

Politicized Business Ties: Network Dynamics of a Democratizing Polity and a Globalizing Economy, Hungary 1987-2006

David Stark (PI) and Balazs Vedres (Co-PI) Project summary

This project analyzes the interactions of firms and parties across an entire epoch of economic and political transformation from 1987 to 2006 in a case where market-oriented enterprises and competitive political parties emerged in tandem.

The proposed case involves the simultaneous transformation of political and economic fields, the separation of state from economy and a possible re-politicization of the economic field. In examining newly market-oriented firms and newly competitive political parties, a key question arises: What is the relationship between business networks and political ties? By collecting data on political business groups from the first moment of network formation, the project will test rival hypotheses from political sociology and political science about the causal relations and timing of business ties and political affiliations.

The case provides an opportunity to study how the dynamics of network evolution at the national level are shaped additionally by transnational processes, both economic and political. From a relatively autarchic, closed economy, Hungary is now integrated into the EU and has one of the most open economies in the world, with unprecedented levels of foreign direct investment. Does massive foreign investment lead to the break up of business groups? Or does it precipitate group restructuring, perhaps in the direction of more defensively cohesive groups composed of firms without foreign investment but with even stronger ties to national politicians? Similarly, as regulatory policy shifts from Budapest to Brussels, do we see an attendant decline in affiliations to national parties, or perhaps a shift from national to supranational or even to local level affiliations?

To study the formation and dynamics of political business groups, the investigators will construct an unprecedented dataset. For the business side, the dataset will list all economic officeholders in Hungary, identifying every senior manager and all of the members of the boards of directors of the largest 2,200 enterprises in the country for the entire twenty-year period. On the political side, the dataset will list all political officeholders in Hungary, identifying every elected politician from the Prime Minister to local mayors, including as well all cabinet ministers, their politically-appointed deputies, and all Members of Parliament, with party affiliations of each officeholder. For the years prior to free elections, the political dataset will include members of the Communist Party's Politburo and Central Committee, as well as government ministers and deputies. By merging the lists of economic and political officeholders, for any given enterprise in any given month, the investigators can precisely identify whether that company had an economic officeholder who was also a current or former political officeholder affiliated with a particular political party.

To identify processes of the co-evolution of business networks and political affiliations, the investigators develop innovative methods of social sequence analysis and dynamic cohesion analysis.

Intellectual Merit. This is the first comprehensive study of modern political business groups that examines network dynamics from the first moments of network formation while encompassing an entire epoch of economic transformation and political regime change. This unprecedented dataset makes it possible to test rival hypotheses about the dynamics of political business groups using innovative methods of quantitative historical sociology.

Broad Impact. This study of the relationship between newly market-oriented firms and newly competitive political parties will yield insights about democratization and economic development. The analysis of the dynamics of political business groups in a context of massive foreign investment and supranational integration into the EU will be of interest to policy analysts in emerging democracies, in U.S. government agencies, and international institutions such as the World Bank.

Politicized Business Ties: Network Dynamics of a Democratizing Polity and a Globalizing Economy, Hungary 1987-2006

David Stark (PI) and Balazs Vedres (Co-PI) Project Description

Rationale. This project analyzes the interactions of firms and parties across an entire epoch of economic and political transformation from 1987 to 2006 in a case where market-oriented enterprises and competitive political parties emerged in tandem.

At the beginning of the period we propose to investigate, Hungary was a planned economy in which almost all productive assets were owned by the state, and the polity was ruled by a monopolistic Communist Party. By the end of the period, both the economy and the polity had been integrated into the European Union (EU) and more than half of the capital in the large-firm sector was controlled by foreign investors. In the intervening decades, enterprises were privatized and political competition among parties had resulted in the defeat of the incumbent party in each of the parliamentary elections in 1990, 1994, 1998, and 2002.

We propose to gather data on the relationship between newly market-oriented firms and newly competitive political parties in order to study the role of political business groups in democratic consolidation and economic development. By collecting data on the emergence of business networks and political ties from the first moment of network formation we can test rival hypotheses from political sociology and political science about the causal relations and timing of business ties and political affiliations.

Our case provides an opportunity to study whether and how the dynamics of network evolution are additionally shaped by transnational processes, both economic and political. From a relatively autarchic, closed economy, Hungary is now one of the most open economies in the world, with unprecedented levels of foreign direct investment (FDI). Does massive foreign investment lead to the break up of business groups? Or does it precipitate group restructuring, perhaps in the direction of more defensively cohesive groups composed of firms without foreign investment but with even stronger ties to national politicians? Similarly, how has entrance into the EU affected enterprise-party ties? As regulatory policy shifts from Budapest to Brussels, do we see an attendant decline in affiliations to national parties, or perhaps a shift from national to supranational or even to local level affiliations?

To study the formation and dynamics of political business groups, we propose to construct an unprecedented dataset. On the business side, we will construct a list of all economic officeholders in Hungary, consisting of the names of every senior manager and all of the members of the boards of directors and supervisory boards of the largest 2,200 enterprises in the country for the entire twenty-year period. On the political side, we will construct a list of all political officeholders in Hungary, consisting of the names and party affiliations of every elected politician, from the Prime Minister to local mayors, including as well all cabinet ministers, their politically appointed deputies, and all Members of Parliament. For the years prior to free elections, our political dataset will include members of the Communist Party's Politburo and Central Committee, as well as government ministers and deputies.

For every economic officeholder and every political officeholder, we will record their tenure in office on a monthly time resolution. The fine grain of our recording will allow us to test

propositions about the effects of ownership (and other) changes on replacement or retention of key enterprise personnel, as well as the timeliness of such. For example, does a new controlling interest by a multinational result in immediate replacement of the Hungarian firm's senior management and board of directors? Does privatization in the early period typically result in retention (evidence of managerial-led property transformation)? Is managerial replacement the more likely outcome in later periods? Similarly, our monthly time resolution will allow us to look at board membership in the months immediately prior to each of the five parliamentary elections to test the effects of political changes with different post-electoral time lags.

