THE UNIVERSITY OF WARWICK

January 2013 No.112

Geography and Intra-National Home Bias: U.S. Domestic Trade in 1949 and 2007

Nicholas Crafts and Alexander Klein

WORKING PAPER SERIES

Centre for Competitive Advantage in the Global Economy

Department of Economics

CAGE Competitive Advantage in the Global Economy

E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

Geography and Intra-National Home Bias: U.S. Domestic Trade in 1949 and 2007[1]

Nicholas Crafts

University of Warwick

n.crafts@warwick.ac.uk

and

Alexander Klein

University of Kent

a.klein-474@kent.ac.uk

January 2013

Abstract

This paper examines home bias in U.S. domestic trade in 1949 and 2007. We use a unique data set of 1949 carload waybill statistics produced by the Interstate Commerce Commission, and 2007 Commodity Flow Survey data. The results show that home bias was considerably smaller in 1949 than in 2007 and that home bias in 1949 was even negative for several commodities. We argue that the difference between the geographical distribution of the manufacturing activities in 1949 and that of 2007 is an important factor explaining the differences in the magnitudes of home-bias estimates in those years.

Keywords: intra-national home bias, spatial clustering, manufacturing belt, gravity equation

[1] We are grateful to Tim Guinnane and Mark Thomas for their help with the U.S. Carload Waybill data, Natalie Chen and Dennis Novy for generously sharing their data with us, and Anwita Basu, Mariela Dal Borgo, and Maciej Maruszczak for their excellent research assistance. We would like to thank the participants of the CAGE/FRESH 2012 Winter School in Venice, Trade Policy in a Globalised World Workshop in Venice 2012, and seminars at Queen's University Belfast, University of Kent, University of Groningen, and The Philipp University of Marburg for helpful comments.

Introduction

The effect of borders on trade has received considerable attention in recent years. Since the seminal paper by McCallum (1995), which showed that, after controlling for numerous explanatory factors, trade between the Canadian provinces was about 22 times higher than their trade with U.S. states, scholars have paid close attention to the robustness as well as explanation of border effect. One surprising result which has emerged from that literature is that home bias is not found only in international trade; domestic trade also exhibits a rather substantial border effect (Wolf 2000, Nitsch 2000, Hillberry 2000, Chen 2004, Millimet and Osang 2007, Coughlin and Novy 2013). These results are surprising in that U.S. domestic trade takes place in a situation where the usual trade barriers such as tariffs, quotas and exchange rate variability do not exist. This suggests that other explanations for home-bias should be sought.

Earlier studies investigating home-bias in domestic trade focused on the estimation and the robustness of that finding; later studies have begun to investigate its possible causes. A number of papers point to the structure of production and the spatial concentration of economic activities as an important factor explaining home bias in domestic trade (Hillberry 2000, Hillberry and Hummels 2003, 2008, Chen 2004). If this argument is correct, it suggests that intra-national home bias probably does not connote significant welfare losses from barriers to trade.

We explore this hypothesis in more depth. Specifically, we examine the home bias of U.S. domestic trade in 1949 and 2007 respectively by estimating gravity regressions at the aggregate as well as the commodity level. The paper makes two contributions. First, it examines the variation of home bias across commodities and time. Second, it investigates the relationship between the magnitude of the intra-state home bias and the changing spatial distribution of manufacturing activities. Indeed, analysing home bias in 1949 and 2007 provides a unique opportunity to examine that relationship at the times when the geographical distributions of industries were dramatically different. If the spatial distribution of industrial activities matters, then we should observe that different patterns of geographical location of industries affect the intra-national home bias.

It is a well-known fact that the spatial distribution of economic activities across U.S. regions underwent significant changes in the last century. The industrialization of the U.S. economy in the second half of the nineteenth century brought about a divergence in regional specialization. In manufacturing, regions became highly specialized and by the turn of the twentieth century, most of manufacturing employment was concentrated in the regions of New England, Middle Atlantic and East North Central, later labelled the 'Manufacturing Belt' (Fritz 1943, Perloff et al. 1960, Meyer 1983, 1989, Kim and Margo 2004, Holmes and Stevens 2004, Klein and Crafts 2012). This pattern was sustained until the 1940s, after which the degree of regional specialization declined (Kim 1995). Indeed, while in 1947, a little more than seventy per cent of manufacturing employment was concentrated in the Manufacturing Belt, it was only forty per cent in 1999 (Holmes and Stevens 2004). This dramatic decline in the importance of the Manufacturing Belt went hand-in-hand with a rise in the importance of the southern states such as Tennessee, Arkansas, Mississippi, and Texas, and the emergence of the Sun Belt (Glaeser and Tobio 2008, Glaeser et al. 2011). Overall, we can say that the spatial distribution of economic activities evolved from one of concentration in the north-east at the turn of the twentieth century to one of dispersion toward the south by the end of the twentieth century although this pattern was of course not uniform across all industries (Kim 1995).

This paper examines the implications of changes in the geographical distribution of manufacturing activities in the second half of the twentieth century for the U.S. domestic trade of manufactures. It shows that home bias in 1949 was considerably smaller than in 2007 (and for many commodities even negative) and finds that this can be explained by the change in the spatial distribution of industries. Specifically, the paper finds that the U.S. inter-state trade in 1949 was more prevalent than in 2007 and that this was very likely connected to the existence of the Manufacturing Belt. Once the Manufacturing Belt dissolved and industrial activities moved to the south, intra-state trade became more important, causing home bias to increase. Domestic trade-flows are analysed with 2007 Commodity Flow Survey data and a unique data source of railroad trade-flows in 1949, compiled by the Interstate Commerce Commission; the spatial distribution of industries is captured by a version of the Ellison and Glaeser (1997) index due to Maurel and Sedillot (1999).

The paper proceeds as follows. Section 2 derives a gravity regression equation. Section 3 discusses the data sources, section 4 presents the regression results, section 5 discusses them, and the last section concludes.

Section 2

This section presents a theoretical and empirical framework for estimating the home bias effect. We follow an approach that is common in the home-bias literature: a gravity regression. To derive the gravity regression equation, we use the widely adopted framework due to Anderson and Wincoop (2003).[2] Let's denote X_{ij}^{k} as the value of shipments of commodity *k* at destination prices from origin *i* to destination *j*. Let t_{ij}^{k} be the trade cost of shipment of commodity *k* from *i* to *j*, E_{j}^{k} denote expenditure on commodity *k* at destination *j*, Y_{i}^{k} the sales of commodity *k* at destination prices from *i* to all destinations. The resulting gravity equation model is the following:

[2] The exposition follows Anderson and Yotov (2010).

$$X_{ij}^k = \frac{E_j^k\, Y_i^k}{Y^k}\left(\frac{t_{ij}^k}{P_j^k\, \Pi_i^k}\right)^{1-\sigma_k} \quad (1)$$

$$\left(\Pi_i^k\right)^{1-\sigma_k} = \sum_j \left(\frac{t_{ij}^k}{P_j^k}\right)^{1-\sigma_k} \frac{E_j^k}{Y^k} \quad (2)$$

$$\left(\mathrm{P}_j^k\right)^{1-\sigma_k} = \sum_i \left(\frac{t_{ij}^k}{\Pi_i^k}\right)^{1-\sigma_k} \frac{Y_i^k}{Y^k} \quad (3)$$

The term Π_i^k is called outward multilateral resistance, P_j^k inward multilateral resistance, and σ_k is the elasticity of substitution parameter for *k*. If we have the data in physical quantities (for example metric tons), we need to adjust the equation (1) as follows:

$$X_{ij}^k = p_i^k t_{ij}^k Z_{ij}^k \quad with \quad (4)$$

$$Z_{ij}^k = \frac{E_j^k\, Y_i^k}{Y^k p_i^k}\left(\frac{1}{P_j^k\, \Pi_i^k}\right)^{1-\sigma_k} t_{ij}^{k\ -\sigma_k} \quad (5)$$

where Z_{ij}^k is the volume of export in physical quantities, p_i^k is the f.o.b. price of commodity *k* at the origin, and t_{ij}^k is again the trade cost of shipment of commodity *k*.[3] Expressing Z_{ij}^k from equation (4) and adding a multiplicative error term ε_{ij}^k yields

$$Z_{ij}^k = \frac{E_j^k\, Y_i^k}{Y^k p_i^k}\left(\frac{1}{P_j^k\, \Pi_i^k}\right)^{1-\sigma_k} t_{ij}^{k\ -\sigma_k} \varepsilon_{ij}^k \quad (6).$$

To complete the derivation of the gravity regression equation, we need to specify t_{ij}^k. The standard approach in the gravity literature is to relate trade costs to a set of observables such as distance, common language, and the presence of contiguous borders.[4] Here we specify the trade costs as follows:

[3] Here we follow Wolf (2009).

[4] For a discussion, see Anderson and Wincoop (2004).

$$t_{ij}^{k\ -\sigma_k} = e^{\left(\ln\,(distance)^{\beta_1^k}\ ownstate^{\beta_2^k} adjacent^{\beta_3^k}\right)} \tag{7}$$

where *distance* is the bilateral distance between trading partners, *ownstate*, capturing intra-state trade, is a dummy variable equal to one when *i*=*j*, and *adjacent* is a dummy variable equal to one if *i* and *j* have a common border. Then, substituting (7) into (6) we get

$$Z_{ij}^k = \frac{E_j^k\, Y_i^k}{Y^k p_i^k} \left(\frac{1}{P_j^k\, \Pi_i^k}\right)^{1-\sigma_k} e^{\left(\ln\,(distance)^{\beta_1^k}\ ownstate^{\beta_2^k} adjacent^{\beta_3^k}\right)}\ \varepsilon_{ij}^k \qquad (8).$$

The estimation of equation (11) presents several challenges. First, we need to take into account unobserved multilateral resistance terms. We use the exporter/importer fixed-effects approach, as applied by a number of authors, e.g. Hummels (1999), Hillberry and Hummels (2003), Coughlin and Novy (2013). Second, we need to deal with the high number of zero bilateral trade flows and heteroskedasticity. As was noted by Santos Silva and Tenreyro (2006), the standard log-linearized gravity equation is incompatible with zero trade flow data and failing to account for heteroskedasticity leads to inconsistent estimates. To address those issues, they proposed the Poisson pseudo-maximum likelihood (henceforth PPML) estimation technique to estimate the gravity regression with the dependent variable in levels rather than logs.

A few papers investigating intra-state home bias also control for the location of U.S. states (e.g. Wolf 2000, Anderson et al. 2003, Miliment and Osang 2007). We do this as well and following Wolf (2000), we use a remoteness measure to control for the location of states *i* and *j* relative to all other states. Specifically, remoteness for exports from state *i* to state *j* is defined as the GDP weighted average distance between state *i* and all other states but *j*:

$$Remote_{i,j} = \sum_{k=1,k<>j}^{48} \frac{D_{ik}}{GDP_k} \qquad (9).$$

Equation (8) then becomes

$$Z_{ij}^{k} = \frac{E_j^k \, Y_i^k}{Y^k p_i^k} \left(\frac{1}{P_j^k \, \Pi_i^k}\right)^{1-\sigma_k} e^{\left(\ln{(distance)}^{\beta_1^k} \, ownstate^{\beta_2^k} adjacent^{\beta_3^k} remote^{\beta_4^k}\right)} \, \varepsilon_{ij}^{k} \qquad (10).$$

We estimate equation (10) with PPML for 1949 and 2007 where Z_{ij}^{k} are physical quantities shipped within and between the U.S. states. Robust standard errors are clustered around state pair *ij*, following Coughlin and Novy (2013).

Section 3

This paper uses data from the 1949 U.S. Interstate Commerce Commission carload waybill statistics and the 2007 U.S. Commodity Flow Survey (CFS). The carload-waybill data comprise a random sample of all shipments on railroads between the origin and the destination state. The ICC collected data on the quantities shipped as well as the number of shipments for five commodity groups: products of agriculture, products of forest, animals, products of mines, and manufactures and miscellaneous products. We have used the commodity level data for the last category which reports 134 products including some from every SIC 2 category.[5] The CFS is collected by the Census Bureau on behalf of the U.S. Department of Transportation and is a survey of shipments from origin to destination of manufacturing, mining, wholesale trade and selected retail establishments. The shipments were collected for eight single-modes and five multiple-modes of transportation.[6] The survey excludes shipments in services, crude petroleum and natural gas extraction, farm, forestry, fishery, construction, government, and most of the retail sector. We have used the data for 41 commodity classes, but we have excluded agricultural products and animals to be comparable

[5] The list of commodities is in the Appendix.

[6] Single modes include for-hire truck, private truck, rail, shallow draft, the Great Lakes, deep draft, air (includes air and truck), and pipelines; multiple-modes include parcel, truck and rail, truck and water, rail and water, and other.

with 1949 carload waybill data.[7] The CFS records the value of shipment as well as its weight in tons.

