling Area Member	-0.07 (0.38)	0.09 (0.44)	0.11 (0.55)
n	560	560	560
S.E.	1.782	1.210	1.468

Notes: See Table 1.

Table 5

Reich Bloc Preferences versus the Exchange Control Group

Variable	1928	1935	1938
Constant	-6.73 (7.17)	-8.41 (7.61)	-7.69 (6.87)
National Incomes	0.81 (17.43)	0.89 (16.96)	0.78 (14.59)
Per Capita Incomes	0.38 (5.46)	0.24 (3.13)	0.23 (3.26)
Distance	-0.52 (6.31)	-0.50 (5.09)	-0.39 (4.11)
Contiguous	1.64 (4.94)	0.96 (2.52)	1.04 (2.73)
Within German Bloc	0.56 (1.48)	0.97 (2.20)	0.90 (2.10)
German Bloc Member	0.30 (1.49)	0.03 (0.13)	0.04 (0.19)
Within Exchange Control	-0.41 (0.81)	-0.17 (0.30)	-0.46 (0.79)
Exchange Control Member	-0.79 (7.17)	-1.09 (4.36)	-0.93 (3.77)
n	560	560	560
S.E.	1.891	1.266	1.542

Notes: See Table 1.

of countries, the growing importance of both trade and currency arrangements. The fact that the Commonwealth dummy is several times larger than the sterling area dummy suggests that tariff preferences and the political ties of the Commonwealth had a greater impact on trade flows than the financial arrangements associated with sterling-area membership.[25] In both cases, no significant external effect is detected: neither the Commonwealth nor the sterling area discouraged trade with non-members.

The same questions can be asked of the German bloc and of countries imposing exchange controls, which again have overlapping membership.[26] When both variables are included in the gravity equation, as in Table 5, within-bloc trade now appears to be greater than would have otherwise been predicted, as a result of Germany's special trade arrangements. This is in contrast with Table 2, where no significant trade-creating effect was detected. Unlike Table 2, moreover, the diversionary effect of the German bloc disappears with the addition of the exchange control variable. The decline in the volume of trade between Central Europe and the rest of the world in fact appears to reflect not discriminatory commercial policies but the restrictive effects of exchange controls.[27] As in Table 3, there is no evidence that exchange controls promoted the trade of such countries, whereas it significantly curtailed trade with non-control countries.

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[25] If we impute the change in the Within Commonwealth coefficient between 1928 and 1935 to the Ottawa agreement, then this implies preferences increased trade by about 350 percent among members. The independent effect of the sterling area in 1938 increased trade by roughly 250 percent.

[26] Austria, Czechoslovakia, Germany, and Hungary were members of both the German commercial bloc and exchange control group. Italy also imposed exchange controls, and Bulgaria, Greece, and Brazil fell within the German sphere.

[27] The coefficients for 1935 imply that within-German bloc trade increased by about 150 percent while exchange control countries diminished trade with the rest of the world by roughly 66 percent.

We also investigated the impact of the less prominent economic arrangements of the period. The Ouchy accord between the Netherlands, Belgium, and Luxembourg sought to stimulate trade through preferential tariff reductions, although it lasted only from 1932-33. The results in Table 6 show that these countries already traded heavily with one another in 1928, before the agreement, and the coefficient increases in magnitude in 1935 and again in 1938. Despite the formal failure of the accord, the more liberal trade policy stance of the low countries evidently enabled them to trade more extensively with one another than contiguity and propinquity on average suggest in our sample -- and without concomitant trade diversion. In contrast, not only does the Brocchi agreement between Austria, Hungary, and Italy appear not to have significantly stimulated their trade, but a pronounced diversionary impact is evident. Our finding largely confirms the negative assessment of this agreement that dominates the literature.[28]

Finally, Table 6 presents tests for the existence of a Western Hemisphere bloc comprised of the United States and various Latin American countries. Because countries signing bilateral trade agreements and those pegging their exchange rates to the U.S. dollar tended to be the same, it was not possible to differentiate between the trade and monetary arrangements. It appears that although these countries already traded unusually heavily with one another in 1928, intra-Hemisphere trade had become even more pronounced by 1935. By 1938, any intra-Hemisphere-trade effect is less obvious, perhaps reflecting the more wide-ranging application of the Reciprocal Trade Agreements Act. In no year does there appear to be a diversionary element in Western Hemisphere trade.

