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Abstract

The financial sector is typically thought to enhance economic growth by aiding in the capital formation process. With the recent decline in the importance of the durable goods sector, however, the business transaction patterns of this sector have also played an ever increasing role in the local economy. In this study, utilizing a unique data base and an econometric input-output model we generate estimates of the contribution of these markets to the local economy. We find the current impact on both employment and output to be significant. We project a major, and increasing role for the industry into the next century. We also find the new local industry survey data produces significantly different forecasts than those found with the traditional approach. This brings into question the use of national data for use in regional forecasting models.

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1 Introduction

The fundamental role of the financial sector in an economy is to enhance growth by aiding the capital accumulation process. It is typically assumed, and evidence in the recent financial literature supports the contention, that a mature and healthy financial sector is important for regional growth.¹ Typically ignored, however, is the contribution of the transactions, employment and earnings of this sector to local economic activity. Similarly, also ignored is the interaction of the financial industry with other industries. This sectoral interaction generates industrial clusters which Porter (1990, 1996) argues is the relevant unit of analysis for determining regional public policy. It is the growth of the cluster, rather than any specific industry, that characterizes the competitive position of a region.

In this paper we evaluate the role of the financial services industry on the Chicago economy. We do this by utilizing an econometric input-output model and emphasizing the interaction of this industry with other sectors of the local economy. A major feature of the analysis is the introduction of industry survey data describing the purchases and sales of the *local* financial sector. This allows for the traditional input-output tables, which are primarily based on national data for the service sectors, to be adjusted to reflect local transaction patterns. We argue that the new table more accurately describes the activity of the financial sector and contrast the projected roles found using the alternative measures. Similarly, since public policy is frequently based on perceived industrial clusters, and the resulting potential for agglomeration economies, their empirical identification is important. We contrast the clusters found under the traditional input-output tables with those using the augmented tables.

¹See King and Levine (1993) and Strahan and Jayaratne(1996).

As a preview, we find the current impact of the financial industry on both employment and output to be significant and we project a major, and increasing role for the industry into the next century. We also find the new local industry survey data produces significantly different forecasts of multipliers and clusters. This highlights the importance of earlier findings concerning the key role played by the choice of input-output data in impact and forecasting models.² It emphasizes the importance of accurate information on local transactions.

In the next section we provide background on the Chicago financial industry and discuss how the service sector has replaced manufacturing as the driving force in the local economy. We then discuss how we model the local economy and generate estimates of the role of the financial sector on the aggregate economy and on individual sectors. Means to derive *economic clusters* are then discussed followed by a discussion of the results from an empirical evaluation of the Chicago economy. The final section summarizes.

2 Background and Purpose

The economic structure of Chicago's markets has changed dramatically since the 1970s with services coming to dominate local economic activity. The financial service sector has lead this change and currently serves a major role in addressing the funding and risk management needs of consumers and businesses.³ With the recent decline in the importance of the durable goods sector in the Midwest, and the increased use of financial derivative products which have markets predominantly housed in Chicago, the financial services

²See, for example, Israilevich, Hewings, Schindler and Mahidhara (1996).

³For a detailed description of these changes see Israilevich and Mahidhara (1991) and Kaglic and Testa (1996).

sector has played an ever increasing role in the local economy.

The financial sector has both exploited and initiated agglomeration economies.⁴ It exploits them by drawing upon valuable local resources – the human capital at local universities for advances in risk management tools and techniques, and significant enhancements in telecommunications and other service sectors. It initiates them by creating a demand for new service providers and making the local area an attractive market for new businesses. Business purchases from local firms keep revenues local and generate incomes which lead to additional expenditures. Such a chain reaction continues as long as part of the expenditures are at local establishments. This multiplier effect describes the influence that activity in one sector of the market can have on the overall local economy.

We evaluate just how important the financial sector is to the Chicago economy. What is the current relationships between business sectors? If the role of this sector were to change, what would this mean to other industries; both individually and in aggregate? Which sectors would be most affected by this change? We try to better measure the flow of transactions involving the financial industry by using special survey data to more accurately account for employment and output effects. Below we develop estimates of the direct role of the financial services sector in the local economy based in large part on the new data and use that to draw inferences about the effect of potential “shocks” to the sector.

⁴These are cost savings arising from the spatial proximity of market agents; i.e., firms, workers, or consumers. They are generally thought to arise from unique characteristics related to the local labor market, other location-specific resources, or information flows.

3 Modeling the Regional Economy

In analyzing the workings of a local economy and the potential impact of policy alternatives, two standard methods are employed. The traditional input-output approach models interactions between economic sectors and can be used to examine both direct and indirect effects of exogenous shocks to the economy. In essence, the approach provides a description of the local economy at a particular point in time. The other methodology typically employed for regional forecasting is time-series analysis in which the interactions between sectors of the economy, and within sectors over time, is modeled parametrically. While this approach allows for dynamic analysis, it has its disadvantages in that it is difficult from both an econometric and practical sense to empirically duplicate the complex relationships among economic sectors that characterize the input-output approach. Similarly the input-output approach ignores the potential dynamic effects of permanent shocks to the local economy.

We employ an approach that captures the benefits of both forecasting approaches. It is a combined econometric input-output model for the Chicago metropolitan region: the Chicago Region Econometric Input-Output Model (CREIM).⁵ CREIM is a simultaneous system of equations that identifies output, employment, and income of 53 industrial, and three government sectors of the local economy. In addition, components of population and final demand are also detailed. In total there are 259 forecasted endogenous variables. Interactions among the variables in the model are captured as

⁵The model was developed by the Regional Economics Applications Laboratory, a joint venture between the University of Illinois and the Federal Reserve Bank of Chicago. The methodology is described in Conway (1990) and Hewings, Merrifield and Schneider (1984) and the specific model is described in Schindler, Israilevich, and Hewings (1997), Israilevich, Hewings, Schindler, and Mahidhara (1996), and Israilevich and Mahidhara (1991).

nonlinear relationships and the model allows for structural changes through time. The combination of time-series and input-output modeling techniques results in a comprehensive model of the Chicago economy capable of predicting changes in final demand and business production practices, along with many other variables typical of regional analysis.

CREIM is set up for annual long-term projections. To summarize how these are derived, the local economy is assumed to face two sets of demands: (1) exports (external demand), and (2) demand from the various economic sectors within the local economy (internal demand). In the first stage of estimation, changes in exports from Chicago are estimated using sectoral or total national output figures. In the second stage, as firms respond to changes in external demand, they give rise to changes in local inter-industry demands. Sector output equations capture these internal demands using input-output relationships. In addition, the inter-industry coefficients are indirectly adjusted for changing supply-demand relationships, thus allowing for inter-industry relationships that change on an annual basis.

Forecasts of output (obtained using national data and exports) are combined with forecasts of labor productivity and wage rates to predict employment and industry earnings. These projections are combined with projections of the labor force participation rate and the unemployment rate to obtain population forecasts. Total earnings by industry are combined with predictions of property income, transfer payments, residence adjustments, and personal contributions to social insurance to obtain estimates of personal income.