We also use data on GDP and total personal incomes at the state level, intra- and inter-state distances and geographical concentration indices. The GDP in 2007 and total personal income in 1949 for U. S. states are from the Bureau of Economic Analysis (BEA). The distance between the U.S. states is calculated using the standard great-circle distance formula. As for intra-state distance, we use several measures: distance between the two largest cities in a state, distance between the two largest cities in a state weighted by their population, as suggested by Wolf (2000), a measure suggested by Nitsch (2000) which uses land area and, for 2007 only, a measure suggested by Hillberry and Hummels (2003) which is based on the actual shipping distances calculated from the data on individual establishments. We do so because previous research has shown that the magnitude of the home-bias estimates can be influenced by the way the intra-state distance is measured (Hillberry and Hummels 2003). To account for the geographical distribution of manufacturing activities, we calculate indices of geographical concentration in 1947 from the 1947 U.S. Census of Manufactures.

Before we proceed with the regression analysis, it is useful to present some descriptive statistics for U.S. domestic trade. Table 1 shows domestic trade by transportation mode in 1948 and 2007, respectively. As we see in Panel A, the most prevalent transportation mode in 2007 was trucking which accounted for more than 70 percent of the value and the weight of shipments respectively and for more than 40 percent of ton-miles. Railroad transport is a

[7] The commodity classes include: live animals and live fish, cereal grains, other agricultural products, animal feed and products, meat and fish, grains and alcohol and tobacco products, other foodstuff, alcoholic beverages, tobacco products, calcareous monumental or building stone, natural sands, gravel and crushed stones, non-metallic minerals, metallic ores and concentrates, non-agglomerated bituminous coal, gasoline and aviation fuel, fuel oils, coal and petroleum products, basic chemicals, pharmaceutical products, fertilizers, chemical products and preparations, plastic and rubber, logs and other wood in the rough, wood products, pulp and newsprint paper, paper and paperboard articles, printed products, textiles and leather, non-metallic mineral products, base meals, articles of base metal, machinery, electronic and electrical equipment, motorized and other vehicles, transportation equipment, precision instruments and apparatus, furniture, miscellaneous manufactured products, waste and scrap, mixed freight.

distant second most important mode based on the weight of shipment, a close second based on ton-miles, and third based on the value of shipment. The reason that railroads seem to be almost as important as trucking in ton-miles but not in the value or weight of shipment is that railroads transported heavy goods over long distances. The distribution of domestic trade by transportation mode in 1948 is presented in Panel B. Since there are no data on the value and weight of shipments, Panel B contains information on ton-miles only. Nevertheless, a comparison of ton-miles is still revealing and the picture that emerges is quite clear: railroads were by far the most important mode of transportation in 1948, accounting for more than 60 percent of all ton-miles while trucking was at a distant fourth place with less than nine percent. Inland waterways and transportation on the Great Lakes was the second most important mode.

Maps 1 and 2 show inter-state U.S trade by the place of origin in 1949 and 2007 respectively expressed as a percentage of total U.S. inter-state trade. We see that there are notable differences: in 1949, most inter-state trade originated in the north-east while by 2007 the origins spread toward the south-east and south-west. Indeed, in 1949, more than 52% of the interstate trade originated in the Manufacturing-Belt states while that share dropped to about 35% by 2007.[8] On the other hand, the south-east and south-west became more important: while in 1949 only about 27% of inter-state trade originated in these regions, by 2007 that share raised to almost 50%.[9] Tables 2 and 3 present two specific examples which illustrate that shift. Table 2 shows the main U.S. states exporting motorized vehicles to other U.S. states in 1949 and 2007, respectively. We see that in 1949, the main exporting states were almost exclusively in the Manufacturing Belt, with the exception of California. That picture

[8] The Manufacturing Belt states include Illinois, Indiana, Massachusetts, Michigan, Minnesota, New York, New Jersey, Ohio, Pennsylvania, and Wisconsin.

[9] South-east and south-west regions include the following states: Alabama, Arkansas, California, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas, Virginia, West Virginia.

had changed by 2007: although the now 'Rust-Belt' states were still among the main exporters of vehicles to other U.S. states, south-east states accounted for more than 20% of interstate vehicle trade. A similar picture is seen in Table 3 which shows the U.S. states exporting machinery. Even though in 1949 the origin of machinery exports was more geographically spread than that of vehicles, most of the inter-state trade still originated in the Manufacturing Belt. However, a significant shift toward the south is once again seen in 2007.

Intra-state U.S. trade also experienced interesting changes over time. This is visible in Table 4 which shows summary statistics of the shares of intra- and inter-state trade in a state's total domestic trade. We see that, on average, the intra-state trade was more prevalent in 2007 than in 1949. A similar picture emerges from Figures 1 and 2 which present kernel distributions of the ratio of state's intra-state trade to its total domestic trade in 1949 and 2007, respectively. We see that while the upper tails of the distributions look similar, the lower tails differ; there were more states with low shares of intra-state trade in their total domestic trade in 1949 than in 2007. This, again, indicates that by 2007 intra-state trade was more prevalent than in 1949.

Before we proceed further, one limitation of the 1949 data must be highlighted. As was mentioned at the beginning of this section, the 1949 trade data are based on the railroad trade only. Even though Table 1 showed that railroads were the dominant mode of freight transport at that time and the interstate highway system had not yet been built, trucking was a growing industry (Barger 1951, Meyer et al. 1960). It served mostly local markets and was delivering predominantly highly perishable goods such as livestock, poultry and dairy products. Even though our data contain only shipments of manufacturing and miscellaneous goods, our estimates of home bias are potentially vulnerable to omission of local shipments made by truck. We deal with this issue in the next section.

Section 4

The gravity regression equation (10) is estimated at the aggregate as well as commodity level for 1949 and 2007 respectively. To make the results comparable, the dependant variable is the weight of shipments. We first present the results of the estimation at the aggregate level and then at commodity level.

Empirical Results: Aggregate Level

Tables 5 and 6 report the PPML results for 1949 and 2007, respectively. Since several studies indicated that estimates of home-bias coefficients are influenced by the choice of the intra-state distance measure (Hillberry and Hummels 2003, Chen 2004, Coughlin and Novy 2013) we estimated equation (10) with four internal distance measures in 2007 and three in 1949.[10] Furthermore, Table 6 shows the estimation results for 2007 in two parts. The first part, presented in Panel A, provides the estimation results for all sectors for which the CFS collected the shipment data; the second part, presented in Panel B, provides the estimates for the manufacturing sector only. We do so to make the results comparable with those for 1949 which could be obtained for the manufacturing sector only.

Table 5 shows that the estimates of the distance variables are always negative and statistically significant while the home bias and adjacent variables are positive and significant across all specifications.[11] The results in Table 6 show that, overall, the signs and the statistical significance of the estimated coefficients are similar to Table 5 with the distance variable being negative and mostly significant, and the home-bias and adjacent variables positive and always significant.

[10] We do not use a distance measure suggested by Hillberry and Hummels (2003) for the 1949 regressions because that measure is calculated using Commodity Flow Survey data making it feasible only for regressions using 2007 Commodity Flow Survey data.

[11] The estimates of the distance variable are, larger than -1 which suggests a smaller role of transport costs in explaining trade patterns. This result is similar to the findings of Silva and Tenreyo (2006).

The magnitude of the home-bias coefficients deserves closer attention. Table 6 shows that the estimated coefficients are, in general, higher in Panel A than Panel B, although the magnitudes differ across specifications (the estimates of the home-bias coefficients range between 2.01 and 2.51 in Panel A and between 1.67 and 2.28 in Panel B). The reason for that is very likely the commodity composition: Panel A provides the estimates for all commodities reported in the CFS which include high transport-cost commodities such as gravel and crushed stone while Panel B's estimates are for the manufacturing sector only. Another notable difference is between the magnitude of the home-bias estimates in 1949 and 2007 (here we compare Table 5 with Panel B in Table 6). Indeed, the size of the home-bias coefficient in 1949 ranges from 0.46 to 1.08 while it is between 1.67 and 2.28 in 2007. This indicates that in 2007, intra-state U.S. trade was *much more* prevalent than in 1949. These results concur with the discussion in Section 3 in which we noted an increasing tendency toward intra-state trade by 2007 (Figures 1 and 2, Table 4).

For purposes of comparison, we estimated the gravity equation (10) with the weight of shipment as the dependent variable. Our data sets, however, provide other measures of inter- and intra-state trade as well: the number of shipments in 1949 and the value of shipments in 2007. To check the robustness of the results in Tables 5 and 6, we re-estimated the gravity equation (10) with those other measures; the results are shown in Tables A2 and A3 where the magnitude of the home-bias estimates is seen to be lower than in Tables 5 and 6. In 1949, the home-bias coefficient ranges from 0.29 to 0.89 as opposed to 0.46 to 1.08, and in 2007 from 1.28 to 1.78 as opposed to 2.01 to 2.51 for the whole economy and from 1.43 to 1.90 as opposed to 1.67 to 2.28 for manufacturing.

We pointed out earlier that the carload-waybill data do not include some shipments over short distances. As a consequence, our estimates of home bias might be biased downwards. Since we show that the home-bias in 1949 is smaller than in 2007, we need to establish whether this could be due to downward bias in the 1949 estimate. To do this, we take advantage of an ICC study which estimated the freight that railroads lost to other modes of freight transportation in the period 1929-38.[12] Specifically, the study calculates for all commodities an index of 'potential tons' that railways would have carried and compares it with actual tons carried by railways. That comparison yields a ratio of actual to potential tons in 1937 of 84.9 percent, which means that railways lost 15.1 percent of their freight to other means of transport. We use this information to estimate home bias in 1949 under the assumption that all of the lost freight was the freight from intra-state trade only. Specifically, we add 15.1 percent of 1949 railway freight to our carload waybill data set such that the extra 15.1 percent are traded only *within* the U.S. states and not across them, and re-estimate equation (10). The assumption that all of the lost-trade was only intra-state trade is extreme because some of the lost shipments were made across U.S. states; hence it favours intra- over inter-state trade. We do so deliberately to err on the side of home-biasness to see how much the absence of shipments by modes of transportation other than rail could affect our 1949 home-bias estimate. If the estimated home bias under this extreme assumption is still lower than in 2007, then our arguments hold. Table 7 shows three different home-bias estimates for each of the intra-state distance measures: lower bound 1949 is the estimate from Table 5, 2007 estimate is from Table 6, Panel B, and upper bound 1949 is the estimate with the extra 15.1 percent of intra-state shipments.[13] We see that even under the very extreme assumptions made above the 1949 upper bound estimates are still considerably smaller than those for 2007.

Empirical Results: Commodity Level

[12] Interstate Commerce Commission, 'Fluctuations in Railway Freight Traffic Compared with Production', Statement 3951, November 1939.

[13] These regressions are reported in Table A4.

Tables 8a-8c and 9 present the results of estimating equation (10) at the commodity level for 1949 and 2007, respectively. For brevity, only the estimates of the home-bias coefficients are reported and, for 1949, the estimates are grouped according to their sign and statistical significance.[14] We start by discussing the results for 2007 before turning to those of 1949. Table 9 shows that all the estimates of the home-bias variable in 2007 are positive and they are statistically significant in all but three cases. The magnitude of the estimates varies across different intra-state distance measures but the statistical significance is mostly unchanged.[15] Table A1 ranks the magnitude of the estimated coefficients from the smallest to the largest. Overall, the ranking is relatively stable across intra-state distance measures, although there are some exceptions. Specifically, 'Metallic ores and concentrates', 'Logs and other wood in the rough', and 'Calcareous monumental or building stone' industries show rather large changes of the magnitude of the home-bias estimates across different intra-state distance measures.

Tables 8a-8c show a very different picture. Unlike the estimates for 2007, the home bias estimates for 1949 show considerable variations in magnitude, statistical significance, and sign. The sign of the estimated coefficients is the most distinctive difference between the 1949 and 2007 estimates: there are many products with a negative and statistically significant home-bias effect. Commodities with statistically significant and negative home-bias estimates for all three measures of the intra-state distance include, for example, 'Copper Ingot', 'Copper, Brass, Bronze', 'Automobiles', 'Vehicle Parts', 'Hardware', and 'Airplanes'. Other commodities for which home bias is negative for at least one of the intra-state distance measures are, for example, 'Paper Articles', 'Cigarettes', 'Agricultural Implements', and

[14] The full set of results is available from the authors upon request.

[15] An exception is 'Calcareous monumental or building stone' industry when the estimate is significant only in one out of four cases.

‘Agricultural Implements Parts’. On the other hand, commodities with statistically significant but positive home-bias estimates for all three intra-state distance measures include ‘Fertilizers’, ‘Gasoline’, ‘Boots and Shoes’, ‘Bricks’, and ‘Refrigerators’. Other commodities where home-bias is positive for at least one of the intra-state distance measures include ‘Cloth’, ‘Newsprint Papers’, ‘Acids’, ‘Rubber’, ‘Cement’, ‘Wood Pulp’, ‘Wooden Containers’. We also see that there is quite a bit of variation across different intra-state distance measures, though we can identify commodity groups for which estimates do not change their statistical significance and sign. Those are highlighted as bold.