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[28] See, for example, Condliffe (1940).

Table 6

Determinants of Trade in the Interwar Period

Inclusive of Other Trade Blocs

Variable	1928	1935	1938	1928	1935	1938	1928	1935	1938
Constant	-9.26 (9.48)	-9.25 (9.26)	-9.57 (9.91)	-7.79 (7.48)	-8.00 (8.07)	-8.78 (9.24)	-7.22 (7.11)	-8.56 (8.52)	-9.28 (9.40)
National Incomes	0.42 (20.90)	0.81 (17.87)	0.81 (18.36)	0.96 (18.97)	0.85 (18.29)	0.87 (19.41)	0.82 (17.07)	0.85 (18.37)	0.85 (18.67)
Per Capita Incomes	0.42 (2.96)	0.23 (1.94)	0.26 (2.17)	0.42 (5.48)	0.23 (3.41)	0.25 (4.33)	0.37 (4.95)	0.26 (3.88)	0.27 (4.62)
Distance	-0.55 (6.68)	-0.28 (3.34)	-0.25 (3.18)	-0.67 (7.48)	-0.48 (5.57)	-0.44 (5.59)	-0.51 (5.66)	-0.44 (4.87)	-0.36 (4.30)
Contiguous	1.59 (4.81)	1.28 (3.82)	1.42 (4.45)	1.48 (4.07)	1.05 (3.10)	1.19 (3.73)	1.29 (2.71)	0.97 (2.86)	1.14 (3.50)
Ouchy Bloc	3.52 (2.14)	3.77 (2.29)	4.18 (2.62)	--	--	--	--	--	--
Ouchy Member	0.74 (3.22)	0.57 (2.50)	0.41 (1.89)	--	--	--	--	--	--
Brocchi Bloc	--	--	--	-1.88 (1.79)	-1.27 (1.30)	-1.33 (1.43)	--	--	--
Brocchi Member	--	--	--	-0.79 (3.11)	-1.80 (4.99)	-0.92 (4.62)	--	--	--
Western Hemisphere	--	--	--	--	--	--	1.29 (2.71)	2.32 (5.04)	1.69 (3.66)
West. Hem. Member	--	--	--	--	--	--	-0.01 (0.02)	0.25 (1.32)	0.10 (0.57)
n	560	560	560	560	560	560	560	560	560
S.E.	1.619	1.249	1.568	1.782	1.693	1.568	1.715	1.645	1.583

Notes: See Table 1.

Our last potential determinant of trade during the Depression was exchange rate variability. Ragnar Nurkse's 1944 League of Nation's monograph on exchange rates in the interwar period argued that exchange-rate volatility did much to increase the risk and uncertainty associated with international trade and played a role in reducing trade flows. Nurkse's report did much to color the historical view of the interwar period and left a strongly negative impression about exchange rate flexibility. Like Frankel and Wei (1992), we extend our model to include a measure representing exchange rate volatility. A standard measure, employed by Mussa (1986), is the variance of $\log(e_t/e_{t-1})$, where e_t is the average monthly bilateral nominal exchange rate between two countries. This monthly variance is taken over the three years prior to the trade flows, i.e., from 1925-1927 in the case of trade flows in 1928.[29]

Table 7 reports equations which include this measure of bilateral exchange rate variability. Nurkse's hypothesis is confirmed for all three years -- 1928, 1935, and 1938 -- with the magnitude of the negative impact of exchange rate variability on trade most pronounced in 1935. The midst of the depression, 1932-1934, was precisely the period in which Nurkse argued that competitive devaluations and other forms of exchange rate turbulence had the most detrimental effect on trade. The absence of well-developed and economical hedging instruments and lack of experience with floating exchange rates may have accounted for the negative effect. Controlling for currency-bloc membership, itself highly correlated with bilateral exchange-rate variability, does not substantially affect these findings for 1928 or 1935.

