Car firms in the European Communities

a study on personal linkages, joint-ventures and financial participation

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CAP FIRMS IN THE

EUROPEAN COMMUNITIES:

A study on personal linkages, joint-ventures
and financial participations.

Meindert Fennema

M.F.

Paper prepared for the workshop on multinational corporations
of the ECPP-conference, Stras bourg, 28th March - 2nd
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This paper is an adaption of a master thesis in the Department
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CONTENTS

CONTENTS (continued)

1. OUTLINE OF THE STUDY.

1.1. Introduction.

In this thesis we will give some initial results of the empirical
work on personal linkages conducted at the Institute for Political
Science of the University of Amsterdam by the group of students
mentioned in the acknowledgment. In the data set we have 144
multinationals with at least one subsidiary in the Common Market.
Of these 144 multinationals 11 car firms are singled out for a
detailed case study which should provide us with hypotheses to be
used in the full length analysis of the data set.[*]

In paragraph 1.2. we explain why this kind of research is relevant
in the study of politics. Paragraph 1.3. gives the definitions of
the three forms of relations between firms which will have our
special interest in the rest of this thesis: personal linkages,
joint-venture relations and financial participation. These three
forms of relations will be compared for the car industry. This
productbranch is particularly suitable since all inportant car
producers are included in our data set (paragraph 1.4.)

The hypotheses developed in section 2 and compared with the empi-
rical data in section 3 and 4, and thus refined and reformulated.

These refined and reformulated hypotheses (section 5) can be tested
when we do the same sort of analysis as is done in section 3 and 4
for a larger set of firms and with more exact information on the
different forms of relations.

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[*] This will be done in my doctorate thesis, for which a governmental
subsidy has been granted.

1.2. The firm as an object of political science.

In this section we will explain why and how the private firm
can be regarded as an object of political science and why the
study of personal linkages between firms and between firms and
government institutions is important in this respect.

In the most general, Eastonian sense one can say that private
firms are allocating values authoritatively. Whether they should
do this "for society" or "for a society as a whole" to make their
activities political remains a matter of debate (Meehan,1967:171).
We will not enter this debate, but it is clear that we cannot re-
strict the term politics to the authoritative allocation of values
by the government. Stokman (1973:258,259) rightly attacks this nar-
row view by showing that under this restricted definition a subject
like wage policy can be studied by political scientists in some
periods but not in others, depending on whether formal decisions
are made by the government on this subject, or not.

Defining the activities of private firms as political because they
allocate values authoritatively has its dangers. It suggests that
corporate executives can freely choose the way in which to allocate
the values of their firm. In actual fact, however, their choice is
limited by the need for profitability. Thus if Unilever's Woodroofe
testifies before the U.N. committee of 20 'eminent persons',
that the power of Unilever is very limited, he may not be fully
mistaken.[*] As long as he defines power not in terms of the amount
of values allocated, but in terms of the number of options available
as to how these values are allocated, he may be even right. The
activities of Unilever may be unchecked by its employees or the
government, but they are definitely checked by the need for profit
and accumulation. In other words, the firms are subject to the laws
of motion of capital. As Marx once phrased it:

"Akkumuliert, akkumuliert! Das ist Moses und die Propheten!"
(MEW,23:621)

There is, however, more to it. Marx regarded the process of concentra-
tion and centralization of capital as a process of centralizing the

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[*] We define power here as the possibility to define the alternatives
of behaviour for other people. This implies that those who hold power
have a number of options to exercise their power. Thus a statement
like 'nature has power over human beings' is in our definition non-
sence.

ownership of capital. He implicitly assumed this ownership to be
identical with the power over the capital owned. However, through
the very process of concentration and centralization of ownership
of capital the relation between ownership of and power over capi-
tal becomes problematic. While we reject the thesis of Berle and
Means (1933) and more recently Galbraith (1967) that ownership of
capital has now-days little to do with control over capital, we
have to admit that the development of finance capital makes the
link between formal ownership and actual control complicated and
often indirect.

At the same time, the development from competition into monopoly
leads to the replacement of the blind market forces by the delibe-
rate strategy of finance capital (Fennema,1973: chapter II). This
leaves the multinational with the problem of what strategy it
should choose. And since the link between ownership and control
has become less direct, while at the same time number of options
available to the firm increases, a struggle for the power within
the firm is likely to develop. As Palloix sees it:

> "La mise en valeur du capital d'une firme peut donc se faire
> selon plusieur alternatives, avec certainement des oppositions
> entre les diverses fractions engagées dans tel ou tel procès
> de mise en valeur, d'où des changements d'équipe dans la di-
> rection de la firme, des luttes au sein d'appareil de direction
> ce qui fait de la firme un enjeu pour le capital financier qui
> préfère telle ou telle solution." (Palloix,1973:154)

This leads us to the following conclusions:

1. The corporate giant allocates an ever increasing amount of
values authoritatively.
2. Since the number of alternatives for the allocation of the
values of the firm has increased, the corporate giant can -
though still in a limited sense - be regarded as a political
actor.
3. The corporate giant - more than its predecessor, the small
industrial firm - can be regarded as a political system, where
different groups struggle with each other to obtain binding
decisions.

Our proposition is that the big firm in capitalist society is
still bound by the law of value; but the more the economy is
monopolized, the less this law realizes itself through the market.
The big corporation becomes the main institution through which the

law of value realizes itself, i.e. the allocation of resources
occurs within the corporation by shifting capital from those
product-divisions where the rate of profit is lowest to those
product-divisions where the rate of profit is highest. However,
size and complexity of the big corporation make that the strategy
necessary to obtain the optimal allocation -from the point of view
of capital- is not always clear and unambiguous. Besides, different
groups within the corporation may have different interests and
choose for different strategies.

But not only has the firm grown in size and complexity, many of
them have also become international. It is the internationaliza-
tion of capital which has drawn the attention of many political
scientist to the (multinational) corporation:

> "Surely the international organization of certain industries,
> e.g., oil, computers, chemicals, is as worthy a phenomenon for
> study by political scientists as the Organization of African
> Unity, the Andean Group, the Asian and Pacific Council, etc.
> Assuming this to be the case, let us consider one principal
> international organization theory, functionalism, in light of
> the activities of multinational enterprises."(Galloway,1971:11)

Lastly, we will consider the firm at a different level of analysis:
that of the relationship between the firm and the state. As I have
shown elsewhere, there is a growing interdependence between the
big firms and the state, while the state becomes more and more
involved in the process of accumulation of capital (Fennema,1973:
chapter III). This development has been partly recognized in the
pressure group theory and in the theory of political integration.
This latter theory is largely based on the study of the European
integration, and in this field it has long been recognized that
private enterprise should be regarded as a political actor (Haas,
(1958)1968:162). However, this has not lead to a systematic study
of private enterprise in Europe, except in a few cases (Besson,1962;
Feld,1970; Klein,1965; Meynaud & Sidjanski,1967; Meynaud & Sidjanski,
1971) Most scholars studying European integration -including Haas-
have been content with statements like "Belgian financial interests"
or the "business community" (Haas,(1958)1968:199,293).

Like most modern economists, De Jong uses the concept of concentra-
tion in such a way that it comprises both concentration and
centralization as used by Marx ((1867)1970:625,626).

To deepen our insight in the process of political integration it
is necessary to study the structure of this 'community', the mor-
phology as some have called it (Morphologie,1966), the functioning
of business and its interests. Only then one can answer the questions:
what decisions are made by the different firms, where are they made
and why? Subsequently one can ask what the consequences are of these
decisions for the process of political integration.

We can summarize our argument so far by saying that we regard the
multinational corporation as a political actor on two grounds:
a. the multinational corporation allocates values authoritatively and
b. the decisionmakers of the corporation have a certain amount of
choice as to how these values are allocated. [*]

So far, little research has been done on the question what choice
the decisionmakers of the corporation have. This question can -and
should- be approached on two levels:

theoretically the question arises in how far the development of mono-
poly capital has an impact on the laws of motion of capital as analy-
sed by Marx;

empirically the question before us is what decisions are made by the
corporation, how are they made and where.

The study of personal linkages can only contribute to the answer of
the last part of the last question: how decisions are made and where.
It should be complemented by certain case studies of concrete issues
to find out what decisions are made.

In the process of decisionmaking of firms -individually as well as
collectively- personal linkages can play an important role. In the
most general sense a personal linkage between firms or between firm
and state can be regarded as a communication channel, and the net-
work of personal linkages as a network of communication between firms
and between firms and the state (Stokman,1973:262).

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[*] Theoretically our approach leads to the question in what way the
conditions a and b have to be fulfilled to speak of a political actor
i.e. a political decisionmaker. At this moment we can say no more
than that both conditions should be fulfilled to a certain degree,
a degree which we are as yet unable to operationalize.

Our first task is to lay bare the structure of this communication
network. For this purpose statistical tools have been developed and/
or adapted by Jac.M.Anthonisse, F.N.Stokman and others (see note below).
In this paper we will also inquire into the nature of this communication
network, by formulating some hypotheses. In formulating these we will use

- existing theories on control of corporations;
- existing empirical research on personal linkages between Dutch firms
and state[*];
- the results of our research on multinationals in the European Commu-
nities.

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[*] This research has been conducted at the Institute for Political Science
of the University of Amsterdam and will be published soon:
Graven naar Macht by H.M.Helmers, P.J.Mokken, P.C.Plijter and F.N.Stokman
in coll. with Jac.M.Anthonisse. Van Gennep, Amsterdam.

1.3. Cooperation between firms.

The structure of industry can be defined as the totality of relations between firms. Number of firms, degree of concentration, different forms of cooperation, density of the network of personal linkages, all are properties of that structure. The specific features of the structure must be explained in view of the problems which the firms had to over-come. Thus the high degree of concentration relative to other industries of the car industry must be explained by taking the specific characteristics of car production into account.[*]

Product branch and nationality are important variables determining the industrial structure. For the explanation of relations between specific firms, however, such general variables do not suffice. The close connec-tion between Du Pont de Nemours and General Motors for example, can only be explained by taking the liquidity crises of GM at the end of World War I, together with the enormous war profits of Du Pont at that same time, into consideration.

Cooperation between firms can be distinguished as belonging to three types:

horizontal between firms in the same productbranch;

vertical between firms in the same product column, where difference is made between cooperation with suppliers (backward coope-ration) and cooperation with buyers (forward cooperation): naturally, what is forward to one firm is backward to the other;

diagonal between firms which belong neither to the same product branch nor to the same product column. Cooperation with financial firms is a special case of diagonal cooperation.

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[*] The concept 'degree of concentration' is a statistical concept indicating the market share of a certain number of the largest company in that mar-ket. Different formulae are used in calculating the degree of concentra-tion. This concept should not be confused with the concept of concentra-tion -either in the Marxist or in its 'modern' meaning- which is dynamic, since it indicates a process.

Different forms of cooperation.

The same force which brings firms into conflict with each other, i.e. competition, also forces them to cooperate.

This cooperation varies in intensity: from simple exchange of technical, economical or financial information to near merger.

Meynaud and Sidjanski (1967:28) distinguish two main forms of cooperation:

(I) "celle des accords ou ententes qui laissent normalement intact la structure juridique des firmes participantes;

(II) celle des operations financières qui entraînent une interpene-tration des capitaux."

In the first category we find agreements on selling and buying - jointly or according to certain rules (cartels). We also find there agreements on cooperation in production etc.

In the second category we find direct financial participation, and other forms of financial links, for example through loans. Meynaud and Sidjanski also consider the establishment of joint-ventures to belong to this category.

It is clear that the line between these two categories is difficult to draw. But that is not our main objection against the categorization of the two authors. Our main objection is the rather juridical nature of the criterium on which the distinction is based. We are not in the first place interested in the juridical structure of a firm, nor in its independence de iure. Our main interest lies in the real structure of a firm and in its independence de facto.