The resulting personal income and population figures are used to estimate the internal demands of the final demand sector. Final demand consists of consumption, investment, and government purchases. In the analysis, four types of consumption expenditures, three types of investment expendi-

tures, and two types of federal, state and local government expenditures are considered.⁶

Initially, the entire stimulus to the Chicago economy comes from external demand, that is, exports. For example, an increase in the nation's GNP would lead to an increase in exports from the Chicago region. As explained above, this increase in exports would feed into the input-output model, which would then give rise to a set of inter-industry demands. The increase in output would produce an increase in employment, and thus earnings. Given labor force participation rates, the rise in employment would produce an increase in population. The rise in population and earnings would lead to an increase in personal income, which is reflected in rising personal consumption, investment, and state and local government expenditures. This increase in personal income now produces a second set of demands which drives the model; that is, final demand from within the Chicago economy.

The modeling cycle is completed when the final demand feeds into the output sector. The increase in final demand further raises output. This time, however, the output increase comes about in response to increased internal demand for goods and services, both private and public, and not in response to a nonlocal demand for exports. This increased demand works its way through the input-output model in exactly the same way as exports did, resulting in another chain of increases in output, earnings, employment, population, income, and ultimately, final demand. This process continues and at each stage the multiplier effect dampens. After several iterations, the model converges, and forecasts are generated for employment, output,

⁶Consumption categories include services, nondurables, automobile and automobile parts, and other durables; investment includes equipment, residential structures, and non-residential investment; and government expenditures include Federal and State & Local expenditures.

and income.

3.1 Economic Clusters

As the financial sector grows, it will require additional intermediate goods to enable it to meet the increased market demand. If those intermediate goods are not readily available then either they will have to be obtained outside of the local region or the financial sector will not be able to adequately grow to meet the additional demand. In either case, potential regional expansion (in both the financial and complementing sectors) will not occur. This stresses the importance of regional sectoral interdependences.

We identify industries that are economically linked to the financial sector. This linkage is measured by the extent to which a shock to the financial sector results in a larger regional role for other industries. Those which increase their role in the regional economy are considered absorbing industries. Those which have a decreased role are considered dissipating industries. Absorbing industries are considered to be in the financial sector cluster.⁷

More formally, to analyze employment clusters, an increase in output i implies growth in that industry *and* in others which provide inputs to it. If the increase is adequate to raise the employment share of the industry then it is considered an absorbing industry. That is, growth in the financial sector “pulls along” this complementary sector. Industries with declining shares are considered dissipating industries. That is,

⁷For alternative discussions of technical and economic clusters see Israilevich, Schindler, and Hewings (1996), Simpson and Tsukui (1965), and Hewings, Israilevich, Sonis and Schindler (1996).

$$\begin{aligned}
\frac{s_i^a - s_i^b}{s_i^b} &= \frac{(\Delta_i + n_i)/(\Delta + N)}{(n_i/N)} - 1 = \frac{(\Delta_i + n_i) \cdot N}{(\Delta_i + N) \cdot n_i} - 1 = \frac{(\Delta_i N + n_i N - \Delta n_i - N n_i)}{(\Delta n_i + N n_i)} \\
&= \frac{(\Delta_i N - \Delta n_i)}{(\Delta n_i + N n_i)} = \frac{(\Delta_i N / \Delta n_i) - 1}{(N n_i / \Delta n_i) + 1} = \frac{[\frac{\Delta_i}{n_i} \cdot \frac{N}{\Delta}] - 1}{\frac{N}{\Delta}}
\end{aligned} \tag{1}$$

where superscripts b and a identify the shares before and after the shock, respectively, N and n are total regional employment and sector i employment after the shock, and Δ and Δ_i represent changes in regional employment and sector i employment resulting from the shock.

This essentially reduces to an elasticity measure. The employment cluster, C^E , consists of all sectors for which eq.(1) > 0 . Assuming positive shocks to the i sector, we need only to evaluate the numerator of the last equality in eq.(1) to determine whether shares increase or decrease. That is, sector i is in C^E if

$$\frac{\Delta_i}{n_i} \cdot \frac{N}{\Delta} > 1.0 \tag{2}$$

Similarly, to evaluate output clusters, C^Q , we consider changes in output shares or, equivalently, the elasticity measure:

$$\frac{\Delta_i}{q_i} \cdot \frac{Q}{\Delta} \tag{3}$$

where Q and q are total regional output and sector i output following the shock, and Δ and Δ_i represent changes in regional output and sector i output resulting from the shock. Then sector i is in C^Q if

$$\frac{\Delta_i}{q_i} \cdot \frac{Q}{\Delta} > 1.0 \tag{4}$$

It should be emphasized that these are *economic clusters* instead of the traditional technology clusters which only take into account direct transactions between industries.⁸ There are two advantages of using the economic cluster measure. First, the measure more fully accounts for the impact of changes in sector i by accounting for indirect effects. Second, the means of determining absorbing and dissipating industries is more precise and less arbitrary. Given a positive shock to sector i , the direct effect on all other sectors will be nonnegative. However, there is no fixed rule for determining the appropriate cut-off for inclusion of industries in the cluster and the decision typically reduces to a rather arbitrary process. With relative shares as the cutoff, the decision is straightforward. An additional benefit of our analysis is that we can evaluate the effect of the persistence, in time, of a shock to sector i . This will alter the structure of local transactions and, therefore, produce dynamic changes in the input-output matrices over time.

3.2 Data

The geographic coverage of our analysis includes the six county Chicago metropolitan region consisting of Cook, DuPage, Kane, Lake, McHenry, and Will counties. Projections for all exogenous variables (including GNP and U.S. industrial output) are from DRI/McGraw Hill.

The input-output block of CREIM is a conventional, static input-output model. Typically, "local" input-output tables are constructed using a variety of alternative techniques to "regionalize" a national input-output table. In this regard CREIM is superior to alternative models because it incorporates unpublished, establishment-based, Chicago-specific information for the manufacturing block. These data on industrial purchases and sales are

⁸See Porter (1990).

obtained from the U.S. Bureau of Census.⁹

Similar data, however, are not available for the service sectors. To generate regional input-output tables for these sectors it is assumed that the technology at the regional level is identical to that at the national level with appropriate supply-demand adjustments to estimate the national share supplied within the region. However, this obviously eliminates any regional uniqueness that make the analysis interesting. It may also significantly distort the findings of the model as evidence suggests that the actual differences between regions can be quite significant.¹⁰ In addition, because of data constraints, it is common to treat local "exports" and "imports" as a residual component after deriving the inter-sectoral relationships. While arithmetically correct, this concentrates all measurement errors on the residual sector which may generate misleading inferences.

We improve upon this approach by surveying the relevant financial sector firms to directly obtain local information on industry technology, sectoral inter-relationships, and purchases and sales made outside of the local market. The survey classifies financial services into two distinct sectors: (1) banking and credit agencies, and (2) securities and commodity brokers.¹¹ The survey also provides us with more current information (as of 1995) whereas the standard methodology employs the national technology based on 1987 data; and even this is generated by extrapolating data from earlier years.¹²

General review of the survey data suggests that it is more representative of Chicago business activity than is the average national technology. For example, for the Securities and Commodities sector the census data indicate

⁹Israilevich, Hewings, Schindler and Mahidhara (1996) describe the methodology used in constructing the table within CREIM.

¹⁰See Israilevich, Hewings, Sonis and Schindler (1997).

¹¹These correspond to SIC codes 60, 61, and 67; and SIC 62, respectively.

¹²See U.S. Department of Commerce (1994).

that only two percent of revenues are spent on computer and data processing services. The survey data suggest this is closer to ten percent; a figure thought to be more realistic. Expenditures on Real Estate Management, a relatively expensive category in Chicago compared to the national average, constitute over 15 percent of revenues based on the survey and only three percent based on census estimates. Details of the survey are discussed in Risk Management Center of Chicago (1996).

