

**TESTING NARRATIVES OF POST-SOCIALISM:
TRANSITION AND SEQUENCE APPROACHES TO THE
OWNERSHIP HISTORIES
OF THE LARGEST HUNGARIAN CORPORATIONS,
1991–1999***

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Abstract: Post-socialism is typically framed as a transition, and represented by an a-temporal, unilinear and teleological model of social change. This paper evaluates transition models using firm level event data of ownership changes. I argue that the temporal structure of transition models is insufficiently simple and has a very limited explanatory power when contrasted with event data. The poor fit of transition models is due to the depiction of changes as a single process, answering the question of “what has happened” by constructing a giant transition event. An alternative model of change with multiple pathways is proposed that utilizes optimal matching analysis of sequences to identify typical firm ownership careers. I also argue that a multiple process model is not only fitting better to the data but it provides the opportunity to reinterpret the concept of transition, and opens the opportunity to ask new research questions.

Keywords: Post-socialism, transition, ownership changes, transition models

INTRODUCTION

The collapse of state socialism and the evolution of new economic and social structures in Eastern Europe are cases of historical significance, and a case for the sociology of historical transformations. Such cases provide an opportunity for testing and revising our models of change: as it is often pointed out the models applied in the debates on post-socialism are overwhelmingly a-historical. Post-socialism is typically framed as a *transition*: an a-temporal, singular, macroscopic and grand-narrative guided switch from one state of the society into another. This paradox of a-historicism was critiqued by proponents of a *transformation* model and most recently the quest for temporally structured and non-teleological historical models for post-socialism

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became the focal points of the debate. The contribution of this paper lies in elaborating a critique of transition models, and providing an alternative narrative model. The aim of this paper is to evaluate narratives of change by their empirical explanatory power, rather than by their teleology and historicism.

I argue that it is not only the teleological aspect of transition models that render them inadequate to capture social change, but also the narrative structure of these models is ill suited to prolonged and interwoven processes of economic change. Fifteen years after 1989 and almost fifteen years of unsettled debates in social science, it is plausible to hypothesize that changes in Eastern Europe unfolded as prolonged and interwoven processes. I propose an alternative narrative model of macro scale transformation that is built from temporally structured pathways of change as meso-level social formations derived from micro level event sequences. The aim is however not to deny the possibility of profound social change. The alternative narrative model presented here is designed to enable the recognition of emergent transitions from the conjunctures of multiple processes rather to postulate a transition built into the narrative model, the strategy of narration itself. The aim of this paper is to estimate the explanatory power of both transition models and a multi-process transformation model against the same ownership event data.

The empirical case of this paper is the Hungarian large firm sector. This population of firms was claimed to be subject of two major kinds of transition processes. The first transition is privatization, the migration of ownership from the state to private entities. The second transition process is globalization: the recognition that at the end of the nineties the majority of the largest firms in Hungary are fully or mostly foreign owned. In this paper I outline a model that – by moving away from the transition logic – is able to represent all three processes in a coherent narrative of change. I suggest replacing the present-tense question of *what has happened* by a temporally structured narrative of path dependencies and path conjunctures, transforming the case of post-socialism into a case for historical sociology.

This paper presents an analysis of the ownership events the 200 largest Hungarian firms experienced, those 200 firms that were the largest in terms of revenue in 1999. These firms now provide two-thirds of exports, half of the GDP and one third of employment. Ownership records were obtained from the official archives of the Hungarian registry courts and collected in a dataset of complete ownership histories with a monthly time resolution. The same ownership history dataset is used to operationalize both transition models and a multiple path transformation model.

The paper proceeds the following way: First I outline various narrative structures applied for post-socialist change. Then second, the data are described. After this, third, transition hypotheses are operationalized in terms of expected event patterns and the explanatory power of these hypotheses is tested against actual event data. Then fourth, an alternative multiple-path model is built from the typical ownership sequences of individual firms. The explanatory power of this model is tested in the same fashion as in the case of transition hypotheses. Conclusions are drawn about the competing narratives about property change in Hungary, and about the future benefits of a sequence approach to social and economic change in general.

THE NARRATIVE STRUCTURE IN MODELS OF CHANGE

The paradox of studies of post-socialism is that while the case is declared highly relevant for the study of social change, the typical framework to study it is inherently a-historical. The framework of transition as an ideal type first of all lacks structured time, it collapses time into an A-to-B switch, where A and B are derived in a teleological way from grand narratives of democratization or the triumph of capitalism. Leaving the motivating grand narratives and teleology of transition models aside, I suggest to focus on the narrative structure of these models. These narratives are about a single *giant event* of transition that is built from two cross sections, A and B of society. Transition narratives are unilinear, there is only one switch in the narrative and there are no alternate events or paths.