We therefore propose another distinction based on the scope of coop-eration and the intensity of that same cooperation.

By scope we mean the field of activity over which the cooperation is extended. Is the cooperation extended to all fields of activity of the firm or is it restricted to a certain field (a particular product, selling facilities, and the like)?

The first form of cooperation is incompatible with fierce competition between the two firms, while in the second situation it is well possible that the cooperating firms are competitors in a field of activity not covered by the cooperation.

We now can construct the following matrix:

FIGURE 1: Cooperation between firms.

SCOPE

		OVERALL	RESTRICTED
INTENSITY	HIGH	- holding company - financial partici- pation + multiple personal linkages	- joint-venture relation- ship
	LOW	- agreements on gene- ral strategy + single personal linkages	- cartel agreement - licence agreement - exchange of technical inform.

In this study we will only consider those forms of cooperation which are listed in the upper row. The reason being that information on less intensive cooperation is very difficult to obtain, so that any systematic data collection would take years. We thus consider only jointventure relationships and financial participation (of which a holding company is a special case).

A joint-venture is usually defined as a company which is (founded And) controlled by two different companies (or a company and a state institution) each having 50% of the stock of that company. In this study we will use a broader definition of joint-venture: any firm which shares are owned by two or more firms or institutions is regarded as a joint-venture of these firms or institutions. When we consider the relation between the joint-venture and one of its controlling firms or institutions we see a financial partici- pation of the latter in the former. The relation between the control- ling firms or institutions i a joint-venture relationship. (see figure 1a).

FIGURE 1a : Different relations involved in a joint-venture.

joint-venture relationship.

financial participation   70%   30%

joint-venture
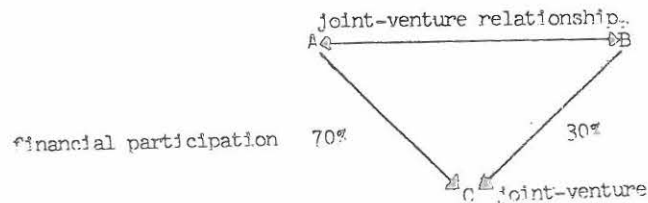
1.4. The car industry as a case study.

We chose for our case study the car industry for two reasons.
(1) The car industry is nearly a one-product industry. There is in fact only a difference between passenger- and commercial vehicles. There are of course different types of cars, but the differences are neglectable if we compare them with the huge number of products of chemical or electro-technical & electronical industry. This makes the relationships between the car firms and between car firms and other product branches easier to analyse, even though we realize that a firm like Fiat has its activities in other product branches, like building, traffic, air- craft and nuclear energy, while General Motors is sometimes regarded as a conglomerate.
(2) The main reason for choosing the car industry as a case study is its high degree of concentration. In nearly all car producing countries the largest four car firms have a market share of 90 % or more. This makes it possible to abstract from the smaller firms, which are either non-existent or play a minor role. This high degree of concentration makes that nearly all important car firms are included in the sample on which our data set is based. This data set consists of the directors and executives of 144 multinationals in 1970, with at least one subsi- diary in the Common Market. To obtain a sample which would consist of multinationals of different countries we divided the multinationals in 5 groups (U.S., U.K., Common Market, Japan and 'other countries') and took from each group the 25 largest. Apart from that we included financial institutions. (For an exact description of the selection procedure see Bolten and Fennema, 1972).

Selection of the car firms.

If we select from the 460 largest companies in 1970 (the 200 largest non-American companies plus the 260 largest American companies) those which are indicated in the Fortune lists as 'vehicle producers', we get 34 companies (see table 1). The Japanese car producers are not in- cluded in our case study, since we could not obtain their annual reports.[*] General Motors, Ford and Chrysler together produce 95 % of all American cars. Of the other car producers only American Motors has significant

[*] Later on we received the necessary information about Japanese firms from EXTEL information sheets, so that we now are in a position to include these firms in our data set.

interests in the Common Market. The rest is not included.

Of the European firms Salzgitter, Joseph Lucas (Industries) and Rolls Royce are excluded because they produce few or no passenger cars.

Of the companies left in table 1 only American Motors, Saab-Scania, Klockner-Humboldt-Deutz and BMW are not included in the data set of 144 multinationals in 1970 with at least one subsidiary in the Common Market. These four firms are underlined with a broken line. The eleven included firms are underlined. The following list of these firms also contains the CODE name to be used in the figures below.

1.	GM	General Motors Corp.	(USA)
2.	FORD	Ford Motor Company	(USA)
3.	CHRY	Chrysler Corp.	(USA)
4.	VW	Volkswagenwerk A.G.	(BPD)
5.	BENZ	Daimler-Benz A.G.	(BRD)
6.	FIAT	Fiat Sp.A.	(It.)
7.	RENA	Regie Nationale des Usines Renault	(Fr.)
8.	LEYL	British Leyland Motor Corp. Ltd.	(UK)
9.	CITR	Citroën S.A.	(Fr.)
10.	PEUG	Automobiles Peugeot S.A.	(Fr.)
11.	VOLV	A.B.Volvo	(Sw.)

Definition.

The only problem left for this section is the problem of definition, because

"In theory, an auto producer might be just an assembler of parts, all of them purchased from suppliers, perhaps designed by the assembler but purchased outside. In fact, the current producers are highly integrated, owning all of the assembly and most of the stamping, machining, and casting facilities for making items like glass, upholstery, steel, batteries, and spark plugs." (White,1971:77)

We will not define the car industry in its narrow sense as only assembling purchased parts. Those products, however, which have a wider use than serving as parts of a car, such as steel, glass, upholstery, paint and rubber are regarded as belonging to another product branch. So do radio's, spark plugs, which belong to the electro-technical industry.

In this paper we will regard only the steel producers as belonging to the productcolumn to which also the car industry belongs.

TABEL 1

List of vehicle producers belonging to the 460 largest companies in 1970. [1)]

		1970 Rank in the list of non-Am. firms (Fortune, Aug.,1971)	1970 Rank in the list of Am. firms (Fortune, May 1971)	In the data set
1.	General Motors		1	x [2)]
2.	Ford Motor		3	x
3.	Chrysler		7	x
4.	Volkswagenwerk	3 (BRD)		x
5.	Daimler-Benz	12 (BRD)		x
6.	Fiat	16 (It.)		x
7.	Toyota Motor	17 (Jap.)		J
8.	Mitsubishi Heavy Industries	19 (Jap.)		J
9.	Renault 3)	20 (Fr.)		x
10.	British Leyland Motor	22 (U.K.)		x
11.	Nissan Motor	23 (Jap.)		J
12.	Citroën	48 (Fr.)		x
13.	Peugeot 4)	49 (Fr.)		x
14.	Borg-Warner		108	s
15.	American Motor		110	s
16.	Volvo	77 (Sw.)		x
17.	Eaton Yale & Towne 5)		121	s
18.	Honda Motor	90 (Jap.)		J
19.	Studebaker-Worthington		143	s
20.	White Motor		150	s
21.	Salzgitter 3) 6)	96 (BRD)		s
22.	Komatsu 7)	101 (Jap.)		J
23.	Toyo Kogyo	109 (Jap.)		J
24.	Joseph Lucas (Industries) 8)	112 (U.K.)		x
25.	Saab-Scania	113 (Sw.)		-
26.	Clark Equipment		178	s
27.	Dana		179	s
28.	KHD(Klöckner-Humboldt-Deutz)	114 (FRD)		s
29.	Rolls-Royce	122 (U.K.)		-
30.	Isuzu Motors	133 (Jap.)		J
31.	BMW	170 (BRD)		s
32.	Fruehauf		242	
33.	Pacific Car & Foundry		257	
34.	A.O.Smith		259	

Notes from table 1

1) This list is based on two Fortune lists: 'The 200 largest indus-
trials outside the U.S. , Fortune, Aug. 1971; and 'The 500 largest
industrial corporations in the U.S.", Fortune, May, 1971. From the
last list we only took the 260 largest so that the smallest American
firm (Crower, Collier & Macmillan) is just as big as number 200 of
the list of non-American firms (J.Lyons). This is how we got the
460 largest firms of the world.
When selecting the 'vehicle producers' from this lists we encountered
the problem that in the Fortune list of American companies no pro-
duct or industry is indicated. To categorize the American firms
we used the appendix I in the book of Chevalier (1970). This appendix
however is based on data from 1965 so there might be a difference be-
tween the Fortune list and Chevalier's.
An additional difficulty of the Fortune list is that it often gives
several branches or products, without indicating how important the
respective products are for the firm: i.e. the relative amount of
output and profit. Thus some firms cannot be classified with great
precision in one industry or another. This is true for Salzgitter,
Joseph Lucas and Rolls-Royce.

2) An x indicates that the firm is included in our data set. An -
indicates that the firm should be included in our sample according
to its size, but not according to its degree of multinationality or
that it did not have a subsidiary in the Common Market (see Selection,
1972). A J indicates a Japanese firm which, for that reason, is not
included in our data set. An s indicates that the firm was too small
to be included in the data set.
3) State owned or controlled.

4) Peugeot has been included in the data set, although it did not
have a sufficient degree of multinationality (a subsidiary in at
least 10 countries).

5) In Chevalier's list we found Eaton Manufacturing. We assumed that
the firm has merged since.

6) Salzgitter produces, according to Fortune, steel, machinery, and
vehicles. Had it been included in our sample, it would certainly
have been put in subset "metal & machines".

7) Komatsu produces, according to Fortune, machinery and vehicles.

8) Joseph Lucas produces, according to Fortune, motor vehicles and
aircraft equipment. In the sample we categorized the firm as electro-
technical & electrical (subset 3). The firm is not included in the list
of car producers of Moneta (1963: 39,40).

2. PERSONAL LINKAGES : SOME THEORETICAL ASPECTS.

2.1. The problem of definition.

In most of the Anglo-Saxon studies concerning personal linkages between
firms the term interlocking directorate is used (Villarejo,1961). This
term is quite adequate for British and U.S. firms, where both executives
and 'outside directors' have its place in the board of directors and
consequently nearly all linkages between firms are carried by members
of the board of directors.
In European firms things are different. A German firm, for example, has
a "Vorstand" and an "Aufsichtsrat", a Dutch firm has a "Raad van Bestuur"
and a "Raad van Commissarissen". The "Vorstand" and the "Raad van Be-
stuur" consists of executives; the "Aufsichtsrat" and the "Raad van
Commissarissen" consists of outside directors. Overlapping is illegal.
Thus, although "Aufsichtsrat" and "Raad van Commissarissen"are often
compared with the Board of Directors, they differ considerably, also
in involvement in company activities: the Board of Directors meets
in general each month, while the "Aufsichtsrat" and "Raad van Commissa-
rissen" often meet no more than four times a year.
It would be misleading to call members of all these different boards
'directors'; therefore we will not use the term 'interlocking direc-
torate', but we will use the more general term 'personal linkage'.
A personal linkage between two firms or institutions exists whenever
a person has simultaniously a function in these firms or institutions.
The representation of such a linkage is an ' 'arc'. We will use
these two terms interchangable.
A person can be responsible for ('carry') several arcs between diffe-
rent firms. On the other hand, one arc between two firms can be carried
by more than one person. We give the arcs a weight equal to the numb-
er of persons carrying that arc. If no weight is explicitly given, the
weight of the arc is 1.

2.2. The meaning of personal linkages.

2.2.1. The Board of Directors.

As we said before, we want to investigate the nature of the communication between two firms between which there exist an arc. To do this it is necessary to know something about the functions of the policy-making committees in the firm. These are

Board of Directors	(and executive committee(s))	U.K. and USA
Aufsichtsrat	and Vorstand	West-Germany
Conseil d'Administration	and Direction	France
Consiglio di Administrazione		Italy
Raad van Commissarissen	and Raad van Bestuur	Netherlands

We do not suggest that there are no other policy-making organs in firms, but they will be either exeptional or insignificant. Nor do we suggest that the influence these organs have is equal in all cases. The influence of the different organs differs from country to country and even from firm to firm, depending on specific historical factors.