4 Empirical Findings

We incorporate the data discussed above within CREIM to generate estimates of the role of the financial sector on the Chicago economy. We present some summary results here. Revenues generated by the two financial services sectors can be allocated to (1) intermediate expenditures (inputs), (2) wages, and (3) the combination of profits, capital expenditures and taxes. This *technology* is reproduced in Table 1 in which some of the most important direct relationships are presented. The share of local expenditures are also presented in the lower panel of the table and suggests that, for both financial sectors, approximately 10 percent of revenue goes toward purchasing inputs in the local market.¹³ The survey data also suggests (not shown in the table) that approximately 50 percent of financial industry sales are to local institutions. This suggests that the major linkage to the local economy is through sales and a resulting income effect as wages and salaries of the affected sectors are spent locally. This significant indirect effect implies that

¹³In another attempt to validate the survey data, we compare these findings to those of a London financial sector study [London Business School (1995)]. That study attributes 62 percent of revenues to value added from the Banking and Finance Sector (pp 2–10). The combined measure across the two financial sectors from the survey data is approximately 70 percent. Although not totally comparable, each of the sectors considered in this study fall within the leading sectors found in the London study.

the sectors most directly linked to the financial sectors may not be those that are ultimately most influenced by its activity.

We are also able to generate measures of the role of the financial sectors on the local economy. Table 2 and Figures 1 and 2 present CREIM forecasted employment shares and levels, and a measure of relative growth rates. Figure 1 highlights both direct and indirect employment benefits generated by the presence of the financial sector. Figure 2 shows that the employment growth of this sector is projected to out-pace the rest of the local economy. In general, the findings suggests that the financial sectors currently serve a significant role in the local economy and are projected to have a significant and increasing role into the future.

One of the major objectives of this study is to contrast the findings using the alternative models: one with traditional input-output tables (the basic model) and one which incorporates survey data on local transactions of the financial sectors into the input-output tables (the survey-data model). The most direct way of evaluating the differences is to directly contrast the regional purchase coefficients. Using standard matrix notation in describing a model of economic activity:

$$X = (I - A)^{-1}Y \quad (5)$$

where Y denotes final demand, X total output, and $(I - A)^{-1}$ is the Leontief inverse. Columns of A are associated with particular industries and the elements are the regional purchase coefficients associating this industry with others. Elements of $(I - A)^{-1}$ depict partial multipliers describing how changes in one industry sector affects another. By including the survey data we are altering the values of elements along the two columns of A associated with our two financial service sectors. Obviously, as discussed

below, changes in regional purchase coefficients affect the partial multipliers depicted in the Leontief inverse.

As a test of differences in the alternative regional purchase coefficients we regress one set against the other and test for differences, i.e.,

$$\alpha_{survey} = \beta_0 + \beta_1 \alpha_{base} \quad (6)$$

where α_{survey} is a vector of input-output coefficients from the survey-data model and α_{base} is the vector of coefficients from the traditional or base-model. The null hypothesis is that there is no difference between the two sets of coefficients, i.e., $\beta_0 = 0$ and $\beta_1 = 1.0$ which we test with an F-statistic. The results presented in Table 3 indicate that while correlated, the two vectors are not equal. We reject the null at reasonable levels of significance. Thus, our initial test suggests that the two models differ. Below we test to see if this leads to additional differences in the general findings and policy implications of the models.

We next evaluate differences in the multipliers generated using the two models. For each financial sector we compare both the employment and output multipliers. The comparison for both multipliers is presented in Tables 4–11. Only the partial multipliers of the sectors most affected by the financial sectors are included in the tables. The most obvious difference from the tables is with the values of the aggregate multipliers. In Table 4 the employment multiplier for the Security and Commodity Broker industry of 3.46 implies that 100 new employees in this sector would result in an additional 246 employees in Chicago concentrated in the leading sectors listed in the table. The survey-data model results imply a significantly smaller multiplier effect (2.83 from Table 5).¹⁴ Similar disparities exist across the

¹⁴To put these multipliers in perspective, the average multiplier across all 53 sectors of

other multipliers using the two models. The large differences suggests that any impact analysis using the base-model will generate different conclusions for the financial sector than would those from a model using the survey data. Using the base-model, the total multipliers for both employment or output are near the top of the range for all sectors included in CREIM. The survey based model produces more moderate total multipliers.

A closer look at the decomposition of the multiplier process across sectors indicates that industries influenced by changes in the financial sectors are frequently not those that have the most direct transactions with the sector. For example, Health Services represent such a small share of expenditures for the financial sectors that they are not even listed among the major suppliers of inputs in Table 1. Apparently the indirect effects dominate the relationship between the industries as Health Services is seen as a major benefactor of growth in both financial sectors. The opposite result is found for the Communications sector which reaps relatively minor indirect effects from the Banking and Credit Agency sector, but is one of its major suppliers—see Table 1.

A visual analysis of tables 4–11 suggests that the ranking of industries by their partial multipliers are similar across the base- and survey-data model. To more formally contrast the partial multipliers we regress the decompositions on one another and test the null hypothesis that the two are equal; again, implying the intercept term is zero and the slope term is 1.0. The results from testing this restriction presented in Table 12 and indicate the restrictions can be rejected for each comparison.

Next we use the two models to generate economic clusters. The change in market shares resulting from a small positive shock to the Security and Com-

the base-model is 2.50; with a range from 1.5 to 3.7.

modity Brokers sector and the Banking and Credit Agency sector are presented in Tables 13–20. The most influenced sectors are ranked in descending order and the cluster of industries (those with positive share changes) are set off from the remaining industries. A cursory review of the employment and output cluster for the Security and Commodity Brokers sector suggests that the clusters are somewhat similar using either the base- or survey-data model. However, we find more differences in the Banking Sector. Both the ordinal ranking *and* the size of the clusters are substantially different—the sector itself makes up the cluster. This decrease in the number of industries in the cluster is consistent with the significantly lower multiplier found for this sector using the survey-data model (Tables 8–11). The lower indirect effect apparently results in significantly fewer sectors being “pulled along” as growth occurs in the Banking Sector.

Finally, we test to see if the two models produce statistically different changes in relative shares. That is, are share changes produced by the base-model equal to those produced by the survey-data model. The results from this test are presented in Table 21 and indicate that we should reject the hypothesis of equal share changes across the two models.

5 Summary and Conclusion

In this paper we evaluate the role of local financial sector purchases, employment and transactions on the Chicago economy. We stress the key role played by the choice of input-output data on forecasts and impact analysis of regional economic models. Although there has been significant progress made in the methodology and techniques used to model regional activity, there are still concerns about the quality of information on local transaction patterns. Recent studies have moved away from “regionalizing” national

purchasing patterns and have incorporated survey data on the manufacturing sector. These changes have been shown to be significant. However, similar data have not been available for the service sectors. We address this issue by introducing new survey data on the local transactions of financial firms.

Summarizing our findings, the new data on financial sector transaction patterns produces significantly different total and partial multipliers, and economic clusters from those found using the "regionalized" national data. The indirect impact of this sector is shown to be quite significant, but not as great as that suggested by the traditional input-output data. Similarly, amalgamation economies, as measured by the size of the financial sector economic cluster of industries, are shown to not be as significant as that suggested by the "regionalized" national purchase patterns.

