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Working Paper

Opening up the black box: Interacting subspheres through enterprise entry and exit in China

CERS-IE Working Papers, No. CERS-IE WP - 2020/37

Provided in Cooperation with:

Institute of Economics, Centre for Economic and Regional Studies, Hungarian Academy of Sciences

Suggested Citation: Csanádi, Mária; Gyuris, Ferenc; Wang, Wanjun (2020) : Opening up the black box: Interacting subspheres through enterprise entry and exit in China, CERS-IE Working Papers, No. CERS-IE WP - 2020/37, Hungarian Academy of Sciences, Institute of Economics, Centre for Economic and Regional Studies, Budapest

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Opening up the black box: Interacting subspheres through enterprise entry and exit in China

Maria Csanádi - Ferenc Gyuris - Wanjun Wang

CERS-IE WP – 2020/37

September 2020

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ABSTRACT

In this paper, we scrutinize in the transforming party-state system of China the subtle dynamics of enterprise adaptation to state interventions, which react to hardening external and internal constraints. We use a comparative systemic framework that interprets adaptation in the context of system dynamics and transformation (Csanádi, 2006). We analyze a firm-level database of the Chinese industry from 1998 to 2013 with more than 3.8 million entities. Enterprise sensitivity and adaptation is measured by entries and exits. Taking a systemic approach, we distinguish enterprises that belong to either the party-state network or to the market as two economic sub-spheres defined by our analytical framework. Using the dynamics of entries and exits of industrial enterprises in each of these two spheres, we measure their expansion and contraction as well as that of the speed of both. Different speed allows for the quantification of the dynamics of economic transformation. Our results reveal that increasing frequency of entries and exits, both within and between the two spheres, are interconnected with state interventions reacting to booming and cooling periods of system-specific overinvestment and hardening and softening external constraints (Csanádi, 2015; Csanádi and Gyuris, forthcoming).

Similarly, we reveal a strong connection between enterprise entries and exits and the occasional changes in the acceleration and slowdown of transformation dynamics through alternating periods of retreat and expansion of the network. We confirm the retreat of the network between 1998 and 2009 in terms of number of enterprises, employment, and sales revenues. However, we find that state interventions reacting to the 2008-2009 global crisis as well as Xi Jinping's anticorruption campaign in 2012-2013 halted the retreat of the network in terms of various statistical indicators. Interventions also changed the moderate annual decline of state-owned capital share among enterprises belonging to the network (a clear trend until 2008), for they led to a "hidden expansion" of the state ownership through a relatively fast increase of its capital share from the early 2010s. Thus, transformation is not continuous, as halts and slowdowns during this process occur in major periods of state intervention.

Neither is the advancement of transformation uniform. Regarding the number, employment, and sales revenue of enterprises, the retreat of the network and the expansion of the market sphere have substantially been more advanced than in case of the allocation of resources, which is selective and biased towards state-owned and large enterprises (Csanádi, 1997; Csanádi and Liu, 2012). These along with the resulting politically rational economic behavior of enterprises are essential characteristics of the party-state system.

JEL codes: O53, P12, P16, P2, P26, P31

Keywords: China, system transformation, power network, local power, enterprise behavior, crisis, anti-corruption campaign, state intervention

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A fekete doboz tartalma: a gazdasági alrendszerek kölcsönhatása a vállalatok ki- és belépésével Kínában

Maria Csanádi - Ferenc Gyuris - Wanjun Wang

ÖSSZEFOGLALÓ

Ebben a tanulmányban a vállalatok alkalmazkodását vizsgáljuk az átalakuló kínai pártállamban a külső és belső korlátok keményedésére reagáló állami beavatkozásokra.. Ennek érdekében egy összehasonlító rendszerszintű keretet használunk (Csanádi 2006), amellyel a vállalati alkalmazkodást és az állami reakciókat az átalakuló rendszer dinamikájának közegében értelmezzük. Vállalati szintű adatbázisunk 1998 és 2013 közötti, több mint 3,8 millió iparvállalat mérlegadatát dolgoztuk fel a szempontrendszerünk szerint. A vállalatok érzékenységet és alkalmazkodást az adatbázisba történt belépéssel és az abból való kilépéssel mérjük. Ezen belül, rendszerszemponitú megközelítésünk alapján, az átalakuló pártállami gazdaságban a vállalatok két gazdasági alszférához tartoznak: vagy a pártállami háló részeként működnek, vagy a hálón kívül terjeszkedő piachoz tartoznak. Felhasználva az ipari vállalatok belépéseinek és kilépéseinek dinamikáját, megmérjük a két alszféra tágulását és összehúzódását, valamint ennek sebességét. A sebesség eltérése lehetővé teszi azt, hogy számszerűsítsük az átalakulás dinamikáját, amely során a háló zsugorodása és a hálón kívüli rész kiterjedése lenne az egyirányú folyamat. Eredményeink szerint a belépések és kilépések növekvő gyakorisága – mind az egyes szférákat tekintve, mind azok közötti vállalati mozgást figyelembe véve – összefüggenek az állami beavatkozásokkal. Ez utóbbiak a rendszerspecifikus beruházási túlfűtöttség lanyhuló és erősödő periódusaihoz alkalmazkodnak, a belső és külső erőforrások puhuló és keményedő korlátaiktól függően (Csanádi, 2015; Csanádi és Gyuris, megjelenésre vár).

Hasonlóképpen feltárjuk a belépés és kilépés. és a trasformációs dinamika alkalmankénti lelassulása és felgyorsulása közötti jelentős összefüggést, a háló váltakozó, időszakonkénti zsugorodása és kiterjedése során. 1998 és 2009 között alátámasztjuk a háló zsugorodását a vállalatok száma, a foglalkoztatás és az értékesítés mutatói segítségével. Azt is kimutatjuk azonban, hogy számos statisztikai mutató szerint a 2008-2009-es válságperiódus, valamint Xi-Qinping 2012-2013 antikorrupciós kampánya megállította, illetve lefékezte a háló

zsugorodását. Azt is feltártuk, hogy a hálózhoz tartozó vállalatoknál, az állami tőke részesedésének évenkénti fokozatos, 2008-ig egyértelmű csökkenését az állami beavatkozás hatására 2010-től kezdve az állami tulajdon “rejtett expanziója” váltotta fel, az állami tőke részarányának relative gyors növekedésével. Mindezzel korábbi elméleti állításunkat empirikusan alátámasztottuk, miszerint az átalakulás nem folyamatos és egyirányú, mivel a nagyobb állami beavatkozások ezt a folyamatot időnként megállítják vagy lelassítják. Az átalakulás előrehaladása nem csak nem egyirányú, de nem is egységes. A vállalatok számát, a foglalkoztatást és értékesítést tekintve, a háló zsugorodásának és a piac expanziójának (átalakulásnak) a sebessége jóval nagyobb, mint az erőforrások allokációja esetén, amely a háló vállalatait, ezen belül a nagyvállalatokat preferálja (Csanádi, 1997; Csanádi and Liu, 2012), s az átalakulást lassítja az állami beavatkozások során. Ezek a sajátosságok, a hálózhoz tartozó vállalatok politikailag racionális magatartásával egyetemben, a pártállami rendszer alapvető jellegzetességei.

JEL kódok: O53, P12, P16, P2, P26, P31

Kulcsszavak: Kína, rendszerátalakulás, hatalmi háló, helyi hatalom, vállalati magatartás, válság, antikorrupciós kampány, állami beavatkozás

Opening up the black box: interacting sub-spheres through enterprise entry and exit in China¹

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¹ Funding: This work was supported by the National Research, Development and Innovation Office (NKFIH) [grant number K115932].

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Acknowledgement: We are thankful to our professional partners in China who provided deep insights during our consultations and discussions to the decision-making processes in different periods. We are especially indebted to Wu Shanshan and Li Shi, and Liu Shengyu who greatly helped our analysis.

1 Introduction

There is a wide range of literature on the dynamics of the Chinese economy based on firm-level data, focusing on firms of different ownership types, organizational forms, sizes, sectors, ages, and political affiliations. This literature embraces databases of different sizes, is concentrated at different locations (e.g., provinces and cities) and levels (e.g., national or local levels), and is spread across different time periods. Approaches in the literature vary from a strictly firm-level focus to the impact of firm behavior on the broader regional or national level. Major issues discussed include enterprise behavior related to total factor productivity (TFP), competitiveness, resource allocation or reallocation, entries, exits and survival. According to one study carried out among listed enterprises, a growing number of enterprises are exiting from the state-owned sphere and entering the market sphere, which increases the TFP of listed firms and, therefore, the maintenance of the national economic growth rate (Iida, Shoji, & Yoneyama 2018). As Brandt (2016a) notes, there is a widespread practice of resource reallocation from enterprises with high TFP to those with low TFP, which causes macrolevel imbalances. A survey of the diversification and specialization determinants of productivity among medium and large industrial firms concluded that younger firms and firms with no political affiliation are found to have higher TFP, whereas the TFP of firms with state ownership proves to be lower (Ding, Guariglia, & Harris, 2015). According to another study, barriers to entry by private businesses are higher in sectors dominated by state-owned enterprises (SOEs) than in non-dominated sectors (Brandt, 2016a, 2016b; Bai, Du, Tao, & Tong, 2004; Bai, Liu, Lu, Song, & Zhang; 2004, Bai & Zhang, 2017). The exit of small and medium firms increases productivity in the economic sector they leave,

while the exit of SOEs does not have the same effect (Feng, Wang, & Wu 2016; Gong & Yang 2004). Other calculations have shown that positive TFP growth rates were sinking to flat or even negative levels in the whole of the manufacturing sector since 2012, which was mainly driven by the slowdown of firm-level TFP growth in SOEs (Alvarez, Chen, & Li, 2017), and that GDP growth slow-down after the global crisis in China was connected to the significantly negative impact of government size and investment rate on productivity (Bai, & Zhang, 2017).

Beyond investigating TFP, several studies have analyzed selective investment behavior on the firm level. Their results show that while the correlation of investment and market uncertainty is negative among private listed enterprises, government control makes the negative relation between investment and firm-specific uncertainty nonsignificant and the relation between market uncertainty and investment positive. Based on these results, Xua, Wang, and Xin (2010) conclude that ownership and the level of government control influence the market-conforming investment behavior of firms, even among state-owned listed companies. Li, Shi and Wang (2010) draw similar conclusions for a more specific group, i.e., listed companies in the real estate sector, which have selective investment opportunities through debt financing. Related findings suggest that private enterprises have lower financial constraints if they are geographically or sectorally close to FDI, whereas they have to face harder credit constraints in geographical regions and economic sectors where SOEs are present. Moreover, financing constraints are found to increase with the relative size of the state sector. Therefore, private firms competing with more SOEs depend more strongly on their internally generated funds (Poncet, Steingress, & Vandebussche 2010). In fact, comparable systematic selection in the distribution has prevailed until the present (Naughton, 2018; Song, 2018). Recent studies on the reason for declining market growth in 2019 confirm continuing bias towards state-owned enterprises in sectors with overcapacity problems: private enterprises are frequently forced to exit the sector while SOEs are being spared from closures and production limits (Nikkei Asian Review, 2018).

Our paper contributes to the above literature with a firm-level analysis from a systemic point of view that combines the above diverse approaches and their results on enterprise behavior: entries, survival, exits, and selectivity of behavior according to ownership, size, political affiliation, government control, and intervention. The systemic approach also allows us to complement existing studies by analyzing enterprise behavior in their interaction with

macroeconomic phenomena, such as external and internal shocks to the party-state system, state interventions in reaction to these shocks, systemic consequences of overinvestment and dynamics of the transformation of the party-state. This approach is based on the empirical application of a comparative framework called the interactive party-state (IPS) model (Csanádi, 2006, 2015, 2016) that explains the structure, operation and transformation of party-state systems and their Chinese specifics. The IPS model interprets the dependence and interest-promotion relationships among decision-makers in the party, state and economy as a power network with actors of different bargaining capacity. This network bears elements and connecting and operating principles that are self-similar in time and space and at different aggregation levels. The distribution of power (bargaining capacities) within the self-similar network may differ and change in time and space and at different aggregation levels. Based on these characteristics, the Chinese party-state system, besides its self-similar characteristics is interpreted as an increasingly decentralized power distribution between 1979 and 2012. Instruments of self-reproduction and its dynamics of operation in the network depend on the specific pattern of power distribution, just like the characteristics of transformation. From a systemic point of view, we interpret transformation as the retreat of the network and the expansion of the field outside it. This process may take place in both the economic and political subfields. The pattern of power distribution will determine the sequence of transformation (first political or economic, or both simultaneously), the speed of transformation (gradual or abrupt), and the political conditions of economic transformation (authoritarian or democratic) or the economic conditions of political transformation (growth or recession). The decentralized Chinese pattern, as opposed to its counterparts in Europe attracts economic transformation first (Csanádi, 1997, 2006, 2011, 2015).