Whereas the recording of our data will be temporally fine-textured, the temporal scope of our study will be broad. Our goal is to chart an entire epoch of transformation, reaching back into the communist period and encompassing the early period of political and institutional uncertainty, the later period of institutionalization, and eventually the final period of integration into the EU. To our knowledge this is the first comprehensive study of modern political business groups that examines network dynamics from the first moments of network formation.¹ Our research design allows us to observe network evolution from inception giving us the ability to test for path dependencies, i.e., temporally self-reinforcing processes in which patterns that were successful in an initial context persist even after the organizational environment changes (Arthur 1989; Mahoney 2000).

Theoretical issues and existing research on firm-party interactions

Political and economic competition re-entangled. To say that the economy under communism was "politicized" would be a misnomer, for to suggest an interaction between one field and another would imply that the two existed as autonomous fields. At the outset of our study, the political and the economic are so tightly entangled they are virtually inseparable (on the lack of autonomy of the communist state see Stark and Bruszt 1998, esp. Chap 4). As part of the *nomenclatura*, senior managers of the large state-owned enterprises were appointed by, and directly accountable to, the central authorities. In fact, by virtue of the strategic importance of their positions, many of these enterprise directors were themselves members of the party's Central Committee.

With the collapse of communist rule in the upheavals of late 1989, policy makers of many stripes posited a clear goal in both the economic and the political arena: a market economy of competing firms and a liberal democracy of competing political parties. The means to achieve these goals were also clearly stated: separate the state from the market and sever political ties from the field of economic action.

Although goals and means were clear, the actual challenges of market competition among firms and political competition among parties lead to the establishment of new ties between firms and parties. Restated, the goal of sharply separated fields is undercut by the very logic of competition within each. On one side, to compete in the political field, governing parties need to manage the economy, and all political parties need access to resources. On the other side, to compete in the economic field, firms need access to government contracts and to timely

¹ Padgett and McLean (2006) examine multiple networks (business, kinship, and political) from inception in Renaissance Florence.

information about government policies. In short, to gain resources to compete for votes, parties compete for firms. At the same time and in parallel, to gain an upper hand in economic competition, firms ally with parties (McMenamin and Schoenman 2004; Schoenman 2005).

Firm-party interactions occur, meanwhile, in a context in which firms are making ties to each other. To cope with the institutional uncertainties of postsocialism (Elster 1993; Stark 1990, 1992; Murrell 2000, 2003) and, later, with the uncertainties of a market economy, firms create inter-organizational networks (Stark 1996; Johnson 1997; McDermott 1997; Róna-Tas 1998; Vedres 2000; Spicer, McDermott and Kogut 2000). These inter-organizational networks are established as firms share directors and make direct ownership ties to other firms.

As firms link to other firms creating business networks, and as parties and firms link to each other creating political ties, a key question thus arises: What is the relationship between business networks and political ties? Does the combination of business and political ties lead to political business groups? Most important, what are the dynamics of the co-evolution of such multiple networks? In answering these questions we address the lacunae noted by Koza and Lewin in their comprehensive review of the literature on inter-organizational alliances:

“Rarely has research on alliances explicitly considered alliances to be embedded within the strategic portfolio of each partner and/or within accepted industry practices or as a function of the regulatory environment, institutional arrangements, and culture of the nation state or form of capitalism” (Koza and Lewin 2000).

Existing empirical research. Our research design builds on network-analytic contributions to political sociology and economic sociology. Recent studies of political cohesion among corporate elites demonstrate that network structures of interlocking directors explain the speed of adaptation of governance practices (Davis and Greve 1997) and that firms that are linked through interlocking directors are more likely to take similar positions on legislative matters (Mizruchi 1992). Burris (2001, 2005) examines political behavior among the top officers of the 1050 largest US companies, operationalizing political behavior as contributions to political candidates in the 1980 elections. Using quadratic assignment (QAP) regression on the 289,180 dyads of the 761 presidential contributors in his sample population, Burris finds that social ties through common membership on corporate boards “contribute more to similarity of political behavior than commonalities of economic interests, such as those associated with operating in the same industry or the same geographic region.”

These studies are part of a wave of empirical research launched after the Federal Election Commission provided machine-readable data, starting in 1978. Widespread availability of these data made campaign contributions the data of choice for political sociologists studying the U.S. corporate elite. Such data are not available for Hungary because political financing in Hungary is not organized around contributions to the campaigns of politicians (Juhász 2001). Sparing the reader the complexities of Hungarian electoral law, candidates for Parliament do not run as individuals but rather on party lists. In effect, no one contributes to a given politician’s campaign.

The absence of campaign contributions to individual candidates does not mean that firms are not a resource for parties. Nor does the absence of data on campaign contributions mean that we cannot find data on firm-party linkages in Hungary. Firms can appoint political officeholders to

their boards of directors,² compensating them quite handsomely in many cases as well as providing other resources (cars, clerical and other support staff, etc).³ Whereas in the U.S. corporations and their executives contribute to politicians' electoral campaigns, in Hungary companies put politicians on their payrolls. Through the appointment of a particular politician who ran on a party list, a firm creates bonds with a party. Through these directors, firms can influence rule-making and gain access to timely information about government contracts, industrial and trade policies, and changes in regulatory policies and enforcement. The business director/political officeholder thus constitutes a direct link between firm and party.

