**Input Output Linkages and Agglomeration: Evidence from Turkey with Panel Data Analysis**

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**Abstract**

In this study, we investigate whether input-output linkages drive agglomeration. We used Localization Quotation (LQ) coefficient which are exhibiting agglomeration level as dependent variable and forward, backward and inward linkage coefficients (we used this term to imply intra industry) as independent variable in the study. We considered all applications to test if there is cross-section dependency between panels and heterogeneous slope coefficients across group members. We use a balanced panel data set that covers 20 aggregated industry groups in Turkey for the period of 1995-2011. Turkey Input Output Tables and some socio economic accounts which are required to achieve goal of this paper were obtained from WIOD database.

**Key Words:** Agglomeration, Input Output Linkages, Panel Data Analysis.

1. **Introduction**

Some of the goods and services are used as inputs for other sectors and input costs have important impacts on total costs. Associated with production structure, particular sectors tend to allocate near to their suppliers while some of them prefer to locate near to demanders. Therefore production relation among sectors through input–output linkages drive agglomeration of economic activities in particular areas. Linkages generate geographic concentration between manufacturer and supplier.

Cost reduction, pecuniary externalities and knowledge spillovers explain how a sector pulls sectors through input output linkages. Cost reduction related to input output linkages occurred in two ways. First; the improvement of productivity of downstream sectors will enlarge the market size for intermediate suppliers. The competition in upstream sectors reduces intermediate prices, which decreases the costs of the downstream sectors (Kranich, 2011; Peng and Hong, 2013). Second, increasing demand by downstream sectors can lead to higher levels of specialization in upstream sectors, which reducing prices (Antonelli vd, 2008).

In this study, we examined whether input-output linkages drive agglomeration. To achieve aim of the study, we used a balanced panel data set that covers 20 aggregated industry groups in Turkey for the period of 1995-2011. Turkey Input Output Tables and some socio economic accounts which are required to achieve goal of this paper were obtained from WIOD database.

1. **Review of the literature**

Although there are numerous studies to investigate the factors affecting the agglomeration, very few studies have examined the relationship between agglomeration and input output linkages in the regional development literature. Glaeser and Kerr (2007) researched importance of both forward and backward linkages on location decision of firms. Sohn vd (2004) examined spatial distribution pattern of manufacturing activities associated with intra-industrial advantage (localization economies) and inter-industrial benefit (urbanization economies). Stressing the importance of intermediate input intensity, Rosenthal and Strange (2001) draws attention to the backward linkages for agglomeration. Rosenthal vd, (2004) also asserts that the input-output linkages between industries encourage interrelated industries to co-locate in some regions and promote industry agglomeration. Smith and Florida (1994) and Ries and Swenson (1995) examined the co-location of backward and forward linked manufacturing enterprises in automotive-related industries in the process of industrial location

**3. Data and Variables**

With regard to Industrial Organization Approach; sectoral and inter sectoral linkages have been taken into account as a main source of productivity and it asserts that agglomeration influences productivity positively both in firm and sectoral level (Tirole, 1988). Thus we chose labor productivity (LnPoL) as dependent variable in the study, intra sector linkages (ISL), sectoral backward linkages (SBL) and sectoral forward linkages (SFL) were added to model as independent variables. All variables were transformed into logarithm for analysis. In this study we used annual data from 1995 to 2009 for Turkish Economy on the basis of 20 sectors. Whole data set is compiled from World Input-Output Database (WIOD).

 **Table 1: Summary Statistics of the Variables**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variable | Obs | Mean | Std. Dev. | Min | Max |
| LQ | 340 | 0.049843 | 0.061762 | 0 | 0.3099 |
| ISL | 340 | 1.118658 | 0.208399 | 1.0001 | 2.2581 |
| SFL | 340 | 1.493115 | 0.680562 | 1.0328 | 5.4525 |
| SBL | 340 | 1.493117 | 0.518522 | 1.0127 | 4.2670 |

**4. Preliminary Analysis**

We try to determine the most suitable estimation method by a model selection procedure based on the panel data. Firstly, possible cross-section dependency and heterogeneity problems were investigated. Then, in order to avoid spurious regression, the unit roots of the relevant variables were investigated by the methods that congruous with first step’s results. After detecting that our model is not stationary, we try to find a co-integration relationship between depended an independent variables. After this procedure, we pick a suitable estimation method.