In our previous paper (Csanádi & Gyuris, forthcoming), we adopted this complex framework to analyze national- and provincial-level dynamics of the investment and party-state transformation in China in relation to internal and external shocks. In this paper, we take this one step further and investigate how the sensitivity of enterprises to shocks and major interventions. Can we examine enterprise behavior from a systemic point of view? How can we measure enterprise sensitivity and reactions? Are there differences in enterprise reactions during major macroeconomic changes? Do these reactions differ for enterprises inside and outside the network? How do these differences reflect transformation dynamics?

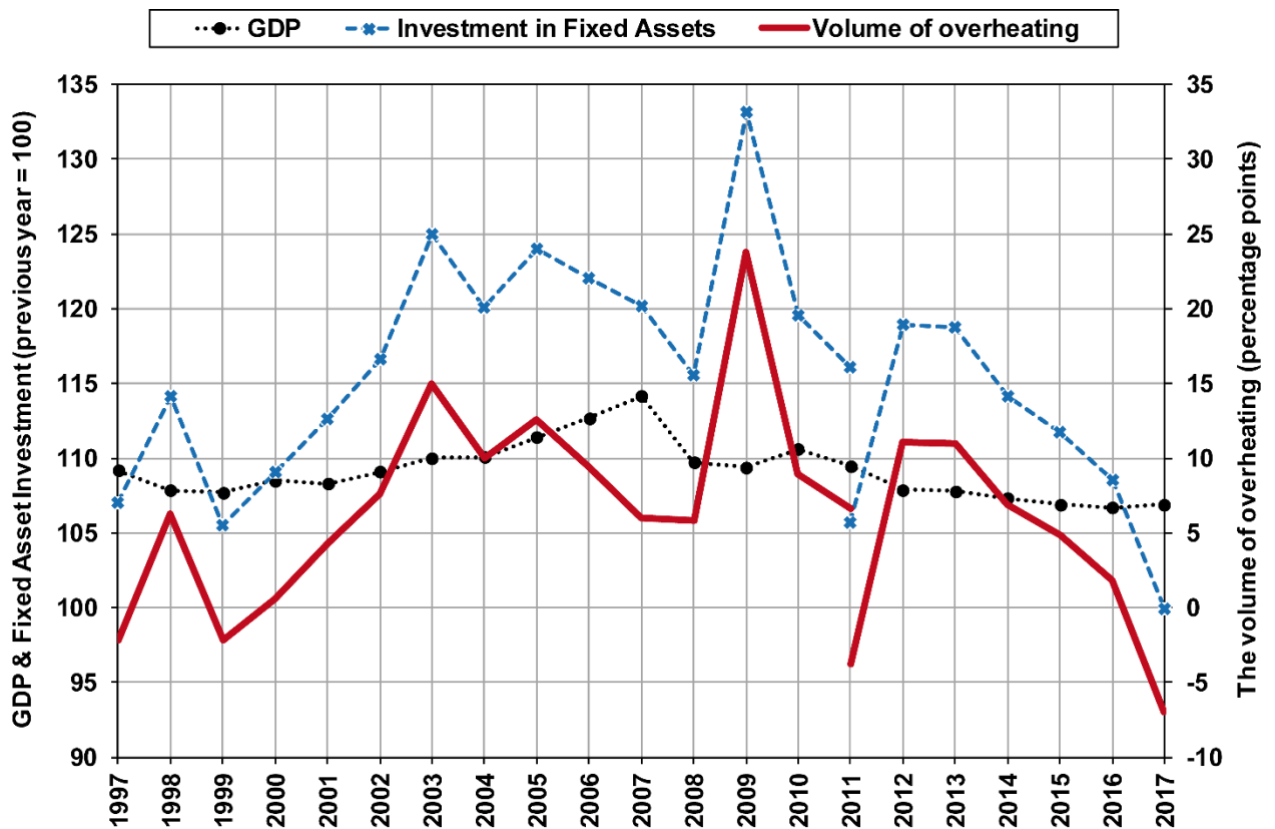
2 Systemic approach: enterprise behavior in a transforming party-state

In the following chapters, we shall detail our analytical methods. Based on those, enterprise-level data allow us to separate enterprises belonging to the party-state network and the field outside of it that we interpret as the market. We shall empirically detect the sensitivity of enterprise behavior in several macrolevel dynamisms: those during the expansion and retreat of the network or that of the market; those within the network and market and; those between the network and the market; those during increasing and decreasing intensity of state interventions; those prioritized and disregarded by distribution priorities; and those in times of investment booms and coolings.

In our previous papers, we have demonstrated that overinvestment is a characteristic phenomenon of the party-state system that is caused by structural motivations that lead to political rationality of the economic behavior of actors as either distributors or pleaders of resources (Csanádi, 2015; Csanádi & Gyuris, forthcoming). Accordingly, priorities are given to large, locally large, state owned and politically connected units. Specific selection in turn, incite drive for growth, for resources and for accumulation political and administrative connections. Thus, this phenomenon in party-state systems should not be identified with reasons of overinvestment in a market environment, even if, specifically in China, due to the specific sequence of transformation (economic first), some of its elements may be revealed since the reform period (Brandt & Zhu, 2000, 2001). Seminal work was done in this regard by Huang (1996) on China's reform and transformation process. In his interpretation, overinvestment peaks are indicated by the emerging threat of hyperinflation, which central authorities try to control with a combination of austerity measures and decentralizing reforms. However, overinvestment in party-state systems is a general characteristic regardless of the time, space (location), aggregation level or distribution of power with reforms or without. Only indicators that mark overinvestment that change at different stages of the system's evolution: for example, in centralized party-states overinvestment might be detected through the occasional accumulation of unfinished investments, while in economically transforming ones inflation might be a suitable

indicator. Systemic motivation for overinvestment, however, will be present independent of these factors.

We will connect fluctuations of overinvestment, state intervention and enterprise adaptation from the point of view of the transforming Chinese party-state system. Occasionally, we shall use the term “overheating” that we interpret as the positive difference between GDP and investment growth on constant prices.² The national level data, while calculated on constant prices, show strong fluctuations in investment and economic overheating, that match occasions of major state interventions (Figure 1). Our firm level data overlap three external shocks that invited massive state intervention: the Asian crisis in 1997-1998, the admission of China into the WTO in 2001 and the global crisis in 2008.



² In our previous paper (Csanádi & Gyuris, forthcoming), we introduced the following definition for overheating: the difference between the annual growth rate of fixed asset investment and GDP if the growth rate of the former is higher than that of the latter. Based on this concept, we showed that the amplitude of overheating increases at times of major state interventions, when new resources are injected into the economy.

Figure 1 Annual change in GDP and fixed asset investment in China at constant prices and the intensity of economic overheating in percentage points (1997–2017).

Authors' own design based on data from the China Statistical Yearbook 2006 and 2018.

All three state interventions stimulated systemic investment fluctuations and economic overheating that soon forced the state to intervene again with restrictive measures to cool it down in 2004 and 2012. Thus, our data also include two occasions of restrictive state intervention as reactions to systemic overheating. The first one was a reaction to the economic consequences of China's WTO accession in 2001, when the SASACs (State-owned Asset Supervision and Administration Commissions) were formed in 2004 to institutionally control and bail out SOEs.³ The second state intervention occurred in 2012 as a reaction to central and local overheating unleashed by the 2008-2010 stimulus package, which the central government introduced to compensate for the impact of the 2008 crisis. The unleashed investment boom led to a restrictive state intervention in the form of a radical anticorruption campaign from 2012 onwards.

Enterprises react sensitively to state interventions. The characteristics of each intervention determine the specifics of enterprise adaptation, i.e., the peculiarities of enterprise entries to and exits from the party-state network and the very specifics of the enterprises that enter and exit. We argue that characteristic entries and exits will have an impact on the direction and speed of the transformation of the network, the dynamics of the retreat and expansion of the network during transformation, and the amplitude of overheating.

We distinguish between two different types of retreat of the network (in other words, the dynamics of party-state transformation): absolute and relative retreat in strong interactions between the network and market spheres. Absolute retreat means the physical shrinking of the network while the market is physically expanding. Typical examples include: privatizations and enterprise shutdowns, when dependency lines of the network are cut; when competitive organizations, activities, capital and/or skill are leaving the network (emptying it); when lower

³ SASACs were set up at each administrative level where SOEs were subordinated: central, provincial, prefecture and county levels. This was coupled with a major tax reform initiated in 2004 and completed by 2009. These institutional and financial changes selectively eased and controlled investments and favored physical investments and capital-intensive technologies (Cai & Harrison, 2019).

levels of the state hierarchy lose their resource distribution function (withdrawal of the network); or when alternative capital and skills are entering the network from the private field, which erodes the political rationality of economic behavior in the network, thus also influencing enterprise decisions (Csanádi, 2006). Relative retreat means that the market sphere is expanding faster than the network sphere or the network sphere is contracting faster than the market sphere. Both absolute and relative retreat may change in time and space and at different aggregation levels. Moreover, absolute and relative retreat may coexist in terms of different indicators if, for example, the number of enterprises belonging to the network is decreasing while those in the market are increasing (absolute retreat) and, at the same time, employment is increasing in both the network and private sphere but at a faster rate in the private sphere (relative retreat). We can indirectly measure the relatively or absolutely shrinking network through the dynamics of the number of enterprises, the number of employees, sales revenue, or allocated loans in the two subspheres.

Within this analytical framework, one major issue is the dynamics of an enterprise within and between the network and the market sphere. An enterprise can leave one subsphere and enter another, either leave the network and the market sphere (e.g., if the enterprises cease to exist) or enter any subsphere, or remain within the same subsphere from one year to another.⁴ These enterprise movements can be analyzed in relation to other features, such as ownership type and relative size (small, medium, large) in terms of sales revenue, number of employees and long-term liabilities. Through such analysis, we can reveal what kind of enterprises become active and what kind of activities become more dominant during interventions. This analysis will also shed light on the extent to which these characteristics harmonize with systemic priorities of resource allocation in the party-state network.

3 Methodology in systemic context based on enterprise-level data

⁴ Unfortunately, we cannot distinguish the reasons behind the movements from the data, such as if entry was caused by a new set up of, e.g., a government financial vehicle, by a merger of several smaller SOEs, or by a smaller enterprise developing to a scale that could reach the statistical threshold. For the same reason, we cannot distinguish whether enterprises disappeared from the network or the market due to, for example, disentanglement and thus decreasing past the statistical threshold, becoming privatized, or definitely leaving the network or the market because they have gone bankrupt or are being closed down.

Our analysis is based on an industrial dataset, which constitutes a very valuable and hard-to-access resource, as presented by Brandt, Van Biesebroeck, and Zhang (2014). By definition, it does not include the service sector. Thus, our annual subtotals for the whole database are smaller than the national economic subtotals of the National Bureau of Statistics of China (NBSC) released, among others, in the volumes of the China Statistical Yearbook. Our enterprise dataset ranges from 1998 to 2013. However, we had to exclude the data from 2010 from our analysis since the datasets for 2010 had many missing values; eventually these data were simply duplicated from 2009 without updating.

