"ECONOMIES OF SCALE AND SCOPE IN THE FRENCH MUTUAL FUNDS (SICAV) INDUSTRY"

by

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1. *Introduction*

The deregulation and integration of financial markets questions the viability of banks, their appropriate size and range of financial services that ought to be offered. The issue is particularly acute in the European Community where the second banking directive will allow for the free provision of financial services across borders by 1993. Recent domestic mergers between major banks in the Netherlands, Spain, Denmark and Norway illustrate the importance of the issue. Already, the European mutual fund industry is fully integrated since October 1989 [1].

The object of the paper is to contribute to the literature on economies of scale and scope in the financial sector. Concerned mostly with depository financial institutions offering deposits and loans services, previous American studies find little evidence of economies of scale, except for banks with assets under $100 millions. The empirical evidence does not support a conclusion of global economies of scope for joint production, but several studies report cost complementarities between pairs of products[2]. A case can be made that additional evidence on economies of scale and scope in the financial sector is needed because the deregulation of capital markets, securitization and the generalization, at least in Europe, of the universal banking model enlarge considerably the scope of banking activities.

The focus of the paper - French firms selling mutual funds (SICAVs)-contribute in part to this effort. Since the mutual fund industry relies very much on information

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[1]. Key features of European legislation involves the single banking licence, home country control and freedom of capital flows. A financial institution (including the subsidiary of a non EC bank) chartered in one country is allowed to provide services across borders. Solvency is assessed by the supervisor of the parent entity. A more complete analysis of European financial integration is available in Dermine (1990).

[2]. Excellent surveys are available in Clark (1988), Gilbert (1984) and Kolari-Zardkoohi (1987).

systems, one could anticipate that investments in computers and softwares create fixed costs and the potential for economies of scale. Turning the argument around, it could be argued that, if no economies of scale are found in the mutual funds industry, they are unlikely to be observed in other market-related activities. This study is to our knowledge, one of the very first on economies of scale and scope in the mutual fund industry[3].

The paper is organized as follows. A brief survey of the literature and its problems are reviewed in section two. The French SICAV industry and the sample are described in section three. The model is developed in section four and the empirical results follow.

2. *Short review of the literature*

The major developments of the literature can be grouped into six stages. In their seminal work, Benston (1965, 1972) and Bell-Murphy (1968) apply the Cobb-Douglas function to a set of banking products. As is the case for most studies, they use functional cost accounting (FCA) data, which are costs allocated by banks to specific products. As is well known, the Cobb-Douglas functional form is quite restrictive. In particular, it imposes constant cost-output elasticites over the entire range of production levels. The second stage is due to Benston-Hanweck-Humphrey (1982) who apply a flexible functional form, the translog, to an aggregate measure of output. The first two stages ignore jointness in bank production and assume that the costs of producing one output is independent of the costs of producing other outputs (Kim, 1986). Murray-White (1983) and Gilligan-Smirlock (1984 $_{a,b}$) take jointness of production into account. They apply the translog to a multi-product banking firm and estimate simultaneously scale and

3. Ferris-Chance (1987) provide evidence on economies of scale in the American mutual funds industry. However, they do not test for scope economies, nor do they use any of the 'modern' functional forms such as the translog.

scope economies. In a fourth stage, Mester (1987) and Berger-Hanweck-Humphrey (1987) push the literature further by providing more careful statistical tests and the concept of "expansion path" that allows for simultaneous change in scale and scope of production. In a fifth stage, Schaffer (1988), Lawrence (1989), Hunter-Timme (1986) and Rangan, Zardkoohi, Kolari and Fraser (1989) apply the analysis to large banking institutions. Finally, Sherman-Gold (1985) and Berger-Humphrey (1990) apply a mathematical programming technique, Data Envelopment Analysis, to study bank operating efficiency. A main result of the literature is the absence of economies of scale for banks with assets above $ 100 millions [4]. As far as operating costs are concerned, small banks can compete with large institutions.