**4.1 Cross-sectional Dependence and Homogeneity**

It is typically assumed that disturbances in panel data models are cross sectional independent. However in panel data models cross section dependence can arise due to spatial or spillover effects, or could be due to unobserved common factors. Cross sectional dependence is important in fitting panel-data models. Otherwise the estimation results might be inconsistent, inefficient and estimated standard errors might be biased.

To test for cross-sectional dependence, Breusch and Pagan (1980) propose the Lagrange multiplier (LM) test statistic. Pesaran (2004) states that this test is not applicable when N is large. For large panels where T → ∞ first and then N → ∞, Pesaran (2004) proposes the scaled version of the LM test. CD test may present substantial size distortions when N is large and T is small. Pesaran (2004) develops a test for panels where T → ∞ and N →∞ in any order. Pesaran et al. (2008) denote that the CD test will lack power in certain situations where the population average pair wise correlations are non-zero. Therefore, for large panels where T → ∞ first and then N → ∞, Pesaran et al. (2008) suggest a bias adjusted version of the LM test that uses the exact mean and variance of the LM statistic (the bias-adjusted LM test). The null hypothesis of cross-section independence is tested against the alternative hypothesis of cross-section dependence for all statistics.

**Table 3: Cross-section Dependence and Homogeneity Tests Results**

|  |  |  |
| --- | --- | --- |
| Test | Statistic | p-value |
| Cross-sectional dependence tests |
| LM | 435.484 | 0.00\* |
| CDLM | 12.593 | 0.00\* |
| CD | 4.207 | 0.00\* |
| LMadj | 15.834 | 0.00\* |
| Homogeneity tests |
| $$\tilde{∆}$$ | 20132.52 | 0.00\* |
| $$\tilde{∆}\_{adj}$$ | 25465.85 | 0.00\* |

Note: \* denotes 1% statistical significance.

In panel-data models, homogeneity is assumed among the regression coefficients. Pooled methods can only applicable if homogeneity is valid. Otherwise serious deviations may be seen in the estimates. To test for slope homogeneity, Pesaran and Yamagata (2008) follow delta $\left(\tilde{∆}\right)$ tests. The null hypothesis of slope homogeneity (H0: βi=β for all i) is tested against the alternative hypothesis of slope heterogeneity (H1: βi≠β for a non-zero fraction of pair-wise slopes for i≠j). When the error terms are normally distributed, the $\tilde{∆}$ tests are valid as (N,T) → ∞ without any restrictions on the relative expansion rates of N and T.

Our model’s cross-section dependence and homogeneity tests results are presented in Table 3. As seen there, both null hypothesis are rejected at %1 significance level. According to this sections are dependent and parameters slope are heterogeneous. These results are determining for the methods used for unit root testing, co-integration testing and model estimating.

**4.2 Unit Root Test**

Dependence in the cross-sections of data set is the main problem encountered in the panel unit root tests. At this point, panel unit root tests are divided into first and second generation test. First-generation tests are also divided into homogeneous and heterogeneous models. While Levin, Lin and Chu (2002), Breitung and Das (2005) and Hadri (2000) assumes homogeneity, Im, Pesaran and Shin (2003), Maddala and Wu (1999), Choi (2001) is applicable for heterogeneous models.

The first generation unit root tests are based on the assumption that all sections forming the panel are independent and all sections are affected at the same level from the shocks to one section. If the complexity of economic relations considered, it more is realistic to think the impact of the shocks has to be differ according to sections. To correct this deficiency, the second generation unit roots test, that taking into account the cross-section dependence, has been developed. Major second-generation unit root tests are MADF (Taylor and Sarno, 1998), SURADF (Breuer, Mcknown and Wallace, 2002), Bai and Ng (2004), CADF (Pesaran, 2007) and PANKPSS (Carrion-I Silvestre etal. 2005).