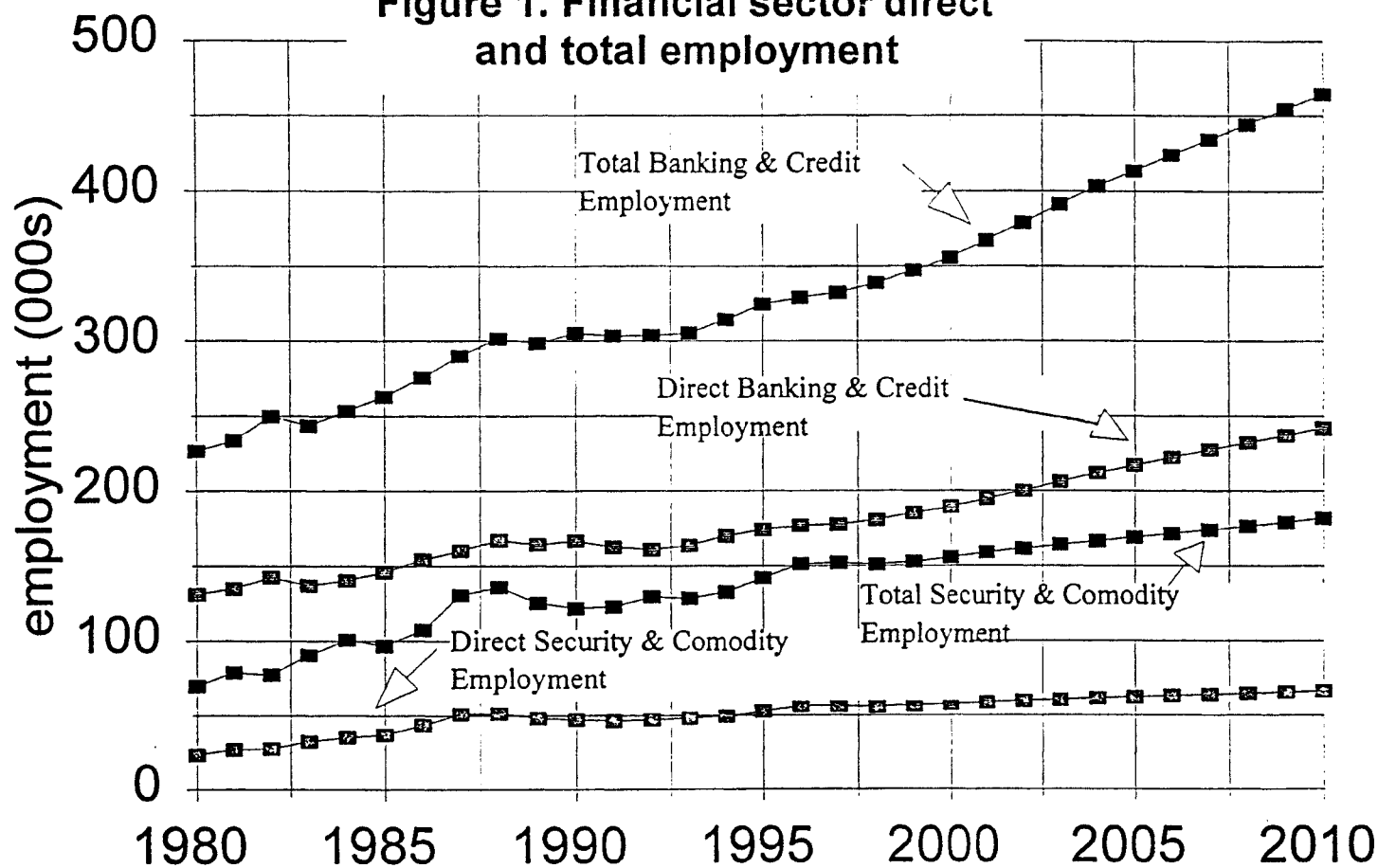
Concerning future research opportunities, given the sensitivity of forecasts and impact analysis to the alternative input-output tables, future attempts to collect local information on purchasing patterns for other service sectors appears warranted. Attention should also be focused on the sources of differences in individual regional transaction coefficients and a determination of their appropriateness.

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Figure 1. Financial sector direct and total employment