By collecting continuous, longitudinal data on all directorship ties among firms and all personnel ties to parties, we create a large data archive that will make it possible to answer questions about the *causal* relationships between business ties and political affiliations. Whereas Burris, for example, analyzes data from one year and one presidential election, we will examine a numerically and proportionally much larger population of firms across a twenty-year time frame encompassing five parliamentary elections. Although Burris finds correlations between social ties and political behavior, his cross-sectional model cannot rule out the possibility that similarity of political views was a factor shaping the composition of directorship boards. With the fine-grain of our longitudinal data, we will be able to assess the precise timing of director interlocks, identifying whether there are conditions in which political affiliations shared by corporations *precede* business group formation. Similarly, we can answer questions about the dynamics of the re-politicization of the economy. Do firms with ties to the governing party typically change their political affiliation after an election to align with the new governing coalition? Or, do business groups establish robust political affiliations that are stable across the (mis)fortunes of electoral politics? Under what conditions do firms (or groups of firms) create ties to both left- and right-wing political parties? And do these processes have distinctive temporal properties, for example, with systematic variation across the earlier and later periods in our study?

A key criterion in our research design is to make it possible to test rival theories informing long-standing debates between political sociologists and political scientists. In those debates, political sociologists typically look to the primacy of social ties, explaining political behavior by reference to social structure. Political scientists, for their part, look to the primacy of political institutions, arguing as well that there are conditions in which the contingencies of political processes can shape social structure. For example, in recent debates about the consolidation of party systems in new democracies (on Eastern Europe in particular, see Kitschelt and Smyth 2002, Grzymala-Busse 2002, Orenstein 2001, Lewis, 2000, and Hellman 1998) scholars of East European politics point to the relatively rapid consolidation of the party system in Hungary and explain this with reference to the early institutionalization of constitutional and other political questions (for discussion see Linz and Stepan 1996; Schmitter and Schneider 2005). Our data

² Hungarian regulations on conflicts of interest differ from U.S. law. Moreover, such legal regulations change during the two decades of our study. Until the mid 1990s, for example, cabinet ministers were not prohibited from serving as board members. Some restrictions were later placed on sitting politicians. We will do a thorough review of these regulations, and our models will take such policy changes into account.

³ In our preliminary interviews we learned that a considerable part of the work of the directors of party finance is coordinating such corporate directorships. In party-firm negotiations, parties frequently nominate a list of several of their politicians as candidates for directorship appointments. We inquired about whether it matters that the appointment is to a current or ex-politician. The reply, with muted laughter at our naiveté: "In Hungary, there is no such thing as a *ex-politician*."

will allow us to test a rival hypothesis: the consolidation of a stable party system could be attributable to the consolidation of relatively stable business groups. The mechanism here could be that a stable inducement of rewards through directorship appointments mitigates party switching by politicians and thus contributes to party stability.

Because our case involves extraordinarily high rates of FDI, our analysis will also contribute to debates about the effects of globalization on business networks (Kristensen and Zeitlin 2004; Gereffi 2004; Morgan, Kristensen, and Whitley 2001; Dicken and Malmberg 1994; Ghoshal and Bartlett 1990). Can an economy be open to high levels of FDI and still maintain the basic structures of its national inter-organizational networks? This was the problem posed in an important study of inter-organizational networks and foreign investment by Kogut and Walker (2001) who examined inter-organizational networks in Germany between 1994 and 1997. In an innovative application of Watts' (1999) small-world models, they found that small-worlds structures could persist even during a major wave of foreign investment. With previous support from NSF we found that FDI restructured but did not eliminate inter-enterprise *ownership* networks in Hungary (Stark and Vedres 2006). In the proposed research we will test the effects on *directorship* networks. Moreover, because we will have the complete list of political officeholders, we can test the effects of FDI on political business networks. Specifically, we will test the hypothesis that high levels of FDI will result in a segregated economy in which business groups with FDI will sever ties to the national political parties while business groups without FDI will forge stronger ties to national politicians.

Because our case selection includes the period of Hungary's integration into the EU, beginning with associate state status in 1994 and then its accession to full membership in 2004, we can test the effects of supranational political institutions on national parties. Political scientists have begun to examine the effects on EU enlargement on party systems (Mair 2000; Ladrech 2002; Lewis 2004; Brusis 2004) but that literature typically looks at ideological families of parties. Our consultations with colleagues in Florence and Cologne who specialize in studying the EU suggest that no one in any country in Europe has studied the effects of EU integration on political business ties. As the locus of decision-making about trade, tax, labor, and industrial regulations – indeed, about nearly every important institutional aspect of the economy – shifts from Budapest to Brussels, we expect that firms will reduce their ties to national political figures. But here we are in completely uncharted waters. What we can expect is that our findings will be of considerable interest to many researchers who follow how a changing international environment alters enterprise behavior.

In the following section on research design, we define our populations of firms and actors, define ties and shared political affiliations, and outline our methods of data collection. After describing basic variables that we will test as correlates of political ties, we elaborate two analytic methods – *social sequence analysis* and *dynamic cohesion analysis* – that we propose to develop for analyzing our data. With each of these analyses our goal is to develop new methods for studying historical processes with analytic rigor. Network analysis has made enormous strides in moving from static to dynamic modeling (Padgett and McLean 2006; Uzzi and Spiro 2005; Powell, Koput, White, and Owen-Smith 2005; White and Johansen 2004; Snijders 2001; Gulati and Gargiulo 1999; Stuart 1998; Brudner and White 1997). As part of that collective endeavor, our task is to develop analytic tools that bring network analysis into historical sociology and historical sensibilities into network analysis.

Research Design

Data collection. We define a large firm as ranking among the top 500 firms (based on revenue) in any of the years from 1987 to 2006. On the basis of the data collection for our previous NSF-sponsored research, we estimate that this will yield approximately 2,200 firms. For a small country like Hungary, this population of firms accounts for more than a half of all employment, two-thirds of the GDP, and the overwhelming proportion of export revenues. For each firm in our population, we will gather directly from the 20 Courts of Registry the names of all *economic officeholders* which we define as all senior managers (e.g., CEOs, CFOs, and the like whose signatures are legally binding on the firm), all members of its Board of Directors, and all members of its Supervisory Board for the entire length of the firm's existence (with 1987 as the earliest starting point). For each economic officeholder, we record tenure in office as the month and year of accession to office and month and year of exit.