Another problem emerges for certain years and indicators relevant to the analysis. Some indicators in the industrial database are randomly reported. Other general indicators, such as the number of enterprises, their annual sales revenues, the number of employees and the ownership type, are included for every year (except for 2010) for all enterprises. (In fact, the values of these indicators for 2011 are also unreliable, with the exception of number of enterprises.) However, other indicators that are crucial from our point of view are registered only in specific years. Examples include information on the status of an enterprises' registration (whether an enterprise is subordinated or registered at the central, province, prefecture or county level) and enterprise size (large, medium, small); these data are accessible for all enterprises only in 2004–2007, 2011 and 2013. In these cases, the analysis is constrained to the given years.

Taking the above problems into consideration, we have the following number of enterprises for each year: 162,081 (1998), 178,997 (1999), 175,484 (2000), 185,414 (2001), 185,555 (2002), 195,766 (2003), 279,571 (2004), 279,282 (2005), 290,026 (2006), 329,389 (2007), 403,643 (2008), 349,025 (2009), no data for 2010, 214,296 (2011), 286,981 (2012), 315,361 (2013). These are equal to 3,830,871 entities for the whole period. These numbers include enterprises with different ownership types, enterprises of different sizes, and enterprises that are subordinate to (and registered at) different administrative levels. For analytical reasons, we divide the whole population of enterprises every year into two sub-spheres by ownership: we categorize enterprises with private ownership below 50% as belonging to the network and those with private ownership above 50% as belonging to the market sphere. Enterprises belonging to the network are those that evidently institutionally depend on the party-state network through their activity, organization and positional structure (network field=N), whereas enterprises

belonging to the market are those that do not institutionally depend (to the same extent) on the party-state network (market field=M). Such enterprises can switch from one sphere to another and even from one year to the next if the referred percentage value changes.

To reveal the temporal interaction between these two spheres, we form 8 categories, each of which is labeled with a two-character abbreviation. The first character refers to the ownership type of the enterprise in the previous year, $t-1$, whereas the second character shows which ownership type category the enterprise belongs in the next year, t (Figure 2).

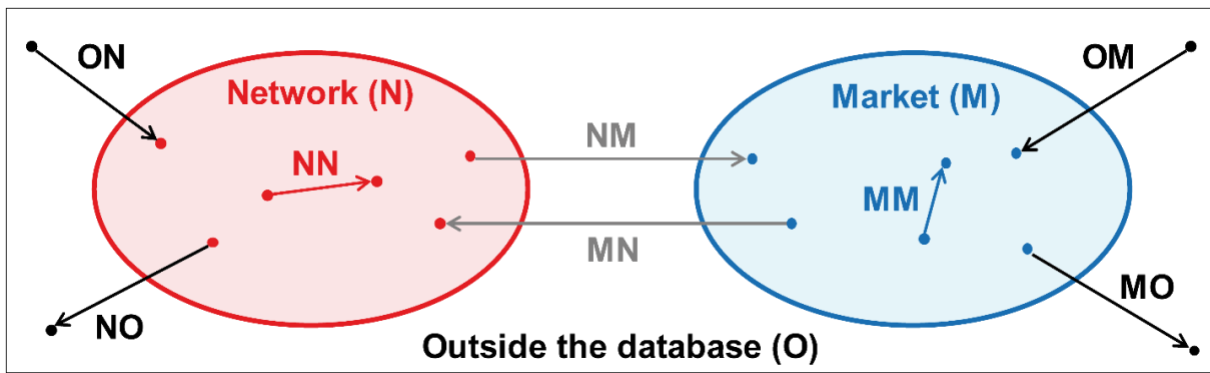


Figure 2. The 8 movement types. Authors' own design.

Therefore, an enterprise mainly owned by actors in the network (N) in 1998, but becoming predominantly owned by market actors (M) in 1999, are labeled with NM for 1999. Similarly, enterprises shifting from the market (M) to the network (N) are categorized as MN. If the enterprise belongs to the network in both years, it is labeled NN, and enterprises still owned by market actors are defined as MM. Enterprises that are registered in the industrial database for only one of two consecutive years (e.g., because they are newly founded or they cease to exist), need the introduction of further categories. We use the letter O (outside) in instances where an enterprise is not registered in the dataset for a given year. Therefore, if an enterprise was excluded from the dataset or did not exist in 1998 but it shows up in the network in 1999, its label is ON for 1999. Enterprises similarly appearing in the market sphere receive the label OM. Enterprises disappearing from the database, from either the network or the market, are labeled NO and MO along similar logic. Altogether, we have eight labels and eight movement types that record the dynamic changes in enterprise ownership types.

As these movement types can be defined and calculated relative only to the previous year, they cannot reliably be analyzed for 1998 since none of the enterprises were included in the database in 1997. Therefore, in 1998, they would all be categorized as either OM or ON, which does not make sense from our analytical perspective. We cannot investigate dynamics for 2010 and 2011, either, due to the lack of reliable data in 2010, which also distorts the values of 2011, when every enterprise has either an OM or an ON label. Hence, we will study the period of 1999–2009 as well as 2012–2013 in our dynamic analyses of movement types, which means that a total number of 3,454,494 entities are included in the analysis.

In all the years between 1999–2009 and 2012–2013, there were 2,456,583 cases where the enterprise belonged to the same category in year t as it did in the previous year, $t-1$. This situation describes 71.1% of all the cases that are included in our analysis. Of these, 568,489 enterprises (16.4%) are labeled NN, and 1,888,094 (54.7%) are labeled MM. Consequently, enterprises moved from one category to another in 28.9% of the cases.

We interpret these movements as reflections of enterprise sensitivity, in other words, as the reactions (adaptation) of enterprises to impacts from external events, be they foreign or domestic. The dynamics of the 8 movements also represent the characteristics in the pulsation of the network during the examined period, namely, either the expansion or the retreat of the network relative to the market sphere, both of which are adapting to different economic policies and external or domestic shocks. In this approach, MN and ON contribute to the expansion of the network, while NM and NO promote its retreat. Likewise, NM and OM contribute to the expansion of the market sphere, while MN and MO foster its retreat. In our systemic approach, from the perspective of the transformation of the party-state network, NO can be interpreted as the cut-off of the network, MN as the weakening, and NM as the emptying. From the perspective of transformation dynamics, NN and MM are those enterprises that “survive” from one year to the next.

These indicators are adequate for following the radical reactions of enterprises in periods of economic shock. However, exits and entries are robust reactions to state intervention, while less radical adaptations to it are registered only in the dynamics of the remaining enterprises in the network (NN) or the market (MM), without being able to distinguish mergers, disaggregation, rationalization of production, employment, working shifts, organizational changes, creation or

closure of subsidiaries, etc. This measurement also cannot differentiate the complexity of enterprise behavior; for example, only an in-depth survey was capable of revealing (Csanádi and Liu, 2012) that responses to the impact of the crisis of those enterprises that did not change status quo in the network were overwhelmingly market-oriented regarding their production; at the same time, responses to the allocation priorities of the stimulus package were similarly politically rational, and their successes in resource attraction reflected the systemic selection criteria.

Similarly, regarding enterprise entries and exits, we can clearly follow the ownership type, size, indebtedness, transfer, etc. of those that exited the market or the network. However, we can register only the fact of exit; the multiplicity of motivations, reasons and consequences cannot be revealed. Balance sheet data will reflect transfers from network to market or market to network, but an enterprise will receive a different registration number if it exited one year (e.g., its size shrank below the threshold due to detachment of some units or the enterprise was shut down, nationalized, or privatized) and entered as a new enterprise in the respective private sphere or into the network in the next year. Therefore, we cannot differentiate between enterprises newly established and those that just changed identities. We shall reflect on these shortcomings in due course.

Nevertheless, even this robust indicator of enterprise sensitivity allows us to clearly detect reactions and adaptations of enterprises to shocks and state interventions and to distinguish different behaviors according to ownership, size and subordination and the pulsation of the network (expansion and retreat) during transformation as a consequence of state intervention and the firm's adaptation in the form of entries, exits and transgressions. Our analysis will gradually reach our main target: first system dynamics, with overinvestment fluctuations and impact of state interventions at national level; second, the dynamics of system transformation connected to the impact of major state interventions by introducing network and market spheres aggregated from enterprise level data and national statistics; and third, the dynamics of enterprise reactions through exits and entries, survivals and transgressions in the two spheres at the occasion of major state interventions in the economy resulting in the pulsation of transformation.

4 The dynamics of absolute and relative retreat and the expansion of the network

The positive difference between the annual national growth rate of investment and GDP, which we call economic overheating, made several swings between 1998 and 2016 (Figure 1). These swings (booms and cooling downs) are due to the interplay of the dynamics of external and domestic constraints and state interventions adapting to this. Thus far soft constraints have hardened internally when an overinvestment boom reaches its resource limit in the given distribution of power and motives for politically rational behavior weaken, that reduces the cohesion of the network while incites motivation for state intervention to restore it. The frequencies of hardening constraints, loosening cohesion and adapting state intervention depend on the specifics of the power distribution (i.e. structural specifics) (Csanádi, 2006).⁵ However, the characteristics of intervention depend on the interplay of internal (structural) and external constraints.

External constraints may be either hard or soft and may develop either alternatively or simultaneously with hardening or softening internal constraints. External, internal, soft and hard reproduction constraints and reforms are interconnected. A temporal match or phase delay will have different effects on adapting state reactions. If external constraints are hard but structural ones are soft (as in 2008), new resources are injected into the economy, the status quo is maintained, and no reforms are initiated. The reactions are similar if structural constraints become hard while external ones remain soft (2001, entering the WTO).

Differences emerge if both constraints are simultaneously hard. In this case, austerity measures are applied, and decentralizing (resource revealing) reforms are initiated. These combined measures might lead first to slowdown of overinvestment, while new resources are revealed by the reforms that reactivize systemic motivations, inciting new investment drives. If the simultaneous presence of external and structural constraints is persistent, more drastic austerity measures (e.g., an anti-corruption campaign in 2012) might be implemented to slow down overinvestment (Csanádi, 2019).

In re-examining Figure 1, we can detect the impact of alternating or simultaneous internal and external hardening of constraints and corresponding state interventions on the fluctuation of overinvestment and overheating. Hard external and soft internal constraints and budgetary

⁵ The more decentralized the power distribution, actors with more resource attracting, extracting, allocating capacity and resisting capacity will more frequently lead the reproduction of the network into hardening reproduction constraints (Csanádi, 2006).

injection in the Asian Crisis (1997-1998) resulted in overheating, which was prolonged by the soft external constraints for entering the WTO (2001) and subsequently halted and slowed down by the hardening external and domestic constraints in 2003-2004. This latter shift incited a new overheating that was quickly halted by the hardening constraints of the global crisis (2008-2009) but re-initiated by the stimulus package's soft constraints, which culminated in another overheating under hardening external and internal constraints that was slowed down in 2012 by Xi Jinping's radical and restrictive anti-corruption campaign.

In turn, Figures 3 and 4 reveal that the injection of resources coexists with selective resource distribution that takes shape not only according to size, ownership and political connections (Csanádi, 2006; Csanádi & Liu, 2012), but also between the network and market (Figure 3) as well as regarding central- and local-level investments (Figure 4). This fact enables a much more nuanced explanation for the causes of national-level overheating in decentralized power relations and transformation.

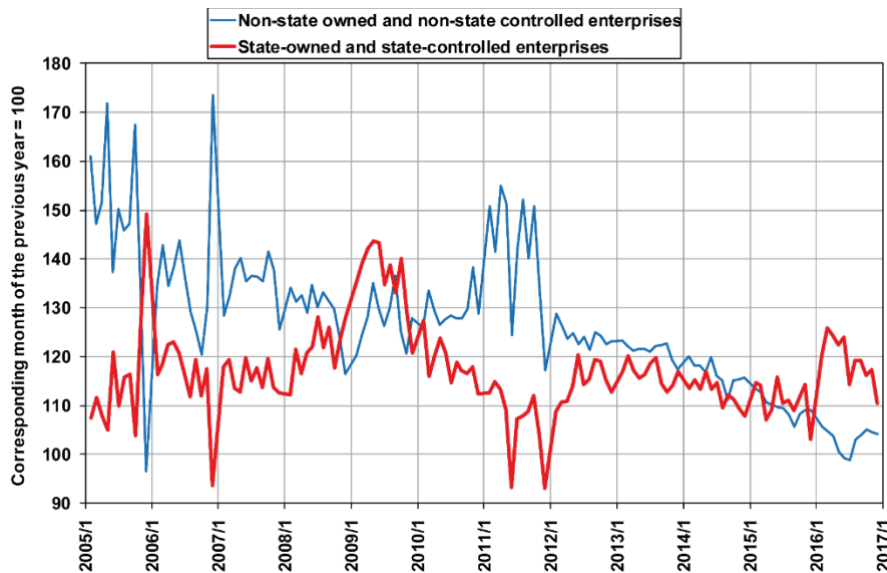


Figure 3 Monthly investment dynamics for state-owned and state-controlled enterprises and other enterprises (January 2005–December 2016). Authors' own design based on data from volumes of the China Statistical Yearbook. Source: Csanádi and Gyuris, forthcoming.