By the 1938, in contrast, exchange rate variability does not appear to have been a significant impediment to trade once controls for currency blocs are introduced. This plausibly reflects the impact of the Tripartite Agreement of 1936 between the United States, the United

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[29] Gaps in the availability of exchange rate data (which we draw from League of Nations' publications) reduces the sample size somewhat.

Table 7

Bilateral Trade and Exchange Rate Variability

Variable	1928		1935		1938	
Constant	7.61 (6.55)	8.77 (6.55)	11.80 (10.17)	8.19 6.28	9.40 (9.50)	8.52 (7.57)
National Incomes	0.91 (15.20)	0.98 (15.91)	0.84 (17.73)	0.70 (13.37)	0.77 (16.53)	0.87 (17.58)
Per Capita Incomes	0.26 (2.77)	0.21 (2.23)	0.16 (2.42)	0.11 (1.49)	0.19 (2.97)	0.08 (1.60)
Distance	-0.74 (6.96)	-0.75 (5.80)	-0.21 (2.47)	-0.37 (3.63)	-0.32 (4.10)	-0.57 (6.07)
Contiguous	1.04 (2.98)	1.17 (3.14)	1.00 (2.89)	1.10 (2.84)	0.86 (10.50)	0.77 (2.16)
Exchange Rate Variability	-0.06 (2.22)	-0.06 (2.32)	-0.16 (3.17)	-0.18 (2.83)	-0.10 (4.50)	-0.03 (0.91)
Sterling Area	--	0.82 (2.05)	--	0.53 (1.77)	--	1.14 (3.61)
Sterling Area Member	--	0.12 (0.55)	--	-0.06 (0.34)	--	0.01 (0.03)
Gold Bloc	--	-0.24 (0.05)	--	-0.65 (1.30)	--	-0.27 (0.60)
Gold Bloc Member	--	0.29 (1.23)	--	-0.54 (2.57)	--	-0.17 (0.89)
Exchange Controls	--	0.15 (0.26)	--	-0.45 (0.80)	--	-0.24 (0.52)
Exchange Control Member	--	-0.30 (1.30)	--	-0.83 (4.06)	--	-0.70 (3.74)
n	377	351	435	435	464	464
S.E.	1.584	1.538	1.427	1.540	1.489	1.505

Notes: See Table 1. The measure of exchange rate variability is the log of the variance of $\log(e_t/e_{t-1})$.

Kingdom, and France, an agreement which sought to increase international monetary cooperation with the aim of mitigating exchange rate fluctuations.[30] Eichengreen (1992, Table 12.6) reports that the Tripartite Agreement not only reduced the variability of the major bilateral exchange rates, but also reduced the exchange risk premium (the forward exchange rate minus the spot rate that obtained when the forward contract matured). The results in Table 7 provides some evidence consistent with claims that this agreement, by reducing exchange rate uncertainty and risk, contributed to the reconstruction of trade.

Several other conclusions can be drawn from Table 7. Accounting for exchange-rate variability does not eliminate the positive effect on the trade volume of two countries belonging to the sterling area. Nor does its inclusion eliminate the negative effect of exchange controls on trade with the rest of the world. But adding exchange-rate variability uncovers for the first time a negative effect of gold bloc membership on trade with non-gold countries. Gold bloc countries suffered from overvalued currencies vis-a-vis the rest of the world and hence engaged in less trade, but also had more stable exchange rates which facilitated trade; until exchange-rate variability is added, the second effect is picked up by gold bloc membership, offsetting its negative impact on trade.