For each firm we will also collect data on its annual revenues, industrial classification (SIC code), location, privatization history, and increase or decrease in capitalization as well as information on the date when the firm was founded and the date of filing for bankruptcy, liquidation or cessation for any reason, i.e., the date when the file of the firm was closed at the registry court. For some purposes, our new dataset on personnel can also be merged with our earlier dataset on the complete ownership histories of the largest 1,696 firms from 1987-2001 in which we recorded the following: equity in thousand Hungarian forints, the names of the firm's top twenty-five owners, and the percentage stake that each owner holds in the company. For this subset of our population, types of owners are coded in four categories: state, Hungarian firm, Hungarian person, and foreign owner.

We define *political officeholders* as all elected national and local officials, including all Members of Parliament (MPs) and all local mayors, and all national level government officials, including the Prime Minister, all cabinet ministers, and their politically appointed deputies. For the years prior to 1990, we include government ministers, deputies, and members of the Communist Party's Politburo and Central Committee. For the entire period examined, 1987-2006, we will gather the names of each of these political officeholders, recording their party affiliations and any changes in such. As with the economic officeholders, tenure in office will be recorded on a monthly time frame. We estimate that the list of political officeholders will include approximately 25,000 names. These data are available for a fee from the MTI, the official agency of record. These data are highly reliable.

With our dataset on economic officeholders, we can chart the network evolution of directorship ties among the largest Hungarian enterprises. By merging the lists of economic and political officeholders we can precisely identify (for any given enterprise in any given month) whether that company had an economic officeholder who was also a political officeholder as well as identify the party label of that officeholder. To assess the feasibility of merging and analyzing the twin datasets, we conducted a pilot study of the economic and political officeholders in 2001. The project proved quite manageable.

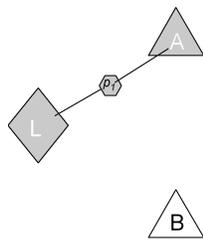
We will augment our datasets by interviews with a targeted set of CEOs (selecting across a range of industrial branches, locating actors who played important roles in the earlier period as well as those on the contemporary scene, and finding directors of companies owned by multinationals as

well as domestically-controlled firms), politicians across political camps, journalists who cover party financing and corporate governance, and Hungarian lobbyists in Brussels. These interviews will provide contextual background for the quantitative analysis.

Operationalizing ties and political affiliations

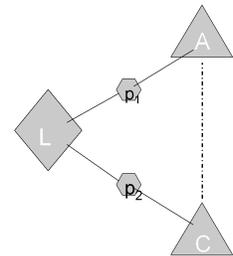
We count a *directorship tie* between two companies when

- a senior manager of one company sits on a board of another company or
- an individual sits on a board of each of the two companies.

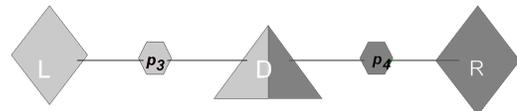


We count a company as having a *political tie* when one of its economic officeholders is a current or former political officeholder.⁴ In the schematic to the left, Company A is politically affiliated with Party L because one of its officeholders, p_1 , is also a current or former political officeholder in Party L. With no political tie, Company B is without political affiliation.

We count two companies as *sharing a party affiliation* when each has a political tie to the same party. In the schematic to the right, Company A and Company C share a party affiliation because each has a political tie to Party L, Company A through economic and political officeholder p_1 and Company C through p_2 .



We count a company as *politically balanced* if it has at least one political tie to a left-wing party and at least one political tie to a right-wing party.⁵ In the schematic below, Company D is politically balanced because it has a political tie to left-wing Party L through p_3 and to right-wing Party R through p_4 .



Identifying firm-level correlates of political ties

Our rich dataset will provide opportunities for several different kinds of analysis. We start with relatively straightforward operations that identify cross-sectional changes over time in the broad patterns of ties and then move to more complex sequence analytic and dynamic network modeling that captures historical processes.

Beginning with fundamental questions, we will chart how the number of firms with political ties to parties changes over time. We expect that the proportion of firms with political ties will grow rapidly in the early post-socialist period, perhaps heating up considerably in the mid-90s following the electoral victory of the socialist party and again at the end of the decade following

⁴ Because we have precise records of tenure in office, we have options, of course, of running some models restricting the definition only to ties through current officeholders.

⁵ Our use of the terms “left-” and “right-“ wing are strictly relational. In Hungary, these terms construct the political field but do not correspond to conventional ideological or policy preferences. In the coming 2006 election, the major political consultant for the “right-wing” Fidesz party is a former advisor to Bill Clinton while the nominally “left-wing” Socialists have hired a former advisor to Arnold Schwarzenegger.

the electoral victory of a new right-wing party. In addition to overall proportions, we can chart across the entire period the number of firms allied to distinctive parties. We expect, for example, that former communists will gain positions on company boards in the early period. The interesting question, of course, is whether they maintain these seats, or perhaps even increase their corporate presence a decade after the demise of their party.

We further propose to study how ownership categories (e.g., state and foreign ownership) are related to political ties. In our previous study we found that the *state's* share of large firm capitalization declined from about 98 percent in 1988 to about 20 percent in 2001. We expect that firms in which the state holds an ownership stake will be more likely to have political ties. Whereas majority holdings (50 percent + one share) and qualified minority holdings (25 percent + one share) are likely to be strongly associated with political ties, we further expect that as little as 1 percent state shareholding will be a predictor of political ties.