The absence of a temporal structure is an inherent feature of transition narratives. One could argue that early approaches to post-socialism resorted to transition narratives without time because indeed there was no post-socialist time available. In the early nineties contemporary social changes prevented a historical perspective. However, the transition perspective, more than a decade after 1989 did not become more historical. A prominent – and in many respects ideal-typical – work of contemporary transitology is the article of Eric Hanley and his co-authors about the transition of Hungarian ownership from state to private. The authors feel confident to criticize David Stark's conclusions that he drew from data collected in 1994 with their data from 1997. Regardless of whether David Stark was wrong or right, this move of Hanley *et al.* is symptomatic of a transition framework, where even the mere passing of time is irrelevant to understand change. The structure of time – speed and rhythms of social processes – inevitably escapes any transition narrative. By a transition narrative the switch of post-socialism for them has already happened (presumably before 1994), the task is to find support for hypotheses in the A-to-B switch genre.

The aim of this paper is to move away from the *presentism* of what has happened and formulate models that open up the temporal dimension compressed in A-to-B switch narratives to make the unfolding of change the focus of the analysis. To accomplish this, contemporary historical sociology provides conceptual elements to build a model that opens up the temporal dimension to formulate new models of post-socialist social change. The most important of these is the concept of the *event* as the unit of analysis. I propose to shift focus from a single giant event to the hundreds of ownership events the largest firms in Hungary have experienced. As a fundamental shift I propose a new way of building these events together: instead of aggregating them into synchronous macroscopic cross sections I propose to build firm level sequences. To chart social change with data on firms or individuals one needs to bridge the chasm between the micro and the macro level. For transition models this bridge is built by an aggregation of individual-level phenomena into cross sections and then formulating a macro level giant event as a sequence of two cross sections. It is this cross sectional aggregation strategy that is in the sharpest contrast with the aim to explain social change. To replace cross sections and regain temporal structuring in creating the bridge between the micro and the macro levels the key is the meso level concept of pathways.

Critics of the transition logic often point to the multi-process nature of social change. However, they typically equate multiple processes to the transformation of

various fields or areas of society (such as political elites, economic institutions or organizational structures). Thus, their critique concerns the image of society (the cross sectional dimension) inherent in transition views: typically these critics propose a finer grained cross sectional dimension rather than a more elaborate temporal model. The simplest recognition along this line is that instead of one transition a political and an economic transition needs to be distinguished: the change of political elites, rules and laws follows a more rapid trajectory than economic restructuring. A more refined approach takes power, culture and organizational forms also into account. The recognition of a need for a more complex multi-process model of social change is an important step away from the transition logic. However, it is only a small step, the present approaches to multiple processes hardly go beyond a reproduction of the transition logic within domains of society.

The utility of the meso level pathway concept is that it regains the multiple temporalities in the micro-level firm histories as much as possible while reduces the complexity of the model with its temporality, branching and sequencing, and it conforms to the widely used sociological notion of a process as a meso-level concept. The multiple pathway model presented in this paper is operationalized inductively from firm ownership sequences and not from a-priori knowledge about sub-sections of this field. To accomplish this I employ optimal matching analysis to distil typical ownership sequences. Optimal matching analysis is a tool to identify paths or typical sequences according to similarity in the events experienced and the temporal structure of the sequence. This approach makes the recognition of parallel running typical sequences possible (I will present the method in detail later).

The quest for alternative models to replace transition narratives does not entail by any means a denial of the possibility for fundamental change in Eastern Europe. It would be a misunderstanding to interpret this paper as an attempt to refute that private property became a prevailing form, and that it replaced state ownership that was practically the only form of ownership for the largest firms in Eastern Europe at the beginning of the nineties. Similarly, I do not suggest challenging that foreign ownership drastically increased over the last decade. On the contrary, I will work on incorporating an understanding all of these major and radical shifts. It is the puzzle that we find evidence for more than one of these radical restructurings that prompted me to engage in the analysis of temporality.

My strategy in this paper is to take the debate about temporal structure to the ground of empirical testing. To accomplish this I operationalize both transition models and my transformation model using the same dataset of firm-level ownership events. There are three major types of transition hypotheses that I operationalize: privatization, recombination, and globalization. Privatization transition narratives are the most widespread, most generic form of transition hypotheses about ownership. The giant event here is formulated as a transition between state ownership and private ownership. The hypothesis of recombination tells a narrative switch from state ownership to networks of inter-organizational ownership. Globalization hypotheses assume a switch from domestic ownership to foreign ownership.

In the following I outline the data that I will use to test these transition hypotheses and to formulate an alternative multi-pathway narrative model.

DATA

The data used in this paper is built from the ownership histories of the largest 200 Hungarian firms. These firms were the largest in terms of their gross revenues in 1999. The data covers all the changes in the top 25 owners (owners holding the highest proportion of shares) over the entire careers of these firms. The source of this data was the Hungarian registry courts (*Cégbíróság*), where firms are obliged to register all changes in their ownership structure by law. The sources for the population listings of the top 200 companies were two commercially available corporate databases. The reason for using two sources is that without an authoritative listing of firms by revenues one has to rely on commercial datasets that are built with the consent of firms. The two 200 company listings did not coincide completely (these commercial data sources rely on self-reported data), the pooled 200 lists yielded 222 companies. Out of this population there were finally 185 companies with analyzable ownership histories. The missing 37 firms (17%) either had inaccessible files at the registry courts or their ownership records were missing from the files. The missing companies are not significantly different from the rest regarding size ($p=0.141$) or industry ($p=0.366$). The missing firms were somewhat smaller on the average than the firms in the analysis.