One of the first scholars to study personal linkages between firms was the German economist Jeidels in his book "Das Verhältnis der Deutschen Grossbanken zur Industrie mit besonderer Berücksichtigung der Eisenindustrie." published in 1905.
Jeidel's main thesis is that there is a new development in German industry which gives the relations between banks and industry a new form and a new content. The six big banks are growing rapidly, local bankers are taken over and replaced by branches of the big banks. There is a growing relationship between big banks and industry. More and more enterprises are drawn into the sphere of influence of the big banks. (Jeidels,1905:181) The influence of the banks is, according to Jeidels, for a great deal exercised through personal linkages of banks and firms, carried mostly by bankers who obtain a seat in the Aufsichtsräte of the industrial firms. As the results of Jeidels extensive empirical research show (see table 2 on page 15) there are also many arcs which are not carried by a banker. The fact however, that an industrialist sits in the Aufsichtsrat of a bank does, again according to Jeidels, not give him an important influence in the bank. This is due to fact that the bank is active in far more industrial

TABLE 2. Number of industrial firms with which the big German banks in 1903 have personal linkages. (source: Jeidels, 1905:161,162)

	Deutsche Bank	Diskonto Gesellschaft	Darmstädter Bank	Dresdner Bank	Schaaffhausencher Bankverein	Berliner Handels-Gesellschaft
Through executives	101	31	51	53	68	40
Through 'outside directors'	120	61	50	86	62	34
Together	221	92	101	133	130	74
Number of firms reached through the chairman of the B.of D. or the industrial firm or by more than two persons	98	43	36	41	38	33

spheres than the individual industrialist can oversee and control.

In his own words:

> "Eine Großbank ist ein so großes, so kompliziertes Gebäude allge-
> meiner, nicht bloß industrieller Kreditvermittlung, ihre Berliner
> Direktoren haben eine tatsächlich so unbegrenzte Selbständigkeit,
> der Aufsichtsrat besteht aus so verschiedenen Elementen, daß ein
> Industrieller im Aufsichtsrat nichts gegen die Verwaltung vermag."
> (Jeidels,1905:152)

This quotation reminds one of the concept 'internal control' launched by Berle and Means in 1933. Although they use the concept 'internal control' for industrial firms rather than banks, their arguments do not differ greatly from those of Jeidels. The main difference between Jeidels and Berle and Means is that the latter concentrate on the difference between ownership and control, while the former emphazises the independence of the management, not from the owners of the bank, but from the Aufsichtsrat members who are there to represent an industrial firm. But as long as the management do not contain important shareholders, the problem of all three of them can be reduced to the question how much influence does the Aufsichtsrat (the 'outside directors') have on the management of the firm. Because the directors, and especially the outside ones are supposed to represent the shareholders, it is important to consider the way in which the Board of Directors is elected. Formally, the power to elect the Board of Directors belongs to the meeting of shareholders. In actual fact however, this meeting has little or no influence upon the hiring and firing of directors. The mechanisms through which this happens to occur is different in every country, and even within the same country there are important differences in decision-making structure between different firms. Most well known institutions through which the power of the meeting of share holders over the appointment of directors is taken away are

- the voting power of the proxy-committee, to which a lot of small shareholders transmit the voting right of their shares, the committee often being controlled by the management. (USA);
- the voting power of the banks who exercise the voting rights of there shareholding clients (Germany);
- certificates are issued which give the same rights as shares, except voting right;
- complicated holding-systems and exchange of share between related firms (Belgium,France,BRD);
- transmission of decision power to foundations etc.

The articles of association may take decision power away from the meeting of shareholders by:

- giving the board of directors the right to nominate the new directors;
- giving voting rights to non-shareholders (Belgium);
- issuing shares without voting right (Belgium,France, BRD);
- issuing priority shares. (Cremers,1971:7-24)

These forms of institutionalized withdrawal of decision-making
power from the meeting of shareholders are the most frequent
ones in the respective countries. The list is by no means ex-
haustive. It is not the place here to dwell on the different
forms in different countries.

Our central interest lies in the question: if the meeting of
shareholders has been robbed of its major decision-making power,
to whom is this power transmitted? The answer of Berle and Means
to this question is: to the management. They call this 'internal control'.
There are others who deny this. Their answer is: to the big
snareholders.

The arguments of the latter run as follows:

a) Berle and Means assume internal control to be the case if none
of the shareholders have more than 15 % of the total amount of
shares. In actual fact it is often possible to dominate a firm
with far less: in some cases -depending on the overall distribution
of the shares- 5% is sufficient.(Chevalier,1970:202)

b) Berle and Means assume internal control, when they cannot find
shareholders with more than 15 % of the stock. It is,however,
quite possible that Berle and Means could not find out everything.
Villarejo gives an example of Firestone Tire & Rubber, classified
by Berle and Means as an internally controlled firm, while the
Firestone family possesses 25 % of the shares.(Villarejo,1961 (II,
1):56). Perlo also emphsizes this problem:

> "Stockholding by financial institutions is impersonal in form,
> but not in substance. The essence of the power of the leading
> bankers is the ownership of the most vital control blocks of
> all, the shares of the great banks. These stocks are very closely
> held. They are not traded on the stock exchanges. The "floating
> supply" that anybody with the funds may buy, is small. Maximum
> secrecy surrounds the identity of the owners."(Perlo,1957:41)

It is thus possible that Berle and Means were driven to the conclu-
sion of internal control by lack of data. The same goes for the
research by Larner on this subject (Larner,1966:779).

c) It remains to be seen in how far the management of the firms
which are 'internally controlled' possesses an important part of
the company's stock of shares.

However bitterly the two 'schools' oppose each other[x], they agree
on the crucial position of the Board of Directors. The 'internal
control school' states that the management of the firms is increa-
singly able to elect the outside directors themselves, while their
opponents maintain that the big shareholders nominate the outside
directors. (To simplify matters we will assume that the outside
directors in Anglo-Saxon firms are more or less comparable with
the members of the Aufsichtsrat in Germany, of the Raad van Commis-
sarissen in Holland, of the Conseil d'Administration in France and
of the Consiglio di Administrazione in Italy). It is also possible
that the big shareholders nominate the ton-executives of a company
and leave it to them to choose the outside directors and the executives
by means of cooptation.

Since the Board of Directors seems to play such a crucial role in
the decision-making process of the firm, we will now have a closer
look at the members of this board.

In a not widely distributed, but excellent article, Don Villarejo
gives a list of the different types of directors to be found in an
industrial firm in the USA. We will find in the Board of Directors,
so Villarejo says,

(1) propertied rich,"with a large and continuing stockholding";
(Villarejo,1961(III):2)[xx]

(2) investment bankers:

> "An investment banker may serve as a corporate director in one
> of several capacities. First, he may represent substantial holdings
> by the banking firm itself, by one of the firms other partners,
> or by clients. Second, and far more often, he represents the
> firm's connection to the money market. That is, the banker may
> represent a firm that handles all stock and bond offerings when
> the corporation in question needs new capital. A third, and much
> less obvious function is closely related to the first: a banker
> may represent financial interests with important stakes in the
> corporation which he serves as a director."(Villarejo,1961(III):2,3)

(3) commercial bankers are found less frequently on the Board of

Directors than investment bankers:

> "While commercial bankers are often preoccupied with deposits
> (note that a giant industrial corporations means millions of dollars
> in deposits for some commercial bank), many commercial bankers
> serve as corporate directors in their role as fiduciaries. That
> is, since the trust departments of these giant banks act as trus-
> tees for $66 billion worth of common stock, the banker actually
> represents a large stockholding over which he is bound to be
> concerned."(Villarejo,1961(III):3)

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[x] The bitterness stems mainly from the conclusions which were drawn
by Berle, Mean, Burnham and others on the political consequences of the
internal control thesis.
[xx] On the photocopy we got the page numbers are missing. Therefore we
numbered the pages ourselves from 1 to 17.

(4) <u>lawyers</u>, "partners of a handful of law firms which handle the legal matters of many of the large corporations", as well as "independent" lawyers (Villarejo,1961(III):4);

(5) <u>insurance company executives</u>, because

"(...)the giant insurance companies not only hold common and preferred stock of many of the sample (e.i.Villarejo's sample,M.F.) corporations, but also hold large portions of the bond issues of these same enterprises(...)"(Villarejo,1961(III):4);

(6) <u>local businessmen</u>, who are important in communities where the corporations has major plants;

(7) <u>miscellanious:</u> in this category Villarejo places,among others, educators and retired army officers.

"While certain of these types have special functions in respect to the ordinary activities of the corporation, some are simply directors because of their contacts (....) or because of their prestige value."(Villarejo,1961(III):5);

(8) <u>corporation executives who serve as director in other industrial corporations</u>. The function of such executives on the Board of Directors is not quite clear,

"It is significant, however, that we find cases of important suppliers having representation on the boards of their purchasers and vice versa."(Villarejo,1961(III):4);

(9) <u>corporation executives who are also director of the corporation which employs them</u>.

"In some cases, they may actually have built up sizable shareholdings in the corporations. However, such persons even though they are now wealthy, began their careers without the advantage of large property holdings. These persons are the true members of the socalled managerial class." (Villarejo,1961(III):4)

(10)<u>former officers</u>, whose directorship is a kind of token honor for concluded careers with the companies and/or provide counsel either to the management or to the board. (Villarejo,1961(III):5)

If we look at the outside directors (1 to 8) it is interesting to note that 4 out of 8 types represent, directly or indirectly, the capital owners. It is also noteworthy that the small shareholder seems to have no opportunity to call to account the commercial banker who is supposed to 'represent' him. Thus it is not farfetched to assume that only the big shareholders are truely represented in the Board of Directors.

On the other hand, the 4 types of outside directors who do not represent the capital owners do either represent another corporation (in the case of corporate executives (8)), provide the company

with special know-how (lawyers,, former officers, university professors) or with contacts with the capital market or important sectors of society (lawyers, educators, retired army officers and commercial bankers). We want to stress here that it is impossible to seperate the 'know-how function' from the 'contact function'. The latter can be regarded as a special case of the former: know how to contact. We only have to remind the reader to the number of succesful politicians in the USA who run an equally succesful law firm,to see this point.

When we compare Villarejo's list with the remarks made by Jeidels sixty years earlier there is a striking similarity. Of course, we should be aware of the differences:

a. It is generally assumed that in Germany the banks played (and play) a more dominant role in the process of concentration and centralisation of capital, than they did in other countries.

b. the separation between investment banking and commercial banking which is compulsory in the USA since 1930, did and does not exist in Germany.

c. The function of the Aufsichtsrat is slightly different from that of the Board of Directors.

d. The role of the investment banker is said to have declined in the USA since 1930, so that it is possible that - taking into account that before 1930 the separation between investment banking and commercial banking had not yet occurred - the situation in the USA around 1900 was more 'like that of Germany at the same time. (Sweezy,1953:189-198)

However, from the analysis of Jeidels, as well as from that of Villarejo, we can conclude that four main functions are underlying representation from outside in the Board of Directors, the Aufsichtsrat and other comparable institutions:

A. <u>Representation of the big capital owners.</u>

B. <u>Representation of other industrial firms.</u>

C. <u>Providing access to the capital market.</u>

D. <u>Providing special know-how and/or contacts with important sectors in society</u> .

It is clear that this conclusion solves by no means the internal
control dispute, since the fact that the big shareholders are
represented in the Board of Directors does not say very much about
the amount of influence they actually exercise. The only thing
we can savely assume is that they will not be entirely without.

2.2.2. Relations between firms.

Having regarded the control over the firm from the point of view
of the persons controlling -or not controlling- the firm, we will
now look at it from a different angle: that of the relations between
firms.