In our previous study we also found that the share of *foreign* ownership in the large firm sector increased from almost zero in 1998 to over fifty percent in 2001. We expect that firms in which foreign investors hold a controlling interest will be less likely to have a political tie. We further expect, however, that in cases where such firms do have political ties, these will more likely be to local rather than national level political officeholders. Our reasoning here is that a multinational lacks ties to its particular locality within the host country. A tie to a local mayor is a parsimonious means to establish local connectedness. As another aspect of the “liability of foreignness” (Zaheer 1995), domestic managers of the foreign-held firm are under pressure from the multinational to avoid negative publicity. Local mayors have lower visibility and are less likely to figure in press coverage of political scandals, in part because they typically lack a party label. Therefore, to the extent that foreign-controlled firms make political ties, they will be more likely to link to politically colorless, local officeholders.

Among the other basic variables, we expect that industrial branch will be a factor in explaining companies' political ties. Specifically, we expect that operating in a branch of industry that does contract work for the government (e.g., construction, etc.) will be significantly correlated with having a political tie. Similarly, we expect that firms in highly regulated sectors (e.g., finance, telecommunications, etc.) will be more likely to choose at least one director who is a current or former political officeholder. These and other variables (e.g. size based on revenue rankings, geographic location, etc.) will serve as control variables in the more complex models, to which we turn.

Social sequence analysis of firm-party ties

In a preliminary round of interviews to lay the ground for this proposal, a theme repeated by senior managers was that it has become more rather than less difficult for large firms to escape politicization. “Boards are definitely political,” stated one manager with a combination of emphasis and regret. To our general question, “What’s the significance of political ties in the economy?” the manager of a large manufacturing firm in electronics bemoaned: “It depends on the industry. In our industry it is the unavoidable dark side.” Another senior manager observed:

“Sooner or later everyone gets a political tag. It’s less and less that you can convince others and convince the market that you are neutral. Even just keeping your position can mean that you are with my enemies.”

Recognizing the increasing politicization of boards, other managers told of their firms' efforts to create politically balanced boards. The executive of a large chemical company:

“We want to have balanced political relations. We attempt to have a balanced and stable board. [He then points to four directors, explicitly noting two in the left-wing camp and two in the right-wing camp.] We can demonstrate that this concept is workable over time to defend us when governments change.”

In outlining a hypothetical game-theoretic approach, McMenamin and Schoenman (2004) adopt a marital metaphor to describe types of party-firm relations in post-socialist Eastern Europe: *monogamy* (a firm-party “marriage” survives crises), *serial monogamy* (a firm links to a party, “divorces,” and establishes ties to another party, perhaps repeatedly), *polygamy* (a firm with simultaneous ties to more than one party), and *abstinence* (a firm with no party ties).

To empirically test the prevalence of these patterns and to identify the temporal processes that underlie them, we propose to conduct a sequence analysis of firm-party ties. Through that analysis we will identify the distinctive types of pathways that firms make through the space of firm-party relations.

With prior support from the NSF, we demonstrated that sequence analysis (Abbott 1995; Stovel, Savage, and Bearman 1996) could be a powerful tool when optimal matching analysis is appropriately modified for social sequence analysis (Stark and Vedres 2006). In that study we gathered data on the complete ownership histories of the largest 1,696 Hungarian firms from 1987-2001. With those data we reconstructed the ego networks for each firm for each of the fifteen years in our study. A tie consisted of a direct ownership stake by any firm in our large-firm population to any other firm in the population. The methodological innovation at the heart of that study was to combine the tools of sequence analysis and network analysis to yield a sequence analysis of changing network positions. We used logistic regression to demonstrate that the typical pathways through a network space significantly explain patterns of foreign investment.

In the proposed study we further refine this method with application to a different, and more complex, set of ties. As in our previous study, here we also gather data directly from the Courts of Registry. In both studies the unit of observation is the firm, but the unit of analysis is a sequence of ties. Whereas in the prior study, ties were *among firms* through direct ownership links, in the social sequence analysis we propose here ties are *between firms and parties* through shared personnel.

To identify the space of firm-party relations, we start with the notion that a firm can have a portfolio of political ties. The possible portfolios are given by the number of political parties in the field at any given time. To illustrate such a portfolio space, we start with two left-wing parties, Communist (C) and Socialist (S); two right-wing parties, MDF (M) and Fidesz (F); and local mayors who are typically Independents (I).⁶ A firm with no political ties is Neutral (0). In

⁶ There are four other minor parties, three of which served in right-wing coalition governments and one of which served in a left-wing coalition government. Our modeling can collapse these into the dominant parties with which they were in coalition or retain them as separate political entities. Similarly, if a local mayor has a party affiliation, it typically indicates that this official does have close party ties and would be coded appropriately. For some models we retain the possibility of coding that official as local.

principle the portfolio space has as many possible states as $1 +$ the permutations of the number of parties. The empirically observed portfolio types are likely to be considerably smaller. For illustrative purposes, consider here the likely five pure types (C, S, M, F, I); two within-camp portfolios (CS and MF); and four across-camp “balanced” portfolios (CM, CF, SM, SF), with likely variations of these depending on the inclusion of a tie to an independent local official. Designate the pure types by their party identifier, label the two within-camp portfolios as Left (L) and Right (R) respectively, and label the four across-camp portfolios as Balanced (B).

For each of our estimated 2,200 firms, we record the observed political portfolio for each of the 240 months in our investigation. For each firm we then have a discrete sequence of portfolio positions. The table below presents a simplified illustration (registering the units in years instead of months) of a given firm’s sequence through the space of portfolio positions.