Several problems have been recognized in the banking literature. They include, besides the focus on deposits and loan services, the definition of bank output, the use of FCA data, the measurement of input prices, the level of the organizational form and the degeneracy of the translog function at zero points.

A first problem has been the definition of bank output. Two schools are competing. The production approach takes the view that banks are selling services linked to loans and deposit accounts. The number of accounts is used as a proxy for output. The second school - the intermediation approach - takes the view that inputs such as capital, labour and deposits are used to produce an output, the earning assets.

Many of the studies have relied on functional cost accounting data. Large banks are excluded from this sample and the accuracy of data depends very much on the cost allocation system used by banks.

A third problem has been the difficulty in estimating input prices in cross-sectional study. This leads to possible measurement errors in explanatory variables.

Fourth, there is the issue of the level in the organization chosen to analyse costs and economies of scale: branch, bank or holding company.

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[4]. Schaffer is an exception (1988). But he applies an hedonic function to an aggregate measure of output.

Finally, in most of the empirical studies of multiproduct banking technology, the sample included banks which generally offered all products. That is, very little information about economies of scope is contained in the sample, since few of the observed banks specialize. A related issue, as emphasized by Berger, Hanweck, and Humphrey (1987), is that the translog functional form is not defined at zero output points so that the conclusions depend very much on the closeness of the zero output approximation. Furthermore, given the limited scope information, it becomes important to choose a functional form that does not distort the scope results. In particular, as pointed out by Röller (1990_a), the translog is not a good functional form to use due to its inherent flip flop property. He argues that the translog puts a heavy weight on the sign and significance of second order parameter estimates. The argument is as follows. Let the translog (TL) cost function be given by

$$
\text{(1)} \quad \ln(C) = \alpha_0 + \sum_{i=1}^{n} \alpha_i \ln(q_i) + \sum_{i=1}^{k} \beta_i \ln(p_i) + \frac{1}{2}\sum_{i=1}^{n}\sum_{j=1}^{n} \alpha_{ij} \ln(q_i)\ln(q_j) + \frac{1}{2}\sum_{i=1}^{k}\sum_{j=1}^{k} \beta_{ij} \ln(p_i)\ln(p_j) + \sum_{i=1}^{k}\sum_{j=1}^{n} \delta_{ij} \ln(p_i)\ln(q_j)
$$

where total cost, output quantities and input prices are being denoted by C, q_i (i = 1,...,n) and p_j (j = 1,...,k), respectively.

Assume that all α_{ii}'s in the above TL specification are estimated to be negative but small in absolute value. In this case, it is easily verifiable that the TL cost function approaches zero as either one of the outputs approaches zero, leading by definition to disecononomies of scope[5]. Alternatively, assume that α_{ii} is positive. Now the limiting behaviour of the TL is infinity as the output tends towards zero, leading to tremendous economies of scope, since any specialization is very costly. Thus, as one or more outputs

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[5]. Note that Mester (1987, p. 424) and Berger-Hanweck-Humphrey (1987, p. 513) assume prematurely that total costs tend towards zero as outputs tend towards zero. This is clearly only true whenever $\alpha_{ii} < 0$.

approach zero, i.e. as production processes are modelled along the axis in output space, the estimated costs surface will either be zero or infinite, depending largely on the sign of the second order parameter estimate[6]. In other words, a change in sign of α_{ii} will flip-flop the cost surface around, leading to a fundamentally different cost structures - globally as well as locally - and different policy conclusions.

In conclusion, to empirically analyze economies of scope one should ideally include a large number of firms that have specialized and not rely exclusively on the TL specification[7]. In the current study we will do both, as well as try to avoid some of the other problems discussed in this section.

3. *The Mutual Fund (SICAV) Industry in France*

The growth of mutual funds in France ('Organisme de Placement Collectif en Valeurs Mobilières') is a recent phenomenon. Closed-end funds were created in 1945, while open-end funds appeared in 1964. The assets managed by these funds in 1979 added up to FF 47 billions. Growth started in 1979, following a favourable tax treatment of equity investment and a regulation on interest rates paid on time deposits[8] . The size of the market increased at an annual growth rate of 50% to reach FF 1213 billions in 1987.