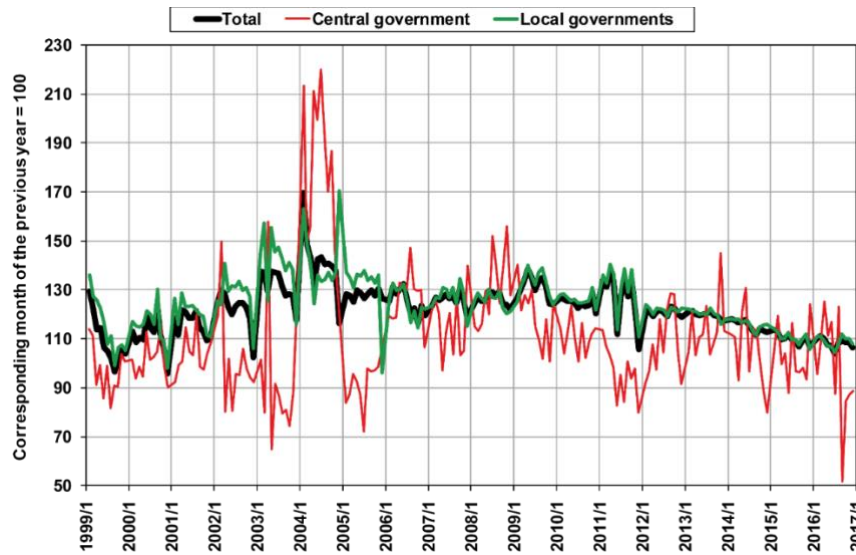


Figure 4 Fixed asset investment by the central government and by local governments in China on a monthly basis compared to the corresponding month of the previous year (Jan 1999–Dec 2016). Authors' own design based on data from the National Bureau of Statistics of China Statistical Database (online). Source: Csanádi and Gyuris, forthcoming.

First, the consequences of China joining the WTO in 2001 boosted overheating by 2004, which provoked selective state intervention that benefited the central level over the local one, while overheating was increased or widened by the investments of the private sphere. Second, the stimulus package in 2008-2010, which the central government introduced in order to compensate for the global crisis of 2008-2009, and the resultant investment boom reinforced each other, had similarly stimulating impacts on both the market and network spheres, and privileged enterprises at the central level. Third, the overheating in 2010-2012, which motivated Xi Jinping's radical centralizing efforts through the anticorruption campaign starting in 2012, was mainly propelled by investments of the market sphere, predominantly by local enterprises, which allowed a transitory boom of the state-owned sphere in 2016.

Taking these results together from the perspective of transformation, we can detect different central-local processes during the relative and absolute retreat of the network in the periods we analyzed. The reaction to overheating was reflected in the relative retreat in 2004-2005, while behind the scenes, central investments increased (due to the selective intervention of the SASACs), and local investments slowed down. During the period of the stimulus package,

which was the next period of overheating, the absolute retreat of the network took place and local investment growth exceeded central investment growth.

In fact, as Table 1 reveals, not only were these processes selective between the network and market and between central- and local-level enterprises, but their impact was also selective within both the network and the market sphere, preferring enterprises of certain sizes and enterprises subordinated to and registered at specific administrative levels.⁶

	Status of registration (annual total=100%)				Enterprise size (annual total=100%)			Ownership (annual total=100%)	
	Central	Provincial	Prefectural	County	Large	Medium	Small	Network	Market
2004	0.5	7.0	35.5	57.0	0.8	9.3	89.9	20.3	79.7
2011	0.6	5.7	28.8	64.9	3.2	34.1	62.7	13.0	87.0
2013	0.6	5.3	28.4	65.7	1.8	53.2	45.0	12.7	87.3

Table 1. Share of enterprises by status of registration, enterprise size, and ownership type in terms of the number of enterprises (left) and debt (right) (2004, 2011, 2013); 100% = all industrial enterprises in the database. Authors' own calculations based on data from the industrial enterprise database.

As Table 1 shows, the share of the number of enterprises subordinated to the central level did not change among all industrial enterprises by 2013, but the share of enterprises with provincial- and prefectural-level registration declined, while the share of county-level enterprises increased. This selectivity by status of registration suggests a similar process of selective decentralization, as had occurred in 1994 during the tax reforms (Csanádi & Lai, 2003). Then, as a reaction to the restrictive tax reforms, inefficient enterprises were decentralized by delegating their subordination to lower administrative levels. However, the county was the lowest level where SOEs were officially subordinated to; therefore, they had to privatize many small SOEs in order to eliminate burdens.⁷ This interpretation is also substantiated by the observation that that the

⁶ In the enterprise database we used, the variable “status of registration” shows the administrative level that enterprises in the network are subordinated to and, for enterprises in the market sphere, the level at which they are registered and have to pay taxes.

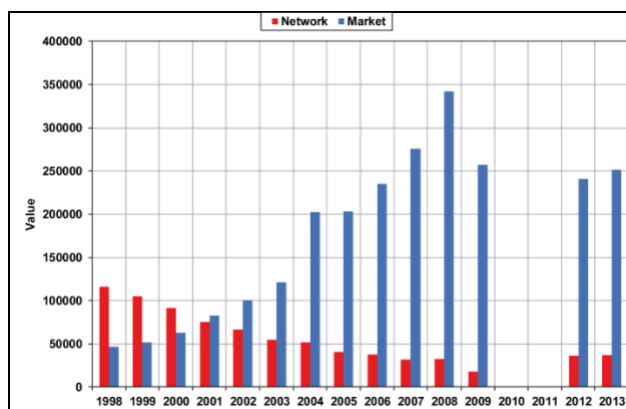
⁷ For the credible interpretation of these tendencies, it is important to know about the institutionalized subordination of SOEs to different administrative levels. Before the reform and opening up started in 1978, Mao's repeated

share of medium-sized enterprises radically increased even between 2011 and 2013, while the share of small enterprises dropped by half between 2004 and 2013 and declined by almost one-third from 2011 to 2013. This interpretation holds even if the dataset does not enable us to concretely demonstrate how many enterprise mergers, shutdowns, separations, and/or shifts in subordination from the central administrative level to a lower level took place in 2013 in order to eliminate burdens at higher levels. Nor can we follow the opposite strategy, i.e., how many efficient enterprises were shifted to a higher subordination level.

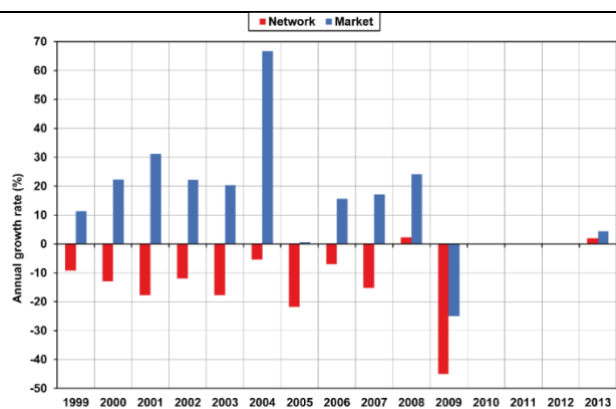
Reading these results along with the formerly described structural developments, a deeper selective process can be identified behind national-level reactions to overheating and the dynamics of party-state transformation. A radical retreat of the network field occurred through the redistribution of overburdened SOEs from higher administrative levels to lower ones.

Does this process advance similarly in the case of other indicators? Given that the above results all refer to the number of enterprises, there is an obvious need to analyze other indicators as well, which may reflect the dynamics of the network sphere relative to that of the market sphere. These additional indicators are annual sales, the number of employees, and the volume of long-term liabilities. The next figures (Figures 5.1 and 5.2) show the three indicators separately for enterprises belonging to either the network or the market sphere in a given year. Two graphs belong to each indicator. The first one simply presents the sum of the indicator for the given sphere in the given year, whereas the second one indicates growth rate compared to the previous year. Hence, the graphs reveal both the direction (either positive or negative) and the speed of changes or, in other words, the dynamics of transformation in absolute and relative terms for both the network and the market sphere.

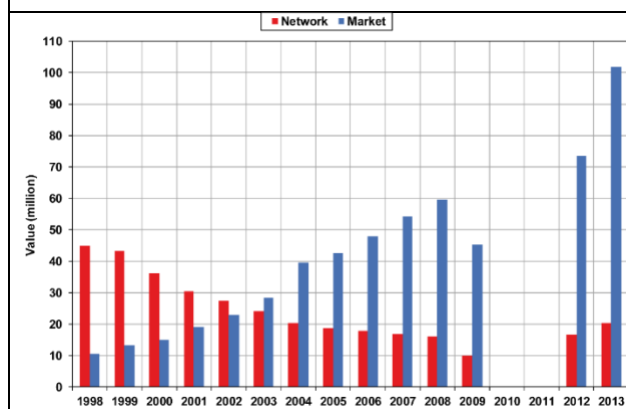
decentralizing campaigns subordinated many SOEs to lower-level administrative units, including county units. As a general principle, the lower a level was, the smaller the enterprises subordinated to it. This structure changed considerably with the 1994 tax reform, where the share of central tax revenues was radically increased at the expense of those flowing to local level governments and the subordination and registration of efficient enterprises shifted to higher administrative levels, while those of inefficient firms was delegated to lower levels (Csanádi & Lai, 2003). Our database allows us to calculate similar processes in the later period based on registration and subordination. This we will carry out in a future paper.



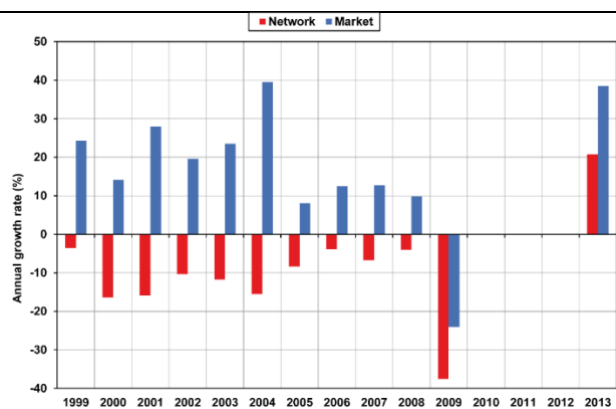
a. Volume, number of enterprises



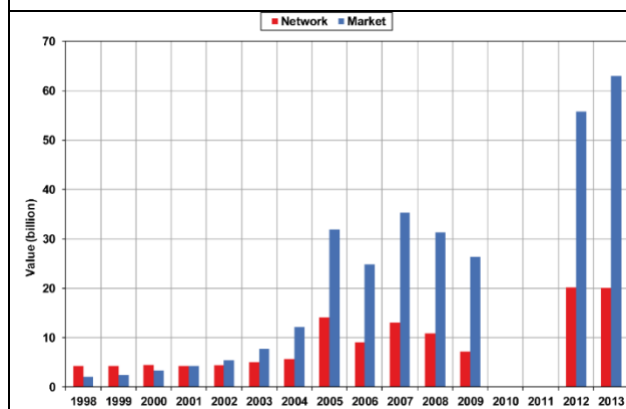
b. Annual growth rate, number of enterprises



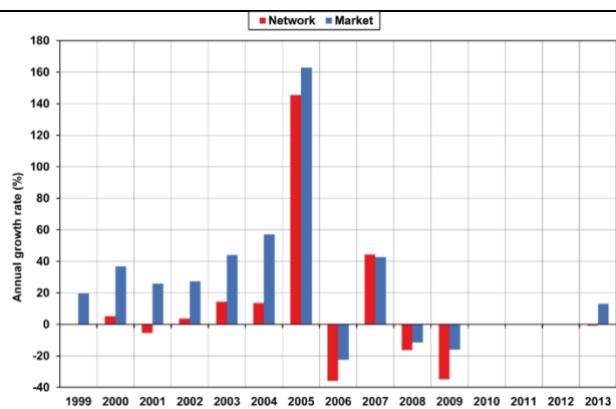
c. Volume, employment



d. Annual growth rate, employment



e. Volume, sales revenue



f. Annual growth rate, sales revenue

Figure 5.1. Transformation dynamics: annual volume and growth rate of the number, employee count and sales revenues of enterprises by ownership (network, market) (1998-2013). Authors' own calculations based on data from the industrial enterprise database.