**Figure 2. Financial sector
indexed total employment**

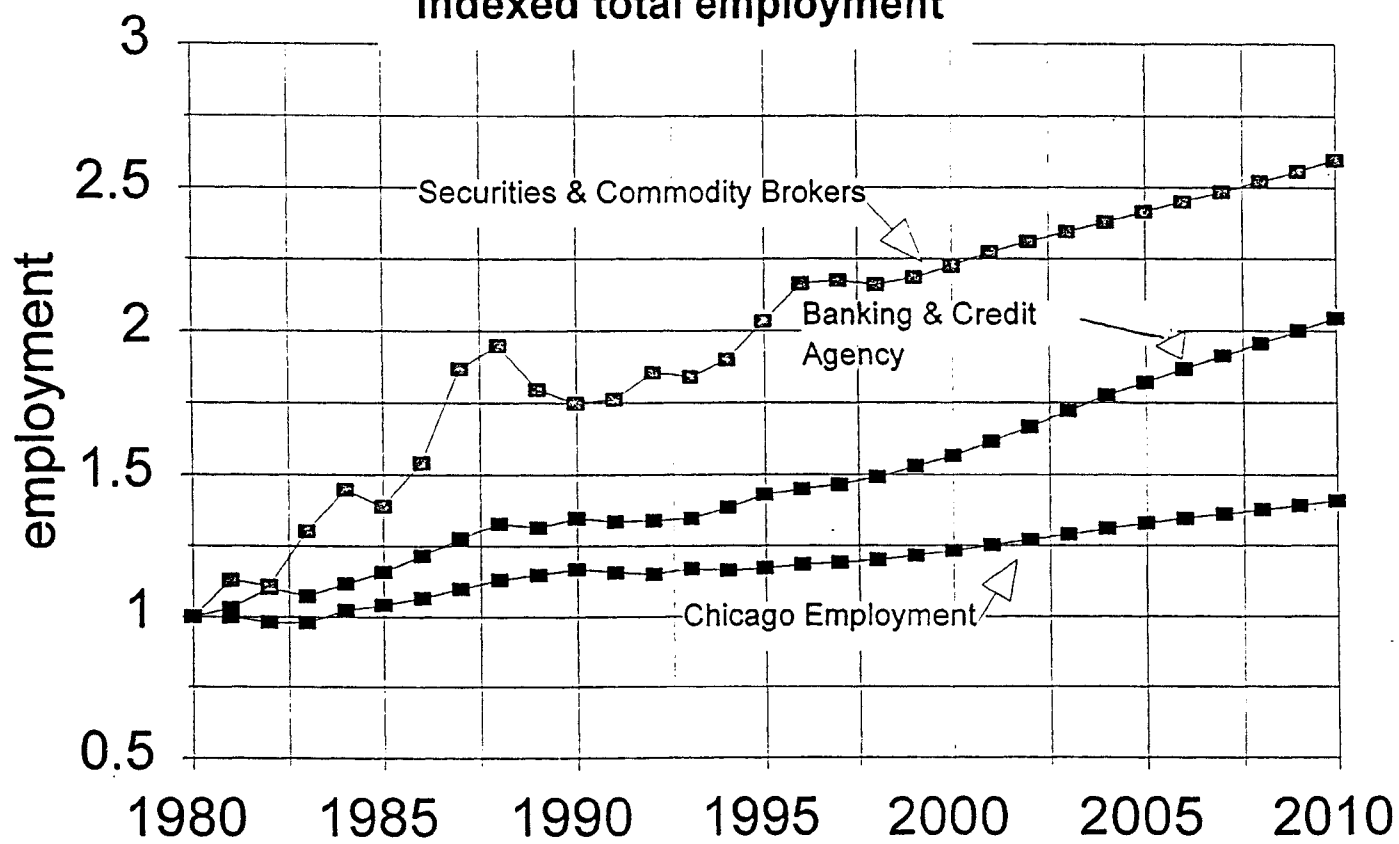


Table 1 - Financial Sector Technology

	<u>Banking & Credit Agencies</u>	<u>Securities & Commodity Brokers</u>
Intermediate Inputs (Share of total revenue)		
Banking & Credit Agencies	.005	.004
Communications	.014	.015
Securities and Commodity Brokers	.002	.051
Real Estate	.042	.018
Business & Engineering Management Services	.105	.124
Others	.075	.156
 Total Intermediate	 .243	 .367
 Wages	 .290	 .380
 Capital Expenditures, Profits, Taxes	 .460	 .250
 <u>Intermediate Inputs</u> <u>From Chicago Supplier</u> (Share of total revenue)		
Banking & Credit Agencies	.002	.004
Communications	.005	.008
Securities and Commodity Brokers	.001	.016
Real Estate	.020	.015
Business & Engineering Management Services	.059	.073
Others	.010	.013
 Total	 .095	 .129

Table 2. Employment shares in the Chicago region

YEAR	BANKING	SEC. BROKERS	SERVICES	MFG	OTHER
1970	0.025	0.004	0.512	0.281	0.178
1980	0.036	0.006	0.562	0.220	0.177
1990	0.039	0.011	0.624	0.155	0.171
2000	0.042	0.013	0.660	0.113	0.173
2010	0.046	0.013	0.689	0.084	0.168
	Banking: employment in Banking and Credit Agencies				
	Sec. Brokers: employment in Securities and Commodity Brokers				
	Services: employment in Other Services				
	MFG: employment in Manufacturing				
	Other: employment in the rest of the economy				

Financial sector

Table 3: Pairwise Regression of Regional Purchase Coefficients

INDUSTRY	INTERCEPT	SLOPE COEFFICIENT	ADJUSTED R^2	F-STATISTIC
Securities & Commodities	.001 (0.47)	.349 (6.22)	.42	70.6
Banking & Credit Agencies	-.001 (0.60)	.234 (7.79)	.53	370.8

Based on the regression $\alpha_{survey} = \beta_0 + \beta_1(\alpha_{base})$. The F-statistic is from a test of the null hypothesis that $\beta_0 = 0$ and $\beta_1 = 1.0$. The critical value for the test is $F_{.01}(2, 51) \approx 5.06$. In each case we reject the null hypothesis. For coefficient estimates the t-statistics are presented in parentheses.

Table 4

EMPLOYMENT MULTIPLIER COMPONENTS: Security and Commodity Brokers

(Base-Model)

Total Multiplier 3.46

Rank	Sector	contribution	% share
1	Security and Commodity Brokers	1.17869	0.34103
2	Business, Engineering Management Services	0.35221	0.10191
3	Health Services	0.29000	0.08391
4	Retail Trade	0.24718	0.07152
5	Eating and Drinking Places	0.21821	0.06313
6	Banking and Other Credit Agencies	0.09755	0.02823
7	Membership Organizations Household Services	0.07096	0.02053
8	Wholesale Trade	0.06636	0.01920
9	Educational Services	0.06014	0.01740
10	Social Services	0.05714	0.01653
11	Electronic and other Electric Equipment	0.05592	0.01618
12	Food and Kindred Products	0.05354	0.01549
13	Real Estate	0.05306	0.01535
14	Federal Government Enterprises	0.05156	0.01492
15	Insurance Carriers	0.04847	0.01402
16	Printing and Publishing	0.03702	0.01071
17	Legal Services	0.03668	0.01061
18	Auto Repair, Services, and Parking	0.03638	0.01052
19	Hotels and Other Lodging Places	0.03534	0.01023
20	Chemicals and Allied Products	0.03457	0.01000

*Sectors correspond to two digit SIC codes or, in a limited number of cases, a combination of two digit sectors.

Table 5

EMPLOYMENT MULTIPLIER COMPONENTS: Security and Commodity Brokers
(Survey-data Model)

Total Multiplier 2.83

Rank	Sector	contribution	% share
1	Security and Commodity Brokers	1.03934	0.36704
2	Business, Engineering Management Services	0.31291	0.11050
3	Health Services	0.24454	0.08636
4	Retail Trade	0.20115	0.07104
5	Eating and Drinking Places	0.16093	0.05683
6	Banking and Other Credit Agencies	0.06701	0.02366
7	Membership Organizations Household Services	0.05627	0.01987
8	Wholesale Trade	0.05187	0.01832
9	Educational Services	0.04864	0.01718
10	Social Services	0.04813	0.01700
11	Electronic and other Electric Equipment	0.04614	0.01629
12	Food and Kindred Products	0.04377	0.01546
13	Real Estate	0.04236	0.01496
14	Insurance Carriers	0.03704	0.01308
15	Trucking and Warehousing	0.02866	0.01012

*Sectors correspond to two digit SIC codes or, in a limited number of cases, a combination of two digit sectors.

Table 6

OUTPUT MULTIPLIER COMPONENTS: Securities and Commodity Brokers

(Base-Model)

Total Multiplier 2.96

Rank	Sector	contribution	% share
1	Security and Commodity Brokers	1.17869	0.39865
2	Business, Engineering Management Services	0.19649	0.06646
3	Real Estate	0.16204	0.05480
4	Food and Kindred Products	0.14326	0.04845
5	Health Services	0.12465	0.04216
6	Retail Trade	0.09573	0.03238
7	Banking and Other Credit Agencies	0.07460	0.02523
8	Chemicals and Allied Products	0.07104	0.02403
9	Wholesale Trade	0.06573	0.02223
10	Eating and Drinking Places	0.06337	0.02143
11	Electronic and other Electric Equipment	0.06241	0.02111
12	Electric, Gas, and Sanitary Services	0.05956	0.02014
13	Communications	0.05729	0.01938
14	Printing and Publishing	0.04057	0.01372
15	Petroleum and Coal Products	0.03844	0.01300
16	Insurance Carriers	0.03740	0.01265
17	Legal Services	0.03351	0.01134
18	Auto Repair, Services, and Parking	0.03310	0.01120
19	Trucking and Warehousing	0.03040	0.01028
20	Transportation Equipment	0.02950	0.01000

*Sectors correspond to two digit SIC codes or, in a limited number of cases, a combination of two digit sectors.