French mutual funds are divided in two categories that account for 25% and 75% of the market respectively: Fonds Commun de Placement (FCP) and Sociétés

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6. In addition, these second order effects are often insignificant. See for example the studies in the US telecommunication debate (Evans and Heckmann, 1984; Charnes, Cooper and Sueyoshi, 1988).

7. For example, Röller (1990b) develops a proper quadratic cost function model which does not suffer from the flip flop property. Applied to the US telecommunication industry most of the robustness problems experienced in the literature are shown to disappear.

8. Monory Law (1978) and Delors Law (1983). A more detailed analysis of French regulations is available in Hawawini (1987) and Boeglin (1989).

d'Investissement à Capital Variable (SICAV)[9]. Because of data availability, the study is exclusively concerned with SICAVs. France is a dominant player in the European mutual funds market[10] with a market share of 51%.

Institutions

In this study, the multi-product firm is an institution that offers several types of SICAVs characterized by their risk-return characteristics. The sample includes 137 institutions offering 604 SICAVs. The data are gathered from TGF, a subsidiary of the French credit institution, Caisse des Dépots et Consignations. Twenty five SICAVs had to be eliminated because they were offered jointly by a group of institutions. The remaining SICAVs represent 94% of the market.

Data on the volume of funds managed by the 137 institutions are given in Table 1.

(Insert Table 1)

Institutions range in size from FF 100 millions to FF 152, 500 millions. As the last quintile indicates, there is a number of very large institutions. The individual market shares of the five largest firms are reported in the table. Together, these institutions control 56% of the market.

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9. A SICAV is an incorporated firm, subject to the July, 24, 1966 Law on Commercial firms. A FCP is simply a mandate given by investors to a manager. SICAVs are subject to the "obligation de l'obligation", that is an investment requirement of 30% of assets in bonds.

10. The market share of the United Kingdom, Germany and Italy are respectively 20%, 11% and 18% (ABB, 1989).

SICAVs

TGF and the Commission des Opérations de la Bourse recognize twelve categories of SICAV. To limit the number of parameter estimates, we have grouped them into five categories.

A = Money Market Funds

B = French bonds

C = French equities

D = Real estate

E = International.

The definition of the twelve categories and their grouping is discussed in appendix. Wherever an institution is offering several SICAVs of the same category, they are merged into one. After merging, we keep 137 institutions offering 298 SICAVs.

Data on the volume of assets in each category, the number of SICAVs, their size and the level of operating expenses are given in Table 2.

(Insert Table 2)

The operating expenses published by TGF include the costs of promotion, auditing and legal fees and the management fee[11]. One observes a heavy concentration in money market funds, the size of which range from FF 200 millions to FF 80, 500 millions.

Degree of Specialization

A unique characteristic of the sample is that many institutions specialize, that is they do not offer all products (SICAVs). As a consequence, we are fortunate to have a

[11]. Separate data on the management fee are not available. The definition of operating expenses is similar to the one used by Ferris-Chance (1987).

large number of 'zero' points in the sample. Evidence on the degree of specialization is reported in Table 3.

(Insert Table 3).

Sixty institutions, almost half the sample, offer one category of SICAV only. Twelve institutions offer all products.

4. The Model

Using the above data set for the French mutual funds industry we now specify a model analyzing the underlying multiproduct technology. We assume that each institution is a multiproduct firm selling up to five types of SICAVs described above. The output is defined as the total asset of each type of mutual fund. The total cost variable is based on the operating expenses which include costs of promotion, auditing and various management fees. In fact, it is rather a revenue variable as the management fee could incorporate a profit margin. This raises the problem of market power. That is, our total cost variable may not differentiate between variations in total costs across firms and higher revenue fees due to market power. In the next section we estimate a model that separates the scale effect from the market power effect.