Here we can say that

- a firm which is represented in the Board of Directors of another
firm will be able to obtain information about the operations and
strategy of that firm in all its field of activity. This leads us
to assume that between firms which are directly competing there will be
no personal linkages. The absence of competition can have two differ-
ent causes. Either the activities of the two firms are such that there
need not to be competition between them, or the power relation between
them is such that they do not compete even though their industrial
activities would induce them to do so.[*] In the latter case there is
strong cooperation between them, or domination of the one over the
other. The first case exists when the firms belong neither to the
same productbranch nor to the same productcolumn(diagonal relation).
The second case exist when the firms belong to the same productbranch,
but cooperate very tightly. Since very close cooperation or domina-
tion between two firm tends to lead to extinction of at least one
of them as an independent legal entity, personal linkages between
firms in the same productbranch will be rare.
This hypothesis has been confirmed by the rsults of the research on
personal linkages between Dutch firms, conducted at the Institute
for Political Science of the University of Amsterdam (Graven naar
Macht (not yet published)).

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[*] In the USA the Clayton Act forbids personal linkages between such
firms; in the European Countries this kind of anti-trust regulation
does not (yet) exist.

Firms in the same productcolumn can be regarded as competing in so far
as each of them wants to obtain or maintain a monopoly or a monopsony
position,towards the others. Here we would nevertheless expect an urge
for cooperation because of the need for a regular flow of products, be
it raw materials or the final product. We expect to find relatively many
personal linkages between firms in the same product column.

- Although we do not expect many personal linkages between firms in the
same productbranch, this does not mean we do not expect any cooperation
between these firms. This cooperation, however, will take the form of
joint ventures. This form of cooperation allows the firms to cooperate
in certain fields, while still competing in others.

- The direction in which the influence is exerted (if any) cannot -in
general- be found by studying only personal linkages. If, in a capitalist
society, power is based on the possession of the means of production,
this would   mean that we should look for the possession of or
control over the shares of the company. Thus our hypothesis is that
in cases where a personal linkage is accompanied by share holding, the
direction of the influence exercised runs from the firm which holds
the shares to the firm which shares are held. This argument can be
extended to other forms of financial links, since these form an actual
or potential claim on the firm's means of production.

The last problem we will deal with in this theoretical section is the
meaning of personal linkages between firms and government institutions,
or in our case the institutions of the European Communities.
From the point of view of the firm it is important to have personal
linkages with those decision-making centres, which make decisions affec-
ting the vital interests of the firm. Thus we would expect to find for
example more personal linkages between the Euratom committees and the
electronical and chemical industry than between these committees and
any other productbranch. The same is, mutatis mutandis, true for the E.C...
and the coal and steel producers and consumers.

Since it is often not possible to establish personal linkages with
the governmental decision-making centre, firms will try to employ
former members of these decision-making centres. We will therefore also
regard the relationship between firms and ex-members of E.C.insti-
tutions, even though they do not constitute personal linkages in
the strict sense of the word.

2.3. Seven hypotheses.

We summarize the conclusions of this section by formulating some
hypotheses:

I.When firm A has a financial participation in firm B, we expect a
personal linkage between A and B. The influence exercises through
this personal linkage will run from A to B.

II. The number of arcs between banks and industrial firms is greater
than the number of arcs between any two industrial productbranches (a).
The centrality of the banks in the network of personal linkages is
higher than that of any industrial productbranch (b).

III. We expect to find the greatest number of arcs between banks
and those industrial productbranches where the need for access to
the capital market is greatest.

IV. Between firms in the same productbranch we will find relatively
few arcs, and the sharper the competition, the less arcs.(a).
Between firms in the same productbranch we expect relatively many
joint venture relationships(b).

V. Between firms of the same productcolumn we will find relatively many arcs,
and the closer the cooperation, the more arcs.

VI. The closer the cooperation between A and B or the greater the
domination of A over B the greater will be the weight of the arc
between A and B.

VII. Personal linkages between firms and E.C.institutions will be
found in those sectors where vital interests of the firm are dealt
with.

To test these hypotheses we need more than a case study of the
car industry, but except for hypothesis III we will make a start
by testing them in this paper. The results can thus be used to
formulate the hypotheses for a more extensive study on personal
linkages more precisely.

3. PERSONAL LINKAGES : THE CAR INDUSTRY IN THE COMMON MARKET.

3.1. The theory of graphs.

The relationship between firms, and groups of firms has been analysed
with the help of a method based on the mathematical theory of graphs.
The application of the graph theory to the field of industrial structures
has been developed by a group of students of the Institute for Political
Science at the University of Amsterdam, who produced a preliminary
report "Invloedstrukturen van politieke en economische elites in Neder-
land." The results will be published soon (Graven naar Macht, Van Gennep,
Amsterdam). The first to suggest the use of the graph theory in an ana-
lysis of personal linkages between firms were R.J. Mokken and F.N.Stokman,
while Jac.M.Anthonisse of the Mathematisch Centrum of Amsterdam developed
computer programs based on this theory.

Basically graph theory is very simple. It defines elements (vertices)
and relations between these elements (arcs). Furthermore it is possible
to add information to the vertices and arcs. These vertices and arcs,
together with the information added form a graph (network) which can
be visualized. Such a network has a structure which can be analysed
with concepts like centrality of the vertices, density of the network
and its components, connectivity etc.
An important information which can be added to the arcs is its direction.
If this is done we get a directed graph. In our first analysis we do
not add this information, because we have no plausible and general
hypotheses about the direction in which the information (or influence)
goes.
For our purposes in this paper we need only to define a few simple
concepts:

A bipartite graph consists of two sets of vertices with the
arcs between them, in which the arcs between vertices of the same
set are neglected. For example: all car firms plus all rubber firms
plus the personal linkages between car firms and rubber firms form a
bipartite graph.

The density of a graph is the probability that an arc exists between two
vertices in the graph, which are randomly chosen. Or

$$\frac{\text{Number of existing arcs in a graph}}{\text{Total number of possible arcs in that graph}}$$

In a graph containing n firms, the total number of possible arcs is

$$\binom{n}{2} = \frac{n(n-1)}{2.1.}$$

In a bipartite graph containing two collections of n and m firms, the
total number of possible arcs is

n.m.

3.2. Network of the personal linkages within the car industry; bipartite graph of car firms with other industries, banks and E.C. institutions: Density.

First we computed the density of the network of personal linkages
between the 11 car firms included in our data set:

$$\text{density car firms :} \quad \frac{1^x}{\frac{11 (11 - 1)}{2.1.}} = \frac{1}{55} = .0182$$

After that we computed the densities of the bipartite graphs of the
car firms versus other productbranches included in our data set and
versus the E.C. institutions. You find the results in table 3:

TABLE 3 Density of the bipartite graphs automobile versus other
industries, banks and E.C. institutions (including auditors).

	vertices		arcs	density
automobile versus metal & machines	11	22	16	.0661
automobile versus banks	11	34	22	.0588
automobile versus chemical	11	15	8	.0485
automobile versus ex-committees	11	15	7	.0424
automobile versus food & tobacco	11	13	6	.0420
automobile versus committees 1970	11	11	5	.0413
automobile versus electro-technique	11	19	6	.0287
automobile versus 'various'	11	7	2	.0260
automobile versus petrochemical	11	16	4	.0227
automobile versus rubber	11	5	0	.0000
automobile versus conglomerates	11	2	0	.0000

^{x} this one is the arc between Fiat and Citroën (weight 2)

Now, if we look at the carriers of the arcs which determine the density of these bipartite graphs (see appendix) it becomes clear that a number of these arcs are carried by auditors or auditing bureau's. It is interesting to note that a handful of auditing firms do the auditing of so many giant multinationals. Peal Marwick Mitchell & Co, Price WAterhouse & Co, Haskins and Sells, Cooper Brothers & Co, and Whinney Murray & Co do the auditing for 30 firms in our data set. All these firms are British or American, with the exception of Svenska Tändsticks. Unilever has even two auditors and both are British.

An arc carried by an auditing bureau cannot have the same meaning as an arc carried by a person who has a function in both firms. A first survey has shown very little evidence that any information is transferred through auditors from one firm to another.[*]
Therefore we decided to eliminate the arcs carried by auditors. The thus recalculated densities are given in table 4.

TABLE 4 Density of the bipartite graphs automobile versus other
industries, banks and E.C.institutions (excluding auditors).

	vertices	arcs		density
automobile versus metal & machines	11	22	15	.0620
automobile versus banks	11	34	21	.0558
automobile versus chemical	11	15	8	.0485
automobile versus ex-committees	11	15	7	.0424
automobile versus committees 1970	11	11	5	.0413
automobile versus 'various'	11	7	2	.0260
automobile versus food & tobacco	11	13	3	.0210
automobile versus electro-technique	11	19	4	.0191[**]
automobile versus petrochemical	11	16	3	.0170
automobile versus rubber	11	5	0	.0000
automobile versus conglomerates	11	2	0	.0000

From table 4 some conclusions can already be drawn:

- the first part of hypothesis II stating that the number of arcs between banks and industrial firms is greater than the number of arcs between any two productbranches must be rejected since the density of the bipartite graph metal & machines versus automobile is higher than the density of that of banks versus automobile.

- hypothesis V, on the other hand, stating that between firms of the same productcolumn we will find relatively many arcs has been confirmed for the car industry, since the density between automobile and metal & machines is highest of all.

- the density of the network automobile versus ex-committees (which does not consist of personal linkages as defined above) is the same as the density of the network automobile versus committees 1970 (which does consist of personal linkages as defined above).

- the bipartite graph with conglomerates and that with rubber firms has a density of zero. In both cases, however, we think this result has little significance[*] since the number of selected conglomerates and rubber firms is 2 and 5 respectively. If, for example, we had included Michelin -having an arc with Citroën (weight 2)- the density of the bipartite graph automobile versus rubber would have jumped from zero to 0.0156. We omit these two 'productbranches' in our analysis.

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[*] This has been done by S.ter Meulen in an unpublished paper at the Institute for Political Science of the University of Amsterdam.

[**] We have assumed that L.Becker, General Manager of ASEA and L.Becker, representative for the employees in the Aufsichtsrat of Daimler-Benz is not one and the same person.

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[*] There has not been developed as yet a statistical procedure to test this significance, so the word used in the text has no statistical meaning.

3.3. Primary and secondary personal linkages.

To obtain more insight into the nature of the personal linkages
between industrial firms we make a distinction betwéen arcs carried
by a person who has only functions in industrial corporations and
arcs carried by a person who has also a function in a bank. The
reason for this distinction lies in the assumption that the arc-
carrier may well perform the function of giving both firm access
to the capital market, so that the arc which he carries between
the two industrial firm is purely 'induced' or as Sweezy calls it,(1953:162)
secondary. Graphically the situation is as follows:

A. Arcs which are carried by a person who has not a function
in a bank (primary linkages):

'Metal & machines' firm o————————o Automobile firm

B. Arcs which are carried by a person who has a function in
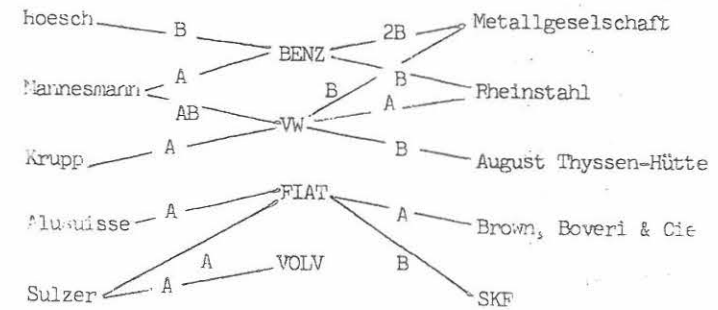a bank (secondary linkages):

When B is the case the arcs may only indicate that the two indus-
trial firms are in the 'sphere of influence' of the same bank, but
this is not necessarily so.