Table 7

OUTPUT MULTIPLIER COMPONENTS: Securities and Commodity Brokers

(Survey-data Model)

Total Multiplier 2.44

Rank	Sector	contribution	% share
1	Security and Commodity Brokers	1.03934	0.42614
2	Business, Engineering Management Services	0.17457	0.07157
3	Real Estate	0.12936	0.05304
4	Food and Kindred Products	0.11711	0.04802
5	Health Services	0.10511	0.04310
6	Retail Trade	0.07791	0.03194
7	Chemicals and Allied Products	0.05773	0.02367
8	Electronic and other Electric Equipment	0.05149	0.02111
9	Wholesale Trade	0.05137	0.02106
10	Banking and Other Credit Agencies	0.05124	0.02101
11	Electric, Gas, and Sanitary Services	0.04711	0.01932
12	Eating and Drinking Places	0.04673	0.01916
13	Communications	0.04326	0.01774
14	Petroleum and Coal Products	0.03087	0.01266
15	Insurance Carriers	0.02858	0.01172
16	Trucking and Warehousing	0.02528	0.01036
17	Printing and Publishing	0.02502	0.01026
18	Auto Repair, Services, and Parking	0.02477	0.01016
19	Transportation Equipment	0.02432	0.01000

*Sectors correspond to two diget SIC codes or, in a limited number of cases, a combination of two diget sectors.

Table 8

EMPLOYMENT MULTIPLIER COMPONENTS: Banking and Credit Agencies

(Base-Model)

Total Multiplier 3.13

Rank	Sector	contribution	% share
1	Banking and Other Credit Agencies	1.19608	0.38250
2	Business, Engineering Management Services	0.43416	0.13884
3	Health Services	0.19792	0.06329
4	Retail Trade	0.17054	0.05454
5	Eating and Drinking Places	0.16801	0.05373
6	Security and Commodity Brokers	0.09965	0.03187
7	Membership Organizations Household Services	0.06010	0.01922
8	Wholesale Trade	0.05370	0.01717
9	Insurance Carriers	0.04959	0.01586
10	Food and Kindred Products	0.04292	0.01373
11	Educational Services	0.04241	0.01356
12	Real Estate	0.04173	0.01335
13	Social Services	0.03913	0.01251
14	Federal Government Enterprises	0.03743	0.01197
15	Electronic and other Electric Equipment	0.03739	0.01196
16	Printing and Publishing	0.03707	0.01185

*Sectors correspond to two digit SIC codes or, in a limited number of cases, a combination of two digit sectors.

Table 9

EMPLOYMENT MULTIPLIER COMPONENTS: Banking and Credit Agencies
(Survey-data Model)

Total Multiplier 1.92

Rank	Sector	contribution	% share
1	Banking and Other Credit Agencies	1.03288	0.53716
2	Business, Engineering Management Services	0.17879	0.09298
3	Health Services	0.11707	0.06088
4	Retail Trade	0.09653	0.05020
5	Eating and Drinking Places	0.08062	0.04192
6	Membership Organizations Household Services	0.02764	0.01437
7	Wholesale Trade	0.02668	0.01388
8	Food and Kindred Products	0.02543	0.01322
9	Educational Services	0.02382	0.01239
10	Social Services	0.02307	0.01200
11	Real Estate	0.02251	0.01171
12	Electronic and other Electric Equipment	0.01970	0.01025

*Sectors correspond to two digit SIC codes or, in a limited number of cases, a combination of two digit sectors.

Table 10

OUTPUT MULTIPLIER COMPONENTS: Banking and Credit Agencies

(Base-Model)

Total Multiplier 3.21

Rank	Sector	contribution	% share
1	Banking and Other Credit Agencies	1.19608	0.37300
2	Business, Engineering Management Services	0.31672	0.09877
3	Real Estate	0.16665	0.05197
4	Food and Kindred Products	0.15020	0.04684
5	Security and Commodity Brokers	0.13031	0.04064
6	Health Services	0.11124	0.03469
7	Retail Trade	0.08637	0.02694
8	Chemicals and Allied Products	0.07576	0.02363
9	Communications	0.06999	0.02183
10	Wholesale Trade	0.06954	0.02169
11	Electric, Gas, and Sanitary Services	0.06513	0.02031
12	Eating and Drinking Places	0.06380	0.01990
13	Electronic and other Electric Equipment	0.05456	0.01701
14	Printing and Publishing	0.05311	0.01656
15	Insurance Carriers	0.05004	0.01561
16	Petroleum and Coal Products	0.04164	0.01299
17	Legal Services	0.03600	0.01123
18	Auto Repair, Services, and Parking	0.03520	0.01098

*Sectors correspond to two digit SIC codes or, in a limited number of cases, a combination of two digit sectors.

Table 11

OUTPUT MULTIPLIER COMPONENTS: Banking and Credit Agencies
(Survey-data Model)

Total Multiplier 1.97

Rank	Sector	contribution	% share
1	Banking and Other Credit Agencies	1.03288	0.52506
2	Business, Engineering Management Services	0.13043	0.06630
3	Real Estate	0.08989	0.04570
4	Food and Kindred Products	0.08897	0.04523
5	Health Services	0.06580	0.03345
6	Retail Trade	0.04889	0.02485
7	Chemicals and Allied Products	0.04330	0.02201
8	Wholesale Trade	0.03456	0.01757
9	Electric, Gas, and Sanitary Services	0.03293	0.01674
10	Eating and Drinking Places	0.03061	0.01556
11	Electronic and other Electric Equipment	0.02876	0.01462
12	Communications	0.02856	0.01452
13	Petroleum and Coal Products	0.02366	0.01203

*Sectors correspond to two digit SIC codes or, in a limited number of cases, a combination of two digit sectors.

Financial sector

Table 12: Pairwise Regression of Partial Multipliers

INDUSTRY/MULTIPLIER	INTERCEPT	SLOPE COEFFICIENT	ADJUSTED R^2	F-STATISTIC
<u>Securities & Commodities</u>				
Employment	-.004 (3.75)	.877 (158.84)	.99	325.8
Output	-.003 (5.28)	.881 (252.60)	.99	730.1
<u>Banking & Credit Agencies</u>				
Employment	-.011 (2.71)	.807 (35.09)	.96	51.5
Output	-.013 (3.70)	.349 (41.41)	.97	60.0

Based on the regression $\alpha_{survey} = \beta_0 + \beta_1(\alpha_{base})$. The F-statistic is from a test of the null hypothesis that $\beta_0 = 0$ and $\beta_1 = 1.0$. The critical value for the test is $F_{.01}(2, 51) \approx 5.06$. In each case we reject the null hypothesis. For coefficient estimates the t-statistics are presented in parentheses.

Table 13

EMPLOYMENT CLUSTER DETAIL: Security and Commodity Brokers

(Base Model)

Rank	Share-Change	Sector
1	0.0013276	Security and Commodity Brokers
2	0.0000347	Federal Government Enterprises
3	0.0000332	Eating and Drinking Places
4	0.0000128	Health Services
5	0.0000060	Real Estate
6	0.0000029	Miscellaneous Manufacturing Industries
7	0.0000028	Local and Interurban Passenger Transit
8	-.0000000	Tobacco Products
9	-.0000001	Leather and Leather Products
10	-.0000002	Pipelines, Except Natural Gas
11	-.0000003	Food and Kindred Products
12	-.0000007	Apparel and Textile Products
13	-.0000010	Petroleum and Coal Products
14	-.0000018	Water Transportation
15	-.0000023	Amusement Recreation Services
16	-.0000034	Electric, Gas, and Sanitary Services
17	-.0000037	Mining
18	-.0000037	Auto Repair, Services, and Parking
19	-.0000039	Social Services
20	-.0000042	Livestock and Other Agricultural Products
21	-.0000045	Miscellaneous Repair Services
22	-.0000048	Furniture and fixtures
23	-.0000054	Motion Pictures
24	-.0000065	Lumber and Wood Products
25	-.0000066	Hotels and Other Lodging Places
26	-.0000073	Paper and Allied Products
27	-.0000098	Stone, Clay, and Glass Products
28	-.0000111	Legal Services
29	-.0000115	Transportation Equipment
30	-.0000123	Personal Services
31	-.0000154	Educational Services
32	-.0000155	Communications
33	-.0000164	Agriculture, Forestry and Fisheries
34	-.0000165	Chemicals and Allied Products
35	-.0000180	Primary Metals Industries
36	-.0000190	Electronic and other Electric Equipment
37	-.0000202	Insurance Agents, Brokers, Service