Our sample constitutes a cross section of 137 institutions located in Paris, having access to the same technology and facing similar factor prices. With this in mind we define the cost function as the usual problem of minimizing costs subject to factor prices, using the following second order approximation

$$(2) \quad C^*(q^*) = \alpha_0 + \sum_{i=1}^{n} \alpha_i q_i^* + \sum_{i=1}^{n} \sum_{j=1}^{n} \alpha_{ij} q_i^* q_j^*$$

where $q^* = (A,B,C,D,E)$ is the output vector of five mutual funds and $C^*(q^*)$ is total costs. Note that input prices and an index of technology are assumed to be imbedded in the constant term. Thus, homogeneity, concavity, and nonnegativity can not be explicitly imposed. Also, factor demand equations via Shepard's Lemma cannot be used in the estimation.

We estimate the above model (2) using two types of functional forms. First, the well-known TL cost function given by $C^*(q^*) = \ln C(\ln(q))$. One of the main reasons for the analysis is to investigate the multiproduct nature of the data. As discussed above the translog is not particularily well suited for analyzing economies of scope. For this reason we also estimate a quadratic (Q) cost function obtained simply by $C^*(q^*) = C(q)$. One nice feature of the data set is that the output vector is rather dispersed. That is, we have some institutions offering a host of mutual funds, as well as other institutions that have specialized. This implies that this data carries significant information regarding both scale and scope. The correlation matrix (in levels and logs) is given in Table 4.

(Insert Table 4)

5. Empirical Results

The parameter estimates for the basic translog and quadratic cost functions for model (2) are reported in Table 5[12].

(Insert Table 5)

It can be seen that the quadratic form explains more than 99% of the variance in costs across firms, whereas the translog explains more than 89%.

Overall returns to scale (ORS) measures cost behaviour when all outputs are expanded by the same proportion, that is overall returns to scale exist if and only if the sum of the cost-output elasticities is larger than one, thus

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[12] Cost-complementaries (CC) for the case of the quadratic functional form can easily be obtained from Table 5 since

$$CC_{ij} = \frac{\partial^2 C}{\partial q_i \partial q_j}$$

$$ORS=\left[\sum_{i=1}^{n}\frac{\partial \ln C}{\partial \ln(q_i)}\right]^{-1}$$

Table 6 reports the overall returns to scale estimates for two functional forms evaluated at the five size categories.

(Insert Table 6)

For the TL cost function we observe increasing and significant ORS for at least the first two size categories of 1.42 and 1.16 respectively. For the three larger size classes we can not reject the hypothesis that constant ORS exists. The Q cost function yields very similar results regarding the smaller size institutions. ORS are increasing and significant at 1.44 and 1.12 for the two smaller size categories respectively. As the institution grows, however, the Q form yields significant diseconomies of scale. The discrepancy between the TL and Q cost function for some ranges in output space is hardly surprising. The fact that the TL may overestimate returns to scale has been documented in the literature (Guilkey and Lovell, 1980). Nevertheless, it can be stated that economies of scale exists up to roughly FF2.9 billion in total assets, whereas for larger firms constant or possibly declining returns to scale prevail.

Overall economies of scope (OEOS) exist if single output production is more costly than multioutput production, that is

$$C(q_1,0)+C(0,q_2)-C(q_1,q_2)>0$$

Overall economies of scope can only be evaluated for the Q cost function. The translog functional form is not defined at zero output points. Furthermore, any approximation of economies of scope based on the TL will be subject to the erratic limiting (flip flop) behavior. This applies, to a somewhat lesser extend, to any of the hybrid transformation as well, and is likely to produce meaningless and nonrobust results.

Table 7 reports the degree of OEOS results for the Q functional form, which is defined as OEOS/C(q).