As Figure 5.1 indicates, the years from 1998 to 2009 brought about the absolute retreat of the network compared to the market in terms of the number of enterprises and employees, with the columns indicating changes in the network and market steadily pointing in opposite directions. In the case of sales revenues, a relative retreat took place, as the gap between the network and the market constantly grew, but the network always changed in the same direction as the market. This happened even in years of decelerating revenue growth rates, i.e., in 2001, the year of China's WTO accession, and in 2006 and 2009, when the global crisis strongly hit both spheres. The negative impact of the global crisis is obvious in the case of all three indicators, with slowdown in both the network and market spheres, although with relatively faster retreat of the network in terms of the number of enterprises and employees (which means the relative retreat of the network), and slower decline in the case of sales revenue (meaning the relative expansion of the network).

However, in the case of all three indicators, both the network and the market expanded radically by 2012 compared to their 2009 rates, and from 2012 to 2013, their values continued growing (number of enterprises, number of employees) or at least remained stable (sales revenue). The market sphere also continued to boom from 2009 onwards in all three indicators and grew faster than the network field, which therefore underwent a relative retreat.

These trends are consequences of the adaptation of enterprises to market criteria in both the network and market spheres.⁸ However, empirical studies have underlined the fact that SOEs had different attitudes and behavior towards the market when they implemented economically

⁸ Csanádi and Liu (2012) presented the example of industrial enterprises in a city in Henan province between 2008 and 2010. They found that while more than 80% of the enterprises increased production either steadily or after recuperating from stagnation or decline, rational ways of adaptation to market were chosen with a different frequency. The most common reactions that would keep the enterprise on the market were decreasing costs (63.6%), changing production structure (38.7%), retraining staff (27.5%), increasing domestic sales (19.1%), investing in R&D (10.0%) and raising funds (9.7%). The least common reactions were different ways of "physical" withdrawal from the market (in increasing order): cutting exports (0.4%), reducing the proportion of migrant workers (2.7%), cutting working time (7.0%), implementing pay cuts (7.4%), and laying off employees (10.0%).

rational changes in reaction to the global crisis but had politically rational economic behavior in terms of resource allocation during the stimulus package period. As Csanádi and Liu (2012) presented, SOEs reacted to the crisis with market-conforming measures, while the stimulus package period reinforced their system-conforming motivations in terms of the drive for growth and resources, with enterprises trying to activate their connections in the institutional units of state administration with distributive functions, local governments, and banks.

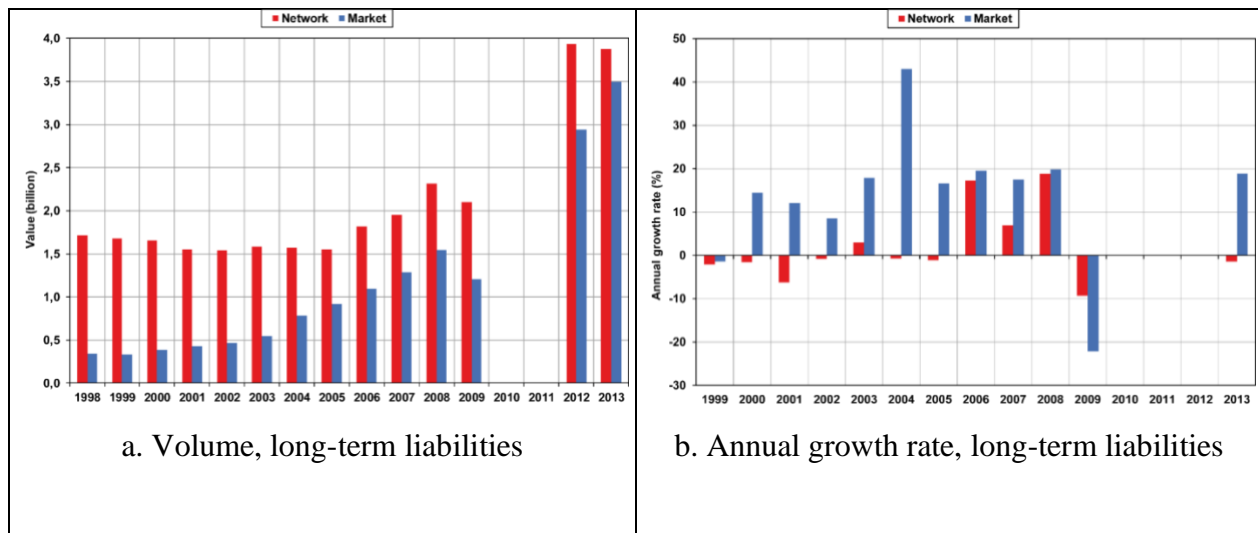


Figure 5.2. Transformation dynamics: annual volume and growth rate of long-term liabilities of the enterprises by ownership (network, market) (1998-2013). Authors' own calculations based on data from the industrial enterprise database.

Allocation can be measured through the long-term liabilities of enterprises (Figure 5.2), which simultaneously reflect the indebtedness of enterprises and the priorities of the central government's resource allocation. In the years studied here, the process differed than that shown in Figure 5.1. Figure 5.2 clearly illustrates the steady bias in official resource allocation towards the network enterprises over those in the market.⁹ Conversely, the growing columns in the market field suggest the increasing indebtedness of private enterprises, which, due to the allocation

⁹ Unfortunately, the industrial enterprise database does not include investment data for the period we are analyzing, only long-term liabilities, which simultaneously reflect the systemic selection in resource allocation at the expense of private enterprises and the indebtedness of those that were selected for allocation.

imbalances, were inevitably turning towards shadow banking to obtain loans with high risk, in addition to exploring their own resources (Mitchell, Liu, & Wildau, 2019; Ehlers, Kong, & Zhou, 2018). Absolute values of long-term liabilities of the network were either stagnating or increasing after the establishment of the SASACs (Figure 5.2); however, in light of the decreasing number of enterprises, these values show the increasing volume of resource allocation per enterprise in the network, while in the market, the volume of resource allocation per enterprise remains steadily low (see later Figure 11). From another point of view, those enterprises that remained in the network were large and overly indebted. Meanwhile, the volume of long-term liabilities in the network was well over the volume in the market sphere during the whole period, but it continuously increased until 2013.

From this aspect, Figure 5.2 shows the moderate absolute retreat of the network sphere in terms of long-term liabilities, though not in 2009, when the network relatively expanded due to the higher market sensitivity of private enterprises to the crisis and the selective implementation of the stimulus package, which gave preference to large SOEs (Csanádi, 2015). This happened despite the steady increase in absolute volume of long-term liabilities from 2009 onwards that continued during the first years of the Xi administration.

Based on the figures so far, we can detect a cumulated and politically rational selection in allocation given the general allocation bias preferring the network over the market, enterprises subordinated to the central level over those with local subordination, and larger firms over smaller ones (Figures 3 and 4).¹⁰ On the other hand, considering the growing number of enterprises entering the market, as well as the increasing number of employees of market enterprises, the volume of long-term liability increased in the market due to the growing number of private enterprises, while the average value per enterprise stagnated or even declined, then dropped in 2009, before starting to increase during Xi Jinping's administration. The results of Table 1, which shows that the share of large enterprises and firms subordinated to county-level administrative units almost doubled, also support this suggestion. In contrast, the radical clampdown on shadow banking was one of the major measures of Xi Jinping's anticorruption

¹⁰ This systemic bias in resource allocation within the network is also supported empirically. The allocations prioritized larger enterprises, those with closer connections with party organizations at different levels, and those with more connections with resource allocators at different levels, including banks, planning offices, land offices, and the local and National Development and Reform Commission (Csanádi & Liu, 2012).

campaign; however, this did not end the systemic bias towards SOEs but instead further selectively constrained investment opportunities for the private sphere.¹¹

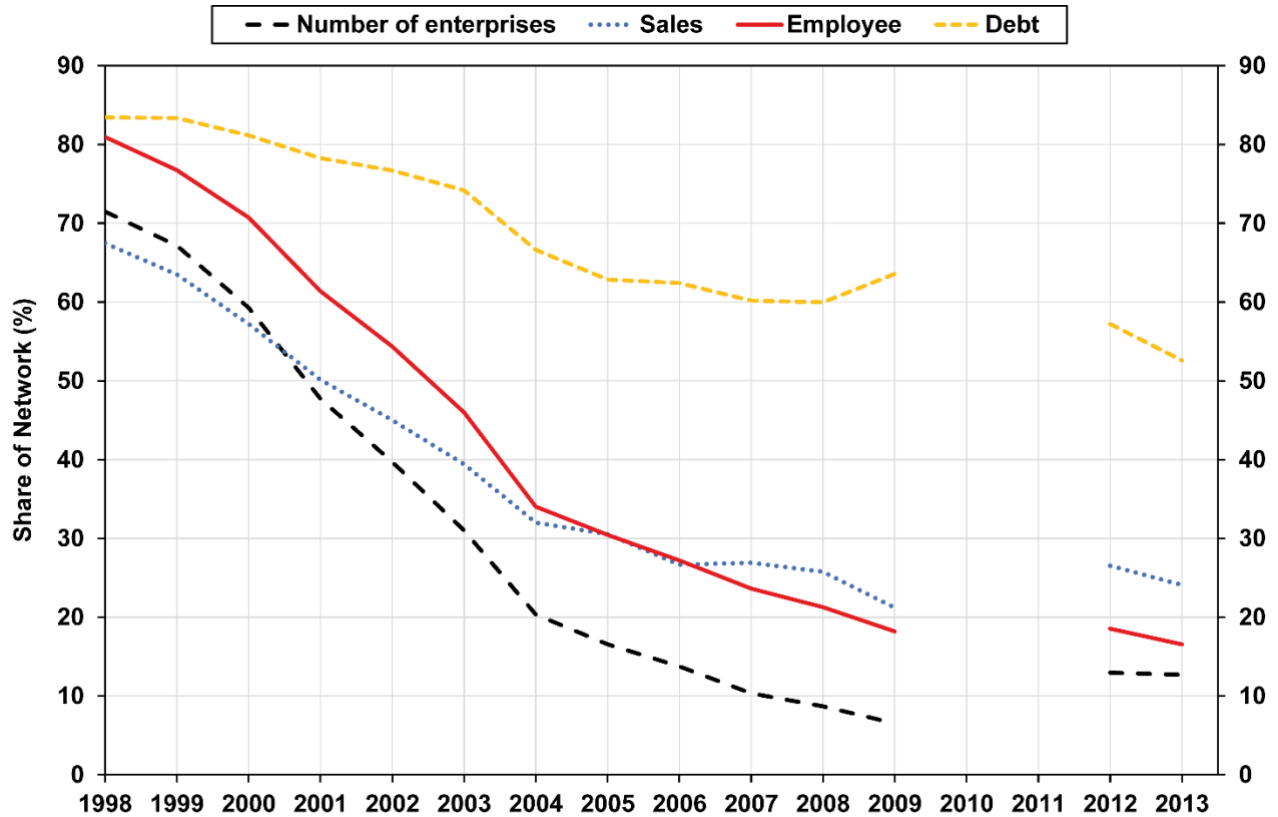


Figure 6. Share of the network from the total of industrial enterprises for 4 indicators (1998–2013). Authors' own calculations based on data from the industrial enterprise database.