	Years																			
	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06
Firm				0	0	M	M	0	S	S	S	S	B	B	B	S	S	0	0	0

This hypothetical firm begins its corporate life in 1990 and for the first two years has no political ties. In 1992 it appoints a director who is a political officeholder in the center-right MDF party. That director is replaced in 1994 with another who is not a politician. In that year the firm has no political ties. Between 1995 and 1998, the firm has a political tie to the Socialist party. Following the election in 1998 which was won by the right-wing Fidesz party, the firm has a balanced portfolio from 1999 to 2001, having retained its ties to the Socialists while also having acquired a director with a tie to the new governing party. It dismisses that director in 2002 but keeps the director that ties it to the Socialists. From 2004 to 2006 it has no political ties.

We propose to construct the political portfolio histories of all of the estimated 2,200 firms in our population in the same fashion as presented in the above example, representing each portfolio history by the sequence of the coded portfolio positions for each month. Our dataset is thus 2,200 sequences that run across 240 months. Those firms that never have a political tie will have identical sequences, up to 240 zeros. But for the remaining firms it is possible that no two firms will have exactly the same sequence history. Our task is to identify *types of sequences*, which we label *pathways*, by grouping firms according to the similarity of their sequence histories.

To do so we use *modified optimal matching analysis*⁷ to find the distance of each sequence from all others. (A detailed account of our methodological procedures is elaborated in [Stark and Vedres 2006](#)). To the resulting matrix we then apply hierarchical clustering that groups sequences so that within-cluster distances are as low as possible and between-cluster distances are high. The combination of these two algorithms yields – not unlike the concept of structural equivalence in network analysis – *sequential equivalence* (Han and Moen 1999).

⁷ Unlike measures based on vector similarities, optimal matching (borrowed from DNA sequencing) has some advantages for historical application; but it has been justifiably criticized by Wu (2000). Because the default optimal matching algorithm is not sensitive to the directionality of time, we make adjustments to the parameters to maximize temporal sensitivity. See Methodological Appendix C of Stark and Vedres (2006) for details about the adjusted parameters used in our modified optimal matching analysis.

Social sequence analysis will make it possible to identify the typical pathways through the space of political portfolios. By doing so, we can answer questions about the patterns of political business network formation and the temporal processes that underlie them. For example, one pattern of politicization of the economy would be that firms establish ties to a particular party and keep those ties regardless of its electoral success. A firm that “locked-in” to the former communist elite, for example, would show a sequence C-C-C-C-C... throughout the period. Firms that start in the right-wing camp and remain tied to that part of the political field might show sequences such as the following M-M-M-R-R-R-F-F-F. An alternative pattern of politicization of the economy would suggest that a sizeable number of firms are switching their party affiliations after each election, always tied to the governing party: M-M-M-M-S-S-S-F-F-F-S-S-S-S, and so on. Political scientists likely expect that many firms will hedge their bets in the period immediately prior to an election – especially in a case such as Hungary’s where the electorate has demonstrated a preference to replace incumbent parties. The following table shows a stylized sequence that would reflect such a strategy. Firms here would be creating balanced boards (with ties to both political camps) in the year before a parliamentary election, going with the winning party, until political uncertainty increased prior to the next election – a strategy repeated across the elections:

	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06
Pathway				M	M	M	B	S	S	S	B	F	F	F	B	S	S	S	B	F

It is unlikely that many firms will adopt a combination of flexibility and hedging in such an extreme form. But our social sequence analysis will make it possible to identify firms that tend to adopt such a strategy. Similarly, we can identify firms that abandon party switching in favor of balanced boards as a long-term strategy, as in the following example:

	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06
Pathway	C	C	C	M	M	M	M	S	S	S	B	B	B	B	B	B	B	B	B	B

As political polarization increases (with a block of firms locking-in right and another block left), we expect to find a significant number of firms opting for balanced boards as a safeguard against such politicization, and our modeling will be sensitive to the timing of such critical turning points.

Having identified distinctive pathways, we will then test for correlations, drawing on the variables described in the previous section. For example, are firms in the pathways that lock-in left or right likely to be in different industries? Are firms in pathways characterized by party-switching more likely to be larger firms? Is the balanced board pathway/strategy a function of location in highly regulated industries? And is FDI a significant factor in explaining different pathways?

Dynamic network analysis of cohesion and political affiliation

In a politicized economy business ties and political affiliations are correlated. Beyond establishing the strength of this correlation we will identify its underlying historical processes. For example, we expect to find processes in which a distinctive business group might form and

then later become increasingly politicized as its member firms become connected to the same party. Alternatively, shared political affiliation might precipitate the formation of a cohesive business group. In this second case earlier patterns of political affiliation will leave their mark on subsequently formed cohesive groups. Third, existing business groups might disintegrate if member firms are split regarding their political party affiliations. This process starts with a cohesive group of neutral firms, and as firms in the group form alliances with different parties, the ties inside the group start to dwindle. Fourth, balanced political affiliations might evolve on the border zones of two groups with different party affiliations. Although we expect business groups to be cohesive, they are not necessarily isolated from other groups. The border zones between groups can be a strategic position for firms that attempt to hedge uncertainties by multiple group affiliations. These firms might also engage in political hedging strategies by forming politically balanced boards.