V. Conclusions

This paper provides a systematic empirical analysis of the impact on world trade of the trade and currency blocs of the 1930s and sheds new light on interwar commercial and financial policies. Our central finding is that both trade blocs and currency blocs significantly reshaped the pattern of trade but that different discriminatory regional arrangements had

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[30] Still other countries joined initialled the Agreement subsequently. For details, see Clarke (1977).

different implications for the evolution of the trading system. Commonwealth preferences and the sterling area encouraged intra-bloc trade without at the same time discouraging trade with the rest of the world. Countries in Germany's sphere of commercial influence also traded more with one than would be expected on the basis of their economic characteristics alone, but their exchange controls and clearing agreements significantly stifled trade with the rest of the world (albeit not with one another). Yet another result emerges for the countries of the gold bloc: continued adherence to the gold standard did little to promote intra-group trade but led to the adoption of ancillary policies that depressed trade with the rest of the world. Many of these results only become clear after controlling for the independent effect on trade of exchange-rate variability, which appears to have exercised a negative influence on trade in 1935 but not in 1938.

Thus, a blanket indictment of the trade and currency blocs of the 1930s is not warranted. Some discriminatory arrangements were liberalizing: they extended preferences encouraging intra-bloc trade without significantly heightening barriers to trade with the rest of the world. The Ottawa Agreements and the sterling area are examples. Others, like the commercial and financial policies pursued by Germany and the Central European countries in her sphere of influence, encouraged intra-bloc trade at the expense of trade with the rest of the world. Similarly, no blanket statement can be made about the effect of exchange-rate variability on trade. Prior to 1936, it caused significant exchange risk that depressed the volume of trade; following the Tripartite Agreement, exchange rates appear to have grown easier to predict and the impact on trade volumes evaporated.

What are the implications for the emerging regional trade agreements and currency areas of today, such as the North American Free Trade Agreement and the European Community's Single Market and European Monetary System? Our results show clearly that these will

depend on the structure and design of these initiatives. Efforts to increase commercial and monetary integration bilaterally and regionally can have positive effects for the participating countries without hampering trade with the rest of the world. But it is equally possible for these measures to have a corrosive impact on the multilateral system. The key, interwar experience suggests, lies not in the regional or global character of policy initiatives, but in the intent of the policymakers who structure and design the precise features of such agreements.

Data Appendix

This appendix describes the sources used for estimating the gravity equations.

Trade. League of Nations (1942).

National Income. Austria, Belgium, Bulgaria, Denmark, Finland, Germany, Hungary, Greece, Italy, the Netherlands, Norway, Spain, Sweden, Soviet Union: Mitchell (1980). France: Toutain (1987). Switzerland, Czechoslovakia, and Poland: Clark (1937). Romania: Kaser and Radice (1985). United States: U.S. Bureau of the Census (1975). Canada: Urquhart and Buckley (1965). Ireland and the United Kingdom: Mitchell (1988). Australia and New Zealand: Butlin (1984). India and Netherlands Indies: Maddison (1989a). South Africa: Mitchell (1982). Japan, Korea, and Taiwan: Ohkawa et. al. (1974), Sang-Chul (1978), and Ho (1978), respectively. Cuba, Guatemala, Mexico, and Brazil: Wilke (1990). Portugal: Valerio (1983).

Population. Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, the Netherlands, Norway, Sweden, Switzerland, the United Kingdom, and the United States: Maddison (1982). New Zealand: Butlin (1984). For Cuba, Guatemala, Mexico, and Brazil: Wilke (1990). India and the Netherlands Indies: Maddison (1989a). Portugal: Valerio (1983). Ireland: Mitchell (1988). The following countries required interpolation between census dates. South Africa: Mitchell (1982). Greece and Spain: Mitchell (1980). Bulgaria, Czechoslovakia, Hungary, Poland, Romania, and the Soviet Union: Shoup (1981).

Distance. Derived from Linneman (1966).

Exchange Rates. Calculated from the League of Nations Statistical Yearbook, various years.

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