(Insert Table 7)

That is the degree of OEOS is the percentage decrease in total costs from joint production. It can be seen that a similar picture emerges as for the economies of scale results, that is, most of the overall economies of scope exist for smaller firms. In particular, in the total asset range of up to FF1.3 billion costs would be more than doubled by breaking the firm into its five components (an increase of 125%). This cost savings is somewhat reduced in firms of asset size of up to FF2.9 billion (a cost saving of 46%), but still statistically significant. For medium size firms the cost savings from combined administration of mutual funds is statistically insignificant, and for the very large firms (total assets from FF2.9 billion and above) substantial and significant scope economies disappear (costs increase by up to 106% for the very largest firms).

One may very well wonder whether these scope economies for smaller firms are due to strong economies between just one or two out of the five mutual funds, or whether all mutual funds exhibit some form of cost complementarity. If the former is the case one would possibly expect that under competetive pressure some firms would specialize in one subgroup of mutual funds, and other firms in a different subgroup. If the latter is the case, one may very well argue that small firms need to offer all the mutual funds to be competitive. To investigate this issue further we analyze product specific economies of scope (PSEOS), defined for two subgroups of the n-dimensional output vector q, say $q_a = (q_1,..,q_l)$ and $q_b = (q_{l+1},..,q_n)$. Then PSEOS with respect to q_a and q_b exist if and only if

$$C(q_a, 0) + C(0, q_b) - C(q_a, q_b) > 0$$

Table 7 reports the degree of PSEOS for various subgroups. It is clear that significant economies of scope exist for smaller firms and not for larger firms independently of the subgroup break down. This indicates that for smaller firms economies of scope exist between all funds.

Thus, it appears that both economies of scale and scope exist for smaller firms, and disappear for larger firms. Furthermore, the economies of scope exist indiscriminantly across all products. This would indicate that in the French mutual fund industry, it is a medium size and diversity that would ensure survival in an increasingly competitive environment.

It is interesting to compare the actual market structure to the estimated cost-minimizing industry structure, i.e. the one that would be observed in a competitive environment. As described in section 3 the French mutual fund industry is characterized by a large number of specialized institutions. Sixty firms offer one SICAV only. Starting from the existing market structure we next present some estimates of the cost savings arising from hypothetical mergers of specialized firms. Table 8 presents three such mergers of small and specialized firms.

(Insert Table 8)

For example, merging the average institutions specializing only in SICAV A and B would result in cost savings of the order of 17.9%. These differences between the cost-minimizing and the actual industry structure could be explained by the fact that the industry has not yet reached a mature and competitive state.

A related but different issue is that of relative market power. A non-competitive management fee does not distort our results if the mark up is constant across firms. However, if larger firms achieve higher price-cost margins due to relative market power, higher management fees do not represent higher costs. This issue is addressed in the next section.

6. Market Power

As discussed above, total cost is based on the operating expenses which includes a various management fee and, possibly, a profit margin. This raises the problem of market power, that is, larger firms would (incorrectly) appear to have no economies of scale if market power allows them to charge a higher management fee. Thus, the result found in the previous section, namely that larger firms have no economies of scale, would be incorrect if market power is significant. To handle this issue, we take two approaches. In the first one, we modify the cost equation to incorporate a market power variable. In the second approach, we eliminate the largest institutions from the sample. Consider first the following model,

$$(3) \quad F = e^{\delta \cdot MS_i} C^*(q^*)$$

where F denotes total operating expenses including the management fee, MS_i, is the market share of firm i in the total mutual fund market, and C^* denotes operating expenses <u>net</u> of the management fee. The parameter δ will test whether market power allows larger institutions to achieve higher price-cost margins. Note that the above specification assumes that market share increases profit margins exponentially.

Table 5 reports the OES estimates of (3) for the TL specification. It can immediately be seen that the market power parameter δ is not significant, indicating that market power is not important and that the industry may be characterized by a fair degree of symmetric competition. Furthermore, the returns to scale estimates reported in Table 6 indicate that scale economies are, if anything, even smaller now. In particular, significant scale economies only exist for the smallest institutions. All the other institutions essentially exhibit constant economies of scale.