The home-bias estimates at the commodity level can help us to understand why the magnitudes of the home-bias estimates in 1949 and 2007 presented in Tables 5 and 6 are so different. Evidently, the low values of commodity home-bias estimates in 1949 and, especially the negative ones, pull down the overall home-bias estimates in 1949 relative to 2007. Therefore, explaining the negativity of the home-bias estimates in 1949 might shed light on the reasons why the home-bias estimates are so low in 1949 relative to 2007 and also why intra-state trade was *not* so prevalent in 1949 as in 2007. The following section addresses this issue.

Section 5

As we noted earlier, a number of authors have suggested that the spatial concentration of industries is a key determinant of home bias. Hillberry (2000) provided a comprehensive examination of the causes of home bias at the commodity level. He investigated differences in the legal and regulatory environment, multinational activity, information flow, government purchases, past transportation networks and geographical location of industries. His results showed that only geographical location can significantly explain the variation of home-bias across commodities. Using the Ellison and Glaeser (1997) geographical concentration index (henceforth EG), he found a negative relationship between the spatial concentration of industries and home-bias estimates. Specifically, the estimates of home bias are low for spatially-concentrated but high for spatially-dispersed industries.

Hillberry and Hummels (2003) also alluded to the role of geography in explaining home-bias of intra-national trade. Using commodity-flow survey data they showed that the home-bias estimate drops after excluding wholesale shipments which tend to be more localized.[16] In another study using commodity-flow survey data (Hillberry and Hummels 2008), it was found that the location of intermediate demand explains the geographical pattern of U.S. trade. Chen (2004), using commodity trade flow data for EU countries, estimated a gravity regression with an interaction term between the home-bias dummy and the EG index.[17] She found a negative relationship between geographical concentration and the magnitude of home bias.

The phenomenon of the Manufacturing Belt suggests a variant of these arguments that builds on an insight in Wolf (1997) and might account for negative home bias. He put forward the hypothesis that 'spatial comparative advantage' is a possible explanation for domestic home-bias. He suggested that if spatial clusters occur within sectors, home bias might be observed because intra-sector trade of intermediate products might take place in these clusters within states even though the distribution of final good consumption was fairly even and not subject to 'excessive' local trade. Klein and Crafts (2012) showed that linkage effects and scale effects were major reasons for the existence of the Manufacturing Belt which led to the spatial clustering of production of final goods which were purchased nationwide. In this case, we might expect that home bias would be negative, i.e., production would be more

[16] The study also controlled for multilateral resistance in the gravity regression as suggested by Anderson and van Wincoop (2003).

[17] Chen (2004) also explored the role of technical barriers to trade and product-specific information costs.

spatially concentrated than sales of the final good. This is, of course, the classic pattern that first emerged in the late 19th century and which Chandler (1977) famously characterized as 'mass production and mass distribution'.

This argument also leads to the hypothesis that intra-national home bias will be negatively related to the EG index. To test this prediction, we examine the relationship between the spatial distribution of industries and home-bias at the commodity level by using a version of EG index developed by Maurel and Sedillot (1999) calculated for 1947. In doing so, we try to understand not only why the 1949 home-bias estimate is considerably lower than that of 2007 and but also how this is linked to the spatial concentration of industries and the structure of production in 1949.

Intra-national home bias and geography

Let us first look at the commodity-level home bias estimates more closely. Tables 8a-8c and Table 9 clearly show that the estimates for 2007 are on average higher than those for 1949. In addition, there are many commodities with negative home-bias estimates in 1949 unlike in 2007 when the estimates for all commodities are positive. A negative value of the home-bias estimate implies a strong preference of a U.S. state for trading with other U.S. states rather than with itself which suggests that the production of those commodities is likely to be spatially concentrated in a few U.S. states which then export them to the rest of the U.S.[18] So, is there any link between the value of the home-bias estimates and spatial concentration of industries in 1949? To answer this question we proceed in two stages. First, we calculate the EG index for commodities in the 1949 carload-waybill statistics; then we examine the relationship between the magnitude of the home-bias estimates and the value of this EG index.

[18] Chen (2004) also found that some commodities in EU trade exhibit negative home-bias.

We use the amended version of the EG index suggested by Maurel and Sedillot (1999) since it does not require plant-level employment data which are not available in the 1947 U.S. Census of Manufactures but only the number of plants in each industry which are reported. A challenge in using the 1947 Census of Manufactures to calculate Maurel and Sedillot's EG index for commodities in the 1949 carload waybill statistics is matching 1947 industries with 1949 commodities. Fortunately, that 1947 census contains up-to-4-digit SIC industries which correspond quite precisely with the commodities included in the 1949 carload-waybill statistics. Indeed, we can match 106 out of 134 commodities, as reported in Table 10.[19]

Tables 11a-11c present the index of geographical concentration for commodities with statistically significant home-bias estimates and distinguish between positive and negative values. The picture emerging from those tables is clear: industries with negative and significant home-bias estimates are, on average, more geographically concentrated than those with significant but positive home-bias estimates. This is confirmed by one-tail t-tests, which are included in the tables. This suggests that commodities with a higher propensity for inter- than intra-U.S. trade are produced by industries which are geographically *more* concentrated than industries which produce commodities with a higher propensity of intra- than inter-U.S. trade.

A more extensive investigation of the relationship between geography and the magnitude of home-bias estimates can be conducted by expanding the regression equation (10) with an interaction term between home-bias and index of geographical concentration, similarly to Chen (2004). The sign and significance of the interaction term indicates whether geographically-concentrated industries exhibit smaller or larger home-bias. The results, presented in Table 12, show that the estimated coefficients of the interaction between home

[19] The full list of 134 commodities is reported in Table A5.

bias and geographical concentration are negative, which means that industries with small values of the home-bias coefficient have high geographical concentration and vice versa. This confirms the findings in Tables 11a-11c and the conjecture about the role of spatial distribution of industries mentioned earlier: small home-bias in 1949 might be caused by highly spatially concentrated industries which produce commodities for the rest of the U.S., hence inter-state trade is more prevalent than intra-state trade.

Intra-national home-bias and the Manufacturing Belt

So far we have established that low values of the home-bias coefficient are caused by highly spatially-concentrated industries which supply their products to the entire United States. Our earlier discussion and Map 1 have already indicated that the main origin of U.S. inter-state trade in 1949 was in the north-east and mid-west regions, also known as the Manufacturing Belt which contained industries producing commodities for the entire United States.

To test the hypothesis that the existence of the Manufacturing Belt impacts the 1949 home-bias results, we expanded the regression equation (10) by including (i) an interaction between home bias and a dummy variable for a manufacturing belt state, and (ii) an interaction term between home bias and a dummy variable for a state outside the Manufacturing Belt. The results are presented in Tables 13a and 13b, respectively. Table 13a shows that the estimated coefficients between home bias and a manufacturing belt dummy are negative and statistically significant which implies that home bias is smaller for trade originating in the Manufacturing Belt. As a sensitivity check, we have also interacted home bias and the geographical-concentration index with the manufacturing belt dummy and the results are qualitatively the same. Table 13b, on the other hand, shows that the home bias is larger for states outside the Manufacturing Belt. Overall, the regression results imply that the magnitude of home bias in 1949 decreases when the trade originates in the Manufacturing-Belt states and increases when the trade originates outside the Manufacturing Belt.

How does the situation in 1949 compares with that of 2007? The Manufacturing Belt had dissolved by 2007 and the production of manufactures had moved towards the south so that the Manufacturing-Belt states were no longer the dominant suppliers of goods such as passenger cars or manufactured iron and steel; southern states were increasingly the producers of what had been typical manufacturing-belt products. Indeed, while exports from Manufacturing-Belt states were about 52% of all U.S. inter-state trade in 1949, they were only about 35% in 2007. This implies that, for example, Michigan supplied the largest number of cars to the rest of the United States; states such as Kentucky or Georgia produced them as well. The spread of manufacturing production implied an increase in intra-state relative to inter-state trade between 1949 and 2007. This is reflected in the sign and magnitude of the estimated home-bias coefficients at the commodity level in 2007. Unlike in 1949, none of them is negative or less than one; hence the magnitude of home-bias is smaller in 1949 than in 2007.

Conclusions

We have shown that home bias in domestic trade in the United States was considerably greater in 2007 than in1949. Moreover, for a number of commodities in 1949 there was a negative home bias with production much more spatially concentrated than consumption. This was associated with the high share of production in the Manufacturing Belt in 1949 compared with a more even distribution in 2007.

Our results clearly indicate that the structure of production and its reflection in the spatial distribution of industrial plants underlies the pattern of home bias. Two important points follow from this. First, as earlier authors have noted, this makes it unlikely that home bias entails substantial welfare losses from barriers to trade. Second, as has not been recognized before, the pattern of home bias in the mid-20th century was quite unlike that observed in recent times and reflected the very different location patterns deriving from the plant sizes, transport costs, and input-output relations of an earlier technological era.

References

Anderson, J. E. and E. van Wincoop (2003). "Gravity with Gravitas: A Solution to the Border Puzzle." *American Economic Review* **93**: 170-192.

Anderson, J. E. and E. van Wincoop (2004). "Trade Costs." *Journal of Economic Literature* **42**: 691-751.

Anderson, J. E. and Y. V. Yotov (2010). "Specialization: Pro- and Anti-Globalizing, 1990-2002." NBER Working Paper No. 16301.

Barger, H. (1951). *The Transportation Industries 1889-1946. A Study of Output, Employment, and Productivity*. New York, National Bureau of Economic Research, Inc.

Chandler, A. D. (1977). *The Visible Hand*. Cambridge, Mass., Harvard University Press.

Chen, N. (2004). "Intra-National versus International Trade in the European Union: Why Do National Borders Matter? ." *Journal of International Economics* **63**: 93-118.

Coughlin, C. and D. Novy (2013). "Is the International Border Effect Larger than the Domestic Border Effect? Evidence from U.S. Trade" *CESifo Economic Studies*, forthcoming.

Ellison, G. and E. L. Glaeser (1997). "Geographic Concentration in U.S. Manufacturing Industries: a Dartboard Approach." *Journal of Political Economy* **105:** 889-927.

Fritz, W. G. (1943). “Natural Resources – Minerals”. *Industrial Location and National Resources*. Washington D.C., United States Government Printing Office.

Glaeser, E. L., G. A. M. Ponzetto and K. Tobio (2011). "Cities, Skills, and Regional Change." Mimeo, Harvard University.

Glaeser, E. L. and K. Tobio (2008). "The Rise of the Sunbelt." *Southern Economic Journal* **74**: 610-643.

Hillberry, R. (2000). "Explaining the "Border Effect": What Can We Learn from Disaggregated Commodity Flow Data?" Mimeo.

Hillberry, R. and D. Hummels (2003). "Intra-national Home Bias: Some Explanations." *Review of Economics and Statistics* **85**: 1089-1092.

Hillberry, R. and D. Hummels (2008). "Trade Responses to Geographic Frictions: A Decomposition Using Micro-Data." *European Economic Review* **52**: 527-550.

Hillberry, R. H. (2002). "Aggregation Bias, Composition Change, and the Border Effect." *Canadian Journal of Economics* **35**: 517-530.

Holmes, T. J. and J. J. Stevens (2004). "Spatial Distribution of Economic Activities in North America." *Handbook of Regional and Urban Economics*: *Cities and Geography*. J. V. Henderson and J-F. Thisse (eds.). Amsterdam, Elsevier North-Holland: 2798-2843.

Kim, S. (1995). "Expansion of Markets and the Geographic Distribution of Economic Activities: Trends in U. S. Regional Manufacturing Structure, 1860-1987." *Quarterly Journal of Economics* 110: 881-908.

Kim, S. and R. A. Margo (2004). "Historical Perspectives on U.S. Economic Geography." *Handbook of Regional and Urban Economics: Cities and Geography*. J. V. Henderson and J.-F. Thisee (eds.). Amsterdam, Elsevier North-Holland**:** 2981–3019.

Klein, A. and N. Crafts (2012). "Making Sense of Manufacturing Belt: Determinants of U.S. Industrial Location, 1880-1920." *Journal of Economic Geography* 12 (2012), pp. 775-809.

Maurel, F. and B. Sédillot (1999). "A Measure of the Geographic Concentration in French Manufacturing Industries." *Regional Science and Urban Economics* **29:** 575–604.

McCallum, J. T. (1995). "National Borders Matter: Canada-U.S. Regional Trade Patterns." *American Economic Review* **85**: 615-623.

Meyer, D. R. (1983). "Emergence of the American Manufacturing Belt: An Interpretation." *Journal of Historical Geography* **9**: 145-174.

Meyer, D. R. (1989). "Midwestern Industrialization and the American Manufacturing Belt in the Nineteenth Century." *Journal of Economic History* 49: 921-937.