Changes in ownership were recorded with date, making it possible to reconstruct firm careers through ownership forms. At each instance when there is a change in any of the top 25 owners (their identity or their shares change), the whole structure of ownership is recorded. These records include the total capital and names and amount of shares held for each of the largest 25 owners. Given the high concentration of ownership in Hungary, the top 25 owners cover 95% of ownership shares on the average.

The owners were categorized into eight types based on the names. The categories for classifying owners were the most refined possible based on the names of owners. In case of ambiguous names Internet searches and typical patterns of ownership were used. Most of these ambiguous names were foreign organizations, where decision was needed to classify the owner either as financial or non-financial owner. Altogether there were 4951 owner names. There were only 2% of the names that were not classifiable with this framework; these were excluded from further analysis. The eight categories used for classification were the following: 1. State Privatization Agency, 2. other state owner, 3. local government, 4. Hungarian firm, 5. Hungarian persons, 6. foreign non-financial firms, 7. foreign financial investor, and 8. foreign person.

Thus, for each firm we know the variety of the types of owners for each month. Let us consider this mix of owners the *ownership form* of the given firm. The collection of all ownership forms that firms can be in is considered the *ownership state space*. When there is a new ownership form, the switch from one form to the other is an *event*. On the average there were 5.31 ownership forms per firm, that means that on the average firms experienced about four ownership events over the nine-year period that I studied.

The ownership state space in the original form is overly complex for any analysis. Considering that each of the top 25 owners can be from one of the eight types there are

as many ownership states as firms. To make firm careers comparable and the testing of transition and transformation hypotheses possible the state space needs to be reduced to a manageable size.

The Ownership State Space

A key building block for the operationalization of both transition and transformation hypotheses is the state space of ownership. The complexity of the original state space needs to be reduced in a way that the loss of information is minimal. This should be achieved so that the new state space conforms to the characteristics of large firm ownership in Hungary. On the one hand the state space should be detailed enough to enable the testing of various hypotheses – one should be able to classify states in multiple ways (e.g. state vs. private ownership, national vs. foreign ownership etc.). On the other hand the state space should be small enough so that firm careers become comparable.

Hungarian large firm ownership is significantly more concentrated than Western European or United States ownership. In the US and Great Britain firms typically have hundreds of owners, with 5–10 percent being the median share. In continental European countries ownership concentration is higher, the median of the largest holding is about 50 percent of the shares. In Hungary ownership is even more concentrated: the median of the share of the largest owner is 85%.

This suggests that a reasonable way to decrease the size of the ownership state space is to cut the number of owners to be taken into account. I have used complete link hierarchical cluster analysis to find typical constellations of owners (in terms of mere proportions, leaving aside the type of owner for a moment), using the percentages of the first, second, third, fourth and fifth owners as variables. A three-group solution fitted well to the data (the percentage correctly classified into the three clusters by discriminant analysis is 92.4% compared to the 33.3% random baseline, worst possible fit). The first cluster represents a “dominance” ownership structure, where there is practically only one owner, typically having more than 90% of the shares. This cluster represents 70% of all ownership structures. The second cluster contains a “coalition” ownership structure that is a feature of 25% of all ownership structures. Here there are typically two or three major owners with ownership structures of a comparable size (e.g. 50% and 40% or 40%, 30% and 30%) plus some minor owners (with a couple of percent shares). The last cluster represents “fragmented” ownership structures similar to the Anglo-Saxon ones with one-digit percentages in the hands of several owners. Only 5% of all ownership structures fall into this cluster. Based on this the conclusion is that the state space should be sensitized to “dominance” and “coalition” ownership structures. It seems to be sufficient to take the top three owners into account in creating a new state space.

The new state space was constructed by classifying all ownership forms by the first largest, second largest and third largest owners. This classification was accomplished qualitatively, by grouping ownership constellations into 16 categories. *Table 1* displays these groupings, the elements of the new ownership state space.

Table 1. The space of ownership forms

Code	Ownership form
1	Local government is only or dominant owner
2	State is only or dominant owner
3	State and Hungarian firms in coalition
4	State and foreign non-financial firm in coalition
5	State and other coalition
6	Hungarian firm
7	Hungarian firms in coalition
8	Hungarian firm and persons
9	Hungarian firm and foreign non-financial firm coalition
10	Persons as first owner
11	Foreign non-financial firm
12	Foreign firms in coalition
13	Foreign non-financial firm and others
14	Foreign financial investor and the state in coalition
15	Foreign financial investor and others in coalition
16	Miscellaneous

The classification was accomplished by the following rules. First, any ownership form with the first owner being clearly dominant (that is the constellation belonged to the “dominant owner” cluster in the clustering outlined above) was classified under the first owner. An example of this is a foreign firm as the dominant owner, which is the 11th ownership form. Ownership states 1, 2, 6 and 11 are about having a dominant owner.