**Table 4: Unit Root Test Results**

|  |  |  |
| --- | --- | --- |
| **Model** | Level | 1st Diff. |
| **Variables** | **t-bar** | **ztbar** | **P Value** | **t-bar** | **ztbar** | **P Value** |
| Without Trend  | LQ | -1.585 | 0.634 | 0.737 | -2.555 | -3.619 | 0.000\* |
| ISL | -2.069 | -1.487 | 0.069 | -3.937 | -9.676 | 0.000\* |
| SFL | -1.551 | 0.784 | 0.783 | -3.712 | -8.692 | 0.000\* |
| SBL | -1.519 | 0.927 | 0.823 | -4.010 | -9.998 | 0.000\* |
| With Trend | LQ | -1.929 | 1.554 | 0.940 | -3.132 | -3.553 | 0.001\* |
| ISL | -2.171 | 0.483 | 0.686 | -3.436 | -4.779 | 0.000\* |
| SFL | -1.585 | 3.078 | 0.999 | -2.710 | -1.853 | 0.000\* |
| SBL | -1.657 | 2.757 | 0.997 | -2.950 | -2.819 | 0.000\* |

Note: \* denotes 1% statistical significance.

In this study, according to the results obtained in preliminary analysis, we used the panel unit root test (CADF), which takes into both heterogeneous slope parameters and cross-section dependence, developed by Pesaran (2007). Statistical values of this tests is compared with the Pesaran (2006) CADF critical table values. The null of unit root is rejected if CADF critical table values is higher than CADF statistical values. As all the variables of the model is stationary at the first level, the necessary assumption of co-integration test is provided.

**4.3 Cointegration Analysis**

Once variable have been classified as integrated of order I(0), I(1), I(2) etc. is possible to set up models that lead to stationary relations among the variables, and where standard inference is possible. The necessary criteria for stationarity among non-stationary variables is called cointegration. Testing for cointegration is necessary step to check if you’re modelling empirically meaningful relationships. If variables have different trends processes, they cannot stay in fixed long-run relation to each other, implying that you cannot model the long-run, and there is usually no valid base for inference based on standard distributions (Sjö, 2008).

**Table 5: Panel Co-integration Test Results for Dependent Variable**

|  |  |  |  |
| --- | --- | --- | --- |
| Statistics | Value | Z-Value | P-Value |
| ISL |  |  |  |
| Gt | -4.389 | -11.319 | 0.000\* |
| Ga | -16.763 | -3.271 | 0.001\* |
| Pt | -9.271 | -2.067 | 0.582 |
| Pa | -13.839 | -3.658 | 0.000\* |
| SFL |  |  |  |
| Gt | -5.431 | -15.303 | 0.000\* |
| Ga | -5.383 | -2.201 | 0.014\*\* |
| Pt | -11.010 | -7.218 | 0.000\* |
| Pa | -6.238 | -4.107 | 0.000\* |
| SBL |  |  |  |
| Gt | -4.312 | -11.210 | 0.000\* |
| Ga | -5.031 | -3.534 | 0.000\* |
| Pt | -11.316 |  0.936 | 0.825 |
| Pa | -4.914 | -1.608 | 0.054\*\*\* |

Note: \*, \*\*, \*\*\* denotes respectively 1%, 5%, 10% statistical significance.

Westerlund (2007) developed four panel cointegration tests that are based on structural rather than residual dynamics and, therefore, do not impose any common-factor restriction. The idea is to test the null hypothesis of no cointegration by inferring whether the error-correction term in a conditional panel error-correction model is equal to zero. The new tests are all normally distributed and are able to accommodate to accommodate unit-specific short-run dynamics, unit-specific trend and slope parameters, and cross-sectional dependence. Two tests are designed to test the alternative hypothesis that the panel is co-integrated as a whole, while the other two test the alternative that at least one unit is co-integrated.

We have used Westerlund (2007) co-integration test as it is strong and applicable in the case of heterogeneous slope parameters and cross-sectional dependence. Results are presented in Table 5. Gt and Pt statistics are quite robust to the cross-sectional correlation (Westerlund, 2007). According to this statistics the null of no co-integration is rejected. Therefore our model is co-integrated as a whole so with appropriate estimator, our model could reach empirically meaningful relationships.