In Figure 6, we have combined the curves of four indicators that represent the economic transformation through the dynamics of the network based on the share of its volumes in the total. These curves clearly show the decline in the relative position of enterprises in the network compared to private ones, even if both spheres were growing in absolute volumes, as shown in

¹¹ The systemic bias towards large SOEs subordinated to the central government has prevailed and even been supported with several other selectively implemented economic policy measures, which implicated the continuous slowdown of the dynamics of the private sphere well into 2018; in turn, this contributed to the continuous deceleration of national GDP growth (Nikkei Asian Review, 2018; Pei, 2018).

Figures 5.1 and 5.2.¹² These results also do not conflict with the ever-widening gap between the growth rates of network and market enterprises likewise demonstrated by the relative and absolute retreat of the network. This overall tendency of network retreat and market sphere expansion in the number, employment count and sales revenues of enterprises lasted until the global crisis of 2008-2009. Between 2008 and 2011, we find either stagnation or a slight decline, and—from the start of Xi Jinping’s time in office—a new increase in the relative share of the network.

Compared to production and market indicators, the tendency for allocating loans (long-term liabilities) deviates from the other three. While the network’s relative share of the whole industrial debt also decreased until 2008, this decrease was much slower, and it even started to increase in 2009. The trends until 2012 support the concepts of the systemic tendency and pressure for overinvestment and the increased activity of the network owing to the stimulus package introduced at the end of 2008. However, this is the only indicator among the four in which, from 2012 onwards, the relative share of network enterprises, unexpectedly, slightly decreased, while the absolute volume of their debt greatly increased, faster than in the case of market enterprises (Figure 6). This suggests either that there were structural changes or that the selectivity of distribution became even more nuanced due to simultaneously hardening external and domestic reproduction constraints.¹³ In this case, it is very hard to distinguish between debts and resource allocation, as allocation increased while the number of SOEs decreased, which suggests a selective bias of allocation. However, if one interprets debts as long-term liabilities, the conclusion will be that indebtedness radically increased in both the network and the market in the initial period of Xi Jinping’s term in office. Moreover, one may also have to interpret both issues together, as selective allocation increases long-term liabilities.

¹² The 12.5 million private firms in China employ 308 million workers, which is five times the number of employees in state-owned entities. The private sector also accounted for 60% of China's fixed-asset investments in 2017. A study by China Minsheng Bank shows that the private sector constitutes over 60% of GDP and 50% of the taxes (more than SOEs), employs 80% of workers in urban areas, and creates 90% of new jobs (Nikkei Asian Review, 2018).

¹³ Expert reports may give the background of this process, which is connected to the destabilizing network of SOEs due to Xi Jinping’s institutionalized anticorruption campaigns reaching that network. Local government and party organization may be reluctant to decide about or become collateral in investment-motivated banks’ shift in loan strategy. Therefore, the share of debt of market enterprises started to increase (Li & Wang, 2019; Csanádi, 2019), and risks to guaranteed repayments increased and began to shift toward financing market enterprises (Li, Wang, & Zhou, 2017). However, this proved to be transitory, as new, selectively applied economic policy instruments further acted to the detriment of the private sphere (Pei, 2018).

While the relative share of network enterprises slightly declined from 2012 on despite the increasing volume, hidden dynamics may be detected in the relationship between the network and market: for instance, the growing “density” of state ownership within the network. Figure 7 shows how the share of state-owned capital out of total capital changed between 1999 and 2013 in the case of network enterprises (where state ownership was over 51%).

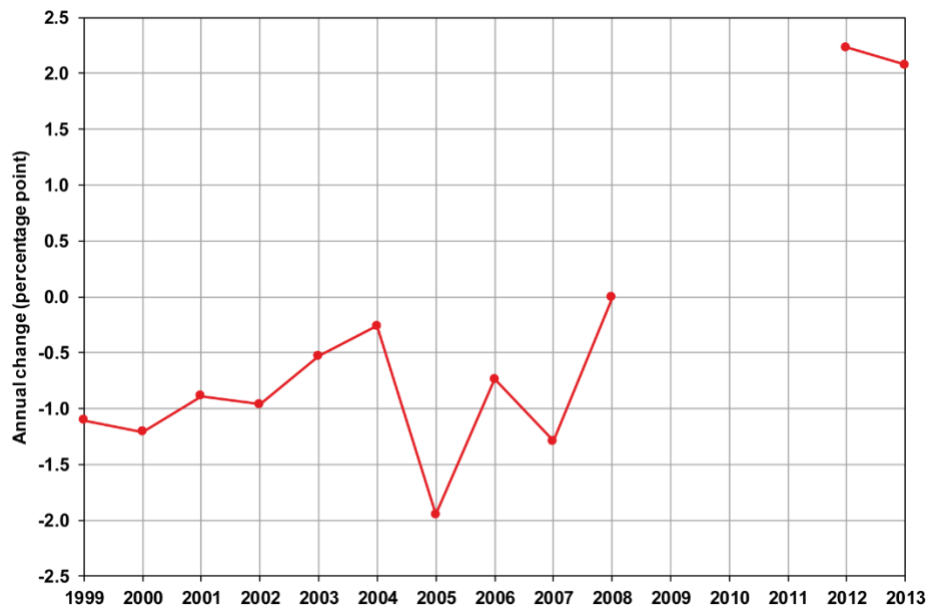


Figure 7. Hidden expansion of the state: the annual change in the share of state ownership within all ownership in network enterprises. Authors’ own calculations based on data from the industrial enterprise database.

Note: zero means identical value to the previous year.

Figure 7 shows that until 2008, the values were below zero: every year, there was some decline in the share of state capital in enterprises in the network. Hence, enterprises remaining in the network became less network-related every year between 1999 and 2008. This trend changed later, however, and the share of state capital increased in 2012 and 2013 by 2.0 and 2.5%, respectively, which also means that the annual increase was much faster than the decline had been before 2009. We call this phenomenon the hidden expansion of state capital (i.e., the network) because these companies are not changing their categories (the share of state capital constantly remains above 50%), but the party-state network is increasing its influence within

those categories. The hidden expansion in different indirect forms persisted in recent years. For example, according to a study by the chief economist of China Merchants Bank, in the campaign centrally initiated in 2013 to reduce different sectors' excess capacity, nearly all of the 11,000 businesses that disappeared as a result of "supply-side reform" between 2016 and the first half of 2018 were privately owned (Pei, 2018).¹⁴ Another study stresses that as shadow banking became suppressed from 2012 onwards, private enterprises were starved of resources and were open to any other firm, mostly SOEs, that could bail them out or buy shares. Such was the case of "Twenty-one privately owned groups who have sold large stakes to SOEs since the start of 2018, according to stock exchange filings. Of these, 10 are de facto nationalizations because the SOE will become the formerly private company's largest shareholder" (Nikkei Asian Review, 2018; Taplin, 2019). Explicit expansion of the network (Csanádi, 2019) can also be observed in the meantime. Since 2011, the establishment of party branches within private economic units has accelerated, thereby linking 70% of foreign and 68% of domestic private enterprises to the network. (This institutional process is, at least so far, independent from changing the ratio of state ownership.) (People's Daily, 2001).

Concluding our analysis from the perspective of transformation so far, the long-term trend was clearly the relative retreat of the network compared to the market, which slightly and temporarily reversed in each overheating period. Even the fast implementation of the 2008 stimulus package, which increased the level of overinvestment due to selective resource allocation in favor of state-owned and large enterprises and further increased local indebtedness, halted or reversed this process only temporarily. However, the retreat of the network radically reversed between 2009 and 2012 in terms of the number of enterprises, sales revenue and number of employees and volume of long-term liabilities. (Unfortunately, it is not possible to analyze this three-year period on an annual basis due to the lack of reliable statistics in the dataset for this period). In fact, the growth rate of the network (in terms of various indicators) was higher than that of the market sphere, though. In addition, there was no remarkable return to pre-crisis shares of the market from 2012 to 2013, when radical restrictions and a drastic anticorruption campaign that reached all levels of the party-state network, including large enterprises, started. Moreover, a

¹⁴ Tsai (2015) describes how the selective allocation of resources from the stimulus package incited excess capacities and indebtedness of local governments and increased shadow banking.

specific process of “hidden expansion” started adding to the slowdown of retreat, with the share of state capital significantly increasing in network enterprises. Unfortunately, our data do not extend after 2013 so that we can see whether this reversal was temporary or longer term.

5 The dynamics of entries and exits

The black box had already been opened at the national level by separating the macroeconomic dynamics into network and market spheres to see the transformation process and its changes according to the adaptation to radical shocks. In the next step, the temporal analysis of different movement types will throw even sharper light on the inside of the black box to examine more subtle and structured dynamics than those in the previous sections of the paper.

5.1 Enterprise sensitivity reflected in movements (entries, transfers, exits and survivals)

So far, we have analyzed enterprises that were in either the network or the market field for at least two consecutive years (MM and NN from the 8 movements). This, however, does not mean there were no changes in their ownership status.¹⁵ In fact, movement types influence the dynamics of both the network and the private fields. The number of enterprises leaving or entering the database or transferring from one sphere to the other may change from year to year.

Table 2 shows the annual changes in the number of enterprises in each movement type. These values indicate the years of major changes in terms of acceleration and deceleration in the market sphere or the network sphere due to internal changes within and transfers between the two fields as well as entries and exits. We can also compare the different trends of each movement type to the others. We can determine whether the dynamics of these years match those of macroeconomic shocks and central government measures. We can also identify what kind of enterprise movement types the shocks stimulated.

¹⁵ For example, the ratio of state ownership may increase or decrease between the boundaries pertaining to the network or the market. Parts of the enterprise may be sold, enterprises may be merged, or some of the enterprises' shares may be purchased. These can all increase the fixed assets, income, investment, output, etc. without the enterprise changing subspheres. Internal dynamics will change the relative position of the network to the private field, as we have seen in the above figures.

The numbers show that major economic policy decisions and enterprise behavior are strongly interrelated and that different sensitivity is revealed in the case of different movement types. There were two outstanding years for entries into the network and the market (ON and OM movement types). First, in 2004, when the creation of central- and lower-level SASACs dynamized the network and tax reforms were introduced, this apparently activated the entry of private enterprises (Cai and Harrison, 2019; Permanent Mission of the People's Republic of China to the United Nations Office at Geneva and Other International Organizations in Switzerland, 2004) while also leading to an increase in transfers from the market to the network; these transferring enterprises were presumably seeking privileges distributed in the network while also loosening the network up with alternative interests and capital (MN). The other explanation could be that MN is the antecedent of the bail out and hidden expansion of the network. Entries into the network (ON) also increased in 2008, when the 4 trillion RMB stimulus package was introduced, as did the transfer of enterprises from the market to the network, further loosening up the latter (MN). Both movement types, however, dramatically slowed down in 2009, presumably due to the stimulus plan's selective distribution of resources and unfulfilled initial expectations of ON and MN enterprises regarding successful resource attraction. The same year, a similar decline occurred in entries to the market field (OM), and exits from the market strongly accelerated in 2009. Similar processes took place in 2013 after the introduction of the anticorruption campaign and the further hardening of external constraints. Likewise, exits from the network increased in 2008 and even more remarkably so in 2013. However, transfers from the network to the market (NM), which is a form of emptying the network, instead showed a short-term pulsation of growth and decline. Nevertheless, there were no major fluctuations in this respect. Exits (NO), which we interpret as a cut off from the network and thus a further factor of absolute retreat, were the highest among all movements, although there were large fluctuations. The number of enterprises remaining in the network continuously declined, except for 2005, when a small increase can be seen. The number of enterprises that remained in the market increased at changing pace every year except for 2004.