Meyer, J. R., M. J. Peck, J. Stenason and C. Zwick (1960). *The Economics of Competition in the Transportation Industries*. Cambridge, Massachusetts, Harvard University Press.

Millimet, D. L. and T. Osang (2007). "Do State Borders Matter for U.S. Intra-national Trade? The Role of History and Internal Migration." *Canadian Journal of Economics* 40: 93-126.

Nitsch, V. (2000). "National Borders and International Trade: Evidence from the European Union." *Canadian Journal of Economics* 33: 1091-1105.

Perloff, H. S., E. S. Dunn, E.E.Lampard and R. F. Muth (1960). *Regions, Resources, and Economic Growth*. Lincoln, University of Nebraska Press.

Santos Silva, J. M. C. and S. Tenreyro (2006). "The Log of Gravity." *Review of Economics and Statistics* **88**: 641-658.

Wolf, H. C. (1997). "Patterns of Intra- and Inter-State Trade." NBER Working Paper **5939**.

Wolf, H. C. (2000). "Intra-national Home Bias in Trade." *Review of Economics and Statistics* **82**: 555-563.

Wolf, N. (2009). "Was Germany Ever United? Evidence from Intra- and International Trade, 1885-1933." *Journal of Economic History* **69**: 846-881.

Table 1: Distribution of Shipments by Transportation Modes in the United States: 1948, 2007.

Transportation Mode	Values			% from total		
	Value of shipment ($mil)	Weight of shipment (000 tons)	Ton miles	Value of shipment	Weight of shipment	Ton miles
			Panel A: 2007			
Air (incl truck and air)	124,159	1,120	1,370	1.14	0.01	0.05
For-hire truck	4,891,695	3,994,568	993,599	44.88	34.89	36.77
Private truck	3,370,550	4,610,793	265,909	30.93	40.27	9.84
Truck and rail	124,282	120,296	100,219	1.14	1.05	3.71
Truck and water	21,500	58,146	28,195	0.20	0.51	1.04
Parcel, U.S.P.S., courier	1,520,533	32,002	25,584	13.95	0.28	0.95
Great Lakes	239	13,833	4,290	0.00	0.12	0.16
Water	88,930	305,669	108,817	0.82	2.67	4.03
Pipeline	348,073	543,169		3.19	4.74	
Deep draft	9,521	21,956	7,019	0.09	0.19	0.26
Shallow draft	76,955	265,011	96,205	0.71	2.31	3.56
Rail	315,788	1,468,575	1,066,065	2.90	12.83	39.45
Rail and water	6,627	13,261	4,808	0.06	0.12	0.18
All modes	10,898,852	11,448,399	2,702,080	100.00	100.00	100.00
			Panel B: 1948			
Railroads			647,267			64.39
Highways			87,640			8.72
Inland waterways and Great Lakes			150,530			14.97
Pipe lines			119,597			11.90
Airways			223			0.02
All modes			1,005,257			100.00

Notes: 1948 figures refer to intercity freight traffic.

Sources: Interstate Commerce Commission 1950, Commodity Flow Survey 2007.

Table 2: Origins of Inter-State U.S. Trade of Motorized Vehicles in 1949 and 2007 (% of U.S. Domestic Trade).

2007		1949					
Motorized and Other Vehicles		Vehicle, not Motor		Vehicle parts		Automobiles	
Alabama	2.42	California	5.00	Illinois	2.72	California	23.34
California	7.21	Colorado	1.67	Indiana	7.00	Illinois	2.46
Florida	1.77	Illinois	21.67	Michigan	53.74	Indiana	8.81
Georgia	3.32	Indiana	0.83	New Jersey	1.16	Michigan	61.43
Illinois	4.18	Massachusetts	4.17	New York	4.37	Ohio	3.89
Indiana	4.37	Michigan	4.17	Ohio	18.21	Pennsylvania	0.07
Kentucky	5.55	Minnesota	2.50	Pennsylvania	6.10		
Michigan	11.45	Missouri	6.67	Wisconsin	4.22		
Missouri	2.25	New York	7.50				
New Jersey	1.68	Ohio	32.50				
New York	2.02	Pennsylvania	10.00				
North Carolina	1.69	Wisconsin	3.33				
Ohio	5.79						
Pennsylvania	1.50						
South Carolina	1.46						
Tennessee	1.59						
Texas	6.30						
Wisconsin	2.01						

Note: U.S. States with the shares less than 1% are excluded.

Source: Interstate Commerce Commission 1950, Commodity Flow Survey 2007.

Table 3: Origins of Inter-State U.S. Trade of Machinery in 1949 and 2007 (% of U.S. Domestic Trade).

2007		1949	
Machinery		Machines	
Arizona	1.02	Alabama	1.15
California	5.40	California	2.22
Connecticut	1.07	Connecticut	1.60
Florida	2.07	Georgia	1.78
Georgia	2.19	Illinois	14.92
Illinois	4.80	Indiana	3.64
Indiana	2.63	Iowa	3.11
Iowa	1.86	Maine	1.60
Kentucky	1.85	Massachusetts	5.51
Massachusetts	1.05	Michigan	4.80
Michigan	4.67	Minnesota	1.24
Minnesota	1.32	New Jersey	2.58
Missouri	1.32	New York	7.90
New Jersey	1.38	Ohio	15.10
New York	2.60	Pennsylvania	9.24
North Carolina	2.18	Rhode Island	1.15
Ohio	5.77	Texas	1.07
Oklahoma	1.22	Vermont	1.51
Pennsylvania	2.58	Wisconsin	9.41
South Carolina	1.59		
Tennessee	3.09		
Texas	6.76		
Virginia	1.24		
Washington	1.21		
Wisconsin	3.41		

Note: U.S. States with the shares less than 1% are excluded.

Source: Interstate Commerce Commission 1950, Commodity Flow Survey 2007.

Table 4: U.S. Intra- and Inter-State Trade in 1949, 2007: Summary Statistics.

	N	Mean	Std. Dev	Min	Max
			1949		
intra-state (%)	48	26.5	14.9	1.63	78.7
inter-state (%)	48	73.5	14.9	21.2	98.4
			2007		
intra-state (%)	48	31.9	17.3	8.7	88.6
inter-state (%)	48	68.1	17.3	11.4	91.3

Note: intra- and inter-state trade is percentage of state's total domestic trade
Sources: Interstate Commerce Commission 1949, Commodity Flow Survey 2007.

Table 5: Gravity Equation with Intrastate Home Bias, U.S.1949.

	Panel A: Manufacturing		
	Intra-state distance measures		
	Nitsch	Wolf	Largest Cities
	(I)	(II)	(III)
ln_distance	-0.89***	-0.25***	-0.58***
	[0.06]	[0.07]	[0.06]
home_bias	0.46***	1.00***	1.08***
	[0.11]	[0.11]	[0.10]
ln_remote_ij	-1.44***	-0.67*	-1.22***
	[0.34]	[0.34]	[0.43]
ln_remote_ji	1.39**	1.70***	1.46***
	[0.64]	[0.64]	[0.67]
adjacent	0.48***	1.22***	0.80***
	[0.09]	[0.11]	[0.11]
Constant	9.19	-8.51	3.43
	[9.04]	[9.16]	[9.91]
N	289955	289955	289955
Export/Import FE	Yes	Yes	Yes

Source: 1949 Carload Waybill Data, ICC.

Notes: the dependent variable is the weight of shipment (in tons).

Table 6: Gravity Equation with Intrastate Home Bias, U.S. 2007.

	Panel A: Whole Economy			
	Intra-state distance measures			
	Nitsch	Wolf	Largest Cities	Actual Distance
	(I)	(II)	(III)	(IV)
ln_distance	-0.79***	-0.08	-0.11**	-0.1
	[0.13]	[0.06]	[0.05]	[0.07]
home_bias	2.01***	2.48***	2.51***	2.43***
	[0.12]	[0.09]	[0.06]	[0.12]
ln_remoteij2007_gsp	1.79	4.15	3.94	4.15
	[4.43]	[4.63]	[4.53]	[4.63]
ln_remoteji2007_gsp	43.62***	92.11***	88.97***	92.11***
	[10.54]	[7.09]	[7.22]	[7.09]
adjacent	0.58***	0.78***	0.79***	0.75***
	[0.08]	[0.07]	[0.07]	[0.08]
Constant	51.24***	89.25***	86.69***	89.25***
	[7.98]	[5.31]	[5.49]	[5.31]
N	2304	2304	2304	2304
Export/Import FE	Yes	Yes	Yes	Yes
	Panel B: Manufacturing Sector			
	Intra-state distance measures			
	Nitsch	Wolf	Largest Cities	Actual Distance
	(I)	(II)	(III)	(IV)
ln_distance	-0.98***	-0.09*	-0.21***	-0.16***
	[0.12]	[0.05]	[0.06]	[0.04]
home_bias	1.67***	2.28***	2.25***	1.79***
	[0.11]	[0.11]	[0.09]	[0.09]
ln_remoteij2007_gsp	24.85***	35.16***	32.49***	70.40***
	[4.91]	[5.92]	[5.71]	[5.56]
ln_remoteji2007_gsp	13.17	67.32***	59.43***	10.10***
	[8.83]	[6.89]	[6.60]	[3.86]
adjacent	0.40***	0.67***	0.66***	0.51***
	[0.10]	[0.09]	[0.10]	[0.07]
Constant	28.32***	72.12***	65.35***	31.97***
	[6.80]	[5.24]	[5.08]	[2.79]
N	49137	49137	49137	49137
Export/Import FE	Yes	Yes	Yes	Yes

Source: The Commodity Flow Survey 2007.

Notes: the dependent variable is weight of shipment in short-tons (2000 pounds).

Table 7: Estimates of Home Bias in 1949 and 2007.

	Lower Bound 1949	Upper Bound 1949	2007
	Intra-State Distance: Nitsch Formula		
home_bias	0.46***	1.22***	1.67***
	[0.11]	[0.10]	[0.11]
	Intra-State Distance: Wolf Formula		
home_bias	1.00***	1.89***	2.28***
	[0.11]	[0.10]	[0.11]
	Intra-State Distance: Largest Cities		
home_bias	1.08***	1.90***	2.25***
	[0.10]	[0.08]	[0.09]

Source:
Lower bound 1949: Table 6; 2007: Table 7, Panel B
Upper Bound 1949: Table A4 based on 1949 Carload Waybill Data, ICC; Fluctuations in Railway Traffic Compared with Production', ICC Statement 3951, 1939.

Table 8a: Home Bias Estimates by Commodities, U.S. 1949: Summary Table.

Statistically Significant				Statistically Insignificant			
Positive Effect	Estimates & Stat Signif	Negative Effect	Estimates & Stat Signif	Positive Effect	Estimates	Negative Effect	Estimates
Intra-State Distance Measured with Nitsch Distance Formula							
Fertilizers	**0.87*****	Paper articles	-0.44***	Cloth and Fabrics	1.96	Food Products	-0.12
Gasoline	**0.96*****	Chemicals	-0.50**	Woodware	0.11	Candy, Confectionary	-0.66
Boots, Shoes	**2.43****	**Copper Ingot**	**-3.44*****	Wooden containers	0.01	**Manuf Iron and Steel**	**-0.35**
Bricks Common	**1.82*****	**Copper, Brass, Bronze**	**-1.45****	Wood pulp	0.53	**Furniture**	**-0.52**
Refrigerators	**0.72****	**Automobiles**	**-4.40*****	Acids	0.18	Iron and Steel	-1.00
Oils Nos	1.72**	**Vehicle parts**	**-1.20*****	Crude rubber	0.24	Tires, Tubes, Rubber	-0.34
Cement Nos	1.42***	**Hardware**	**-3.42*****	Cement Portland	0.08	Agricul Impl.	-0.35
Glassware Nos	0.93*	**Airplanes**	**-4.66*****	Lime	0.81	**Vehicle not Motors**	**-0.68**
Laundry Equipment	1.09***	Cigarettes	-1.92*	Machines	0.09	Newsprint paper	-0.18
		Lubricating Oils	-1.13***	**Electrical Equipment**	**0.13**	Agric Impl. Parts	-0.77
		Gasfs Not Petroleum	-0.82*	**Cotton Cloth**	**0.91**	**Machinery parts**	**-0.8**
		Cottonseed Oil	-1.37**	Fuel Road Oils Nos	0.15	Refd Petrol Nos	-0.12
		Soybean Oil	-4.44***	Insecticides	0.26	Linseed Oil	-0.33
		Oil Foots Sediment	-2.80**	Tanning Material Nos	0.49	Vegetable Nut Oils	-0.31
		Sodium Products	-0.67**	Paint Putty Varnish	0.09	Sulphuric Acid	-0.84
		Tar Pitch Creosote	-0.72***	Sewer Pipe Not Metal	0.01	Alcohol Nos	-0.41
		Cast Iron Pipe Ftgs	-2.12***	Scrap Paper Rags	0.1	Blacks Nos	-1.29
		Tanks Nos	-1.37***	Chinaware Crockery	0.41	I And S Pipe Ftgs	-0.01
		R R Equip Own Whls	-1.62***	Floor Covering	0.83	R R Equipment Parts	-0.38
		RR Track Mtl I And S	-1.06***	Wine	1.23	Military Vehicles	-0.76
		Automobiles Freight	-2.13***	Syrup Molasses Refnd	0.43	Bricks Building Tile	-0.1
		Vehicles Motor Nos	-1.19***	Molasses Residual	0.1	Printing Paper Nos	-0.12
		Explosives	-2.90***	Scrap For Remeltg	0.14	Printed Matter Nos	-0.94
		Refractories	-0.55**	Waste Mtl Nos	0.71	Wallboard	-0.11
		Plaster Stucco Wall	-1.29***			Blog Woodwk Millwrk	-0.73
		Wrapping Paper	-1.12***			Building Materials	-0.26
		Paper Bags	-0.97***			Bldgs Houses Portabl	-0.51
		Paperboard Fibrebo	-0.91***			Bathroom Fixtures	-0.44
		Bldg Paper Roofing	-1.84***			Household Utensils	-1.07
		Insulating Materials	-0.81**			Bagging Burlap Etc	-0.39