An alternative approach to disantangle market power from scale effects is to eliminate the largest institutions from the analysis. In our sample, in particular, the largest five institutions hold 56% of the total market. However, none of the results reported above in Section 5 are affected by the elimination of the five largest firms[13].

The absence of market power could be explained by the distribution system in France. The SICAVs are distributed mostly through the branch network of banks. Branches have an incentive to promote the SICAVs managed by their banks and a local monopoly power could exist at the level of branches which hold a captive clientele. This market power would be identical for the branches of small and large banks.

7. Conclusions

The purpose of the paper has been to analyze empirically the degree of economies of scale and scope in the French mutual fund industry. The focus on a very specific sector of the financial services industry is motivated by two reasons. The first is that the sample of firms includes small, large, specialized and diversified institutions. It is extremely well suited to study economies of scale and scope. The second reason is that the mutual fund industry uses information technology intensively. One could extrapolate the results to other market-related activities. It appears that both economies of scale and scope exist for smaller firms, and disappear for larger firms. Furthermore, economies of scope exist indiscriminantly across all products. This would indicate that in the French mutual fund industry, it is both medium size and diversity that would ensure survival in an increasingly competitive environment.

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[13]. These results are available from the authors upon request.

Furthermore, it appears that the cost-minimizing industry structure is quite different from the actual industry structure, indicating some potential for future restructuring of the industry. Our empirical results suggest that this restructuring is likely to yield less specialized firms of medium size.

Finally, these results are not affected by controling for market power. Dropping the five largest institutions or adding a mark up variable, we find no empirical support for the hypothesis that larger institutions have higher price-cost margins. Thus, it does not appear to be true that the lack of economies of scale is due to large institutions demanding higher prices.

Appendix: Grouping of SICAVS

TGF and the Commission des Opérations de la Bourse consider twelve categories of SICAV, defined as follows:

	'SICAV court terme'
1. 'SICAV monetaire':	More than 75% of assets in money market assets, such as T-bills, commercial paper or Repos.
2. 'SICAV régulières':	Primary objective is to stabilize value.
3. 'SICAV sensible':	accept 'some' fluctuation in value.
'SICAV Obligataires'	
4. 'SICAV obligataire'	French bonds with state 1er catégorie guarantee
5. 'SICAV Obligations Long Terme':	Other french bonds.
	SICAV Actions Francaises
6. 'SICAV Monory - CEA':	Investment in French shares benefiting from the 13 July 1978 Loi sur l'orientation de l'epargne (Monory Law) and Loi de Finance de 1983 (Delors Law). More than 60% of assets in french stocks.
7. 'SICAV Immobilières et Foncières':	Real estate
8. 'SICAV diversifiées francaises':	Investment in French Stocks.

SICAV Internationales

9. 'Dominante Actions':	Mostly shares
10. 'Dominate Obligations:	Mostly banks
11. 'Diversifiées':	Bonds and Shares
12. 'Specialisées':	Industry or country specific.

The grouping into five categories is achieved as follows:

SICAV A = Money Market Funds: 1 + 2

SICAV B = French Bonds = 3+4+5

SICAV C = French Shares = 6+8

SICAV D = Real Estate = 7

SICAV E = International = 9+10+11+12

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Table 1

The Size of the 137 Institutions in 1987
(FF Millions)

Quintiles	Mean	Minimum	Maximum
1	178	100	300
2	515	300	800
3	1267	900	1800
4	2804	1800	4100
5	25266	4600	152500

The five largest institutions include:
Crédit Agricole (17.7% market share)
Banque Nationale de Paris (11.48%)
Caisse des Dépôts Consignations (11.1%)
Crédit Lyonnais (9.2%)
Sociéte Générale (7%)

Table 2

Charactersitics of the SICAVs (December 1987)