Year	ON	OM	NM	MN	NN	MM	NO	MO
2000	-31.4	57.8	18.8	-18.6	-8.5	17.6	-8.1	7.3
2001	11.8	71.1	11.9	18.3	-26.0	10.9	13.0	54.2

2002	-37.9	-8.6	-27.8	-21.3	-8.1	43.7	-40.7	-19.2
2003	-35.8	7.4	25.7	9.1	-21.6	15.3	-5.2	13.8
2004	181.5	151.5	-16.1	28.7	-52.6	-19.9	-23.2	6.8
2005	-85.7	-71.4	-47.1	-36.5	9.0	70.0	-5.8	74.8
2006	26.3	55.6	-4.2	22.9	-14.5	5.0	-61.9	-49.5
2007	-19.9	7.3	-36.2	-43.2	-24.4	3.1	40.0	2.2
2008	86.2	55.3	39.7	164.7	-37.2	-12.0	-47.8	34.3
2009	-92.6	-94.2	-92.9	-93.2	-6.1	22.3	89.1	217.0
2013	-9.3	4.8	84.7	1.1	-7.9	-7.6	167.9	137.5

Table 2. Change in the number of enterprises relative to the previous year by movement types (in percent) (2000–2013). Authors' own calculations based on the industrial enterprise database.

Table 2 shows a continuous decline in the number of NN enterprises, those that steadily belong to the network, and an annual pulsation of enterprises newly entering the network. In conclusion, there were four years that activated enterprises: 2004, 2008, 2009 and 2013. Each of these years witnessed major state intervention measures and a shift from investment overheating to cooling (see Figures 1, 2 and 3). The 2004 intervention was a result of overheating and brought about a selective cooling. There were similar consequences of reactions to the global crisis in 2008 with the introduction of the stimulus package, and Xi Jinping's radical restrictive measures in 2012 that aimed to cope with the overheating and local indebtedness present since 2010.

5.2 Behind signs of sensitivity: the changing number of enterprises by movement type

Figure 8 demonstrates that regarding the number of enterprises, the overall tendency of the retreat of the network since 1998 was experienced not only in the dramatic decline in the number of enterprises remaining in the network but also in the larger number of entries into the market than number of exits from the market and the expanding number of enterprises in the market sphere.

Regarding the network, exits and entries remained minimal, while the number of NN enterprises declined since 1998. This indirectly suggests substantial cases of mergers or, less likely, the consequence of disaggregation, which produces smaller enterprises no longer reaching the statistical threshold for being registered in the database. The first option is supported by the

political motivation of the economic behavior of actors within the network to increase bargaining capacity and adapt to selective allocation criteria in the system, as demonstrated in the IPS model (Csanádi, 2006). This tendency is empirically confirmed in Figures 9, 10 and 11, where we can see the concentration in sales revenue, number of employees and volume of long-term liabilities per enterprise in the network.¹⁶

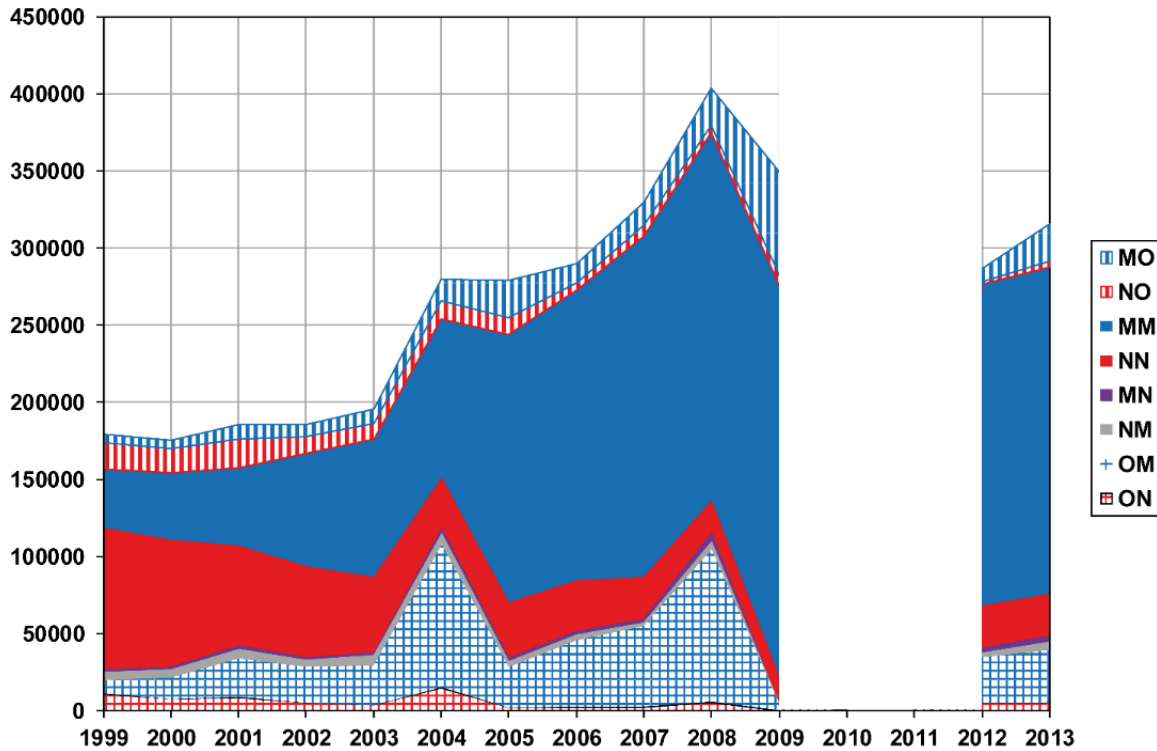


Figure 8. Number of enterprises by movement type (1999–2013). Authors' own calculations based on data from the industrial enterprise database.

Due to the lack of data for 2010 and 2011, we cannot simply compare 2009 and 2012 to each other without considering the nature of dynamics between the two years, nor can we figure out whether there was a linear trend between them or there were contradictory annual changes. Moreover, exactly during the two missing years, chaotic processes were taking place that laid the

¹⁶ There is, however, a statistical factor to these phenomena: the threshold size for registering enterprises in the enterprise dataset was increased in 2011, which automatically increased the enterprise size of those remaining in the network and, thereby, the volume of sales revenues, number of employees and volume of long-term liabilities per enterprise.

foundation for the developments seen in the following figures in 2012 and 2013. Budgetary expenses grew at an exceptional rate, lawful and unlawful sales and the forced acquisition of land use rights boomed, the expansion of local banks' loans became practically uncontrollable, the number of bad and risky loans soared again, local governments' indebtedness persistently increased¹⁷ through local financial vehicles' loans (Bai, Hsieh, & Song, 2016), shadow banking increased at an exceptional pace, and bubbles developed in real estate building and some sectors of the industry (Csanádi, 2015). All these phenomena incited the repeated intervention of the state to withhold investment as early as 2010, when the original plan's deadline was due (Csanádi, 2015).

Keeping this in mind, we can still assert that in terms of the number of enterprises, the declining tendency of the network, which was obvious until 2009, reversed by 2012. This shift was presumably the consequence of the selective implementation of the stimulus package that caused economic overheating and local indebtedness during the intermediate years (Csanádi, 2015; Wong, 2011a, 2011b). As Figure 8 further reveals, during the initial period of Xi Jinping's evolving power and anticorruption actions in 2012-2013, the number of enterprises in the network (NN) increased somewhat, and minimal entries also occurred. This, too, demonstrated increased exits from the market from 2012 to 2013, with stagnating (stable) entries and, as a result, a moderate decrease in the market (MM). Nevertheless, the number of enterprises in the market remained much higher compared to those in the expanded network. This means that the change between 2009 and 2012 continued in 2013 as well.

5.3 Major changes matching crucial times

While overall absolute numbers increased in the long run due to the growth of the Chinese economy (Figures 5.1, 5.2 and 8), what we see here is the sensitivity of enterprises reflected by

¹⁷ "A comprehensive audit of local government debt, which Chinese officials ordered in July, should soon reveal just how much China's provinces and towns are in hock. Credit Suisse estimates the figure could exceed 17 trillion yuan (\$2.8 trillion) - more than one-third the size of the Chinese economy. If that estimate is correct, it would mark a nearly 60 percent increase since 2010, when China's National Audit Office estimated the total at 10.7 trillion yuan (\$1.7 trillion). That, in turn, was nearly double the 5.6 trillion yuan (\$920 billion) debt load of 2008, right before the central government unleashed a massive stimulus program in 2009 to stave off the global financial crisis." (Kindergan, 2013).

the hectically changing number of entries, exits and transfers in critical years as potential reactions to major economic policy impacts (Table 2). However, from the point of view of sensitivity and yearly activity, an interesting picture may be detected in Table 3. We checked which three years were the major years of intensifying change in the number of enterprises in each movement type. We have chosen the three years with the highest rates and the deepest “recession”. In both cases, firm activity in terms of entries, transfers and exits increased, thus also activating those firms that remained in either the market or the network.

Year	ON		OM		NM		MN		NN		MM		NO		MO	
	H+	H-	H+	H-	H+	H-	H+	H-	H+	H-	H+	H-	H+	H-	H+	H-
2000			x													
2001	x		x							x		x				
2002											x			x		x
2003					x											
2004	x		x				x			x						
2005		x		x		x		x	x		x				x	
2006							x							x		x
2007						x		x					x			
2008	x				x		x			x		x		x		
2009		x		x		x		x			x		x		x	
2013					x							x	x		x	

Table 3. Three highest growth (H+) and decline (H-) rates on an annual basis among the 8 movement types. Authors' own design.

First, the most radical changes in terms of the number of enterprises, both increases and declines, took place in the second part of the examined period, from 2004 onwards. Between 2000 and 2003, these events were less frequent. However, the most active years were the aftermaths of radical shocks and/or state interventions: 2001, 2005 (as a result of 2004), 2009 (the impact of 2008) and 2013 (as a consequence of the 2012 anticorruption campaign).

Among all movement types, only market entries reached a percentage in 2000, which belonged to the three highest ones of the analyzed period. In 2001, China entered the WTO, which attracted the increased entry of both market and network enterprises, while there appears to

be a radical decline in the number of surviving market and network enterprises (MM and NN), possibly due to there being more mergers than exits. The year 2002 looks like a phase-delayed market activity that still persisted in the year after China joined the WTO, while the number of enterprises that were willing to leave the attractive market conditions dropped radically, as did exits from the network. In 2003, the only movement type with one of the three highest growth rates for the investigated period was that of NM: enterprises that emptied the network to transfer values to the market.

From the point of view of network enterprises, the first most positive (attractive) year after 2001 was 2004—the year of the next larger state intervention that greatly triggered the entry of both market and network enterprises and attracted more private enterprises to join the network (MN) (presumably by either being bought up or bailed out or by becoming mixed-ownership enterprises). This was the year when, despite entries and transfers, the first major decline occurred in the network, presumably due to mergers and, less likely, disaggregation that pushed them under the statistical threshold. Both results underpin the theoretical arguments of the IPS model: when the activity of the network increases and is followed by adapting private enterprises, selective resource distribution occurs. The most exposed year in activity cooling was 2005 from the perspective of all movements. It appears that by that time, the stimulating impact of earlier state intervention either vanished or selectivity created disappointment among enterprises that lead to the radical decline in entries to both spheres (ON, OM) and in transfers in both directions. This was paired with the increase in exits from the market (MO), while the number of firms in NN and MM increased due to the previous year's entries and the enterprises reaching the statistical threshold. Then, 2006 was a year of selective overheating: exits dropped strongly, and the transfer of market enterprises to the network was the highest (MN). The following year (2007) still counts as part of the overheating period. No major activity occurred; instead, we find the lowest transfers from one sphere to the other (NM and NM). Only the number of those leaving the network notably increased, despite the fact that investments were still booming (Figure 5.2). The latter phenomenon might have occurred as the constraints of self-reproduction of the network began to harden, the circle of privileged firms narrowed, and the usual mechanisms revived to eliminate allocation burdens (shifting subordination to lower administrative levels, enterprise shutdown, privatization, disaggregation, etc.) (Csanádi & Lai,

2003). This suggestion is supported later in Figures 9-11, where we can see the declining value of long-term liability, sales revenue and employment count per enterprise of those firms leaving the network between 2006 and 2007 in contrast to those staying (NN) and entering (ON) in the same period.