The second rule was that ownership forms should distinguish those types of coalitions that are important to the two hypothesized processes (privatization, and globalization), without creating overly infrequent categories. Such coalition categories in this case are the mixes of state and private ownership (ownership states 3, 4, 5 and 14), coalitions of Hungarian firms and other Hungarian firms (state 7), Hungarian firms and persons (state 8), and Hungarian firms and foreign firms (state 9). While persons are hardly ever dominant owners of large firms, it is interesting to distinguish those coalitions where persons (in all of the cases Hungarian persons) are holding the largest block of shares (state 10). There are coalitions of foreign firms with other foreign firms (state 12), and foreign firms with others (state 13). Foreign financial investors are never dominant owners; however it is interesting to distinguish those ownership states where foreign financial investors are in the first position with the state (state 14), others (state 15) in the second and third positions. Finally, there were some cases that were not classifiable in this scheme.

This state space was used to recode the ownership histories of each firm into a sequence of states ranging from 1 to 16. In the subsequent analysis these firm histories are used to test narratives of change.

TESTING TRANSITION NARRATIVES

Transition narratives depict switches between two cross sections as a grand event. In this part of the chapter I operationalize and test the three major transition narratives – privatization, recombination and globalization – using the firm-level event sequence data outlined above.

Transition narratives are operationalized to retain the key features of their narrative structure: a-temporality (the absence of structured time), unilinearity (one path of changes) and teleology (a-priori known stages of “from” and “to”). A transition narrative is a-temporal in a sense that there are only two relative time points: the “before” and the “after”, which are connected by a grand transition event. Unilinearity means that there is only one such grand event; there are no alternative parallel events. Teleology is reflected in the pre-definition of stages. Stages are derived from a pre-existing grand narrative that not only defines the inevitable future, but also provides the unambiguous starting point.

The ideal type of a transition narrative can be operationalized as an aggregation of firm-level events into a grand event. Events are defined here as a firm-level transition from one ownership form to another. These firm-level transitions can be aggregated into a table – the transition frequency matrix – that lists the same ownership forms (elements of the state space) on the rows and columns. The cell entries of the table x_{ij} mean that there had been x number of firms that have ever made transition from state i to state j . This matrix conforms to the transition view in that it is a-temporal, it collapses time completely into a before-after dichotomy. Once this matrix is constructed the transition hypotheses are formulated as simplified expected structures of this matrix, aggregations of firm-level events into a giant event. For example, if transition from state to private ownership is considered, the transition hypothesis predicts a transition matrix where all the cells that qualify as “from state to private ownership” will contain significantly higher numbers than those cells that do not qualify as such. *Table 2* shows the matrix of observed transition frequencies (*Table 2.a*) and one of the hypothesized transition matrices (with expected transitions indicated as ones, on *Table 2.b*), representing a privatization hypothesis.

Table 2. The original transition matrix (2.a) and the hypothesized transition matrix based on the privatization hypothesis A (2.b)

2.a. Transition matrix	
	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
1	-
2	- 2 12 10 7 3 4 4 6 3 4 4 5 2 4
3	1 - 2 2 4 3
4	1 1 4 3 3 1 2 1
5	3 2 1 - 3 2 3 1 1
6	2 2 - 1 1 4 3 1
7	1 2 2 - 3 3 1
8	2 4 - 1 6
9	3 2 1 1 - 16 5 2 1 1
10	2 5 1 - 1 2 1 1
11	5 3 - 7 2
12	1 1 1 2 8 - 1 1
13	2 2 1 - 1
14	1 1 - 6 1
15	1 3 1 2 2 3 - 1
16	1 2 1 1 -

Note: The indices of the rows and columns represent ownership forms from Table 1.

2.b. Hypothesized transition matrix – privatization transition A	
	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
1	-
2	- 1 1 1 1 1 1 1 1
3	- 1 1 1 1 1 1 1 1
4	- 1 1 1 1 1 1 1 1
5	- 1 1 1 1 1 1 1 1
6	-
7	-
8	-
9	-
10	1 1 1 1 - 1 1 1 1
11	-
12	-
13	-
14	1 1 1 1 1 1 1 - 1
15	-
16	-

Note: The indices of the rows and columns represent ownership forms from Table 1.

There are three types of transition hypotheses constructed: the first type is about the change of state ownership into private ownership, the second is about the change of state ownership into network forms of ownership, while the third is about the change of Hungarian ownership into foreign ownership. Within each type there are two subtypes based on how intermediary or mixed forms of ownership are dealt with.

Privatization hypotheses are formulated by grouping state ownership forms into one, and private ownership forms into another, and then postulating a switch between these two groups of forms. The following ownership forms qualify as pure state-ownership forms: 2 (State dominant) and 5 (State and other), while the following forms are considered pure private forms: 6 (Hungarian firm), 7 (Hungarian firms), 8 (Hungarian firms and persons), 11 (Foreign non-financial firm), 12 (Foreign firms), 13 (Foreign non-financial firm and others), and 15 (Foreign financial investor and others). The following are mixed forms: 3 (State and Hungarian firm), 4 (State and foreign non-financial firm), 10 (Person as first owner), and 14 (Foreign financial investor and the state).