Table 14

EMPLOYMENT CLUSTER DETAIL: Security and Commodity Brokers
(Survey-data Model)

Rank	Share-Change	Sector
1	0.0011979	Security and Commodity Brokers
2	0.0000202	Health Services
3	0.0000086	Eating and Drinking Places
4	0.0000038	Real Estate
5	0.0000026	Miscellaneous Manufacturing Industries
6	0.0000002	Local and Interurban Passenger Transit
7	-.0000000	Tobacco Products
8	-.0000001	Leather and Leather Products
9	-.0000002	Pipelines, Except Natural Gas
10	-.0000003	Food and Kindred Products
11	-.0000005	Apparel and Textile Products
12	-.0000009	Petroleum and Coal Products
13	-.0000015	Water Transportation
14	-.0000021	Social Services
15	-.0000027	Amusement Recreation Services
16	-.0000031	Livestock and Other Agricultural Products
17	-.0000032	Mining
18	-.0000036	Electric, Gas, and Sanitary Services
19	-.0000038	Furniture and fixtures
20	-.0000040	Federal Government Enterprises
21	-.0000043	Miscellaneous Repair Services
22	-.0000046	Motion Pictures
23	-.0000055	Lumber and Wood Products
24	-.0000060	Auto Repair, Services, and Parking
25	-.0000071	Paper and Allied Products
26	-.0000085	Stone, Clay, and Glass Products
27	-.0000085	Business, Engineering Management Services
28	-.0000096	Transportation Equipment
29	-.0000107	Personal Services
30	-.0000139	Educational Services
31	-.0000141	Agriculture, Forestry and Fisheries
32	-.0000142	Chemicals and Allied Products
33	-.0000156	Electronic and other Electric Equipment
34	-.0000156	Primary Metals Industries
35	-.0000159	Communications
36	-.0000160	Hotels and Other Lodging Places
37	-.0000173	State and Local Government Enterprises

Table 15

OUTPUT CLUSTER DETAIL: Security and Commodity Brokers

(Base Model)

Rank	Share-Change	Sector
1	0.0017715	Security and Commodity Brokers
2	0.0000234	Federal Government Enterprises
3	0.0000205	Real Estate
4	0.0000125	Eating and Drinking Places
5	0.0000044	Health Services
6	0.0000033	Miscellaneous Manufacturing Industries
7	0.0000012	Local and Interurban Passenger Transit
8	-.0000001	Tobacco Products
9	-.0000001	Leather and Leather Products
10	-.0000010	Apparel and Textile Products
11	-.0000011	Pipelines, Except Natural Gas
12	-.0000018	Amusement Recreation Services
13	-.0000018	Social Services
14	-.0000033	Livestock and Other Agricultural Products
15	-.0000035	Water Transportation
16	-.0000036	Hotels and Other Lodging Places
17	-.0000039	Food and Kindred Products
18	-.0000051	Auto Repair, Services, and Parking
19	-.0000054	Miscellaneous Repair Services
20	-.0000061	Agriculture, Forestry and Fisheries
21	-.0000065	Mining
22	-.0000066	Personal Services
23	-.0000075	Educational Services
24	-.0000094	Motion Pictures
25	-.0000100	Furniture and fixtures
26	-.0000129	Lumber and Wood Products
27	-.0000131	Stone, Clay, and Glass Products
28	-.0000133	Electric, Gas, and Sanitary Services
29	-.0000152	Legal Services
30	-.0000153	Petroleum and Coal Products
31	-.0000154	Paper and Allied Products
32	-.0000171	Insurance Agents, Brokers, Service
33	-.0000177	Membership Organizations Household Services
34	-.0000252	State and Local Government Enterprises
35	-.0000275	Electronic and other Electric Equipment
36	-.0000292	Trucking and Warehousing
37	-.0000353	Business, Engineering Management Services

Table 16

OUTPUT CLUSTER DETAIL: Security and Commodity Brokers

(Survey-Data Model)

Rank	Share Change	Sector
1	0.0015960	Security and Commodity Brokers
2	0.0000116	Real Estate
3	0.0000081	Health Services
4	0.0000028	Miscellaneous Manufacturing Industries
5	0.0000022	Eating and Drinking Places
6	-.0000000	Local and Interurban Passenger Transit
7	-.0000000	Tobacco Products
8	-.0000001	Leather and Leather Products
9	-.0000008	Apparel and Textile Products
10	-.0000010	Pipelines, Except Natural Gas
11	-.0000011	Social Services
12	-.0000021	Amusement Recreation Services
13	-.0000024	Livestock and Other Agricultural Products
14	-.0000030	Federal Government Enterprises
15	-.0000030	Water Transportation
16	-.0000044	Food and Kindred Products
17	-.0000053	Miscellaneous Repair Services
18	-.0000053	Agriculture, Forestry and Fisheries
19	-.0000057	Mining
20	-.0000058	Personal Services
21	-.0000069	Educational Services
22	-.0000079	Furniture and fixtures
23	-.0000080	Auto Repair, Services, and Parking
24	-.0000082	Motion Pictures
25	-.0000083	Hotels and Other Lodging Places
26	-.0000107	Business, Engineering Management Services
27	-.0000110	Lumber and Wood Products
28	-.0000114	Stone, Clay, and Glass Products
29	-.0000142	Petroleum and Coal Products
30	-.0000143	Electric, Gas, and Sanitary Services
31	-.0000151	Paper and Allied Products
32	-.0000155	Insurance Agents, Brokers, Service
33	-.0000158	Membership Organizations Household Services
34	-.0000216	State and Local Government Enterprises
35	-.0000231	Electronic and other Electric Equipment
36	-.0000243	Trucking and Warehousing
37	-.0000262	Legal Services

Table 17

EMPLOYMENT CLUSTER DETAIL: Banking and Other Credit Agencies

(Base Model)

Rank	Share Change	Sector
1	0.0039098	Banking and Other Credit Agencies
2	0.0002992	Business, Engineering Management Services
3	0.0001972	Security and Commodity Brokers
4	0.0000629	Federal Government Enterprises
5	0.0000087	Local and Interurban Passenger Transit
6	-.0000001	Tobacco Products
7	-.0000007	Pipelines, Except Natural Gas
8	-.0000018	Leather and Leather Products
9	-.0000039	Petroleum and Coal Products
10	-.0000051	Water Transportation
11	-.0000060	Apparel and Textile Products
12	-.0000083	Miscellaneous Manufacturing Industries
13	-.0000107	Mining
14	-.0000125	Miscellaneous Repair Services
15	-.0000130	Livestock and Other Agricultural Products
16	-.0000134	Real Estate
17	-.0000171	Motion Pictures
18	-.0000175	Electric, Gas, and Sanitary Services
19	-.0000178	Lumber and Wood Products
20	-.0000210	Paper and Allied Products
21	-.0000215	Furniture and fixtures
22	-.0000242	Food and Kindred Products
23	-.0000257	Auto Repair, Services, and Parking
24	-.0000290	Stone, Clay, and Glass Products
25	-.0000313	Amusement Recreation Services
26	-.0000379	Eating and Drinking Places
27	-.0000397	Transportation Equipment
28	-.0000403	Communications
29	-.0000425	Legal Services
30	-.0000492	Insurance Agents, Brokers, Service
31	-.0000494	Agriculture, Forestry and Fisheries
32	-.0000504	Social Services
33	-.0000531	Hotels and Other Lodging Places
34	-.0000538	Instruments and Related Products
35	-.0000539	Primary Metals Industries
36	-.0000575	Chemicals and Allied Products
37	-.0000589	Personal Services