**5. Empirical Model and Results**

The estimator implemented in our study form part of the panel time-series (or nonstationary panel) literature, which emphasizes variable nonstationarity, cross-section dependence, and parameter heterogeneity (in the slope parameters, not just time-invariant effects). Our empirical model is;

(1) yit = βixit + uit

(2) uit = a1i + Λift + Εit

(3) xit = a2i + Λift + Γigt + eit

Where xit and yit are observables, βi is the country-specific slope on the observable regressors, and uit contains the unobservable and the error terms eit. The unobservable in (2) are made up of standard group-specific fixed effects a1i, which capture time-invariant heterogeneity across groups, as well as an unobserved common factor ft with heterogeneous factor loadings Λi, which can capture time-variant heterogeneity and cross-section dependence. The factors ft and gt are not limited to linear evolution over time; they can be nonlinear and nonstationary, with obvious implications for cointegration. Additional problems arise if the regressors are driven by some of the same common factors as the observables: the presence of ft in equations (2) and (3) induces endogeneity in the estimation equation (Eberhardt and Teal, 2011). Εit and eit are assumed white noise. For simplicity, the model here includes only one covariate and one unobserved common factor in the estimation equation of interest. This model is developed by Eberhardt and Teal (2010) and it is based on Pesaran and Smith (1995) MG estimator and The Pesaran (2006) CCEMG estimator.

**Table 6: Panel Model Estimation Results**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Observations | 340 |  |  |  |  |  |
| Groups | 20 |  |  |  |  |  |
| Wald chi2 (3) | 24.84 |  |  |  |  |  |
| Prob > chi2 | 0.000\* |  |  |  |  |  |
| Dependent Variable | LQ |  |  |  |  |  |
| **Independent Variables** | **Coefficients** | **Std. Err.** | **z** | **P > |z|** | **[95% Conf. Interval]** |
| ISL | -0.10513 | 0.05684 | -1.85 | 0.064\*\*\* | -0.21653 | 0.00627 |
| SFL |  0.00195 | 0.01108 | 0.18 | 0.860 | -0.01977 | 0.02369 |
| SBL |  0.03842 | 0.00831 | 4.62 | 0.000\* | 0.02214 | 0.05471 |
| CONS |  0.07110 | 0.03220 | 2.21 | 0.027\*\* | 0.00797 | 0.13423 |

Note: \*, \*\*, \*\*\* denotes respectively 1%, 5%, 10% statistical significance.

Panel model result are presented in Table 6. As seen from the table, the model as a whole is statistically significant at %1 level. Also two of dependent variable are significant. But as we found pre-estimation test, these coefficient are not valid for all sector because of heterogeneity problem. Therefore we chose to interpret all sectors individually. Sectoral results are presented in appendix A.

When the model finding are reviewed for throughout economy; statistically significant correlations has been found between agglomeration and both backward and intra industry linkages in the study. Agglomeration has been impacted negatively from intra industry linkages while backward linkages have positive effects on agglomeration in this period. Relation between forward linkages and agglomeration haven’t been found statistically significant with respect to results. Results of the study has been given in table below.

|  |
| --- |
| **Table 1: Summarizes of Econometric Results** |
| **Sectors** | **Type of linkage** |
| Intra sectoral linkages | Forward Linkages | Backward Linkages |
| Agriculture |  |  | BL (-) |
| Mining |  |  | BL (+) |
| Food | ISL (+ ) | FL ( -) | BL (+) |
| Textile | ISL (+ ) | FL ( -) |  |
| Wood | ISL (- ) |  |  |
| Press and. Publ. | ISL (- ) | FL ( +) | BL (+) |
| Petrol |  |  | BL (+) |
| Chemical | ISL (- ) | FL ( +) |  |
| Plastic | ISL (- ) | FL ( +) | BL (+) |
| Other Minerals | ISL (- ) | FL ( +) |  |
| Metal |  |  | BL (+) |
| Machine |  |  | BL (+) |
| Energy |  | FL ( +) |  |
| Construction |  |  | BL (+) |
| Trade | ISL (+ ) | FL ( -) | BL (+) |
| Hotel Restaurant |  |  | BL (+) |
| Transportation | Statistically Insignificant |
| Communication |  |  | BL (+) |
| Finance | ISL (- ) | FL ( +) |  |
| Public services |  |  | BL (+) |

**Results By The Sectors Summarized As Follows.**

**Agriculture (Group 1)**

Backward linkages have been found statistically significant with respect to relation between sectoral linkages and agglomeration in agriculture. Relation between agglomeration and both forward and intra sectoral linkages haven’t been found statistically significant in this sector. Agglomeration in agriculture impacted negatively from backward linkages.