There are two privatization hypotheses: Privatization A and Privatization B. In Privatization A mixed forms are grouped with pure state ownership. This hypothesis represents the narrative that “what has happened is that ownership forms with any state involvement have switched to pure private ownership”. Privatization B is a hypothesis where intermediary forms are grouped with pure private ownership, representing a narrative of “what has happened is that full state ownership has switched to at least partial private ownership”. Note that it is possible to leave out ownership forms from a transition hypothesis: the “miscellaneous” ownership form is not implied in either the “from” or the “to” end of the grand event.

Hypotheses about globalization are stated by grouping Hungarian ownership forms into one group and foreign ownership forms into another. Pure Hungarian ownership forms are the following: 1 (Local government dominant), 2 (State dominant), 3 (State and Hungarian firms), 5 (State and other), 6 (Hungarian firm), 7 (Hungarian firms), and 8 (Hungarian firm and persons). The pure foreign ownership forms are the following: 11 (Foreign non-financial firm), 12 (Foreign firms), 13 (Foreign non-financial firm and others), and 15 (Foreign financial investor and others). The mixed forms are: 4 (State and foreign non-financial firm), 9 (Hungarian firm and foreign non-financial firm), and 14 (Foreign financial investor and the state).

The first hypothesis, Globalization A groups the mixed Hungarian-foreign forms of ownership together with the pure Hungarian forms of ownership, representing the narrative “what has happened is that domestic owners were entirely replaced by foreign owners”. The second version of this hypothesis, Globalization B groups the mixed forms with the pure foreign ownership forms, saying that “what has happened is that pure Hungarian ownership switched to ownership forms with foreign involvement”.

The test of transition hypotheses are accomplished by QAP (Quadratic Assignment Procedure) correlation analysis. QAP methods are primarily used to test social network hypotheses. The transition matrix in this study can be thought of as relational network data – a network of ownership forms connected by transition events, with interdependency between dyads of states that is similar to social network relations.

Predicted transition matrices are block models of the transition relation¹. I argue that QAP analysis fits the nature of the data and the theoretical model of transition narratives best. QAP correlation analysis starts with the comparison of two matrices by correlating the corresponding cells. This requires the two matrices to be of equal size, and to contain the same actors (nodes) in the same order on the rows and columns in both matrices (to ensure that x_{ij} in both matrices refers to the same tie). Significance is assessed through a permutation test that is the rows and columns of the two matrices are independently randomly permuted, and the correlation is recalculated. This procedure is repeated enough (usually several thousand times) to assure that the observed original correlation coefficient is larger in absolute value than at least 95% of the correlations we observe in randomly permuted data.

To test transition hypotheses I have computed the R-squared and significance (permutation test p-value) of each of these hypotheses. If a hypothesis suits well to the actual changes of ownership I expect to see a high R-squared and significance for the transition hypotheses outlined above. A small R-squared and lack of significance would suggest that actual events could not be explained with that transition hypothesis. *Table 3* presents the results of the QAP correlation analysis.

Table 3. The proportions of variance in the transition matrix explained by various transition hypotheses

Univariate QAP R squared with 10.000 random permutations. N=240		
Independent variable (transition hypotheses)	Dependent variable	
	Original transition matrix	Transition matrix if $x_{ij} > 1$
Privatization A	0.94% (0.225)	0.74% (0.270)
Privatization B	7.18% (0.084)	7.34% (0.092)
Globalization A	0.71% (0.157)	0.37% (0.242)
Globalization B	0.00% (0.497)	0.00% (0.498)

Note: Cells contain R-squared; significance is indicated in parentheses (proportion of correlations with a higher absolute value from random permutations).

Transition hypotheses overall do not fit well to the observed event data. The R-squared of all the hypotheses are small. We can be confident in rejecting all transition hypotheses except Privatization B. None of the globalization transition narratives help us explaining the variance in firm-level ownership events. These narratives miss ownership processes that involved only changing domestic owners. Such processes – as it is reasonable to expect, and at first sight probably trivial to point out – have played a major role in transforming Hungarian ownership. Turning to privatization narratives, that involve one of the key domestic processes, however, we do not find a satisfactory account for the variance unexplained by globalization narratives. The only significant transition hypothesis is the one that incorporates the narrative of “full state ownership has switched to at least partial private ownership”. However, even this narrative about

¹ This procedure was inspired by block-model analysis that is used to judge the significance of hypotheses in social network analysis. T here the hypothesis matrix indicates the ties between actors that are expected to exist.

the retreat of the state as a dominant owner is only slightly significant (with $p=0.084$), and explains only about 7 percent of the variance in ownership events. With 240 cases in the dataset (thinking of transitions between ownership forms as cases), one would hesitate to see even this transition hypothesis supported by the data. The results are robust for replacing infrequent elements of the transition matrix by zeroes.² In the next part of this chapter I will explore an alternative model that better explains these ownership changes. Thus, it is reasonable to conclude, that the ownership events of the largest Hungarian firms cannot be explained within a transition-logic.