SICAVs	(FF billions) Number	Market Size	Size of SICAVs (FF millions) Mean	Minimum	Maximum	Operating Expenses Per SICAVs (%) Mean	Minimum	Maximum
Money Market Funds	89	433.7	4873	200	80500	0.5	0.05	1
French Bonds	93	216.7	2330	100	39700	0.7	0.1	1.2
French Equities	41	117.2	2858	100	26500	0.82	0.2	1.2
Real Estate	15	12	800	100	6900	0.7	0.4	1.05
International	60	81.7	1362	100	6900	0.76	0.02	1.5

Table 3

The Specialization of the 137 Institutions

Institutions offering one SICAV only:	Number
SICAV A	23
SICAV B	23
SICAV C	2
SICAV D	0
SICAV E	12
	60
Institutions Offering More Than One SICAV	
SICAVS A and B	16
SICAVS A, B and C	5
SICAVs A, B, and E	11
SICAVs A, B, C and E	15
SICAVS A, B, C, D and E	12
OTHERS	18
	77

[1]. Money Market Funds (A), French Bonds (B), French Equities (C), Real Estate (D) and International (E).

Table 4

Correlation Matrix

Log Variables

	LA	LB	LC	LD	LE
LA	1.00000 0.0000	0.17968 0.0356	0.43376 0.0001	0.26993 0.0014	0.20665 0.0154
LB	0.17968 0.0356	1.00000 0.0000	0.38035 0.0001	0.32679 0.0001	0.29849 0.0004
LC	0.43376 0.0001	0.38035 0.0001	1.00000 0.0000	0.47541 0.0001	0.46424 0.0001
LD	0.26993 0.0014	0.32679 0.0001	0.47541 0.0001	1.00000 0.0000	0.36254 0.0001
LE	0.20665 0.0154	0.29849 0.0004	0.46424 0.0001	0.36254 0.0001	1.00000 0.0000

Level

	A	B	C	D	E
A	1.00000 0.0000	0.85023 0.0001	0.86988 0.0001	0.75278 0.0001	0.64338 0.0001
B	0.85023 0.0001	1.00000 0.0000	0.96975 0.0001	0.57186 0.0001	0.68222 0.0001
C	0.86988 0.0001	0.96975 0.0001	1.00000 0.0000	0.59903 0.0001	0.69597 0.0001
D	0.75278 0.0001	0.57186 0.0001	0.59903 0.0001	1.00000 0.0000	0.39737 0.0001
E	0.64338 0.0001	0.68222 0.0001	0.69597 0.0001	0.39737 0.0001	1.00000 0.0000

A (Money Market Funds), B (French Bonds), C (Equity), D (Real Estate), E (International)

Table 5

Parameter estimates of Translog and Quadratic Functions

	Translog		Quadratic		Translog with market power	
	R^2 = 0.898		R^2 = 0.9987		R^2 = 0.895	
	Estimates	T Stat	Estimates	T Stat	Estimates	T Stat
α_0	-.4828	-1.27	1.146	1.89	-.75	-1.73
α_1	-.0107	-.13	.0046	8.13	-.16	-1.77
α_2	.0019	.022	.0020	1.93	.0669	0.79
α_3	.1470	2.59	.0105	6.63	.119	1.75
α_4	.2077	.918	.0145	2.07	.032	0.13
α_5	.0028	.025	.0103	7.93	.0023	0.02
α_{11}	.0509	5.469	-1.73E-07	-1.73	.077	6.12
α_{12}	-.0176	-3.791	2.90E.07	.79	-.019	-4.22
α_{13}	-.0084	-1.689	1.36E.07	.20	-.0069	-1.44
α_{14}	.0266	.679	.00001	5.61	.037	1.007
α_{15}	-.0097	-2.47	6.68E.07	2.64	-.010	-2.74
α_{22}	.0319	4.081	2.75E.07	1.87	.0184	2.059
α_{23}	-.0024	-.42	4.S1E.07	1.01	-.0026	-.48
α_{24}	-.0259	-.56	.000005	.70	-.0020	-.050
α_{25}	-.0162	-3.11	.000002	2.17	-.014	-2.81
α_{33}	.000067	.007	-.0000018	-2.35	-.0075	-.695
α_{34}	.0109	.411	-.000044	-2.83	-.0011	-.045
α_{35}	-.0056	-1.135	-.000003	-1.69	-.00066	-.135
α_{44}	.0074	.370	-.0000018	-.20	.0042	.19
α_{45}	-.0453	-.831	-.000036	-9.13	-.048	-.86
α_{55}	.0265	2.837	-.0000016	-6.41	.020	1.98
δ	-	-	-	-	-.0041	-.62