3.4. Relations with the'metal & machines' industry.

The group of 'metal & machines' firms in our data set is not only
quite large, but also heterogenéous. It contains firms which can
hardly be regarded as belonging to the same productbranch. We should
therefore interprete our findings with caution. The more so, because
three firms (Rheinstahl, Krupp and ARBED) do not have subsidiaries
in 10 or more countries, and were 'smuggled' into the sample (Bolten
en Fennema,1972:4,5)[x].
Figure 2 gives the network of the bipartite graph automobile firms
versus metal & machines, in which an A or B is attached to the arcs
plus the weight. (If no number is given the weight of the arc is one)

[x] We intend to add to our data set a new subset 'steelproducers',
so that the subset 'metal & machines' will become smaller and more
homogenious.

FIGURE 2 'Automobile' firms versus 'Metal & machines' firms.[x]

From this figure the following conclusions can be drawn:

- there are just as many A relations as B relations.

- there are no relations   of   French and American firms, except

for Aluminium Co.of America - GM.

> (comment1:the 1965 Amendment of the Clayton Act contains an
> article prohibiting personal linkages between firms who are
> potential buyers or suppliers of each other's product. It is
> quite possible that GM and Aluminium Co.of America are not
> regarded as such.
> comment 2: the group 'Metal & machines' firms contains only
> one French firm, which may explain the absence of French firms
> in the network.)

- there are three components in the network. The first consists of
American firms (Aluminium Co. of America - GM); the second consists
of German firms (around BENZ and VW); the third consists of an
Italian, three Swiss and 2 Swedish firms(around FIAT).
- While there is a Swedish firm in the network (SKF), this firm
is not related to the Swedish car firm Volvo, but to the Italian
firm Fiat.

[x] The isolated firms, though part of the bipartite graph, will not
be pictured in figures 2 - 11.Furthermore, when we speak of compo-
nents of a graph, we mean a group of firms related to each other by
arcs. Strictly speaking an isolated firm also forms a component.
Again, we will not pay attention to these components of one.

3.5. Relations with banks.

The network automobile firms versus banks is given in figure 3.

FIGURE 3 'Automobile' firms versus 'Banks'.
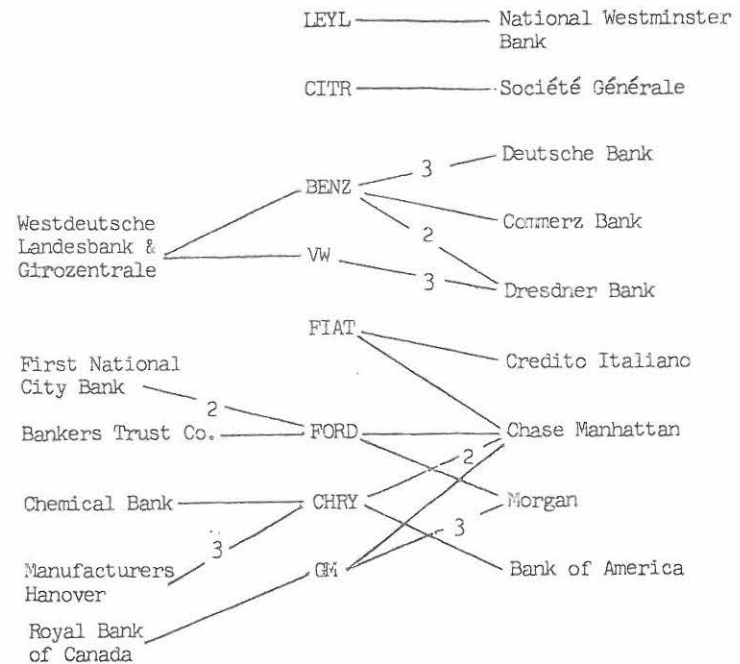
It can be seen that some banks are strongly connected with the car industry. The banks with arcs with more than one firm are

Westdeutsche Landesbank und Girozentrale

Morgan

Chase Manhattan

Dresdner Bank

Westdeutsche Landesbank & Girozentrale.

On the other hand, if we choose the banks which have at least one arc with a weight of 2 or more, we get

Morgan

Chase Manhattan

Dresdner Bank

First National City Bank

Manufacturers Hanover

Deutsche Bank.

Thus Morgan, Chase Manhattan and the Dresdner Bank have both more than one arc with the automobile firms and at least one of these arcs has a weight of more than one.

A few remarks remain to be made:

- with the exception of the arcs Royal Bank of Canada - GM and Chase Manhattan - Fiat all arcs are between firms of the same nationality.

- there are four components in the network. The first consists of British firms; the second consists of French firms; the third consists of German firms; the fourth consists of Italian and American firms.

- Peugeot, Renault and Volvo are isolated in the network

(comment1: there were no Swedish banks included in our data set, which might explain the isolated position of Volvo.
comment 2: Renault is the only fully state owned car firm in our data set, which might explain the isolated position of Renault.
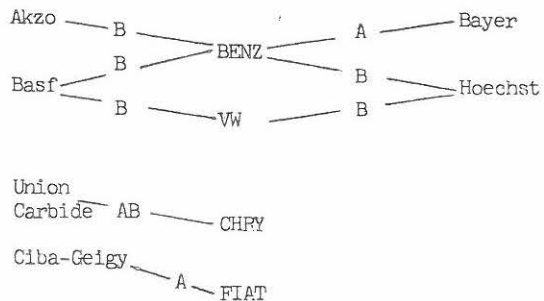comment 3: Peugeot is a family owned firm, also the only one in the sample.)

3.6. Relations with 'chemical' firms.

The network of automobile firms versus chemical firms is given in figure 4.

FIGURE 4 'Automobile' firms versus 'chemical' firms.

Akzo ——— B
             \
         B   BENZ ——— A ——— Bayer
Basf —
         B   B ——— Hoechst
             /
           VW ——— B

Union
Carbide AB ——— CHRY

Ciba-Geigy
              A ——— FIAT

- the network consists of the components

BENZ, VW, Akzo, Basf, Bayer, Hoechst;(1) all German firms plus a Dutch firm
Union Carbide, CHRY;   (2)   both American firms
FIAT, Ciba-Geigy.   (3)   Italian - Swiss firms

- only the arcs BENZ - Bayer and FIAT - Ciba-Geigy are carried by a person who has not a function in a bank. The arc Union Carbide - CHRY is carried by two person of whom one has no function in a bank.

3.7. Relations with 'various' firms.

The network of automobile firms versus 'various firms is given in figure 5:
FIGURE 5 'Automobile' firms versus 'various' firms.

Saint-Gobain-
Pont-à-Mousson ——— B ——— VW

Granges ——— A ——— VOLV
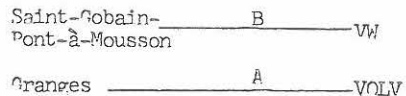
- the group 'various' in the data set not only consists of very different firms, but is also relatively small (7 firms), so that this network cannot tell us very much.
- the relation between VW and Saint-Gobain-Pont-à-Mousson is the only relation between a German and a French firm.

3.8. Relations with 'food & tobacco' firms.

The network of food & tobacco firm versus automobile is given in
FIGURE 6 'Automobile' firms versus 'Food & tobacco' firms.

Procter & Gamble ——— B* ——— CHRY
                    \ B ——— FORD
                     AB ——— GM
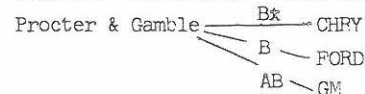
- the network consists of one component of American firms with Procter & Gamble in the center.

3.9. Relations with 'electro-technical' firms.

The network of this bipartite graph is given in

FIGURE 7 'Automobile' firms versus 'electro-technical' firms.

AEG ——— AB ——— BENZ
Siemens ——— AB ———

National
Cash Re- ——— B ——— FORD
gister

General
Electric ——— AAB* ——— CHRY
(U.S.)
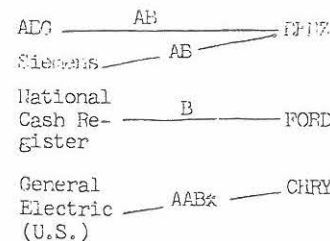
- the network consists of three components: the first contains three German firms, where the weight of the arcs suggests a strong relationship, the second and third contain each a pair of American firms.
- the arc General Electric - CHRY has a weight of three, where none of the arc-carriers produces an induced arc (see note on this page).

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*Mr. N.H. McElroy is director of General Electric (U.S.), Procter & Gamble's president director, director of Chrysler, and he is a member of the International Advisory Committee of the Chemical Bank. Thus although McElroy carries a B-arc, it is unlikely that the arc he carries between the industrial firms are induced.

3.10. Relations with petro-chemical firms.

The network of petro-chemical firms versus automobile firms is given in

FIGURE 8 'Automobile' firms versus 'petro-chemical' firms.

Compagnie ———— A ———— CITR
Francaise
des Pétroles (Total)

Continen- ———— A ———— CHFY
tal Oil

Mobil Oil————B————FORD
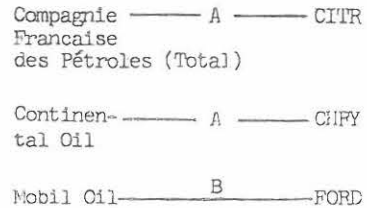
- the network consists of three components: the first contains two
French firms, the second and the third component contain each two
American firms.

3.11. Personal linkages within the car industry.

We have already noticed that between 11 automobile firms in the
data set only one personal linkage exists: FIAT - CITROEN. This
arc has a weight 2. This arc is accompanied by a financial partici-
tion of Fiat in Citroën of 24 %, which -as we will see later- supports
our hypothesis I, which states that we expect financial participation
to be accompanied by personal linkages.
The lack of personal linkages between the rest of the car firms
supports the first part of hypothesis IV : between firms in the same
productbranch we will find relatively few arcs.
The fact, however that the car firms cannot reach each other directly
through a personal linkage, does not imply that they cannot communicate
at all through personal linkages. It is possible that a firm A has
an arc with firm C which in its turn has an arc with firm B. When
this is the case we say that there exists a path between A and B
with a distance of 2. We will call this an indirect linkage.
We have no theory or hypothesis which enables us to attach much meaning
to the existance of these indirect linkages. The only thing we can say
is that it provides a possible channel of communication.
In figure 9 we have depicted the indirect linkages between the
car firms plus the one direct linkage between Fiat and Citroën.

FIGURE 9 Direct and indirect linkages between car firms.
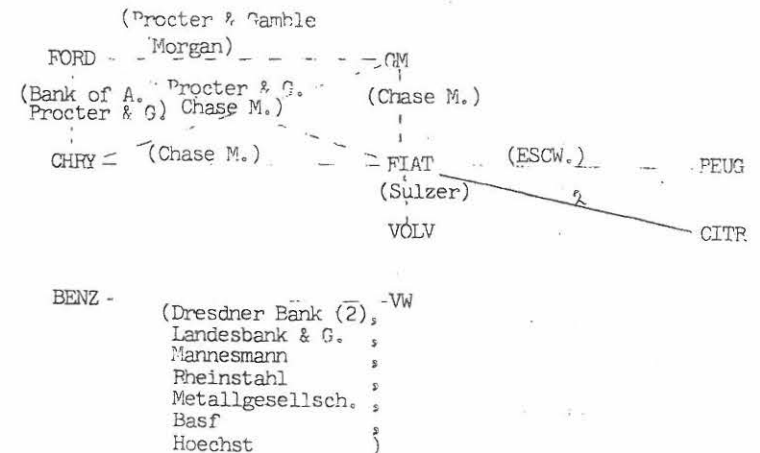
From figure 9 some conclusions can be drawn:

- The indirect linkages between American firms all run through a bank[*]
- The indirect linkages between the German firms are manyfold: the arc between BENZ and VW has a weight of 8: three through a bank, 5 through an industrial firm.
- The indirect linkage between FIAT and PEUG runs through the Economic and social committee of the European Communities.
- LEYL and RENA are not connected with any automobile firm through a path with distance two or one.