PATHWAYS OF OWNERSHIP TRANSFORMATION

Transition narratives have a very limited explanatory power to predict what actually has happened to the ownership forms of the largest Hungarian firms between 1991 and 1999. Now I turn to a sequence approach to construct an alternative model of change that builds pathways of change from the sequences of ownership forms. Here again, I use the space of ownership forms that are the building blocks of firm ownership histories. Now the initial question is: what were the typical histories, the typical sequences of these ownership forms. Answering this question, then, will open the possibility to construct a new narrative that breaks with the a-historical nature of transition narratives. In this section, first, I identify these typical sequences by optimal matching analysis, and then second, I interpret them as pathways of change in a new narrative of economic transformation.

The first step in developing a transformation narrative is the construction of a narrative for each firm that is the assembly of firm-level sequences. One can assign an ownership form to each time period of each firm. These assignments constitute the ownership sequence for each firm. The elements of these sequences are the elements of the ownership space. The time resolution in this study is one month, so a firm's history is represented by reporting the ownership state of the firms for each month of its existence. These firm careers are then the inputs for optimal matching analysis.

Optimal matching analysis

Once firm histories are represented as sequences, optimal matching analysis was used to compare and assess the similarities of all sequences. Optimal matching measures sequence resemblance by finding the optimal way to transform one sequence into another.³ Recording how costly it is to turn each sequence into each of the other

2 Infrequent transitions are defined as those events that only happened to one firm. These events can be considered as outliers.

3 The optimal matching algorithm can substitute, delete or insert elements of the state space in a sequence to match it to a target sequence. Each of these operations (substitutions, insertions and deletions) has its "costs". The cost of substitutions is specified for each dyad of the state space. The most common way to establish this cost structure is to make it inversely proportional to the frequencies of the transitions between states (the transition matrix). As a second type of parameter, the cost of an insertion equals the cost of a deletion. This cost is commonly referred to as the indel cost, and there are various suggestions about the relation of the indel cost to the substitution costs, usually it is set to equal to the highest substitution cost.

sequences thus results in an n-by-n matrix where n is the number of sequences – firm ownership sequences in our case.⁴ Once the sequence distance matrix is obtained the question is whether there are clusters of similar sequences. A cluster of sequences with a small average distance within, and a higher average distance to sequences outside the cluster indicates that there are typical processes producing similar sequences as outcomes. In other words, sequence clusters contain firms with similar ownership histories: comprised of largely the same forms of ownership, in a similar ordering, and timing.

A crucial step in optimal matching analysis is the determination of cost parameters. In this case, I have computed the substitution cost matrix in a way that the ownership forms that follow one another relatively frequently are cheap to substitute for one another.⁵ The cost of insertions and deletions (indel cost) was set to be equal to the maximal substitution cost, so that the algorithm makes a clear distinction between two sequences with the same ownership forms, but with different ordering.⁶ I have used OPTMAT to accomplish the optimal matching analysis of sequences. After running the optimal matching algorithm the resulting distance matrix was clustered by a number of algorithms. Of these, Ward's hierarchical cluster analysis produced the best fitting results.⁷ A seven-cluster classification captured typical sequences best (a finer grained classification produced variants of the same major types of sequences, while a smaller number of clusters collapsed pathways with different temporalities).

Pathways

As a result of optimal matching analysis and cluster analysis the 185 firm histories are now reduced to seven types of histories, ownership narratives. In this section, I outline the common features of the sequences in each of the seven clusters. After identifying the typical event sequences in the seven clusters, I will turn to testing the explanatory power of a seven-pathway model. The descriptive statistics of the seven clusters in terms of typical ownership forms and events are presented in *Table 4*.

4 In this matrix x_{ij} denotes the distance between sequence i and j (the total "cost"). This distance (or cost) is zero if the two sequences are identical. The cost is larger the more unique events the two sequences contain relative to each other (creating a higher need for substitutions), or the greater the difference in length between the two sequences (requiring many insertions or deletions to align them).

5 I have created the substitution cost matrix by first symmetrizing the transition matrix by taking the sum of x_{ij} and x_{ji} . Then this matrix was reversed by subtracting x_{ij} from the maximal symmetrized value. The resulting cost matrix was symmetrical and costs ranged from zero to 19.

6 In natural sciences optimal matching is typically used for comparing sequences that are considered similar even if large chunks of the sequence follow in a different order. This is the case for genome sequencing, or geological layer sequencing. The parameters of optimal matching needs to be adjusted specifically to temporal sequences, where ordering is a crucial aspect of temporality. For an illustration of the relationship between indel cost and sensitivity to ordering see Stark and Vedres (2003).

7 The R-squared of the Ward seven-cluster classification (the variance explained by the seven clusters in the original 185 by 185 element distance matrix) was 0.667. The R-squared of the other clustering algorithms were as follows: CONCOR: 0.623, complete link hierarchical clustering: 0.456, average link hierarchical clustering: 0.353, and single link hierarchical clustering: 0.128.

Table 4. Pathways of ownership transformation

Pathways	Ownership events by time period			N	Percentage
	1991–1993	1994–1997	1998–1999		
1. Late gradual privatization for a foreign firm	2	2 – 4 – 11	11	45	24.3%
2. Late privatization for a Hungarian firm	2	2 – 6	6	17	9.2%
3. Gradual privatization with foreign financial investors	2 – 14	14 – 11	11	28	15.1%
4. Early privatization for persons	2 – 10	10	10	16	8.6%
5. Dissolving joint ventures	9	9 – 11	11	48	25.9%
6. Reshuffling Hungarian firm coalitions	7	7	7	23	12.4%
7. Local government company	1	1	1	8	4.3%
Total				185	100.0%

Note: a: cells contain codes of ownership forms from Table 1.