**Mining (Group 2)**

Statistically significant relations have been found between agglomeration and backward linkage in mining sector. Relations intra sector and forward linkages with agglomeration haven’t been found statistically significant in the sector. Statistical coefficients show that, impacts of backward linkage on agglomeration are positive in mining industry.

**Food (Group 3)**

Relations between all of the sectoral linkages (backward, forward linkages and intra sectoral) and agglomeration have been found statistically significant in food sector. This result implies that agglomeration impacted from both inter and intra sectoral linkages in food sector. While forward linkages has negative impacts on agglomeration, agglomeration has been impacted positively from both forward and backward linkages in the sector.

**Textile (Group 4)**

Relations between agglomeration and both forward and intra sectoral linkages have been found statistically significant in textile sector. This result implies that agglomeration in textile impacted from both forward and intra sectoral linkages in this sector. While intra sectoral linkages has positive impacts on agglomeration, agglomeration has been impacted positively from forward linkages in the sector.

**Wood (Group 5)**

Statistically significant relations have been found between agglomeration and intra sector linkage in wood sector. Relations backward and forward linkages with agglomeration haven’t been found statistically significant in the sector. Statistical coefficients show that, impacts of intra sector linkage on agglomeration are negative in wood industry.

**Press and publican (Group 6)**

Relations between agglomeration and all kind of the sectoral linkages (backward, forward linkages and intra sectoral) have been found statistically significant in this sector. This result shows, agglomeration in press and publication sector impacted from both inter and intra sectoral linkages. Only intra sectoral linkages has negative impact on agglomeration, both backward and forward linkages impacted agglomeration positively in press and publication sector in this period.

 **Petrol (Group 7)**

Backward linkages have been found statistically significant with respect to relation between sectoral linkages and agglomeration in petrol industry like agriculture sector. Relations between agglomeration and both forward and intra sectoral linkages haven’t been found statistically significant in this sector. With regard to coefficient, agglomeration impacted positively from backward linkages in petrol industry in this period.

**Chemical Products (Group 8)**

Relations between agglomeration and both forward and intra sectoral linkages have been found statistically significant in chemical products like textile sector. This result implies that agglomeration in chemical industry impacted from both forward and intra sectoral linkages in this sector. Apart from textile sector intra sectoral linkages has negative impacts on agglomeration while agglomeration has been impacted positively from forward linkages in this sector.

**Plastic Products (Group 9)**

Relations between agglomeration and all kind of the sectoral linkages (backward, forward linkages and intra sectoral) have been found statistically significant in this sector like press and publication. This result shows, agglomeration in plastic products impacted from both inter and intra sectoral linkages. Only intra sectoral linkages has negative impact on agglomeration, both backward and forward linkages impacted agglomeration positively in plastic products like press and publication sector in this period.

**Other Minerals (Group 10)**

Relations between agglomeration and both forward and intra sectoral linkages have been found statistically significant in chemical products like textile and chemical products. This result implies that agglomeration in other minerals impacted from both forward and intra sectoral linkages in this sector. Intra sectoral linkages has negative impacts on agglomeration while agglomeration has been impacted positively from forward linkages in this sector.

**Metal** **(Group 11)**

Statistically significant relations have been found between agglomeration and backward linkage in metal sector. Relations intra sector linkage and forward linkages with agglomeration haven’t been found statistically significant in the sector. Statistical coefficients show that, impacts of backward linkage on agglomeration are positive in metal industry

**Machine (Group 12)**

Statistically significant relations have been found between agglomeration and backward linkage in machine sector. Relations intra sector linkage and forward linkages with agglomeration haven’t been found statistically significant in the sector. Statistical coefficients show that, impacts of backward linkage on agglomeration are positive in machine industry.

**Energy (Group 13)**

Forward linkages have been found statistically significant with respect to relation between sectoral linkages and agglomeration in energy sector. Relations backward linkages and intra sectoral linkages with agglomeration haven’t been found statistically significant in the energy. With regard to calculated coefficient, agglomeration impacted positively from forward linkages.