Furnaces Etc	-0.93***	Liquors Alcoholic	-0.52
Glass	-3.56***	Sugar	-0.06
Glass Bottles Jars	-0.85***	Containers Nos	-0.37
Abrasives Not Crude	-3.11***	Container Retd Mty	-0.36
Liquors Malt	-0.76*	Scrap Iron	-0.32
Starch	-2.30***	Furnace Slag	-0.83
Feed A And P Nos	-0.47***	Mfrs And Misc Nos	-0.29
Soap Cleaning Compos	-0.69*		
Containers Metal	-0.61***		
Containers Fibrbo Kd	-0.85***		
I And S Borings Etc	-0.86**		

Home Bias Estimate for the Whole Economy: 0.46***

Note: Estimates are from the pseudo-Poisson ML regression with import and export dummies, adjacent dummy and remoteness controls.

Source: see text

Table 8b: Home Bias Estimates by Commodities, U.S. 1949: Summary Table.

Statistically Significant				Statistically Insignificant			
Positive Effect	Estimates & Stat Signif	Negative Effect	Estimates & Stat Signif	Positive Effect	Estimates	Negative Effect	Estimates
Intra-State Distance Measured by the Distance between the Largest Cities							
Cloth and Fabrics	2.35**	**Copper Ingot**	**-3.71*** **	Food Products	0.28	Cigarettes	-1.03
Wooden containers	0.60***	**Copper, Brass, Bronze**	**-1.12** **	Candy, Confectionary	0.01	**Furniture**	**-0.13**
Wood pulp	0.78**	**Automobiles**	**-2.47*** **	**Cotton Cloth**	**1.09**	**Manuf Iron and Steel**	**-0.31**
Newsprint paper	2.16***	**Vehicle parts**	**-0.77*** **	Woodware	0.7	Agric Impl. Parts	-0.7
Acids	0.79***	**Airplanes**	**-5.50*** **	Paper articles	0.2	Agricul Impl.	-0.24
Fertilizers	**1.74*** **	**Hardware**	**-2.95*** **	Chemicals	0.1	**Machinery parts**	**-0.85**
Gasoline	**2.26*** **	Soybean Oil	-3.57*	Tires, Tubes, Rubber	0.22	**Vehicle not Motors**	**-0.03**
Crude rubber	0.81***	Oil Foots Sediment	-2.54*	Lime	0.94	Lubricating Oils	-0.08
Boots, Shoes	**2.59** **	Cast Iron Pipe Ftgs	-1.03*	**Electrical Equipment**	**0.33**	Vegetable Nut Oils	-0.13
Cement Portland	1.91***	Tanks Nos	-0.60*	Gasfs Not Petroleum	0.6	Blacks Nos	-0.03
Bricks Common	**2.36*** **	Automobiles Freight	-1.10**	Cottonseed Oil	0.41	R R Equip Own Whls	-0.11
Machines	0.32*	Vehicles Motor Nos	-0.99**	Linseed Oil	0.34	Printed Matter Nos	-0.51
Iron and Steel	1.59***	Explosives	-2.84***	Alcohol Nos	0.63	Paperboard Fibrebo	-0.28
Refrigerators	**0.58** **	Wrapping Paper	-1.02***	Paint Putty Varnish	0.47	Insulating Materials	-0.37
Fuel Road Oils Nos	1.49***	Bldg Paper Roofing	-1.09**	Military Vehicles	0.02	Blog Woodwk Millwrk	-0.31
Refd Petrol Nos	1.10***	Furnaces Etc	-0.60**	Paper Bags	0.03	Building Materials	-0.29
Oils Nos	1.73***	Glass	-1.62**	Bldgs Houses Portabl	0.21	Bathroom Fixtures	-0.12
Sulphuric Acid	1.29***	Starch	-2.03***	Floor Covering	0.85	Glass Bottles Jars	-0.08
Sodium Products	0.33*			Bagging Burlap Etc	0.31	Chinaware Crockery	-0.3
Insecticides	0.75*			Synthetic Fibre	0.52	Household Utensils	-1.08
Tar Pitch Creosote	0.59**			Containers Fibrbo Kd	0.05	Abrasives Not Crude	-0.63
Tanning Material Nos	1.17**			Containers Nos	0.46	Liquors Alcoholic	-0.11
I And S Pipe Ftgs	0.58***			Container Retd Mty	0.22	Wine	-0.03
R R Equip Su On Cars	1.15**			Mfrs And Misc Nos	0.28	Liquors Malt	-0.07
R R Equipment Parts	0.60***					Soap Cleaning Compos	-0.22
RR Track Mtl I And S	0.78***						
Cement Nos	1.30***						
Bricks Building Tile	1.08***						
Refractories	0.61***						
Plaster Stucco Wall	0.70*						

Sewer Pipe Not Metal	1.55***
Scrap Paper Rags	1.34***
Printing Paper Nos	0.74*
Wallboard	0.68***
Glassware Nos	0.84**
Laundry Equipment	0.99***
Syrup Molasses Refnd	0.92***
Molasses Residual	1.77***
Sugar	1.43***
Feed A And P Nos	0.72***
Containers Metal	0.68***
Scrap Iron	1.53***
I And S Borings Etc	1.17***
Furnace Slag	2.02***
Scrap For Remeltg	0.47*
Waste Mtl Nos	2.49***

Home Bias Estimate for the Whole Economy: 1.00***

Note: Estimates are from the pseudo-Poisson ML regression with import and export dummies, adjacent dummy and remoteness controls.

Source: see text

Table 8c: Home Bias Estimates by Commodities, U.S. 1949: Summary Table.

Statistically Significant				Statistically Insignificant			
Positive Effect	Estimates	Negative Effect	Estimates	Positive Effect	Estimates	Negative Effect	Estimates
			Intra-State Distance Measured by Wolf's Formula				
Cloth and Fabrics	2.48*	Cigarettes	-2.01**	**Cotton Cloth**	**1.04**	Food Products	-0.24
Acids	0.92***	Paper articles	-0.62**	Wooden containers	0.05	Candy, Confectionary	-0.75
Fertilizers	**1.63*** **	**Copper Ingot**	**-4.42*** **	Newsprint paper	0.27	Woodware	-0.08
Gasoline	**2.05*** **	**Copper, Brass, Bronze**	**-2.03** **	Crude rubber	0.09	Wood pulp	-0.39
Boots, Shoes	**3.45*** **	Agricul Impl.	-0.63*	Lime	0.82	**Furniture**	**-0.3**
Cement Portland	1.13***	Agric Impl. Parts	-2.14*	Iron and Steel	1.04	Chemicals	-0.15
Bricks Common	**2.10*** **	**Automobiles**	**-4.09*** **	Machines	0.13	**Manuf Iron and Steel**	**-0.6**
Refrigerators	**0.50* **	**Vehicle parts**	**-1.28*** **	**Electrical Equipment**	**0.43**	**Machinery parts**	**-0.79**
Fuel Road Oils Nos	0.91***	**Airplanes**	**-4.95*** **	Linseed Oil	0.37	**Vehicle not Motors**	**-0.88**
Refd Petrol Nos	0.97***	**Hardware**	**-3.53*** **	Vegetable Nut Oils	0.24	Tires, Tubes, Rubber	-0.5
Oils Nos	1.66**	Cottonseed Oil	-0.89*	Sulphuric Acid	0.85	Lubricating Oils	-0.48
R R Equipment Parts	0.66**	Soybean Oil	-4.91*	Alcohol Nos	0.36	Gasfs Not Petroleum	-0.45
Cement Nos	1.08**	Cast Iron Pipe Ftgs	-1.83**	Insecticides	0.51	Oil Foots Sediment	-3.58
Bricks Building Tile	0.59**	RR Track Mtl I And S	-0.59*	Tar Pitch Creosote	0.42	Sodium Products	-0.07
Sewer Pipe Not Metal	1.11***	Automobiles Freight	-2.09***	Tanning Material Nos	0.83	Blacks Nos	-0.49
Scrap Paper Rags	1.04***	Vehicles Motor Nos	-1.50*	Paint Putty Varnish	0.39	Tanks Nos	-0.73
Wallboard	0.56**	Military Vehicles	-1.39**	I And S Pipe Ftgs	0.28	R R Equip Own Whls	-0.56
Laundry Equipment	1.45***	Explosives	-3.68***	Refractories	0.17	Plaster Stucco Wall	-0.63
Floor Covering	1.36**	Wrapping Paper	-2.26***	Printing Paper Nos	0.21	Printed Matter Nos	-0.48
Syrup Molasses Refnd	1.58***	Paper Bags	-0.89**	Bldgs Houses Portabl	0.59	Blog Woodwk Millwrk	-0.47
Molasses Residual	0.89*	Paperboard Fibrebo	-1.29**	Glassware Nos	0.63	Building Materials	-0.56
Sugar	1.07***	Bldg Paper Roofing	-2.37**	Chinaware Crockery	0.71	Bathroom Fixtures	-0.19
Containers Metal	0.55**	Insulating Materials	-1.02*	Synthetic Fibre	1.24	Household Utensils	-1.29
Scrap Iron	0.85***	Furnaces Etc	-0.99**	Wine	1.51	Abrasives Not Crude	-2.14
I And S Borings Etc	1.08***	Glass	-2.64***	Feed A And P Nos	0.21	Bagging Burlap Etc	-0.38
Furnace Slag	1.53***	Glass Bottles Jars	-0.85***	Containers Nos	0.3	Liquors Alcoholic	-0.32
Waste Mtl Nos	1.89***	Liquors Malt	-1.06*	Scrap For Remeltg	0.59	Soap Cleaning Compos	-0.55
		Starch	-3.59***	Mfrs And Misc Nos	0.08	Containers Fibrbo Kd	-0.36
						Container Retd Mty	-0.35

Home Bias Estimate for the Whole Economy: 1.08***

Note: Estimates are from the pseudo-Poisson ML regression with import and export dummies, adjacent dummy and remoteness controls.
Source: see text

Table 9: Home Bias by Commodities: Estimated Coefficients and Standard Errors, US 2007.

Industry	SIC	Internal Distance Measure, without GSP			
		Largest City	Wolf	Actual	Nitsch
Grains, alcohol, and tobacco products	20	1.56***	1.62***	1.62***	0.68***
		[0.11]	[0.12]	[0.15]	[0.18]
Other prepared foodstuffs and fats and oils	20	1.92***	1.99***	1.93***	1.14***
		[0.07]	[0.09]	[0.11]	[0.16]
Alcoholic beverages	20	3.41***	3.14***	3.05***	2.78***
		[0.17]	[0.22]	[0.27]	[0.26]
Tobacco products	21	2.50***	2.34***	2.00***	3.45***
		[0.31]	[0.38]	[0.49]	[0.63]
Calcareous monumental or building stone	32	2.01***	1.04	0.38	2.01
		[0.48]	[0.64]	[0.74]	[0.00]
Natural sands	32	3.06***	2.97***	2.70***	1.96***
		[0.27]	[0.33]	[0.47]	[0.49]
Gravel and crushed stone	32	4.45***	4.47***	4.49***	3.94***
		[0.27]	[0.30]	[0.35]	[0.39]
Nonmetallic minerals nec	32	2.86***	2.45***	1.98***	2.38***
		[0.43]	[0.46]	[0.54]	[0.47]
Metallic ores and concentrates	33	3.57***	2.36***	2.02*	4.70***
		[0.54]	[0.76]	[1.03]	[1.39]
Nonagglomerated bituminous coal	12	3.26***	3.18***	3.70***	3.48***
		[0.55]	[0.55]	[0.63]	[0.66]
Gasoline and aviation turbine fuel	29	4.10***	4.49***	4.70***	3.07***
		[0.33]	[0.39]	[0.46]	[0.41]
Fuel oils	29	3.76***	4.25***	4.39***	3.57***
		[0.36]	[0.30]	[0.38]	[0.55]
Coal and petroleum products, nec	29	3.41***	3.13***	3.05***	2.38***
		[0.19]	[0.21]	[0.26]	[0.30]
Basic chemicals	28	1.65***	1.46***	1.22***	1.08***
		[0.19]	[0.18]	[0.23]	[0.24]
Pharmaceutical products	28	1.69***	1.63***	1.61***	1.75***
		[0.21]	[0.25]	[0.30]	[0.36]
Fertilizers	28	2.73***	2.66***	2.82***	2.87***
		[0.27]	[0.35]	[0.43]	[0.47]
Chemical products and preparations, nec	28	1.66***	1.62***	1.61***	1.58***
		[0.13]	[0.15]	[0.19]	[0.17]
Plastics and rubber	30	1.42***	1.30***	1.21***	1.07***
		[0.09]	[0.09]	[0.11]	[0.10]
Logs and other wood in the rough	24	2.06***	3.05***	3.07***	1.60**
		[0.51]	[0.44]	[0.64]	[0.78]
Wood products	24	1.88***	1.81***	1.71***	1.37***
		[0.09]	[0.11]	[0.14]	[0.14]
Pulp, newsprint, paper, and paperboard	26	1.15***	1.08***	1.00***	0.92***
		[0.09]	[0.09]	[0.11]	[0.13]
Paper or paperboard articles	26	1.56***	1.39***	1.23***	1.36***
		[0.09]	[0.12]	[0.14]	[0.16]
Printed products	26	1.98***	1.78***	1.69***	1.59***
		[0.11]	[0.15]	[0.19]	[0.19]

Table 9: continued.