Table 6

Overall Return To Scale

Five Categories (1) (FF millions)	Translog Return to Scale	Quadratic Return to Scale	Translog with market power Return to Scale
100 < assets < 1300	1.423* (18.35)	1.437* (4.93)	1.25* (11.82)
1300 < assets < 2900	1.165* (3.30)	1.119* (2.87)	0.94 (0.47)
2900 < assets < 5200	1.223 (0.81)	0.955* (7.35)	1.01 (0.85)
assets > 5200 (2)	1.136 (0.28)	0.894* (4.47)	0.92 (0.03)
The five largest institutions offering the five Sicavs (3)	1.040 (0.01)	0.586 (3.38)	0.79 (0.07)

F Value in parenthesis

* Significantly different from one at the 10% level

(1) The groups' structure

100 < assets < 1300	no. of institutions 69	assets mean:	504.34
1300 < assets < 2900	no. of institutions 27	assets mean:	1855.5
2900 < assets < 5200	no. of institutions 19	assets mean:	4131.5
assets > 5200	no. of institutions 17	assets mean:	19770.5
The five largest institutions		assets mean:	72360.00

(2) The five largest institutions offering the five sicavs are not included.

(3) The five biggest institutions offering the five sicav are:
Crédit Agricole, Banque Nationale de Paris, Société Générale,
Crédit Commercial de France, Caisse Centrale de Banques Populaires.

Table 7

Economies of Scope

Quadratic Cost Function:

Five categories (FF millions)	Overall Economies of scope	Product Specific Economies of Scope			
		A,BCDE	AB,CDE	ABC,DE	ABCD,E
100 < assets < 1300(1)	1.25* (3.52)	0.30* (3.23)	0.29* (3.05)	0.29* (3.24)	0.31* (3.54)
1300 < assets < 2900	0.46* (2.89)	0.078 (1.28)	0.084 (1.42)	0.086 (1.63)	0.104 (2.36)
2900 < assets < 5200	0.028 (0.11)	-.055 (1.91)	-0.13* (4.70)	-0.11* (5.61)	0.045* (3.25)
assets > 5200(2)	-.367* (4.40)	-.391* (8.43)	-.632* (3.42)	-.282 (2.33)	-.050* (46.36)
The five biggest(3) institutions offering the five SICAV	-1.06* (6.30)	-1.12* (14.81)	-1.25* (4.73)	-.96* (46.9)	-.73* (8.3)

F value in parenthesis

* significantly different from zero at the 10% level.

(1) The groups' structure

100 < assets < 1300	no. of institutions 69	assets mean:	504.34
1300 < assets < 2900	no. of institutions 27	assets mean:	1855.5
2900 < assets < 5200	no. of institutions 19	assets mean:	4131.5
assets > 5200	no. of institutions 17	assets mean:	19770.5
The five biggest institutions		assets' mean:	72360.00

(2) The five largest institutions offering the five sicavs are not included.

(3) The five largest institutions offering the five sicavs are:
Crédit Agricole, Banque National de Paris, Société Générale,
Crédit Commercial de France, Caisse Centrale de Banques Populaires.

Table 8 :

Hypothetical Mergers of Specialized Firms

Merger of Specialized Firms	Overall Economies of Scope
A and B	0.179*
A, B, C and E	0.22* (2.64)
A, B and E	0.128 (1.38)

* Significantly different from zero at 10% level
t value in parenthesis

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