**Construction (Group 14)**

Statistically significant relations have been found between agglomeration and backward linkage in construction like machine sector. Relations intra sector linkage and forward linkages with agglomeration haven’t been found statistically significant in the sector. Statistical coefficients show that, impacts of backward linkage on agglomeration are positive in construction industry.

**Trade (Group 15)**

Relations between agglomeration and all kind of the sectoral linkages (backward, forward linkages and intra sectoral) have been found statistically significant in this sector like press and publication and plastic products. This result shows, agglomeration in trade impacted from both inter and intra sectoral linkages. While forward linkages has negative impact on agglomeration, both backward and intra sectoral linkages impacted agglomeration positively in trade sector in this period.

**Hotel Restaurant (Group 16)**

Statistically significant relations have been found between agglomeration and backward linkage in Hotel and restaurant industry. Relations intra sector linkage and forward linkages with agglomeration haven’t been found statistically significant in the sector. Statistical coefficients show that, impacts of backward linkage on agglomeration are positive in hotel restaurant industry.

**Transportation (Group 17)**

Relations between productivity and backward linkages have been found statistically significant in transportation sector like agriculture and petrol sectors. Also productivity impacted positively from backward linkages in transportation in this period like other two sectors. Relations forward linkages with productivity haven’t been found statistically significant in the mentioned sector.

**Communication** **(Group 18)**

Statistically significant relations have been found between agglomeration and backward linkage in communication like many other sectors. Relations intra sector linkage and forward linkages with agglomeration haven’t been found statistically significant in the sector. Statistical coefficients show that, impacts of backward linkage on agglomeration are positive in communication sector.

**Finance (Group 19)**

Relations between agglomeration and both backward and intra sectoral linkages have been found statistically significant in sector. Relations forward linkages with agglomeration haven’t been found statistically significant in the sector. While intra sectoral linkages has positive impacts on agglomeration, agglomeration has been impacted negatively from backward linkages in this sector.

**Public services (Group 20)**

Statistically significant relations have been found between agglomeration and backward linkage in public sector. Relations intra sector linkage and forward linkages with agglomeration haven’t been found statistically significant in the sector. Statistical coefficients show that, impacts of backward linkage on agglomeration are positive in public services

Only for trade sector statistically significant relations between sectoral linkages and agglomeration haven’t been found in this research.

**6. Conclusion**

 This paper has considered an important but understudied question on determinants of agglomeration. Using Turkish National Input Output Tables and socio economic accounting we examined relation between agglomeration and sectoral linkages such as intra, forward and backward linkages. We find evidence of the importance of all of these determinants of agglomeration. With respect to results although finding changes across sectors, agglomeration is mostly and heavily impacted from backward linkages. It was found that agglomeration of most of the sectors has been impacted negatively from intra sectoral linkages.