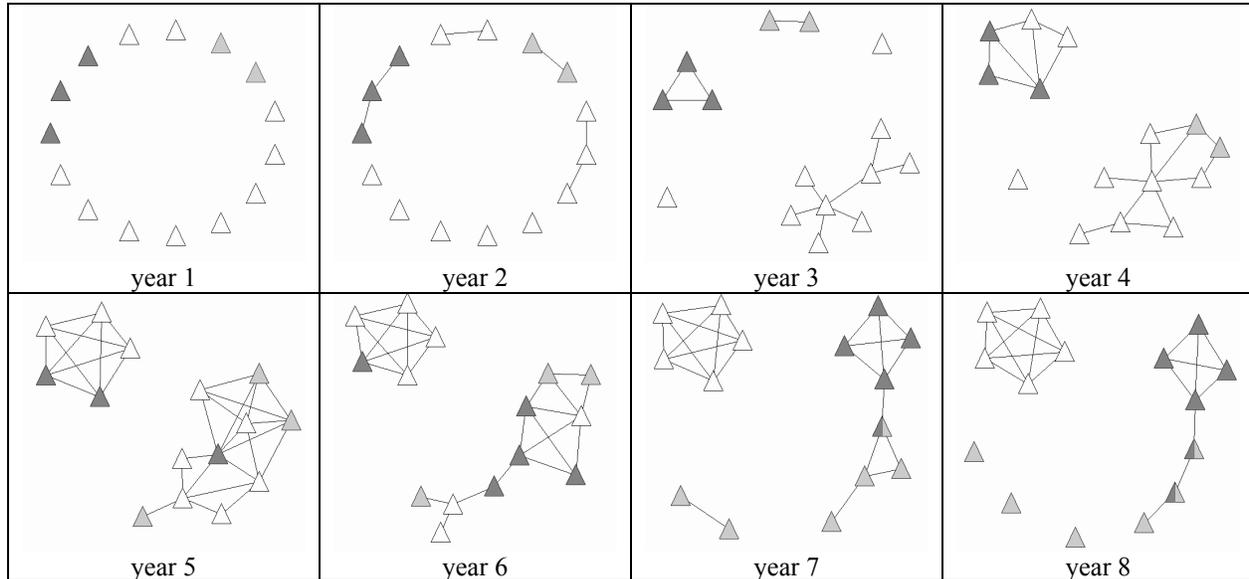
In some cases the formation of business groups precedes party affiliations. That is, business network cohesion shapes political affiliation. In other cases, however, political affiliation precedes business network cohesion, or disintegration. In these latter cases, political affiliations shape business network formation. Interestingly, both processes may be at work contemporaneously, with some groups forming through the former process and others through the latter.

To identify the groups that are formed through these different processes as well as identify the temporal properties of each we develop new methods for dynamic network modeling, building on the work of Doreian and Stokman (1997), White and Johansen (2004), Gibson (2005), and Moody (2005). Our dynamic cohesion analysis incorporates, from the sequence analysis, ties between a firm and parties through the coding of political portfolios. In combination with these political ties it further takes into account the directorship ties among firms. Whereas our modified matching analysis measures distance (similarity) of each firm's sequence from the sequences of all other firms, our dynamic cohesion analysis measures the cohesion profile similarity of each firm with all firms in clique overlap matrices across all points in time.

To identify cohesive groups in a dynamic dataset we will apply statistical methods. The first task is to measure the extent of cohesion for each point in time for each pair of firms. This will be accomplished by identifying the number of clique overlaps (Everett and Borgatti 1998). This yields a dyadic N by N matrix for each point in time. The next task is to identify firms with similar cohesion histories, that is, firms that tend to belong together in cohesive groups with similar timing. This will be accomplished by measuring the profile similarity of firms in the clique overlap matrices across all points in time. Two firms that tend to be cohesively linked to one another at the same points in time have similar cohesion histories. We use Breiger's Convergence of Iterated Correlations (CONCOR) algorithm (Breiger, Boorman, and Arabie, 1975) to identify similar cohesion histories from the correlations of cohesion profiles.

To demonstrate such a dynamic network analysis, we ran the dynamic cohesion analysis outlined above on a small dataset with fifteen firms and eight points in time. The demo dataset presented below records the directorship ties between firms and changes in firms' political affiliations. With this small dataset, it is possible to inspect the graphs of the network for each point in time. For the actual dataset, such visual inspection would be unwieldy but also unnecessary since analysis would be conducted on the statistical outputs. The results of the demonstration analysis are presented here using visualization tools of the PAJEK program (Batagelj and Mrvar 2001).

Lines indicate directorship ties between firms, and colors indicate firms' political affiliations: white nodes indicate politically neutral firms, black nodes indicate firms affiliated with one political party, gray nodes for firms affiliated with the other party in this simplified model, and black + gray for firms with balanced ties to each of the parties. The blocked matrices generated by the application of CONCOR to cohesion histories are omitted due to space constraints.



The evolution of cohesion and party affiliation in the demonstration dataset.

The figure illustrates how the application of our dynamic cohesion method identifies interacting processes of group evolution and political affiliation. As the figure shows, in the initial year, no firm shares a directorship tie but five firms have a political affiliation. In the second year, we find some business ties among firms with similar political affiliations. In the third year, three firms that are affiliated with the black party form a cohesive group – an example of business group cohesion induced by political affiliation. In the fourth year, two neutral firms join this three-firm group. At the same time, a bigger, though less cohesive group forms and incorporates two firms affiliated with the gray party. The initial formation of this group is not driven by political affiliation. By the fifth year this bigger group starts to become politically mixed; and by year six only three of the group's ten firms stay neutral. As all firms in the bigger groups become politicized in the bigger group by the seventh year, the smaller group cuts its ties to politics altogether. The split political affiliation of the bigger group leads to a disintegration of ties, with the two political segments connected by a firm with a balanced board. In the eighth year most firms affiliated with the gray party break ties with their former business group and become isolated. Despite the bridging positions of the balanced boards, split political affiliation leads to partial disintegration of the group.

Thus, like our social sequence analysis, our dynamic cohesion analysis exploits the fact that we have a continuous dataset. Because our data go back to the initial moments of network formation, we are never left wondering, “if only we had data on the prior period.” Yet, because our data are continuous, our findings go beyond first causes to support more nuanced analysis, specifying the conditions (specific configurations and specific timing) under which here political ties and their business ties were causally determinant.