Textiles, leather, and articles of textiles or leather	22	1.43***	1.30***	1.15***	1.26***
		[0.13]	[0.14]	[0.17]	[0.17]
Nonmetallic mineral products	32	2.87***	2.66***	2.54***	2.72***
		[0.10]	[0.12]	[0.16]	[0.12]
Base metal in prim. or semifin. forms & in finished basic shapes	33	1.05***	1.10***	1.05***	0.71***
		[0.14]	[0.15]	[0.18]	[0.19]
Articles of base metal	33	1.51***	1.38***	1.26***	1.20***
		[0.09]	[0.11]	[0.14]	[0.13]
Machinery	35	1.75***	1.78***	1.68***	1.21***
		[0.10]	[0.12]	[0.15]	[0.18]
Electronic & other electrical equip & components & office equip	36	2.15***	2.11***	2.09***	1.42***
		[0.14]	[0.16]	[0.21]	[0.20]
Motorized and other vehicles (including parts)	37	1.62***	1.75***	1.74***	1.04***
		[0.13]	[0.14]	[0.17]	[0.19]
Transportation equipment, nec	37	0.73	1.27**	1.32**	1.18*
		[0.45]	[0.55]	[0.63]	[0.66]
Precision instruments and apparatus	38	2.14***	2.01***	1.92***	1.67***
		[0.28]	[0.30]	[0.34]	[0.43]
Furniture, mattresses & mattress supports, lamps, lighting	25	1.66***	1.50***	1.32***	1.14***
		[0.11]	[0.12]	[0.14]	[0.17]
Miscellaneous manufactured products	39	1.97***	1.79***	1.70***	1.52***
		[0.11]	[0.13]	[0.15]	[0.19]
Average of commodity estimates		*2.25*	*2.17*	*2.09*	*1.94*

Note: The estimates are from the regression with import and export dummies, adjacent dummy and remoteness controls.

Source: see text

Table 10: Ellison and Glaeser Index of Geographical Concentration: Matching of 1947 Industries with 1949 Commodity Groups.

Commodity Group in ICC 1949 Trade Flow Data	Industries in 1947 Census of Manufactures			EG index
	SIC 2	SIC 3	SIC Category	
Abrasives Not Crude	32	329	Miscellaneous Nonmetallic Mineral Products	0.135
Acids	28	281	Industrial Inorganic Chemicals	0.130
Agricultural Impl.	35	352	Farm & Garden Machinery	0.076
Agricultural Impl. Parts	35	352	Farm & Garden Machinery	0.076
Airplanes	37	372	Aircraft & Parts	0.357
Alcohol Nos	20	208	Beverages	0.040
Aluminium Bar	33	335	Nonferrous Rolling & Drawing	0.133
Automobiles (Passengers)	37	371	Motor Vehicles & Equipment	0.119
Automobiles Freight	37	371	Motor Vehicles & Equipment	0.119
Bagging Burlap Etc	23	239	Miscellaneous Fabricated Textile Products	0.212
Bathroom Fixtures	34	343	Plumbing & Heating, Except Electric	0.096
Blacks Nos	28	281	Industrial Inorganic Chemicals	0.135
Bldg Paper Roofing	26	262	Paper Mills	0.138
Bldgs Houses Portabl	24	245	Wood Buildings & Mobile Homes	0.114
Blog Woodwk Millwrk	24	243	Millwork, Plywood, & Structural Members	0.096
Boots and Shoes	31	314	Footwear, Except Rubber	0.209
Bricks	32	325	Structural Clay Products	0.075
Bricks Building Tile	32	325	Structural Clay Products	0.075
Bricks Common	32	325	Structural Clay Products	0.075
Candy and confectionary	20	206	Sugar & Confectionery Products	0.133
Cast Iron Pipe Ftgs	33	332	Iron & Steel Foundries	0.081
Cellulose Articles	28	282	Plastics Materials & Synthetics	0.131
Cement	32	324	Cement,Hydraulic	0.144
Cement Nos	32	324	Cement,Hydraulic	0.144
Cement Portland	32	324	Cement,Hydraulic	0.144
Chinaware Crockery	32	326	Pottery & Related Products	0.166
Cigarettes	21	211	Cigarettes	0.337
Containers Fibrbo Kd	26	265	Paperboard Containers & Boxes	0.118
Containers Metal	34	341	Metal Cans & Shipping Containers	0.167
Copper Ingot	33	333	Primary Nonferrous Metals	0.319
Copper, Brass, Bronze	33	333	Primary Nonferrous Metals	0.319
Cotton Cloth	22	221	Broadwoven Fabric Mills, Cotton	0.119
Cottonseed Oil	20	207	Fats & Oils	0.049
Electrical Equipment	36	362	Electrical Industrial Apparatus	0.101
Explosives	28	289	Miscellaneous Chemical Products	0.087
Feed Animal Nos	20	204	Grain Mill Products	0.038
Fertilizers	28	287	Agricultural Chemicals	0.090
Fuel Road Oils Nos	29	291	PetroleumRefining	0.150
Furnace Slag	33	339	Miscellaneous Primary Metal Industries	0.137
Furnaces Etc	33	331	Blast Furnace & Basic Steel Products	0.307
Gasfs Not Petroleum	29	299	Miscellaneous Petroleum & Coal Products	0.416
Gasoline	29	291	PetroleumRefining	0.150
Glass	32	322	Glass & Glassware, Pressed or Blown	0.220
Glass Bottles Jars	32	323	GlassProducts,MadeofPurchasedGlass	0.230
Glassware Nos	32	322	Glass & Glassware, Pressed or Blown	0.220
Hardware	34	345	Screw Machine Products, Bolts, Etc.	0.134
Household Utensils	36	363	Household Appliances	
Iron & Steel Borings Etc	33	332	Fabricated Structural Metal Products	0.065
Iron & Steel Pipe Ftgs	33	331	Blast Furnace & Basic Steel Products	0.307
Insecticides	28	287	Agricultural Chemicals	0.090

Insulating Materials	29	295	Miscellaneous Nonmetallic Mineral Products	0.135
Iron and Steel	33	332	Iron & Steel Foundries	0.081
Laundry Equipment	35	358	Refrigeration & Service Industry	0.084
Lime	32	327	Concrete, Gypsum & Plaster Products	0.043
Linseed Oil	20	207	Fats & Oils	0.049
Liquors Alcoholic	20	208	Beverages	0.040
Liquors Malt	20	208	Beverages	0.040
Lubricating Oils	29	299	Miscellaneous Petroleum & Coal Products	0.416
Machinery	35	356	General Industry Machinery	0.073
Machinery Parts	35	356	General Industry Machinery	0.073
Machines	35	356	General Industry Machinery	0.073
Manuf. Iron and Steel	34	344	Fabricated Structural Metal Products	0.065
Mfrs And Misc Nos	34	349	Miscellaneous Fabricated Metal Products	0.107
Military Vehicles	37	371	Motor Vehicles & Equipment	0.119
Molasses Residual	20	206	Sugar & Confectionery Products	0.133
Newsprint papers	27	271	Newspapers:Publishing,orPublishing	0.035
Oil Foots Sediment	20	207	Fats & Oils	0.049
Oils Nos	20	207	Fats & Oils	0.049
Paint Putty Varnish	28	285	Paints & Allied Products	0.090
Paper Articles	27	275	Commercial Printing	0.070
Paper Bags	26	267	Miscellaneous Converted Paper Products	0.190
Paperboard Fibrebo	26	263	Paperboard Mills	0.082
Plaster Stucco Wall	32	327	Concrete, Gypsum & Plaster Products	0.043
Plastics	28	282	Plastics Materials & Synthetics	0.131
Printed Matter Nos	26	261	Paper Mills	0.138
Printing Paper Nos	26	261	Paper Mills	0.138
Rail Equip Own Whls	37	374	Railroad Equipment	0.292
Rail Equipment Parts	37	374	Railroad Equipment	0.292
Refd Petrol Nos	29	291	Petroleum Refining	0.150
Refractories	32	329	Miscellaneous Nonmetallic Mineral Products	0.135
Refrigerators	36	363	Household Appliances	0.098
Rail Track Mtl Iron &Steel	33	331	Blast Furnace & Basic Steel Products	0.307
Scrap For Remelting	33	332	Iron & Steel Foundries	0.081
Scrap Iron	33	332	Iron & Steel Foundries	0.081
Scrap Paper Rags	26	267	Paper Mills	0.138
Sewer Pipe Not Metal	32	325	Structural Clay Products	0.075
Soap Cleaning Compos	28	284	Soap, Cleaners & Toilet Goods	0.098
Sodium Products	28	281	Industrial Organic Chemicals	0.084
Soybean Oil	20	207	Fats & Oils	0.049
Starch	20	206	Sugar & Confectionery Products	0.133
Sugar	20	206	Sugar & Confectionery Products	0.133
Sulphuric Acid	28	281	Industrial Organic Chemicals	0.084
Syrup Molasses Refnd	20	206	Sugar & Confectionery Products	0.133
Tanks Nos	37	379	Miscellaneous Transportation Equipment	0.150
Tanning Material Nos	28	286	Industrial Organic Chemicals	0.084
Tar Pitch Creosote	28	286	Industrial Organic Chemicals	0.084
Tires, Rubber	30	301	Tires & Inner Tubes	0.525
Tires, Tubes, Rubber	30	301	Tires & Inner Tubes	0.525
Vegetable Nut Oils	20	207	Fats & Oils	0.049
Vehicle Parts	37	371	Motor Vehicles & Equipment	0.119
Vehicles Motor Nos	37	371	Motor Vehicles & Equipment	0.119
Vehicles Not Motor	37	379	Miscellaneous Transportation Equipment	0.150

Wallboard	32	327	Concrete, Gypsum & Plaster Products	0.043
Wine	20	208	Beverages	0.041
Wood Pulp	26	261	Pulp Mills	0.076
Wooden Containers	24	244	Wood Containers	0.049
Wrapping Paper	26	262	Paper Mills	0.138

Sources: 1949 Carload Waybill Data, ICC, U.S. Census of Manufactures 1947

Table 11a: Home Bias Estimates and EG Indices by Commodities , U.S. 1949.

Statistically Significant					
Positive Effect		Negative Effect			
Commodity Group	EG Index	Commodity Group	EG Index	Commodity Group	EG Index
Intra-State Distance Measured with Nitsch Distance Formula					
Fertilizers	0.090	**Automobiles**	0.119	Automobiles Freight	0.119
Gasoline	0.150	**Airplanes**	0.357	Plaster Stucco Wall	0.043
Boots, Shoes	0.209	**Copper Ingot**	0.319	Refractories	0.135
Bricks Common	0.075	**Hardware**	0.134	Paperboard Fibrebo	0.082
Refrigerators	0.098	**Copper, Brass, Bronze**	0.319	Vehicles Motor Nos	0.119
Oils Nos	0.049	**Vehicle parts**	0.119	Wrapping Paper	0.138
Cement Nos	0.144	Paper articles	0.070	Paper Bags	0.190
Glassware Nos	0.220	Cottonseed Oil	0.049	Bldg Paper Roofing	0.138
Laundry Equipment	0.084	Cigarettes	0.337	Insulating Materials	0.135
		Lubricating Oils	0.416	Furnaces Etc	0.307
		Soybean Oil	0.049	Glass	0.220
		Gasfs Not Petroleum	0.416	Glass Bottles Jars	0.230
		Tar Pitch Creosote	0.084	Abrasives Not Crude	0.135
		Oil Foots Sediment	0.049	Liquors Malt	0.040
		Cast Iron Pipe Ftgs	0.081	Starch	0.133
		Sodium Products	0.084	Feed A And P Nos	0.038
		Explosives	0.087	Soap Cleaning Compos	0.098
		Tanks Nos	0.150	Containers Metal	0.167
		R R Equip Own Whls	0.292	Containers Fibrbo Kd	0.118
		RR Track Mtl I And S	0.292	Iron & Steel Borings Etc	0.065
				Chemicals	
Average	*0.125*			*Average*	*0.162*

One-Tail Test: Positive Home Bias > Negative Home Bias: t = 1.42*

Note: *, ** denote statistical significance at 10% and 5% respectively.