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**Appendix A: Model Estimation Results by Sectors**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  Coef. |  Std.Err. |  z |  p > |z| |  [95% Conf. Interval] |
| Group 1 |  |  |  |  |  |  |
| ISL | -.1932386 | .662939 | -0.29 | 0.771 | -1.492575 | 1.106098 |
| SFL | -.178704 | .124537 | -1.43 | 0.151 | -.4227919 | .065384 |
| SBL | -.3929122 | .2211632 | -1.78 | 0.076 | -.826384 | .0405597 |
| CONS | 1.475093 | .7762542 | 1.90 | 0.057 | -.0463375 | 2.996523 |
| GROUP 2 |  |  |  |  |  |  |
| ISL | -.5229241 | .7065096 | -0.74 | 0.459 | -1.907657 | .8618092 |
| SFL | -.0223669 | .0242798 | -0.92 | 0.357 | -.0699545 | .0252207 |
| SBL | .0840962 | .0463781 | 1.81 | 0.070 | -.0068032 | .1749957 |
| CONS | .4683328 | .6753908 | 0.69 | 0.488 | -.8554088 | 1.792074 |
| Group 3 |  |  |  |  |  |  |
| ISL | .1515077 | .0815105 | 1.86 | 0.063 | -.00825 | .3112655 |
| SFL | -.1096716 | .0427452 | -2.57 | 0.010 | -.1934507 | -.0258925 |
| SBL | .0143059 | .0050919 | 2.81 | 0.005 | .0043261 | .0242858 |
| CONS | -.0306365 | .0527627 | -0.58 | 0.561 | -.1340494 | .0727765 |
| Group 4 |  |  |  |  |  |  |
| ISL | .0997212 | .037436 | 2.66 | 0.008 | .0263479 | .1730945 |
| SFL | -.0552076 | .0187053 | -2.95 | 0.003 | -.0918694 | -.0185459 |
| SBL | .0004626 | .0057957 | 0.08 | 0.936 | -.0108967 | .011822 |
| CONS | -.0010481 | .0147543 | -0.07 | 0.943 | -.0299659 | .0278698 |
| Group 5 |  |  |  |  |  |  |
| ISL | -.165745 | .0840254 | -1.97 | 0.049 | -.3304316 | -.0010583 |
| SFL | .064155 | .0818221 | 0.78 | 0.433 | -.0962133 | .2245233 |
| SBL | .0818371 | .0523793 | 1.56 | 0.118 | -.0208244 | .1844986 |
| CONS | .0217861 | .0506305 | 0.43 | 0.667 | -.0774477 | .12102 |
| Group 6 |  |  |  |  |  |  |
| ISL | -.3081873 | .1444497 | -2.13 | 0.033 | -.5913035 | -.0250711 |
| SFL | .0256839 | .013466 | 1.91 | 0.056 | -.000709 | .0520768 |
| SBL | .0404564 | .0175299 | 2.31 | 0.021 | .0060984 | .0748144 |
| CONS | .2494939 | .1351059 | 1.85 | 0.065 | -.0153088 | .5142967 |
| Group 7 |  |  |  |  |  |  |
| ISL | -.0404457 | .0327222 | -1.24 | 0.216 | -.10458 | .0236887 |
| SFL | .0018022 | .0060153 | 0.30 | 0.764 | -.0099875 | .0135919 |
| SBL | .0120375 | .0050833 | 2.37 | 0.018 | .0020743 | .0220006 |
| CONS | .0288401 | .023776 | 1.21 | 0.225 | -.0177601 | .0754402 |
| Group 8 |  |  |  |  |  |  |
| ISL | -.1669163 | .0687337 | -2.43 | 0.015 | -.3016319 | -.0322008 |
| SFL | .0205477 | .0094662 | 2.17 | 0.030 | .0019944 | .0391011 |
| SBL | .010179 | .0107856 | 0.94 | 0.345 | -.0109603 | .0313183 |
| CONS | .143729 | .0635177 | 2.26 | 0.024 | .0192366 | .2682215 |
| Group 9 |  |  |  |  |  |  |
| ISL | -.5103166 | .2264624 | -2.25 | 0.024 | -.9541748 | -.0664585 |
| SFL | .0325876 | .0122916 | 2.65 | 0.008 | .0084964 | .0566788 |
| SBL | .0462592 | .0103463 | 4.47 | 0.000 | .0259809 | .0665376 |
| CONS | .4359338 | .2188804 | 1.99 | 0.046 | .0069361 | .8649316 |
| Group 10 |  |  |  |  |  |  |
| ISL | -.2952642 | .0955826 | -3.09 | 0.002 | -.4826025 | -.1079258 |
| SFL | .0418186 | .0151459 | 2.76 | 0.006 | .0121332 | .0715041 |
| SBL | .0247886 | .0293582 | 0.84 | 0.398 | -.0327523 | .0823296 |