Basis for further comparative research. Our project might be compared to the project of mapping the human genome in Iceland (Pálsson and Rabinow 1999): take a relatively small country and gather data on nearly the entire population. Although from a small country, the data are disproportionately valuable because they are comprehensive. In this proposal we have highlighted analyses that make firms and parties the central objects of study, but our data will enable other kinds of analyses, focusing at the individual level, for example, in studying the careers of managers or the careers of politicians. The study will also establish a baseline for future comparative research. Hungary is an important case because it is an example of a successful transformation, not only in achieving a competitive market economy but also in consolidating a strong, regulative state that is able to govern the economy – perhaps not despite but in part because of the ties reaching across business and politics (Evans 1995).

Personnel, Prior NSF funding, and Dissemination

Personnel.

David Stark, PI, is Arthur Lehman Professor of Sociology and International Affairs at Columbia University and a member of the external faculty of the Santa Fe Institute. He was a recipient of a Guggenheim Fellowship in 2002. Stark has been studying organizational innovation for more than twenty years in a variety of settings, using combinations of ethnographic research and network analysis. His book, *Postsocialist Pathways: Transforming Politics and Property in East Central Europe* (Stark and Bruszt 1998) is a comparative analysis of the simultaneous expansion of citizenship rights and property rights. His formative paper on postsocialist property transformation, “Recombinant Property in East European Capitalism” (Stark 1996a), has been reprinted seven times and has been cited more than 200 times. Since joining the Columbia faculty in 1997, Stark has studied a new media startup firm in Manhattan’s Silicon Alley from boom to bust (Girard and Stark 2002); a Wall Street trading room before and after the September 11th attack (Beunza and Stark 2003, 2004, 2005a, 2005b); user participation in the design process (Neff and Stark 2003); the use of information and interactive technologies in the immediate wake of the WTC attack (Kelly and Stark 2002); and civic associations and digital technologies in Eastern Europe (Bach and Stark 2002, 2004, 2005; Vedres, Bruszt, and Stark 2004). As this partial list of co-authored papers indicates, Stark has an excellent record of working and writing together with his post-docs and graduate students, and the proposed project promises similar opportunities for mentoring. Stark will be on sabbatical leave in 2007-08 and will devote considerable time to the proposed project.

Balazs Vedres, Co-PI, is an Assistant Professor in the Department of Sociology and Social Anthropology, Central European University. He holds a PhD in sociology from Columbia University and is an International Fellow at the Santa Fe Institute. His research develops new methods that bring network analysis into historical sociology and historical sensibilities into network analysis. Vedres’ research interests include economic sociology, economic transformations, social networks, historical and discourse analysis methods. His recent publications concern the interdependence of strategizing agents and evolving network structures in large scale social change, in the fields of business networks, political discourse, and civil society organizations. Vedres will be on development leave in the Spring of 2007, i.e., when data collection is concluded, and will be able to join Stark at Columbia for data analysis.

Results of prior NSF-funded projects. In 1990, Stark received an SGER grant from NSF, followed in 1991 by a related grant of \$70,000, SES-9024575, jointly supported by the NSF's Sociology, Political Science, and International Programs, entitled "Negotiating the Institutions of Democracy: Contingent Choices and Strategic Interactions in the Hungarian and Polish Transitions." Publications resulting from this NSF grant include Stark (1991, 1992, 1996a, and 1996b), culminating in *Postsocialist Pathways: Transforming Politics and Property in East Central Europe* (Stark and Bruszt 1998). This NSF funded work has been featured in the two major symposia that the *American Journal of Sociology* has organized in 1996 and 2001 on the postsocialist transformations and has received wide recognition from policy analysts (see especially Joseph Stiglitz's 1999 report to the World Bank).

In 2000, Stark received SES-0115378 (\$316,000, initial award dates, July 1, 2000-June 30, 2003), jointly supported by International Programs and the Innovation and Organizational Change Program to study "Organizational Innovation and Interactive Technology among NGOs in Postsocialist Eastern Europe." This project examined the co-evolution of civic associations and interactive technologies. In addition to field research among East European NGOs, Stark's research team conducted an analysis of the websites of 1,600 NGOs in Poland, Hungary, Slovakia, and the Czech Republic. An offline survey of the largest 1000 Hungarian civic associations was conducted during the summer of 2002. Publications resulting from this NSF grant include, Bach and Stark (2002 and 2004) and Vedres, Bruszt, and Stark (2004). "Global Links, Local Roots: Varieties of Transnationalization and Forms of Domestic Integration" (Stark, Vedres, and Bruszt 2005) is under review at *Theory and Society*.

Stark's two current grants from NSF will expire in June 2006. EIA-03-06868 (\$500,000, June 2003-May 2006) "Policy Made Public: Technologies of Deliberation and Representation in Rebuilding Lower Manhattan" (Stark PI, Francesca Polletta, Co-PI) is supported by the Digital Government Program. This project documents and analyzes the role of new technologies in representing the public and in making representations to the public in the rebuilding of Lower Manhattan in the wake of the September 11th attack. Publications from this project include, Polletta and Wood (2005) and Girard and Stark (2006).

SES-0136995 (\$258,167 June 2002-May 2006), supported by NSF's Sociology Program, is entitled "Pathways of Property Transformation: Enterprise Careers in Postsocialist Hungary." The core data collected for this study include the complete ownership histories of approximately 1,696 of the largest enterprises in Hungary for a fifteen year period, from 1987-2001, recording each change in a company's top 25 owners on a monthly basis. A major paper from this project "Social Times of Network Spaces: Network Sequences and Foreign Investment in Hungary," will be published in *American Journal of Sociology* 111(5).

Dissemination We will present our research findings at professional conferences (e.g., the meetings of the American Sociological Association) and workshops (e.g., the Santa Fe Institute) as well as various international forums. The working papers series of Columbia's Institute for Social and Economic Research and Policy and that of the Santa Fe Institute will provide pre-publication outlets. We plan to publish our findings in the major refereed journals of the discipline.