In section four we will try to find out whether the structure of this network of direct and indirect linkages has anything to do with coope-ration between automobile firms.

3.12. Personal linkages with institutions of the European Communities.

We make a distinction between persons who have been a member of EC-institutions before 1970, and persons who had a function in a EC-institution in 1970. Only the latter are arc-carriers as defined above.

FIGURE 10. Automobile firms versus 'ex- members of EC-committees'.

BENZ ——————————o European Parliament
                          Economic and Social Committee (representing workers)
VW   European Investment Bank
                       Consultant Committee of E.C.S.C.(representing workers)
FIAT   Commission of the European Economic Community
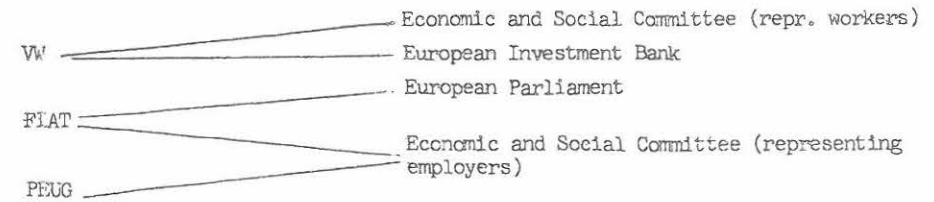   Commission of the European Communities
                       Economic and Social Committee (representing employers)

[*]For the special position of Procter & Gamble see also figure 6.

FIGURE 11. Automobile firms versus 'EC-committees 1970'.

                          Economic and Social Committee (repr. workers)
VW   European Investment Bank
                         European Parliament
FIAT
                         Economic and Social Committee (representing
                         employers)
PEUG

When we look at figure 10 and 11 we see that only four car firms have relations with EC-institutions, either through members in 1970 or ex-members. Compared with other product branches this is still a lot. When we compare the density of the bipartite graphs of the EC-committees and the different productbranches, we see that only 'metal & machines' has a higher density (0.0472) for the bipartite graph with ex-members, while the density of the other groups is at the maximum 0.0256. Of the bipartite graphs with EC-committees 1970 the automobile firms have the highsest density(0.0413), followed by 'metal & machines'(0.0289) and banks (0.0160).

This relatively high density of the steel producing and steel consuming industry no doubt has to do with the history of the European Communities, which were initiated in the E.C.S.C. This provides us with some - slight- evidence for   hypothesis VII, which says that personal linkages between firms and EC-institutions will be found in those sectors where vital interests of the firm are dealt with.

Since we think it very important to know more about the meaning of the personal linkages between business and   vernmental institutions, we will now have a look at the arc-carriers of the two bipartite graphs de-picted in figure 10 and 11.

Volkswagen had and kept a personal linkage with the Economic and Social Committee. It 'lost' its linkage with the Consultant Committee. In both cases the arc was (and is) carried by a representative of the employees, O.Brenner of I.G.Metal. With the European Investment Bank it had and kept a linkage trough A.Kubel.

Fiat had and kept a linkage with the Economic and Social Committee, through E.Minola as representative of the employers. It has an ex-member of the Commission of the European Economic Community -after the merger part of the Commission of the European Communities- on its

board, Colonna di Paliano.

The arc between Peugeot and the Economic and Social Committee is carried
by F.Ceyrac, while H.Schmidt, member of the Vorstand of Daimler-Benz is
an ex-member of the European Parliament.

Some remarks can be made here:

- The representative of the German trade-union IG-Metal is as such
member of the Economic and Social Committee as well as member of the
Aufsichtsrat of Volkswagen (and of Krupp). This means that O.Brenner
does not represent Volkswagen or Krupp in the Economic and Social
Committee. In how far Volkswagen's and Krupp's interests are infor-
mally represented by Brenner depends very much on the attitude of
the trade-union vis-à-vis these enterprises. The same applies to the
question whether Brenner should be regarded as an "Arbeitervertreter"
in the Aufsichtsrat of VW and Krupp not only in the legal sense, but
also in reality.

- Of the other arc-carriers no one has a function in more than one
firm. This indicates that these arc-carriers are part of a political
elite performing functions for the firms, rather than part of a
financial-economic elite participating in politics. This finding
supports our conclusion from page 20 that there are different types
of outside directors, performing different functions.

- Only firms from member-countries have personal linkages with the
institutions of the European Communities.

- Of the firms from member countries only Renault does not have any
personal linkages with the institutions of the European Communities.
Here it should be remembered that Renault is state-owned, although
we dare not formulate any hypothesis relating the first finding to
the latter.

3.18. Some conclusions.

When we look at the figures 2 to 8 a few things jump to the fore.

- There is a remarkable lack of personal linkages between two firms
of different nationality, and those that do exist are between firms
of which one is a 'small country firm' (Dutch, Swedish, Swiss).
The only exceptions are Chase Manhattan - Fiat and Saint-Gobain-Pont-à-
Mousson - Volkswagen.[*]   We will call this phenomenon, where only
small country firms have international personal linkages 'forced
internationalism', since we assume that the relative smallness of its
home economy forces these multinationals to seek contact with multi-
nationals from larger economies.

- The German and American firms appear more frequent in the networks
of non-isolated firms than the firms of other nationalities; the
only exception being the network automobile versus machines, where
American firm are absent for anti-trust reasons.
Because so many arcs are 'induced' B-arcs (about 50 percent), it is
possible that the position of the Banks in the different countries
has something to do with this. Therefore we calculated the densities
of the bipartite graphs of banks versus industry according to the natio-
nality of the banks. Unfortunately, the auditors are not excluded.

TABLE 5 Density of the bipartite graphs banks versus industry,
according to the nationality of the banks.

	density
USA banks versus industry	.1303
German banks versus industry	.0818
UK banks versus industry	.0473
French banks versus industry	.0182
Italian banks versus industry	.0159
Dutch banks versus industry	.0455
Belgium-Lux. banks versus industry	no banks included in the sam.

Indeed, there is a gap between the position of the US and German
banks on the one hand and the other banks on the other. This will
become even more clear when the auditors will be excluded, since the
density of the US and British banks versus industry will drop, while
the density of the German banks versus industry will remain the same.
(see page 27)

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[*] The Royal Bank of Canada is also an exception (it has an arc with VW),
but the Canadian firms form a special category, since the Canadian
economy is so heavily dominated by American firms that most business
economists in the U.S.A. do not regard Canada as 'abroad'.

- When we look at the density of the network of personal linkages
of the automobile firms versus other industrial productbranches,
there appears to be a gap between the 'metal & machines' group
on the one hand and the other productbranches. Only the bipartite
graph automobile versus chemical industry has a density close to
that of automobile versus metal and machines. Figure 4, however, shows
that in the first network 5 out of 8 arcs (62 percent) are 'induced'
by (German) banks, a higher percentage than is the case in other
networks. This provide further evidence supporting hypothesis V
stating that between firms in the same productcolumn we will find
relatively many arcs. (see page 28)

When we look at figure 9 we can conclude that the US-firms and
the German firms are linked on a national base. The banks play an
inportant role in linking the car firms to each other. Between
French car firms, on the other hand, there are no indirect linkages.
And Renault does have no indirect linkages whatsoever. We cannot
say here that the exceptional position of the French car producers
compared with the American and German car firms is typical of the
French car firms or whether it is typical of the French industrial
system as a whole.

We do not dare to say much about the isolated position of British
Leyland and Renault, although nationality might be a explaining
variable in the first case, and state-ownership an explaining va-
riable in the second.

The central position of Fiat jumpes to the fore. It has indirect
linkages with five car firms, and a direct linkage (weight 2) with
Citroën.

As a conclusion of section 3.12. we can only say that we assume
a certain distinction - or division of labour - between the poli-
tical and economic elite, since persons active in politics do not
seem to have many functions in different firms. This is not to
say that members of the political elite may not be able to switch
to the economic elite and vice versa.
To study the relations between business and state apparatus more
thoroughly, we should compare the personal linkages between industry
and state in each of the member-countries.

4. LINKAGES OF DIFFERENT NATURE: JOINT-VENTURES AND FINANCIAL PARTICIPATION OF, IN OR WITH THE CAR INDUSTRY IN THE COMMON MARKET.

4.1. Introduction.

In this section we will look into the joint-venture relationships
between firms, of which one is at least one of our 11 selected car
firms, and into financial participation in the automobile firms.
We used as a source
Who owns whom, Continental edition, 1971;
Who owns whom, U.K.edition, 1970;
Wer gehört zu Wem,1970.

This last publication, of the Commerz Bank, is better than Who owns
whom, in that it gives quantitive information about financial participations.
The Who owns whom, United States edition, contains only American sub-
sidiaries abroad. Therefore we could not use it. Instead we used Perlo
(1957) and Chevalier (1970) for information on financial participation.
For information on joint-venture relationships between U.S.firms this
was not adequate, thus we have to leave the American car firms out of
the analysis of joint-venture relationships.

We will start in 4.2. with an analysis of the financial participation
in the car industry and compare this with the personal linkages with
the car industry. In 4.3. we will do the same with joint-venture rela-
tions within the car industry and in 4.4. with joint-venture relations
between the automobile firms and other industry.

4.2. Financial participations.

Table 5 gives the financial participations in the automobile firms.
If no percentage is given, this means that the amount of participation
in the automobile firm is unknown. Between brackets we have given the
weight of the personal linkage between the car firm and the institution
which has financial participation in it.

- Except in the case of the financial participation of the BRD, Land
Nieder-Sachsen and the Stiftung Volkswagenwerk in Volkswagen -for
which we have no information about the personal linkages- all finan-
cial participations go with personal linkages. This appears to be
an impressive support for the first part of hypothesis I which states:
when firm A has a financial participation in firm B, we expect a personal
linkage between A and B. There is, however, a problem: we do not know
whether this overlap has any significance.
Statistically the problem is as follows: let us assume two sets of
firm or institutions, a certain number of personal linkages between
these two sets and the financial participations of firms from the
two sets. Let us further assume a certain overlap between personal
linkages and financial participation. Should we regard this overlap
as being high or low? The answer can be given by assuming that the
number of financial participations and the number of personal linkages
were arrived at by taking   the number of financial participations
and the number of personal linkages, selecting the pairs of firms or
institutions at random from the two sets. The chance that the overlap
between the latter is the same or higher than the overlap actually
found can be calculated. If this chance is high than the amount of
actual overlap is low, if this chance is low, than the actual overlap
is high.

We can perform this calculation for the automobile firms and the banks
in table 5, since for these we have two sets of firms, for which we
have found the personal linkages (see page 31) and the financial
participations (table 5). We compare the financial participation with
the personal linkages.

Now, of the financial participations, 4 go together with a personal
linkage with a weigt of more than 2 and one (Chase Manhattan - Ford)
does not. On the other hand, of the personal linkages with a weight

TABLE 5. Financial participations in the automobile firms.

	GM	FORD	CHRY	VW	BENZ	FIAT	RENA	LEYL	CITR	PEUG	VOLV
MORGAN	%* (3)										
FIRST NAT.CITY BANK		%* (2)									
CHASE + MANHATTAN Ford Found.		80% (1)									
DEUTSCHE BANK					25% (3)						
DRESDNER BANK				Streu besitz** (3)							
M.A.Hanna Consoli-dated Coal ↓19%			7,3%*** (1)								
family Peugeot										*** % (1)	
family Agnelli						*** 27% (2)					
Michelin									60% (2)		
family Quandt: Varta					8% (1)						
family Flick					40% (2)						
B.R.D.				16% (?)							
Land Nieder-Sachsen				20% (?)							
Stiftung Volkswa-genwerk				4% (?)							
Rep. Francaise							**** 100% (9)				

+Chase Manhattan has no direct financial participation in Ford, but it has
a say in the Ford foundation which in its turn has 80 percent of the stock
of Ford Motor Company.