Source: Tables 8a, 13

Table 11b: Home Bias Estimates and EG Indices by Commodities , U.S. 1949.

Statistically Significant					
Positive Effect				Negative Effect	
Commodity Group	EG Index	Commodity Group	EG Index	Commodity Group	EG Index
Intra-State Distance Measured Measured by the Distance between the Largest Cities					
Fertilizers	0.090	RR Track Mtl I And S	0.307	**Automobiles**	0.119
Gasoline	0.150	Tanning Material Nos	0.084	**Airplanes**	0.357
Boots, Shoes	0.209	Bricks Building Tile	0.075	**Copper Ingot**	0.319
Cement Portland	0.144	Refractories	0.135	**Hardware**	0.134
Bricks Common	0.075	Plaster Stucco Wall	0.043	**Copper, Brass, Bronze**	0.319
Refrigerators	0.098	Sewer Pipe Not Metal	0.075	**Vehicle parts**	0.119
Oils Nos	0.049	Scrap Paper Rags	0.138	Soybean Oil	0.049
Sulphuric Acid	0.084	Scrap Iron	0.081	Bldg Paper Roofing	0.138
Wooden containers	0.049	Wallboard	0.043	Cast Iron Pipe Ftgs	0.081
Machines	0.073	Glassware Nos	0.220	Tanks Nos	0.150
Iron and Steel	0.081	Laundry Equipment	0.084	Automobiles Freight	0.119
Newsprint paper	0.035	Syrup Molasses Refnd	0.133	Oil Foots Sediment	0.049
Fuel Road Oils Nos	0.150	Printing Paper Nos	0.138	Explosives	0.087
Refd Petrol Nos	0.150	Sugar	0.133	Wrapping Paper	0.138
Wood pulp	0.076	Feed A And P Nos	0.038	Vehicles Motor Nos	0.119
Acids	0.130	Containers Metal	0.167	Furnaces Etc	0.307
Sodium Products	0.084	Scrap For Remeltg	0.081	Glass	0.220
Insecticides	0.090	Iron & Steel Borings Etc	0.065	Starch	0.133
Tar Pitch Creosote	0.084	Furnace Slag	0.137		
Cement Nos	0.144	Molasses Residual	0.133		
Iron & Steel Pipe Ftgs	0.307	Waste Mtl Nos			
R R Equip Su On Cars	0.292	Cloth and Fabrics			
R R Equipment Parts	0.292	Crude rubber			
		Average	*0.122*	*Average*	*0.164*
One-Tail Test: Positive Home Bias > Negative Home Bias: t = 1.67**					

Note: *, ** denote statistical significance at 10% and 5% respectively.

Source: Tables 8b, 13

Table 11c: Home Bias Estimates and EG Indices by Commodities , U.S. 1949.

Statistically Significant			
Positive Effect	EG Index	Negative Effect	EG Index
Intra-State Distance Measured by Wolf's Formula			
Fertilizers	0.090	**Automobiles**	0.119
Gasoline	0.150	**Airplanes**	0.357
Boots, Shoes	0.209	**Copper Ingot**	0.319
Cement Portland	0.144	**Hardware**	0.134
Bricks Common	0.075	**Copper, Brass, Bronze**	0.319
Refrigerators	0.098	**Vehicle parts**	0.119
Oils Nos	0.049	Agricul Impl.	0.076
Refd Petrol Nos	0.150	Agric Impl. Parts	0.076
R R Equipment Parts	0.292	Cottonseed Oil	0.049
Acids	0.130	RR Track Mtl I And S	0.307
Fuel Road Oils Nos	0.150	Paper articles	0.070
Cement Nos	0.144	Soybean Oil	0.049
Bricks Building Tile	0.075	Cast Iron Pipe Ftgs	0.081
Sewer Pipe Not Metal	0.075	Furnaces Etc	0.307
Scrap Paper Rags	0.138	Automobiles Freight	0.119
Wallboard	0.043	Cigarettes	0.337
Laundry Equipment	0.084	Starch	0.133
Syrup Molasses Refnd	0.133	Explosives	0.087
Molasses Residual	0.133	Wrapping Paper	0.138
Sugar	0.133	Paper Bags	0.190
Containers Metal	0.167	Paperboard Fibrebo	0.082
Scrap Iron	0.081	Bldg Paper Roofing	0.138
Iron & Steel Borings Etc	0.065	Insulating Materials	0.135
Furnace Slag	0.137	Military Vehicles	0.119
Waste Mtl Nos		Glass	0.220
Floor Covering		Glass Bottles Jars	0.230
Cloth and Fabrics		Liquors Malt	0.040
		Vehicles Motor Nos	0.119
Average	*0.123*	*Average*	*0.160*
One-Tail Test: Positive Home Bias > Negative Home Bias: t = 1.61*			

Note: *, ** denote statistical significance at 10% and 5% respectively.

Source: Tables 8c, 13

Table 12: Gravity Equation with Intrastate Home Bias, U.S.1949.

	Panel A: Manufacturing		
	Intra-state distance measures		
	Nitsch	Wolf	Largest Cities
	(I)	(II)	(III)
ln_distance	-0.91***	-0.59***	-0.24***
	[0.07]	[0.06]	[0.05]
ln_remote_ij	-0.43	0.8	-0.05
	[0.50]	[0.50]	[0.56]
ln_remote_ji	1.00**	1.35***	1.09***
	[0.42]	[0.41]	[0.42]
adjacent	0.49***	1.27***	0.83***
	[0.10]	[0.09]	[0.10]
home_bias	0.90***	1.47***	1.54***
	[0.15]	[0.18]	[0.15]
home_bias x EG index	-3.15***	-3.15***	-3.15***
	[0.55]	[0.57]	[0.56]
Constant	1.77	-22.09**	-6.17
	[8.66]	[8.61]	[9.17]
N	234330	234330	234330
Export/Import FE	Yes	Yes	Yes

Sources: 1949 Carload Waybill Data, ICC, U.S. Census of Manufactures 1947
Notes: the dependent variable is the weight of shipment (in tons).

Table 13a : Gravity Equation with Intrastate Home Bias, U.S.1949.

	Panel A: Manufacturing Belt Dummy			Panel B: Manufacturing Belt and EG index		
	Intra-state distance measures			Intra-state distance measures		
	Nitsch	Largest Cities	Wolf	Nitsch	Largest Cities	Wolf
	(I)	(II)	(III)	(I)	(II)	(III)
ln_distance	-0.83***	-0.54***	-0.32***	-0.87***	-0.56***	-0.29***
	[0.06]	[0.05]	[0.06]	[0.07]	[0.06]	[0.05]
ln_remote_ij	-0.14	0.16	0.71	-0.32	0.01	0.69
	[0.50]	[0.58]	[0.56]	[0.51]	[0.59]	[0.54]
ln_remote_ji	1.22***	1.32***	1.47***	1.08***	1.18***	1.37***
	[0.39]	[0.39]	[0.39]	[0.41]	[0.41]	[0.41]
Adjacent	0.52***	0.82***	1.09***	0.52***	0.84***	1.19***
	[0.09]	[0.09]	[0.09]	[0.10]	[0.10]	[0.09]
home_bias	0.95***	1.60***	1.58***	0.83***	1.47***	1.40***
	[0.12]	[0.11]	[0.13]	[0.12]	[0.12]	[0.15]
home_bias *x* manuf. belt dummy	-0.79***	-0.90***	-1.24***			
	[0.17]	[0.18]	[0.20]			
home_bias *x* EG index *x* manuf. belt dummy				-4.52***	-4.88***	-6.10***
				[0.86]	[0.91]	[1.09]
Constant	-5.13	-11.87	-22.09**	-0.93	-8.25	-20.83**
	[8.31]	[8.99]	[8.81]	[8.61]	[9.30]	[8.87]
N	296204	296204	296204	234330	234330	234330
Export&Import&Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Sources: 1949 Carload Waybill Data, ICC, U.S. Census of Manufactures 1947

Notes: the dependent variable is the weight of shipment (in tons).

Table 13b : Gravity Equation with Intrastate Home Bias, U.S.1949

	Panel A: Outside Manuf. Belt Dummy			Panel B: Outside Manuf. Belt and EG index		
	Intra-state distance measures			Intra-state distance measures		
	Nitsch	Largest Cities	Wolf	Nitsch	Largest Cities	Wolf
	(I)	(II)	(III)	(I)	(II)	(III)
ln_distance	-0.83***	-0.54***	-0.32***	-0.91***	-0.58***	-0.26***
	[0.06]	[0.05]	[0.06]	[0.07]	[0.06]	[0.05]
ln_remote_ij	-0.14	0.16	0.71	-0.34	0.04	0.86*
	[0.50]	[0.58]	[0.56]	[0.50]	[0.56]	[0.51]
ln_remote_ji	1.22***	1.32***	1.47***	1.03**	1.12***	1.37***
	[0.39]	[0.39]	[0.39]	[0.42]	[0.41]	[0.41]
adjacent	0.52***	0.82***	1.09***	0.50***	0.83***	1.24***
	[0.09]	[0.09]	[0.09]	[0.10]	[0.10]	[0.09]
home_bias	0.16	0.71***	0.34	0.45***	1.08***	0.93***
	[0.16]	[0.17]	[0.24]	[0.14]	[0.14]	[0.18]
home_bias x outside manuf. belt dummy	0.79***	0.90***	1.24***			
	[0.17]	[0.18]	[0.20]			
home_bias x EG index x outside manuf. belt dummy				0.39	0.67	1.48***
				[0.49]	[0.49]	[0.51]
Constant	-5.13	-11.87	-22.09**	0.38	-7.65	-23.06***
	[8.31]	[8.99]	[8.81]	[8.61]	[9.13]	[8.65]
N	296204	296204	296204	234330	234330	234330
Export&Import&Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Sources: 1949 Carload Waybill Data, ICC, U.S. Census of Manufactures 1947

Notes: the dependent variable is the weight of shipment (in tons).