The first pathway starts with full state ownership in 1991, and typically lasts until 1995–97. After state ownership there is a wave of partial privatization for foreigners (a transition to state 4), creating a mix of state and foreign-firm ownership. Typically there is one foreign owner, and the state retains only a minority share. After 1997 a number of these firms became fully foreign owned (enter ownership form 11). This is one of the two most populated pathways with almost a quarter of the firms. Most of the firms were first partially privatized in the peak years of privatization (1995 and 1997), while some remained in state ownership until '98. In this pathway the main actors are bureaucrats of the State Privatization Agency and foreign investors – with their interest meeting in a transaction that represents a sale for a single owner that pays cash for state bureaucrats and buying a wholly owned subsidiary for foreign investors. The timing of changes indicates that it is only the second half of the decade when it becomes a viable strategy for foreign investors to own a wholly owned subsidiary without joint venture partners who typically provide legitimacy and social networks.

The second pathway is about becoming owned by one Hungarian firm after being in state ownership. This is a smaller pathway with nine percent of the firms. The temporal pattern of this pathway is similar to the first in that there is a longer initial state ownership (here it lasts for about two years on average) followed by Hungarian firm ownership. The timing of the privatization event is also similar to the first pathway: most of it happens around 1995–97. After becoming owned by a Hungarian firm, there are no further ownership changes.

The third pathway is another privatization pathway, from pure state ownership (form 2) to state and foreign financial ownership coalition (form 14) and then to the dominance of a foreign non-financial firm (form 11). There are 15% of the firms in this pathway. The appearance of foreign financial owners is typically in 1991–93, while the disappearance of state ownership is 1997–98. Here foreign financial investors partner with the state as owners, taking advantage of its guarantees. After the period of

institutional uncertainties the state gradually disappears, and then foreign non-financial investors appear. This indicates that foreign financial investors pave the way for non-financial investors to take the firm over in the late nineties.

The typical story of the fourth pathway starts with a very short state-ownership period – on the average lasting for only six to nine months – then the firm becomes owned by managers or employees or outsiders (with some secondary partners, the state or a Hungarian firm). This is a rather small pathway involving less than a tenth of the firm population. Most of the events here happen in the first years (1990-1993). Here state ownership carries a different meaning than in the case of the first pathway. Being state-owned for three months after being transformed to the corporate form and then being taken over by persons suggests a well planned and prepared transition from a socialist enterprise into a privately owned (management and/or employee buyout) corporation. This personal ownership lasts throughout the entire epoch; there are only some cases where we see foreign financial owners and Hungarian firms becoming more dominant.

The fifth pathway is about the break-up of joint ventures and becoming owned by one foreign firm. This path is the most frequent one with a quarter of all firms. A typical pathway starts with an ownership coalition of a foreign firm and a Hungarian firm (state 9) that lasts for about two years. This ownership coalition then dissolves into 100% foreign firm ownership (state 11). The dissolution of foreign-Hungarian owner coalitions was a gradual process from 1991 to 1996. This pathway represents a foreign direct investment strategy that aims at buffering uncertainties by partnering with a domestic firm. This partnership provides the local knowledge and legitimacy to survive uncertainties. The domestic partner is often a state-owned firm that can provide the foreign investor with political ties and insider information about institutional changes. Once the structure of uncertainties change and adaptation to a market environment becomes the dominant challenge, foreign investors buy out their domestic partner to create a wholly owned subsidiary. A partnership can become a liability in a market environment carrying the risk of information and know-how leakage and the cost of negotiated decisions.

The typical story in the sixth pathway is that the ownership of multiple Hungarian firms (state 7) persists throughout the period, although there is fluctuation in the ownership structures. Hungarian firms as owners in coalition reshuffle throughout the period studied. This pathway represents 12% of the firms. The coalition of Hungarian firms indicate a network form of ownership that was identified by David Stark in 1994 . It seems that this network form of ownership stays throughout the nineties in this pathway. This probably indicates the path dependency of network forms of ownership that can lock firms in. Unlike the coalition of a foreign and a domestic firm, in this setting there are two more or less equal partners, without any one of them having the capital to buy the share of the other. This pathway is also in contrast to the second, where one Hungarian firm buys a state owned firm. This indicates that after 1995 it is possible to be owned by a single Hungarian firm, while before that radical uncertainties pushed firms to rely on multiple ties rather than a single owner. After 1995 this domestic inter-organizational network form of ownership does not dissolve –

the question is whether this is a result of lock in mechanisms or this network form is also a viable strategy in a market environment.

The seventh pathway is about being 100% owned by a local government throughout the whole period. The firms here are mostly late starters (1995-96), and mostly public utility firms that were transformed into a corporate form, spun off from the organization of local governments. This pathway is an outlier without any ownership event, any other ownership ever than local government.