*See Perlo,1957:27,28,176
**"Sie (the Dresdner Bank,M.F.) vertritt über das Depot stimmrecht einen
erheblichen Teil der rund 90000 Kleinaktionäre und hat die Federführung bei
den Bankkonsortien die für Finanztransaktionen des VW-Konzerns gebildet
wurden."(IPW-Berichte,I,3:68). *** See Chevalier,1970:163,177.
****See Jürgensen & Berg,1968:28;we only regarded those directors as bel-
ging to the family, who possessed the family name.
*****9 directors represent 6 different ministeries of the French government.

of two or more, 4 go together with financial participation and three
(BENZ -Dresdner Bank, CHRY - Chase Manhattan, CHRY - Manufacturers
Hanover) do not.

In table 6 we give the total number of possible personal linkages
and financial participations between the two set of firms, which is

$n.m. = 11.34 = 374$.

From this we can calculate the number of relations between which there
exists no personal linkages (=374 - 7) and the number of relations
between which there exists no financial participations (=374 - 5).

TABLE 6 Overlap of personal linkage- and financial participation relations.
'Banks' versus 'automobile'.

		personal linkages with weight of two or more		
		yes	no	total
financial participation	yes	4	1	5
	no	3	366	369
	total	7	367	374

The chance that there be an overlap of 4 or more, when the pairs
were chosen at random is zero (0.00000022)[*] Thus the overlap is
high. (If it was our purpose to test the degree of overlap, we should
have chosen a maximal chance, let say: a smaller than 0.01)

There is now enough evidence to reformulate the hypothesis I:
When firm or institution A participates in firm B, we will expect a
personal linkage with a weight of more than one.

[*] The calculation of this -and the following- chance has been
done by Jac.M.Anthonisse of the Mathematisch Centrum of Amsterdam.

4.3. Joint-venture relationships between automobile firms.

Table 8 gives the joint-venture relationships between the 11 car firms
of our data set. For reasons described in section 4.1, we have not
found any joint-venture relationships between American firms.

Again, we want to compare the joint-venture relationships with the
relationships through (in)direct personal linkages (figure 9).
The reason for this is, that, although direct personal linkages are
rare, the indirect personal linkages may indicate a certain form of
common interest. The firms which can reach each other through a path
with distance two may for example belong to an industrial-financial
'empire'. Thus we expect -as an additional hypothesis- the overlap
between joint-venture relationships and indirect personal linkages
between car firms to be high.

Before we give the table of overlap of indirect personal linkages
and joint-venture relationships between the automobile firms, we
should take account for the missing data in table 8. Since there is
no information on joint-venture relationships between American car
firms, we should eliminate them from our calculation. This means
that the indirect linkages between American car firms should not be
counted and the number of total relations should be reduced by 3.

TABLE 7 Overlap of personal linkage- and joint-venture relationships
between the 11 automobile firms of the sample.

		(in)direct personal linkages		
		yes	no	total
joint-venture relationships	yes	3	5	8
	no	3	41	44
	total	6	46	52

The total number of possible relations between 11 firm is
$\frac{n(n-1)}{2} = \frac{11.10}{2} = 55$. Minus the above named 3 this gives 52.

The chance that there be an overlap of 3 or more, when the pairs were
chosen at random from the set is 0.04. Although this chance is much

TABLE 8 Joint-venture relationships between 11 automobile firms.

	GM	FORD	CHRY	VW	BENZ	FIAT	RENA	LEYL	CITR	PEUG	VOLV
GM											
FORD											
CHRY 73% Simca											
VW											
BENZ				Deutsche Automob. Djakarta							
FIAT			Fiat-Simca								
RENA (Saviem)											
LEYL											
CITR		SOMNA	Comotor; Comob.; Audi-NSU +Citroën		24% SOMNA						
PEUG			Unic-Peugeot			5 j.v's ☆					
VOLV						Saviem, Volvo Magirus Dar:j.v					

☆ Brissoneau et Lotz, Chausson Carosserie, Groupement International de Moteurs, Francaise de Mecanique S.N.C. and Transmissions Automatiques.

than it was for table 6, it is still possible that the overlap is significantly higher than we get in a random choice of pairs. It all depends on the maximal a (alpha) we choose (If we had chosen for a 0.01, than our additional hypothesis would have been rejected).

It is worthwhile to test the additional hypothesis for a larger set of firms and more complete information.

4.4. Joint-venture relationships between automobile firms and firms from other productbranches.

In the case of vertical joint-ventures or diagonal ones, we have only those which form a joint-venture relation between an automobile firm and another firm in our data set. These joint-ventures are given in table 10. We now compare the joint-venture relations per productbranch with the personal linkages per productbranch as given in figure 2 to 8.

There is reason to expect a high overlap between joint-venture relationships and personal linkage relations, since in the case of vertical, but especially diagonal relations there is little chance that personal linkages will be deferred for reasons of competition. Only in the case of American firms the 1965 amendment of the Clayton Act may prevent some firms between which there is cooperation, to form a personal linkage. In all other cases we expect joint-venture relationships to be accompanied by personal linkages.

In our comparison we have, for the same reasons as above, to omit the relations in which US-firms are involved.   Thus, the total possible relations n.m. = 11.22. = 242 minus 3.22 = 66: 242 - 66 = 176 accounts for the column and row total in table 9 which gives the overlap between joint-venture- and personal linkage-relations in the bipartite graph 'automobile' versus 'metal & machines'.

TABLE 9 Overlap of personal linkage- and joint-venture relations: 'Automobile' versus 'metal & machines'.

		personal linkages		
		yes	no	total
joint-venture relations	yes	2	2	4
	no	12	160	172
	total	14	162	176

The chance that the overlap would be 2 or more when the pairs were chosen at random from the two sets of firms, is 0.03. Thus the chance is smaller than that in table 7. Overlap is high.

TABLE 10 Vertical and diagonal joint-venture relationships with the automobile firms and other firms in the data set.

	VW	BENZ	FIAT	RENA	LEYL	CITR	PEUG	VOLV
Mannesmann		Porsche Diesel Mot.bau						
Rheinstahl		Hanomag Henschel	Henschel Saviem					
Pechiney			Trafile rie et Lamina ori di Metalli					
Courtaulds (Snia Viscosa)			E.T.I. COGIS					
Montedison			SIGME COGIS It.Avio.					
General Electric (U.S.)			Turbi-motori Intern.					
Hawker Siddeley					Crompton Leyland Electricars			
Litton			Italiano Avionica					
RCA			Herz It-aliano					
Siemens			Italiano Avionica					
Dunlop-Pirelli						Moulton Develop.		

Table 11 gives the overlap of joint-venture relations and personal linkages for the bipartite graph automobile versus chemical firms.

TABLE 11.

		personal linkages		
		yes	no	total
joint-venture relations	yes	0	2	2
	no	7	111	118
	total	7	113	120

The chance that the overlap would be 0 or more is obviously 100 %. But the chance that the overlap woulb be exactly 0 when the pairs were chosen at random from the two sets is also very high: more than 90 %. We can therefore say that a overlap of 0 is in this case not high (how could it be!), but it is not particularly low either.

The situation for the bipartite graph automobile- versus electro-technical firms is the same as the situation in table 11: an overlap of 0, with a chance of overlap when chosen at random of more than 90 %.

For all other bipartite graphs an overlap is impossible, either through lack of personal linkages (rubber firms) or through lack of joint-venture relations (the other productbranches).

Conclusion: only in the case of vertical relations we found an overlap between joint-venture relations and personal linkages which was high.

For the diagonal relations the two overlaps we could calculate showed no deviation from what would be expected when choosing the pair at random.

Hypothesis V stating that between firms of the same productcolumn we will find relatively many arcs, can thus be reformulated:

Between firms of the same productcolumn we will find relatively many personal linkages and joint-ventures. Personal linkages and joint-venture relationships do not exclude each other. On the contrary they tend to overlap.

5. CONCLUSION.

In section 3 and 4 we have tried to give some evidence for or against the hypotheses formulated in paragraph 2.3. (page 23). The results in section 3 and 4 have brought evidence supporting some hypotheses or parts of them, while rejecting others and made it possible to refine and reformulate some of them. Also we have formulated additional hypotheses.

We now give the thus reformulated, refined or new hypotheses. They can serve as a basis for further research.

I. When a firm or institution A has a financial participation in firm B, there will be a personal linkage between A and B with a weight of more than 1. (page 45)

II. The density of the bipartite graph banks versus industrial firms tends to be high compared with industrial productbranches versus industrial firms (page 28).

III. The density of the bipartite graph of two sets of industrial firms (non-U.S) belonging to the same productcolumn will be higher than that of two sets of non-U.S. industrial firms not belonging to the same productcolumn.(page 26)
For U.S.-firms the opposite hypothesis is likely to be confirmed. This is due to the 1965 Amendment of the Clayton Act which forbids personal linkages between firms in the same productcolumn. (page 30)

IV. The density of the bipartite graph: firms from small countries and from Canada versus the rest of the firms, is higher than that of any country versus the rest of the firms. We have called this phenomenon "forced internationalism" (page36).

V. The density of the graph of a set of firms belonging to the same productbranch will be smaller than the density of the graph including all industrial firms in the data set.

VI. The indirect personal linkages between firms belonging to the
same productbranch will have a high overlap with the joint-venture
relationships of that same set of firms (page 46).

VII. In the case of two sets of firms belonging to the same
productcolumn there will be a high overlap between personal linkage-
and joint-venture relationships (page 51). Due to the Clayton Act
this hypothesis does not hold for US-firms.
VIII. Personal linkages between firms and E.C.-institutions will be found
with those institutions whose decisions affect the vital interests of
the firm (page 40).

Two hypotheses mentioned in paragraph 2.3. have not been touched upon
in section 3 and 4. Hypothesis VI stating that the closer the coope-
ration between A and B or the greater the domination of A over B, the
greater will be the weight of the arc between A and B, has been
partly   accepted in reformulating hypothesis I (page 45).
Hypothesis III stating that we expect to find the greatest number
of arcs between banks and those industrial firms where the need for
access to the capital market is greatest, could not have been treated

properly in the way we restricted our research. It is hoped that in
future these and other hypotheses can be tested.

IX. Our last, and perhaps most trivial, hypothesis states that the
density of the network of firms of the same nationality will be higher
than the density of the network of all firms taken together.

List of References

Aaronovitch, S., 1961. *The Ruling Class - a study of British
finance capital*. Lawrence & Winehart, London.

Anthonisse, Jac.M., 1971. *The rush in a directed graph*. Mathematisch
Centrum, Amsterdam.

Anthonisse, Jac.M., 1972. Optimaliseringsproblemen. *Vacantie cursus
1972, Grafentheorie en haar toepassingen*. Mathematisch Centrum, Am-
sterdam.

Berle, A.A. and G.C. Means, 1933. *The modern corporation and private
property*. Mac Millan Co..

Besson, J.F., 1962. *Les groupes industriels et l'Europe - l'experience
de la C.E.C.A.*. Presses Universitaires de France, Paris.

Chevalier, J.M., 1970. *La structure financière de l'industrie améri-
caine et le problème du contrôle dans les grandes sociétés américaines*.
Editions Cujas, Paris.

Concentratie-indices, 1971. *Concentratie-indices en de concrete toepas-
sing daarvan op de automobiel sector in de Gemeenschap*. serie Concur-
rentie-harmonisatie van wetgeving, 17. Commissie van de Europese Ge-
meenschappen, Brussel.

Donner, F.G., 1967. *The world-wide industrial enterprise: its challenge
and promise*. Mc Graw-Hill, New York/ Toronto/ London/ Sidney.

Feld, W.J., 1970. *Transnational Business Collaboration among Common
Market countries - its implications for political integration*.
Praeger Publishers, New York/ Washington/ London.