Figure 1: Kernel Distribution of Intra-State Trade, U.S. 1949

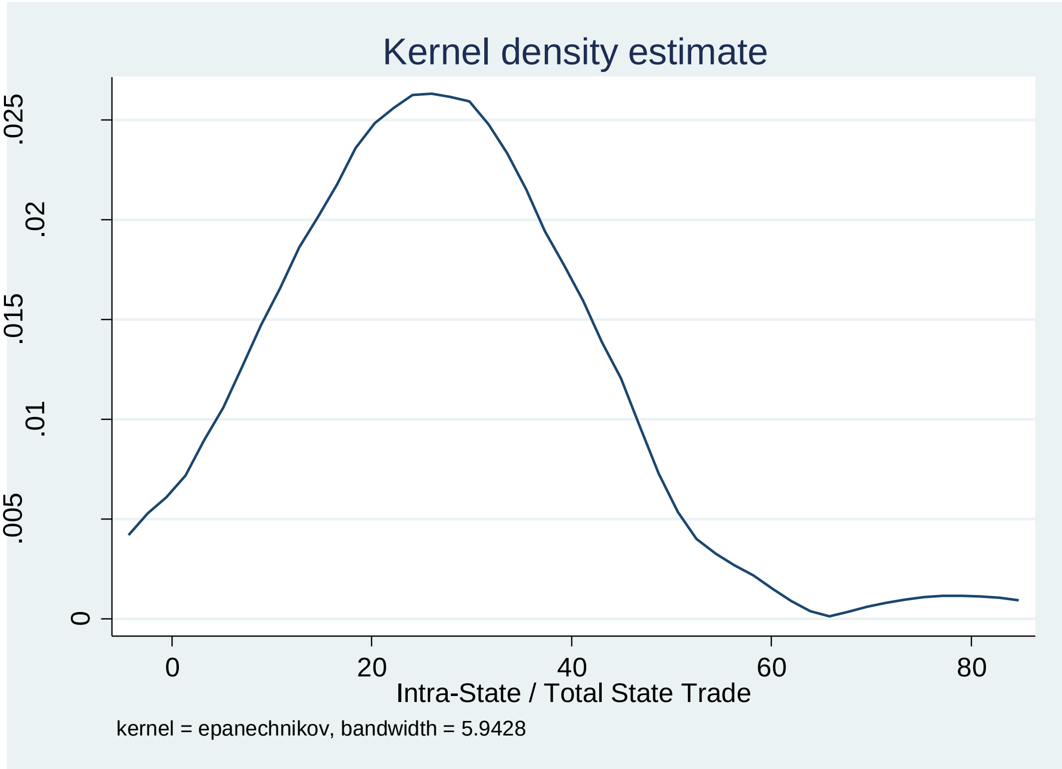
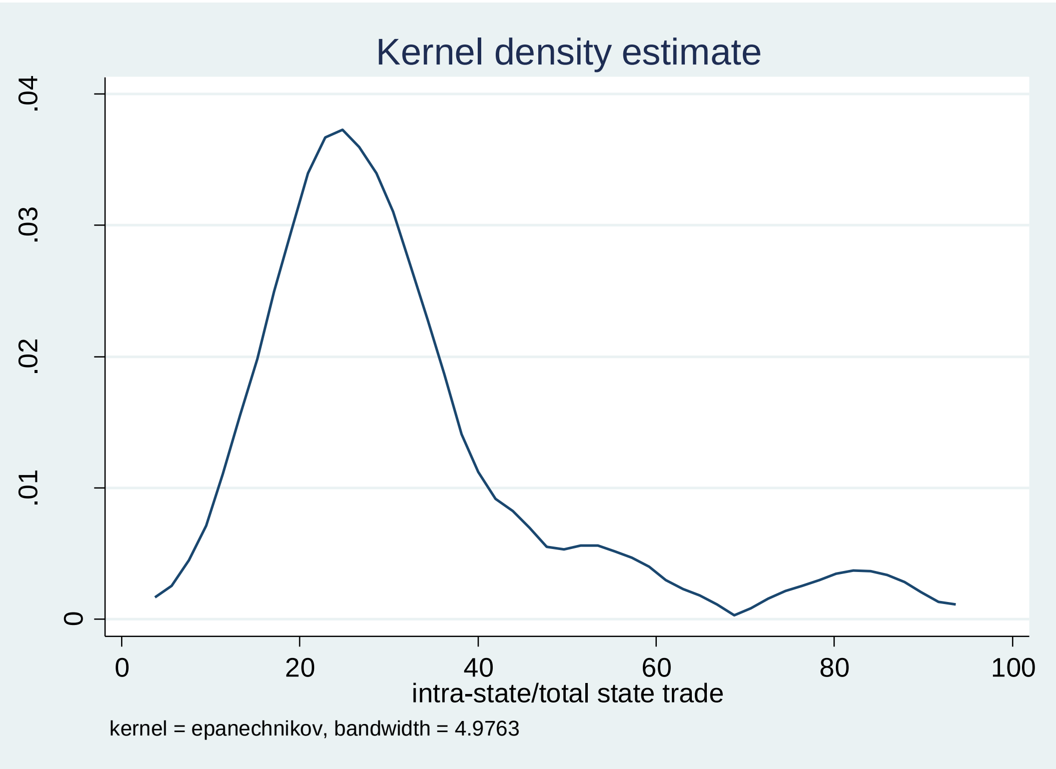


Figure 2: Kernel Distribution of Intra-State Trade, U.S. 2007



Map 1: U.S. Inter-State Trade by State of Origin, 1949

Map 2: U.S. Inter-State Trade by State of Origin, 2007

Appendix

Table A1: The Rank of Home-Bias Estimates by Commodities, 2007.

Industry	SIC	Largest City	Wolf	Actual	Nitsch
Grains, alcohol, and tobacco products	20	27	23	22	34
Other prepared foodstuffs and fats and oils	20	19	16	15	27
Alcoholic beverages	20	5	5	6	8
Tobacco products	21	12	13	13	5
Calcareous monumental or building stone	32	16	34	34	12
Natural sands	32	8	8	9	13
Gravel and crushed stone	32	1	2	2	2
Nonmetallic minerals nec	32	10	11	14	10
Metallic ores and concentrates	33	4	12	12	1
Nonagglomerated bituminous coal	12	7	4	4	4
Gasoline and aviation turbine fuel	29	2	1	1	6
Fuel oils	29	3	3	3	3
Coal and petroleum products, nec	29	5	6	6	10
Basic chemicals	28	25	26	29	29
Pharmaceutical products	28	22	22	23	14
Fertilizers	28	11	9	8	7
Chemical products and preparations, nec	28	23	23	23	18
Plastics and rubber	30	31	29	30	30
Logs and other wood in the rough	24	15	7	5	16
Wood products	24	20	17	18	21
Pulp, newsprint, paper, and paperboard	26	32	33	33	32
Paper or paperboard articles	26	27	27	28	22
Printed products	26	17	19	20	17
Textiles, leather, and articles of textiles or leather	22	30	29	31	23
Nonmetallic mineral products	32	9	9	10	9
Base metal in prim. or semifin. forms & in finished basic shapes	33	33	32	32	33
Articles of base metal	33	29	28	27	25
Machinery	35	21	19	21	24
Electronic & other electrical equip & components	36	13	14	11	20
Motorized and other vehicles (including parts)	37	26	21	17	31
Transportation equipment, nec	37	34	31	25	26
Precision instruments and apparatus	38	14	15	16	15
Furniture, mattresses & mattress supports, lamps, lighting	25	23	25	25	27
Miscellaneous manufactured products	39	18	18	19	19

Note: The estimates are from the regression with import and export dummies, adjacent dummy and remoteness controls.

Source: Table 9

Table A2: Gravity Equation with Intrastate Home Bias, U.S.1949.

	Panel A: Manufacturing		
	Intra-state distance measures		
	Nitsch	Wolf	Largest Cities
	(I)	(II)	(III)
ln_distance	-0.90***	-0.27***	-0.61***
	[0.05]	[0.07]	[0.06]
home_bias	0.29***	0.79***	0.89***
	[0.11]	[0.13]	[0.11]
ln_remoteij2007_gsp	-1.40***	-0.66**	-1.20***
	[0.27]	[0.26]	[0.34]
ln_remoteji2007_gsp	1.45**	1.78***	1.54**
	[0.65]	[0.66]	[0.69]
adjacent	0.33***	1.06***	0.63***
	[0.09]	[0.11]	[0.10]
Constant	4.35	-12.97	-1.08
	[8.97]	[9.09]	[9.71]
N	289955	289955	289955
Export/Import FE	Yes	Yes	Yes

Source: 1949 Carload Waybill Data, ICC.

Notes: the dependent variable is the number of carloads.

Table A3: Gravity Equation with Intrastate Home Bias, U.S. 2007.

	Panel A: Whole Economy			
	Intra-state distance measures			
	Nitsch	Wolf	Largest Cities	Actual Distance
	(I)	(II)	(III)	(IV)
ln_distance	-0.80***	-0.15***	-0.19***	-0.19***
	[0.09]	[0.03]	[0.05]	[0.04]
home_bias	1.28***	1.71***	1.78***	1.61***
	[0.08]	[0.08]	[0.06]	[0.09]
ln_remoteij2007_gsp	40.01***	51.73***	49.31***	51.73***
	[3.43]	[4.15]	[4.01]	[4.15]
ln_remoteji2007_gsp	-16.30***	15.83***	14.23***	15.83***
	[5.20]	[3.56]	[3.69]	[3.56]
adjacent	0.44***	0.69***	0.69***	0.62***
	[0.08]	[0.07]	[0.07]	[0.08]
Constant	9.25**	35.86***	34.12***	35.86***
	[4.06]	[2.80]	[2.88]	[2.80]
N	2304	2304	2304	2304
Export/Import FE	Yes	Yes	Yes	Yes
	Panel B: Manufacturing Sector			
	Intra-state distance measures			
	Nitsch	Wolf	Largest Cities	Actual Distance
	(I)	(II)	(III)	(IV)
ln_distance	-0.76***	-0.13***	-0.19***	-0.16***
	[0.10]	[0.03]	[0.04]	[0.04]
home_bias	1.43***	1.86***	1.90***	1.79***
	[0.08]	[0.08]	[0.07]	[0.09]
ln_remoteij2007_gsp	55.30***	70.40***	66.67***	70.40***
	[4.57]	[5.56]	[5.38]	[5.56]
ln_remoteji2007_gsp	-20.55***	10.10***	7.34**	10.10***
	[5.99]	[3.86]	[3.74]	[3.86]
adjacent	0.34***	0.58***	0.57***	0.51***
	[0.08]	[0.07]	[0.07]	[0.07]
Constant	5.69	31.97***	29.03***	31.97***
	[4.47]	[2.79]	[2.70]	[2.79]
N	49137	49137	49137	49137
Export/Import FE	Yes	Yes	Yes	Yes

Source: The Commodity Flow Survey 2007.

Notes: the dependent variable is $ value of shipment.

Table A4: Gravity Equation with Intrastate Home Bias, U.S.1949. Upper Bound Estimates

	Panel A: Manufacturing		
	Intra-state distance measures		
	Nitsch	Wolf	Largest Cities
	(I)	(II)	(III)
ln_distance	-0.88***	-0.18***	-0.53***
	[0.06]	[0.06]	[0.05]
home_bias	1.22***	1.89***	1.90***
	[0.10]	[0.10]	[0.08]
ln_remote_ij	-2.62**	-1.74	-5.49***
	[1.33]	[1.35]	[1.64]
ln_remote_ji	0.46	0.91*	0.84
	[0.52]	[0.52]	[1.06]
adjacent	0.50***	1.30***	0.86***
	[0.09]	[0.11]	[0.11]
Constant	34.95***	13.95	62.97***
	[17.50]	[17.86]	[14.97]
N	290344	290344	290211
Export/Import FE	Yes	Yes	Yes

Source: 1949 Carload Waybill Data, ICC.

Notes: the dependent variable is the weight of shipment (in tons).

Table A5: List of commodities in 1949 carload waybill data.

Abrasives Not Crude	Food Products	Railroad Equip Su On Cars
Acids	Food Products Frozen	Railroad Equipment Parts
Agric imp. Parts	Fuel Road Oils Nos	Railroad Track Mtl Iron And Steel
Agriculture Implements	Furnace Slag	Refd Petrol Nos
Airplanes	Furnaces Etc	Refractories
Alcohol Nos	Furniture	Refrigerators
Aluminium bar	Furniture parts	Rope Cordage Twine
Artificial Stone	Games And Toys	Rubber Goods Nos
Athletic Equipment	Gasfs Not Petroleum	Rubber crude
Automobile(passengers)	Gasoline	Scrap For Remeltg
Automobiles Freight	Glass	Scrap Iron
Autos Autotrucks Ko	Glass Bottles Jars	Scrap Paper Rags
Bagging Burlap Etc	Glassware Nos	Sewer Pipe Not Metal
Bags Burlap Cotton	Hardware	Soap Cleaning Compos
Bathroom Fixtures	Household Utensils	Sodium Products
Beverages Nos	Iron And Steel Borings Etc	Soybean Oil
Blacks Nos	Iron And Steel Pipe Ftgs	Starch
Bldg Paper Roofing	Ice	Stoves Ranges Parts
Bldgs Houses Portabl	Insecticides	Sugar
Blog Woodwk Millwrk	Insulating Materials	Sulphuric Acid
Boots. Shoe findings	Iron&Steel	Synthetic Fibre
Bricks Building Tile	Laundry Equipment	Syrup Molasses Refnd
Bricks common	Lime	Tanks Nos
Broken Brick Etc	Linseed Oil	Tanning Material Nos
Building Materials	Liquors Alcoholic	Tar Pitch Creosote
Candy_Confectionary	Liquors Malt	Tires,Tubes,Rubbers
Cast Iron Pipe Ftgs	Lubricating Oils	Tools and Parts
Cellulose articles	Luggage Handbags Nos	Vegetable Nut Oils
Cement Nos	Machinery parts	Vehicle not motor
Cement Portland	Machines	Vehicle parts
Chemicals	Manufactured iron&steel	Vehicles Motor Nos
Chinaware Crockery	Matches	Wallboard
Cigarettes	Mfrs And Misc Nos	Waste Mtl Nos
Cloth&Fabric	Mftd Tobacco Nos	Wine
Container Retd Mty	Military Vehicles	Wooden Container
Containers Fibrbo Kd	Molasses Residual	Woodpulp
Containers Metal	Newspaper	Woodware
Containers Nos	Oil Foots Sediment	Wrapping Paper
Copper Ingot	Oils Nos	
Copper,brass,bronze	Paint Putty Varnish	
Cotton Cloth	Paper Bags	
Cotton factory prdts.	Paper articles	
Cottonseed Oil	Paperboard Fibrebo	
Electrical equipment	Plaster Stucco Wall	
Explosives	Plastics	
Feed A And P Nos	Printed Matter Nos	
Fertilizers	Printing Paper Nos	
Floor Covering	Railroad Equip Own Whls	

Source: 1949 Carload Waybill Data, ICC.