Table 18

EMPLOYMENT CLUSTER DETAIL: Banking and Other Credit Agencies
(Survey-data Model)

Rank	Share-Change	Sector
1	0.0035549	Banking and Other Credit Agencies
2	-.0000001	Tobacco Products
3	-.0000005	Pipelines, Except Natural Gas
4	-.0000013	Leather and Leather Products
5	-.0000030	Petroleum and Coal Products
6	-.0000033	Water Transportation
7	-.0000044	Apparel and Textile Products
8	-.0000072	Local and Interurban Passenger Transit
9	-.0000072	Mining
10	-.0000077	Livestock and Other Agricultural Products
11	-.0000096	Miscellaneous Manufacturing Industries
12	-.0000114	Lumber and Wood Products
13	-.0000130	Motion Pictures
14	-.0000135	Miscellaneous Repair Services
15	-.0000143	Furniture and fixtures
16	-.0000189	Electric, Gas, and Sanitary Services
17	-.0000189	Food and Kindred Products
18	-.0000196	Stone, Clay, and Glass Products
19	-.0000205	Real Estate
20	-.0000209	Paper and Allied Products
21	-.0000257	Federal Government Enterprises
22	-.0000259	Transportation Equipment
23	-.0000267	Amusement Recreation Services
24	-.0000326	Auto Repair, Services, and Parking
25	-.0000335	Agriculture, Forestry and Fisheries
26	-.0000348	Social Services
27	-.0000368	Primary Metals Industries
28	-.0000380	Instruments and Related Products
29	-.0000390	State and Local Government Enterprises
30	-.0000407	Chemicals and Allied Products
31	-.0000411	Personal Services
32	-.0000430	Rubber and Misc. Plastics Products
33	-.0000474	Insurance Agents, Brokers, Service
34	-.0000501	Hotels and Other Lodging Places
35	-.0000505	Communications
36	-.0000537	Security and Commodity Brokers
37	-.0000552	Legal Services

Table 19

OUTPUT CLUSTER DETAIL: Banking and Other Credit Agencies

(Base Model)

Rank	Share Change	Sector
1	0.0039589	Banking and Other Credit Agencies
2	0.0002802	Business, Engineering Management Services
3	0.0002775	Security and Commodity Brokers
4	0.0000467	Federal Government Enterprises
5	0.0000060	Local and Interurban Passenger Transit
6	0.0000037	Eating and Drinking Places
7	-.0000005	Tobacco Products
8	-.0000007	Leather and Leather Products
9	-.0000024	Real Estate
10	-.0000030	Pipelines, Except Natural Gas
11	-.0000038	Apparel and Textile Products
12	-.0000053	Miscellaneous Manufacturing Industries
13	-.0000085	Livestock and Other Agricultural Products
14	-.0000090	Water Transportation
15	-.0000104	Miscellaneous Repair Services
16	-.0000141	Amusement Recreation Services
17	-.0000149	Social Services
18	-.0000158	Agriculture, Forestry and Fisheries
19	-.0000164	Mining
20	-.0000189	Auto Repair, Services, and Parking
21	-.0000212	Hotels and Other Lodging Places
22	-.0000244	Motion Pictures
23	-.0000252	Personal Services
24	-.0000301	Paper and Allied Products
25	-.0000320	Lumber and Wood Products
26	-.0000330	Insurance Agents, Brokers, Service
27	-.0000342	Stone, Clay, and Glass Products
28	-.0000348	Educational Services
29	-.0000374	Furniture and fixtures
30	-.0000384	Electric, Gas, and Sanitary Services
31	-.0000390	Food and Kindred Products
32	-.0000404	Legal Services
33	-.0000406	Petroleum and Coal Products
34	-.0000448	Membership Organizations Household Services
35	-.0000655	State and Local Government Enterprises
36	-.0000678	Communications
37	-.0000853	Trucking and Warehousing

Table 20

OUTPUT CLUSTER DETAIL: Banking and Other Credit Agencies

(Survey-data Model)

Rank	Share-Change	Sector
1	0.0035806	Banking and Other Credit Agencies
2	-.0000003	Tobacco Products
3	-.0000006	Leather and Leather Products
4	-.0000021	Pipelines, Except Natural Gas
5	-.0000023	Local and Interurban Passenger Transit
6	-.0000030	Apparel and Textile Products
7	-.0000050	Livestock and Other Agricultural Products
8	-.0000058	Water Transportation
9	-.0000084	Miscellaneous Manufacturing Industries
10	-.0000104	Social Services
11	-.0000107	Agriculture, Forestry and Fisheries
12	-.0000112	Mining
13	-.0000129	Miscellaneous Repair Services
14	-.0000131	Amusement Recreation Services
15	-.0000148	Federal Government Enterprises
16	-.0000177	Personal Services
17	-.0000190	Motion Pictures
18	-.0000205	Lumber and Wood Products
19	-.0000214	Hotels and Other Lodging Places
20	-.0000232	Stone, Clay, and Glass Products
21	-.0000248	Furniture and fixtures
22	-.0000257	Educational Services
23	-.0000298	Eating and Drinking Places
24	-.0000310	Auto Repair, Services, and Parking
25	-.0000329	Petroleum and Coal Products
26	-.0000340	Insurance Agents, Brokers, Service
27	-.0000340	Paper and Allied Products
28	-.0000360	Food and Kindred Products
29	-.0000396	Membership Organizations Household Services
30	-.0000428	State and Local Government Enterprises
31	-.0000469	Real Estate
32	-.0000511	Electric, Gas, and Sanitary Services
33	-.0000515	Business, Engineering Management Services
34	-.0000575	Trucking and Warehousing
35	-.0000605	Railroad Transportation and Transportation Services
36	-.0000618	Legal Services
37	-.0000622	Security and Commodity Brokers

Financial sector

Table 21: Pairwise Regression of Changes in Market Shares

INDUSTRY	INTERCEPT	SLOPE COEFFICIENT	ADJUSTED R^2	F-STATISTIC
<u>Securities & Commodities</u>				
Employment	-.000 (0.09)	.887 (221.77)	.99	397.5
Output	.000 (0.00)	.888 (394.21)	.99	1241.2
<u>Banking & Credit Agencies</u>				
Employment	-.000 (0.07)	.884 (59.82)	.98	31.5
Output	-.000 (0.00)	.877 (55.17)	.98	30.1

Based on the regression $\alpha_{survey} = \beta_0 + \beta_1(\alpha_{base})$. The F-statistic is from a test of the null hypothesis that $\beta_0 = 0$ and $\beta_1 = 1.0$. The critical value for the test is $F_{.01}(2, 51) \approx 5.06$. In each case we reject the null hypothesis. For coefficient estimates the t-statistics are presented in parentheses.