Franko, Lawrence G., 1971. *Joint venture survival in multinational
corporations*. Praeger Publishers, New York/ Washington/ London.

Galbraith, John Kenneth, (1967) 1969. *The new industrial state*.
Pelican Books, Harmondsworth.

Galloway, Jonathan F., 1971. Multinational Corporations as world-wide
interest groups. *Politics and Society* 2(1), Fall 1971: 1-20.

Haas, (1956)1968 . *The Uniting of Europe: Political Social and Econo-
mic Forces 1950-1957*. Standard University Press, Stanford (Cal.)

Jeidels, O., 1905. *Das Verhältnis der Deutschen Grossbanken zur In-
dustrie mit besonderer Berücksichtigung der Eisenindustrie*. Leipzig.

De Jong, H.W., 1971. *Ondernemingsconcentraties- de ontwikkelingen in
Europa, Amerika en Japan*. Stenfert Kroese, Leiden.

Fennema, Meindert, 1973. *De multinationale onderneming en de natie-staat*.
(doktoraalskriptie) Amsterdam. (unpublished).

Cremers, J.H.F.J., 1971. *Prioriteitsaandelen*. Kluwer, Deventer.

De Jong, H.W., 1972. *Dynamische concentratie theorie.* (diss.)
Stenfert Kroese, Leiden.

Jürgensen, H. und H. Berg, 1968. *Konzentration und Wettbewerb im Gemeinsamen Markt. Das Beispiel der Automobilindustrie.* Van den Hoeck und Ruprecht, Göttingen.

Karssen, W.J., 1970. Automobielindustrie in de EEG - concurrentie en concentratie in de Euromarkt. *Economisch-Statistische Berichten,* 4 febr.: 136-141.

Klein, D., 1965. *Staatsmonopolistische Programmierung in der EWG.* Dietz Verlag, Berlin.

Lindberg, Leon N. & Stuart A. Scheingold, 1970. *Europe's would-be polity-patterns of change in the European Community.* Prentice-Hall, Englewood Cliffs (N.J.)

Lenin, W.I., 1968. *Notebooks on Imperialism.* Collected works, Vol.39. Progress Publishers, Moscow.

Mandel, E., 1967. International Capitalism and Supranationality, *The Socialist Register,* (Milliband, R. and J. Saville (eds.)), London.

Mandel, E., 1970. *Europe versus America - contradictions of imperialism.* NLB, London.

Marx, K., (1867) 1970. *Capital. A Critique of Political Economy.* Lawrence & Wishart, London.

Maxcy, G., 1958. The motor industry. in: Lesley Cook, P. and R. Cohen, 1958. *Effects of mergers - six studies.* George Allen & Unwin Ltd., London.

Meehan, Eugene J., 1967. *Contemporary political thought. A Critical Study.* The Dorsey Press, Homewood, Illinois.

Meynaud, J. & D. Sidjanski, 1967. *L'Europe des affaires - rôle et structure des groupes.* Payot, Paris.

Meynaud, J. & D. Sidjanski, 1971. *Les groupes de pression dans la Communauté Européenne 1958-1968 - structure et action des organisations professionelles.* Editions de l'institut de sociologie, Université libre de Bruxelles, Bruxelles.

Moneta, E.H., 1963. *Die Europäische Automobilindustrie Unternehmungen und Produktion.* August Lutzeyer, Baden-Baden.

Morphologie, 1966. *Morphologie des groupes financiers.* C.R.I.S.P., Bruxelles.

Neusüss, Christel, 1972. *Imperialismus und Weltmarkt Bewegung des Kapitals.* Politladen, Erlangen.

Perlo, V., 1957. *The empire of High finance.* International Publishers, New York.

Rowthorn, R. (in coll. with S. Hymer), 1971. *International Big Business 1957-1967 - a study of comparative growth.* Cambridge University Press, University of Cambridge, department of applied economics. Occasional Paper 24.

Sanders, P., 1971. The European company on its way. *Common Market Law Review,* VIII: 29-43.

Scheuermann, F., 1963. *Die Stellung der deutschen Personenwagen Industrie in der Europäischen Wirtschafts Gemeinschaft und die mögliche Entwicklung des Bestandes an PKW in Deutschland.* Mayer, Stuttgart.

Schumpeter, Joseph, 1939. *Business cycles.* Mc Graw-Hill Book Company New York.

Schumpeter, Joseph, 1926. *Theorie der Wirtschaftlichen Entwicklung. Eine Untersuchung über Unternehmengewinn, Kapital, Kredit, Zins und den Konjunkturzyklus.* (zweite, neubearbeitete Auflage) Verlag von Duncker & Humboldt, München und Leipzig.

Schumpeter, Joseph, (1941) 1959. *Capitalism, Socialism and Democracy.* George Allen & Unwin Ltd., London.

Selection, 1972. *Selection of the firms and institutions.* Multinationals and the European Communities. by J. Bolten and M. Fennema. University of Amsterdam, Institute of political science. (unpublished)

Stokman, F.N., 1973. Graven naar Macht, dubbelfuncties tussen grote Nederlandse bedrijven en instellingen in 1969. *Acta Politica VIII,* July 1973: 257-291.

Verslag, 1972. *Verslag van de kodering MNO 1971/1972* door G.J. van Oenen en B. Reinalda (not published). Report of the coding of the group 'Multinationals and the European Communities'.

Villarejo, D., 1961. Stockownership and the control of corporations. *New University Thought,* Vol II (1,2) (Part I and II in Autumn 1961; part III in winter 1961)

De Vree, Johan Karel, 1972. *Political integration: the formation of theory and its problems.* Mouton, 's-Gravenhage.

§ Sweezy, 1953. *The Present as History. Essays and Reviews on Capitalism and Socialism.* Monthly Review Press, New York/London.

Wer gehört zu Wem, 1971. *Wer gehört zu Wem - Mutter- und Tochter-gesellschaften von A bis Z*. Neunte und erweiterte Auflage. Commerz Bank.

White, L.J., 1972. The American automobile industry and the small car, 1945-1970. *Journal of Industrial Economics XX*, 2: 179-192.

Who owns whom, 1970. *Who owns whom 1970 (U.K. Edition) - a directory of parent, associate and subsidiary companies*. Compiled and published by O.W. Roskill & Co (Reports) Ltd., London.

Who owns whom, 1971. *Who owns whom (Continental Edition) (2 vol.) - a directory of parent, associate and subsidiary companies, 1970/1971*. Compiled and published by O.W. Roskill & Co (reports) Ltd., London.

APPENDIX

List of arc-carriers between car firms and other firms in the data set.

Abs, H.J.	Akzo (DD), Basf (PD), BENZ (DD), Deutsche Bank (PD), Hoesch (DD), Metallgesellschaft (DD), Siemens (PD).
Agnelli, G.	Chase Manhattan (Int. Adv.Com.), Credito Italiano (DD), FIAT (PD), Skf (DD).
Beesley, E.N.	GM (Bonus Sal.Com.,Fin.Com.,DD), Procter & Gamble (DD).
Brenner, O.	(ex-)Economic and Social Committee, Krupp(DD) ex-Consultant Committee, VW(DD).
Burgess, C.L.	FORD (PD), Morgan (DD).
Ceyrac, F.	Economic and Social Committee (employers), PEUG (DD).
Coleman, J.A.	CHRY (Fin.Com.,DD), Manufacturers Hanover (DD).
Colonna di Paliano, G.	ex-Commission of the European Economic Community, ex-Commission of the European Communities, European Parliament, FIAT (DD).
Connor, J.I.	Chase Manhattan (DD), GM (Fin.Com.,DD).
Cullman 3, J.F.	Bankers Trust (DD), FORD (DD).
Deuss, H.	BENZ (DD), Commerz Bank (PD), Hoechst (DD), Rheinstahl (DD).
Dillworth, J.R.	Chase Manhattan (DD), CHRY (Fin. Com.,DD).
Flick, F.K.	Aeg. (DD), BENZ (PD).
Halaby, N.E.	Bank of America (DD), CHRY (Comp.Ben.Com.,DD)
Hartmann, F.	Sulzer (DD), VOLV (PD).
Hewlett, W.R.	Chase Manhattan (DD), CHRY (Comp.Ben.Com.,DD).
Holste, W.	Mannesmann (DD), VW (Vorstand).
Kubel, A.	(ex)-European Investment Bank, VW (DD).
Littlefield, E.W.	CHRY (DD), General Electric U.S. (DD).
Lord Stokes	LEVL (MD,PD), Westminster Bank (DD).
Lotz, K.	August Thyssen Hütte (DD), Dresdner Bank (DD), VW (MD).
Love, G.H.	Union Carbide (DD), CHRY (Exec.Com.,Fin.Com.,DD), Continental Oil (DD), General Electric (DD).
Marais, R.	CITR (DD), Société Générale (Dir.général adjoint)
Mayer, J.A.	Aluminium Company of America (DD), GM (DD,Audit.Com.)
McElroy, N.H.	Chemical Bank (Int.Adv.),CHRY (DD,Comp.Ben.Com.), General Electric U.S. (DD), Procter & Gamble (PD).
McLaughlin, W.E.	Royal Bank of Canada (MD), GM (DD, Audit.Com.)

McNeill Jr.,R.E.	Union Carbide (DD), CHRY (DD,Exec.Com., Fin.Com.), Manufacturers Hanover (PD).
Minola, E.	(ex)Economic and Social Committee (employers) FIAT (DD)
Morgens,H.J.	GM (Bon.Salary Com.,Fin.Com.,DD), Morgan (DD), Procter & Gamble (DD).
Mortimer,C.G.	First National City Bank (DD),FORD (DD), Mobil Oil (DD).
Murphy,H.D.	Bank of America (DD), FORD (DD).
Nasi,G.	CITR (DD), FIAT (DD)
Oelman,R.S.	National Cash Register (Exec.Com.,PD), First National City Bank (DD), FORD (DD), Procter & Gamble (DD).
Perkins,T.L.	GM (Fin.Com.DD), Morgan (DD).
Ponto,J.	Dresdner Bank (Vorstand), BENZ (DD), Metallgesellschaft (DD).
Poullain,L.	Landesbank und Girozentrale (MD), Mannesmann (DD), Saint-Gobain-Pont-à-Mousson (DD), VW (DD).
Quandt,H.	BENZ (DD), Deutsche Bank (DD).
Reischl,G.	Rheinstahl (DD), VW (DD).
Reyre,J.	Compagnie Francaise des Petroles (DD), CITR (DD).
Richter,H.	Dresdner Bank (DD), Hoechst (DD), Metallgesellschaft(PD), VW (DD).
ROTA,F.	CITR (DD), FIAT (DD,MD).
Russel, G.	GM (Fin.Com.,DD), Morgan (Int.Council).
Rust, J.	Basf (DD), Dresdner Bank (Verwaltungsrat), VW (PD).
Schmidt,H.	BENZ (Vorstand), European Parliament, Landesbank und Girozentrale (Verwaltundsrat)
Schulthess,F.W.	Alusuisse (Verwaltungsrat), Brown Boveri (Verwaltungsrat,DD), Ciba-Geigy (Verwaltungsrat,DD), FIAT (DD), Sulzer (Verw.rat,DD).
Svensson,E.	Granges (MD), VOLV (DD).
Townsend,L.	CHRY (Fin.Com.,PD), Manufacturers Hanover (DD).
Ulrich,F.H.	Bayer (DD), BENZ (PD), Mannesmann (PD), Siemens (DD)
Vierhub, E.	AEG ( ), Dresdner Bank (Verw.rat),BENZ (DD).
Zahn,J.	BENZ (Vorstand), Deutsche Bank (MM).

Note:
Underlined are those arc-carriers who have no function in a bank.
DD = Board of Directors   PD = chairman of DD
    Aufsichtsrat   MD = Managing Director
    raad van commissarissen   MM = Manager, Direktor etc.
    Conseil d'Administration
    Consiglio di Amministrazione