| CONS | .2347748 | .0832349 | 2.82 | 0.005 | .0716374 | .3979121 |
| Group 11 |  |  |  |  |  |  |
| ISL | -.062114 | .0380023 | -1.63 | 0.102 | -.1365972 | .0123691 |
| SFL | .0075945 | .0134895 | 0.56 | 0.573 | -.0188445 | .0340335 |
| SBL | .0338164 | .0080288 | 4.21 | 0.000 | .0180803 | .0495525 |
| CONS | .0343527 | .0363491 | 0.95 | 0.345 | -.0368903 | .1055957 |
| Group 12 |  |  |  |  |  |  |
| ISL | -.134509 | .1199926 | -1.12 | 0.262 | -.3696902 | .1006722 |
| SFL | .001079 | .0372265 | 0.03 | 0.977 | -.0718836 | .0740417 |
| SBL | .0430085 | .0077448 | 5.55 | 0.000 | .027829 | .058188 |
| CONS | .1131448 | .0999578 | 1.13 | 0.258 | -.0827689 | .3090585 |
| Group 13 |  |  |  |  |  |  |
| ISL | -.0321104 | .0228792 | -1.40 | 0.160 | -.0769529 | .0127321 |
| SFL | .0143662 | .0051429 | 2.79 | 0.005 | .0042863 | .024446 |
| SBL | .013827 | .0118845 | 1.16 | 0.245 | -.0094662 | .0371202 |
| CONS | .0069926 | .0097373 | 0.72 | 0.473 | -.0120922 | .0260773 |
| Group 14 |  |  |  |  |  |  |
| ISL | -1.035152 | .8220046 | -1.26 | 0.208 | -2.646252 | .575947 |
| SFL | -.0570383 | .1104179 | -0.52 | 0.605 | -.2734533 | .1593767 |
| SBL | .0777622 | .0228234 | 3.41 | 0.001 | .0330292 | .1224952 |
| CONS | 1.056063 | .7393799 | 1.43 | 0.153 | -.393095 | 2.505221 |
| Group 15 |  |  |  |  |  |  |
| ISL | .4678705 | .0912616 | 5.13 | 0.000 | .2890011 | .6467398 |
| SFL | -.1239789 | .0390091 | -3.18 | 0.001 | -.2004353 | -.0475225 |
| SBL | .1397766 | .0668566 | 2.09 | 0.037 | .0087402 | .2708131 |
| CONS | -.3899004 | .088634 | -4.40 | 0.000 | -.5636199 | -.2161808 |
| Group 16 |  |  |  |  |  |  |
| ISL | -6.918199 | 7.903598 | -0.88 | 0.381 | -22.40897 | 8.572567 |
| SFL | .1309268 | .2169216 | 0.60 | 0.546 | -.2942317 | .5560852 |
| SBL | .0961326 | .0333942 | 2.88 | 0.004 | .0306812 | .161584 |
| CONS | 6.69947 | 7.707395 | 0.87 | 0.385 | -8.406747 | 21.80569 |
| Group 17 |  |  |  |  |  |  |
| ISL | .0070569 | .0118469 | 0.60 | 0.551 | -.0161626 | .0302764 |
| SFL | .0032267 | .0053112 | 0.61 | 0.544 | -.0071831 | .0136365 |
| SBL | .0000316 | .0078501 | 0.00 | 0.997 | -.0153544 | .0154176 |
| CONS | .027958 | .0086017 | 3.25 | 0.001 | .0110991 | .044817 |
| Group 18 |  |  |  |  |  |  |
| ISL | -.1023191 | .1621594 | -0.63 | 0.528 | -.4201458 | .2155075 |
| SFL | .00109 | .0114625 | 0.10 | 0.924 | -.0213762 | .0235561 |
| SBL | .0340537 | .0137415 | 2.48 | 0.013 | .0071208 | .0609866 |
| CONS | .073418 | .1516166 | 0.48 | 0.628 | -.223745 | .370581 |
| Group 19 |  |  |  |  |  |  |
| ISL | -.0471267 | .0162475 | -2.90 | 0.004 | -.0789712 | -.0152822 |
| SFL | .002535 | .0068116 | 0.37 | 0.710 | -.0108155 | .0158854 |
| SBL | .0305122 | .0124316 | 2.45 | 0.014 | .0061468 | .0548777 |
| CONS | .0214294 | .0120038 | 1.79 | 0.074 | -.0020976 | .0449565 |
| Group 20 |  |  |  |  |  |  |
| ISL | .1034198 | .2190536 | 0.47 | 0.637 | -.3259173 | .5327568 |
| SFL | -.0163479 | .1156547 | -0.14 | 0.888 | -.2430269 | .2103311 |
| SBL | .0424725 | .0206538 | 2.06 | 0.040 | .0019917 | .0829532 |
| CONS | .0065206 | .1701098 | 0.04 | 0.969 | -.3268885 | .3399297 |

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