TESTING THE SEVEN-PATHWAY NARRATIVE

To test the fit of this multiple-path model of change, a hypothesis matrix was constructed of the typical events in the seven pathways. This means that the typical events from each of the typical sequences (displayed by time periods in *Table 4*) were picked in the original transition matrix. The multiple-path transformation model is represented as a predicted event pattern, with ones where there is a typical event in any of the seven pathways. The same QAP correlation test was used to test the significance and explanatory power of this model.

Using the same method to estimate the explained variance in ownership events, we find that the R-squared is 0.59 with a p value of 0.00. The seven-path transformation model explains about 59% of the original event variance. The remaining 41% of the variance are those events that are atypical in the seven pathways.

One could account for these events given that one employed a more finely grained classification system of processes. It would be possible to account for all of the variance with a number of processes close to the magnitude of the number of cases. However, that model would have little analytical value; it would be little more than replicating the original complexity of firm histories. There is a trade-off between model complexity and explained variance. However, this does not mean that the choice of model complexity – in this case the number of narrative lines, pathways in the narrative of economic transformation – is arbitrary. *Figure 1* displays the idea, that the relationship that we find between model complexity and fit is not linear. Thinking about the amount of variance explained by one story line, one pathway in the narrative as a measure of model performance, the seven-pathway model build from ownership sequences clearly outperforms both the single-path transition models, and the other extreme, where all firms have their own story lines. The amount of variance explained by one path in the best transition narrative is 7.18 percent, in the seven-pathway model the variance by one pathway is 8.43 percent (59 percent divided by seven), and in the 185 path model it is 0.54 percent (100 percent divided by 185).

The amount of variance explained is one measure of worth to evaluate various narrative structures in models of change. I suggest turning to other criteria of worth now, the ability of a model to generate explanations, to reframe scientific concepts, and to open the field for further research questions. I argue that using these criteria of worth, the seven-path transformation model outperforms the single-path transition model, and clearly the 185 path model as well. To illustrate this, let us return to *Table 4*, where characteristic events in the seven pathways are displayed by three time

periods. These time periods were determined by separating more and less eventful phases across all the seven pathways. This gives us an insight into how the concept of transition might be reformulated by a sequence model. The period from 94 to 97 seems to be an emergent period of transition, with many pathways changing direction, and after this period all pathways seem to freeze. This indicates that arguments about the end of post-socialism by 1997 are supported by event sequence data.

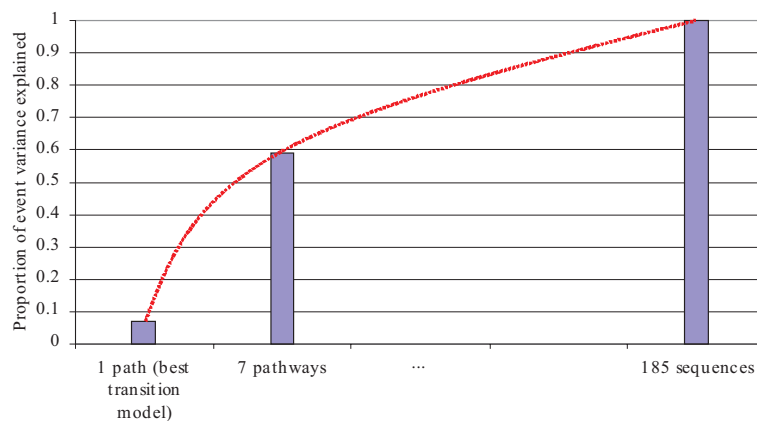


Figure 1. Relationship between the number of narrative pathways and explanatory power in terms of the variance of event frequencies

CONCLUSIONS

The narrative structure of a model of social change is not exclusively a theoretical question, but a question of analytic strategy, and empirical performance. Opening up the temporal dimension in a narrative structure by building from sequences in time can lead to better explanations, increased explanatory power. It is ironic that while post-socialism is often declared to be a living laboratory of social change the models applied to these changes are a-temporal and foreign to historical explanations. Presentism inherent in transition narratives hardly explains the ownership events of the past decade at all.

Formulating a model with temporality at its core not only provides for more explanatory power but helps in reinterpreting key concepts of social change. Transition as derived from a grand narrative can be replaced by the concept of emergent transition that emerges from the conjunctures of pathways of change. The first step in formulating a model of social change is to understand sources of change and stability. In a transition view the source of change is external, removed from structure and action. This stems from the systemic view of society: if society is a system, action within it is completely constrained by the operating logic of the system that prohibits any transformative agency. This induces then the affinity of systemic

thinking with grand narratives, trajectories of history that drive for example redistributive systems to transform into market systems.

The theoretical weaknesses and limited explanatory power of systemic transition approaches prompt alternative conceptions of the sources of change and stability. The major theoretical shortcoming of systemic transition approaches is that mechanisms that link macro-level change and micro processes are not clear. How does a grand narrative of history translate to local relational structures? The only mechanism is the selection of congruent and incongruent elements by being favored and not favored by the emerging new system. This does not account for how and when the new system emerges in the first place. New relations between actors at ground level do not come about automatically by the guidance of a grand narrative.

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