Next came the global crisis and the prompting of large, stimulating state intervention in 2008 that activated enterprises in both the network and the market. Entries in both fields (OM and ON) were then among the three highest of the whole analyzed period, as were transfers from one field to the other (NM and MN). Meanwhile, NN dropped, just like exits from the network (NO), both suggesting strong mergers and privatizations. Most likely, mergers also occurred among market enterprises, as there, the number of exits neither increased nor declined radically compared to those in the years before. Following the global crisis, 2009 was a similarly cooling year to 2005. By 2009, firms were still suffering from the impact of crisis in both the network and the market. In 2009, the drop of entries into both fields was among the largest, as were the decline in transfers from both fields and the increase in enterprises leaving the network and the market. Only market firms (MM) regenerated rapidly after the radical drop of 2008. However, increased exits from the market field suggest increased selectivity in the market. The two years after the major state intervention, 2005 and 2009, show the same kinds of enterprise reactions in the case of both highest growth and decline rates in the same movement types, except for NN and NO. This suggests that in 2009, the selection of enterprises within the network and the market both reached a high level, despite the stimulus package.

Finally, there was a change from 2012 to 2013 following the radical anticorruption campaign to which both network and market enterprises reacted with the highest number of exits (NO), (MO) and transfers (escapes) from the network to the market (NM), which also may be interpreted as the network emptying and being cut off and the higher administrative levels in the network eliminating burdens. Cooling was overall, as radical exits from the market (MO) and the network (NO) and transfer from network to market (NM) went parallel to the highest decline in the market (MM).¹⁸ Drastic restrictions, the anticorruption campaign and growing uncertainties discouraged market enterprises as well.

¹⁸ Unfortunately, we can only provide a logical suggestion, not a proof, of exactly what happened behind the changing numbers.

5.4 Importance, oscillation and tendency of movement types in different indicators

Next, we shall measure not only the number of enterprises entering, exiting, transferring and surviving but also their average employment counts, sales revenues, long-term liability values and temporal changes. Based on that, we can measure and compare the importance (per enterprise average value) of all movement types in different years. More specifically, the average value of different movement types in terms of a given indicator represents the same firms' average sizes (employment counts), average revenues (sales) and average long-term liabilities (allocations) when they entered, exited, transferred or survived in the given year as well as their movement types. The analysis of temporal changes in the average values of different movement types will allow us to compare the dynamics and importance of one movement type to those of other movement types within one indicator or compared to the location of the same movement in other indicators in a given year. This analysis also demonstrates the extent to which this location (importance) changed and what dynamics occurred. This allows for the comparison of importance and hecticness of the dynamics of the given movement among other movements and between the market and network within the same indicator and compared among indicators. Dynamics of these movements (flatness, hecticity and smooth tendency) will show what kind of enterprises have performed the given movement, thus showing different sensitivity and whether, compared to other movements in the same indicator and in other indicators, they are better at adapting to major shocks. This will also allow us to interpret the different dynamics of transformation and its fluctuation and characteristic movements in comparison to different indicators in crucial years. This also reveals the different dynamics and the extent of transformation regarding both relative and absolute retreat or of the expansion of the network at different times according to market or allocation indicators.

Figures 9, 10, and 11 show the hectic dynamism of different movements behind the likely steady tendencies of each indicator reflected in Figure 6. We shall analyze the characteristics of these three indicators and 8 movements in comparison with each other by fields (network or market), movements, and, in time and major shocks. To do so, we also have to occasionally recall the results of former figures that dealt with the network and market (Figures 5.1 and 5.2) and with

the movements represented by the absolute number of firms (Figure 8) and their yearly relative changes (Table 2). We interpret the level of importance of the given movement in either the network or the market in a given year and in terms of one indicator by comparing the given movement's average value in the figure to those of other movements. On the other hand, we shall also interpret the characteristics (hecticity or flatness) of the temporal change and the overall tendency (decline or increase) in the researched period.

Our figures unfortunately suffer from a large gap in a crucial period, the overheating process that lasted until 2012; therefore, the figures cannot reflect the movements' average importance according to indicator values and behavior or sensitivity. However, the overarching tendency of the averages becomes visible at the start of 2012, where the 2011/2012 movements have located it.

We shall examine the following questions: What characteristics did those enterprises that reacted to the economic policy context with the given movement in the given time have? How did these characteristics differ between those in the network and those in the market? What is the average importance of enterprises choosing the given movement in terms of their size, revenue and long-term liabilities compared with the importance of those choosing other movements? Dynamics in these cases will be interpreted as the change or stagnation of those firm characteristics during the examined period.

At first glance, we can see that the kind of enterprises sensitive to the shocks reflected in the different movements may be clearly distinguished in view of different indicators. Moreover, these movements show different levels of importance and different dynamics when compared to each other within each indicator and among indicators at different times. These differences appear despite representing the same enterprises' movements in the case of different indicators. Therefore, we can argue that the motivations of those movements in the same enterprises might differ according to employment count, sales revenue or volume of long-term liabilities.

We can also confirm from our conclusion so far that regardless of the indicators, firms reacted sensitively to major external shocks, and their adaptations to state intervention have driven overheating and subsequent new interventions to withhold that overheating (2004, 2008-2009 and 2012-2013). Nevertheless, the three figures offer different impressions of the "distribution" of characteristics of enterprises that choose these different movements and their

dynamics. The largest dispersion is shown in Figure 11, which shows the long-term liability of those enterprises by movement. In Figure 10, sales characteristics of enterprises with different movements practically converge until 2004 and then suddenly disperse, while the employment characteristics reflect the most sensitive simultaneous pulsation in reaction to overheating and state intervention periods (which are distinguished by movements and network or market fields), although at different locations. In 2012-2013, dramatic state intervention triggered most movements, be they the entries, exits or survival of firms in the market or network.

Increased activity during these periods came from enterprises that were of different importance regarding size (employment count), market position (sales) and bargaining capacity in allocation. This was visible despite the exits and entries being more robust signs of enterprise sensitivity than the restructuring adaptation moves of surviving enterprises (MM and NN) hidden in the figure were and also despite the fact that the network enterprises themselves react differently to market and allocation criteria. Reactions, however, differed by location in the network or the market (roughly, ownership), size and allocation level and indicators that brought about the different dynamics of transformation regarding indicators.

If we examine these figures by movement type, private enterprises entering (OM) and leaving (MO) the market had the fewest fluctuations and the lowest average values of long-term liabilities per enterprise among all movement types and all indicators. This pattern remained stable despite the steeply increasing absolute number of market enterprises and their skyrocketing employment count, as well as sales and loans in the market field until 2009 (Figures 5.1 and 5.2). This, on the one hand, means that the overwhelming part of market enterprises must have invested from their own resources and the shadow market in response to the systemic bias of selective allocation. On the other hand, this also underlines our earlier argument that these enterprises' motivations for entering or exiting the market are not connected to resource allocation. The average per enterprise employment count and sales value of firms entering and exiting the market were higher than those of firms with other movement types (which was not the case for long-term liabilities), and the former group's sensitivity to major shocks is more explicit.

This fact also underlines the suggestion that the overwhelming part of the increase in loans (5.2) was due to the growing entries and exits of small firms that otherwise had a low amount of long-term liability per enterprise. Flatness would mean that although private firms, in

terms of their number, reacted sensitively to economic policy shocks with entries, exits and restructurings (Figure 8), the dominant part of enterprises were small in terms of employment count (Figure 9) and sales revenue (Figure 10).

The average values of enterprises that survived in the market (MM) were much higher in terms of both employment count and sales than those of the firms either entering or exiting the market. Nevertheless, the dynamics of all three movement types are similar in shock periods. The average number of employees per enterprise in the market fluctuated only mildly in 2004/2005 and 2008/2009, despite, for example, the drastic temporary mass lay-off of migrant employees from the private sphere in late 2008, when the crisis first hit. Unfortunately, annual employment data cannot reflect this short, half-year period, though the drop in enterprise numbers is evident in Figures 5.1 and 8. This means that private firms chose more radical measures: they reacted by exiting and entering. Nevertheless, as time passed, the average number of employees tended to decline slightly until 2009.

Regarding sales, MM enterprises remained low and flat until 2004. They then gained momentum by 2005 before slowing down again the next year. This fluctuation parallels that of new entries into the market, while the average values of exits decline. Similar fluctuations appeared in 2006 to 2008, with slightly sharper decline by 2009, while the average sales value of the firms entering increased, suggesting the presence of market selection during the first year of the crisis. In this year, movements in sales demonstrated the same dynamics as the movement of average number of employees. However, both indicators show faint but similar sensitivity to shocks, and their dynamics reflect similar booms and slows.

In 1999, the average employment count and sales value of firms entering the network (ON, MN) steeply increased, which reflects the selective support of network enterprises from the resources the state invested to curb the impact of the Asian crisis (Figure 2). This increase paralleled the dramatic increase in the value of those enterprises that emptied the network by transferring to the market (NM), while the values of transfers in the opposite direction (MN) only mildly increased. Except for the initial year of the stimulus package, NM rapidly increased in terms of employment count, sales revenue and long-term liability. Meanwhile, MN shows larger fluctuations during the whole period in terms of all indicators than OM, MO and MM do. Since 2004, MN shows the highest per enterprise values among all movement types related to the

market in all indicators. This suggests that, on average, larger private enterprises with lower volumes of long-term liabilities were attracted to the network. Their temporal dynamics were different from those of any other movement types in the market and followed the fluctuation of those entering the network (ON) in reacting to the shock years. In the case of loans, NM steeply deviated from ON from the start of the crisis and the stimulus package. Simultaneously, the increasing values of average employment count, sales revenue and long-term liability of NM enterprises show the flight of increasingly large enterprises from the network to the market. This tendency also continued from 2012 onwards.

The average per enterprise values of employment count and sales revenue in MM enterprises dramatically increased between the global crisis and 2012, and this increase continued during Xi Jinping's early years in office, despite the increasing number of firms leaving the market. This means that despite the slow decline in the number of enterprises (Figure 5.1), those that remained in the market were, on average, larger enterprises than those that left. Regarding average long-term liabilities of MM enterprises, we see equal flatness and low values throughout the whole examined period, just like we do for the firms either entering or exiting the market, despite the likely sharp increase in liability volume (Figure 5.2). However, this is parallel to the increase in the number of private firms (Figure 8); thus, average allocation was nonsignificant. This tendency in MM enterprises continued after 2012, with a slightly higher start after the 2009 statistical gap, presumably owing to the increased exit (MO) of firms with higher burdens.

The opposite was the case for network enterprises in all movement types. Their average values were much higher, while strong sensitivity is shown in the hecticity of changes. Moreover, changes are more connected to major shocks, state interventions and overheatings. Figures 9, 10 and 11 confirm our earlier arguments regarding the selectivity of resource allocation between various NN enterprises according to their size and other allocation preferences. This is underlined by the fact that enterprises that survived in the network (NN) had the highest and most consistently increasing average values of allocation compared to enterprises with all other movements. This happened despite the continuously declining number of enterprises in the network and their slowly declining relative share compared to the share of market enterprises (Figures 5.1 and 6). NN enterprises had the highest values of average employment count, sales, and long-term liability and thus the highest allocation. All three figures show the systemic

selection of state intervention, as these values suddenly increased in 2004 upon the establishment of the SASACs. Average employment count and sales values in NN enterprises somewhat declined from 2008 to 2009, while average allocation dramatically increased during the period the stimulus package was in effect.

Changes occurred during the undocumented overheating period, as the average number of employees declined between 2009 and 2011, while sales revenue radically increased and allocation grew still further from an already high average. During Xi Jinping's anticorruption campaign, average allocation (or debt value) in NN enterprises somewhat declined. This tendency, along with signs of adaptation at crucial periods in NN enterprises, was parallel to the hectic changes in the different network movements of entering (ON), exiting (NO) and transferring enterprises (NM). The average values were located at different lower levels for different indicators, but except for MM enterprises, all of these represented higher values, be they in ON, NM or NO enterprises. All of the later enterprises show sensitivity to major intervention periods, as also demonstrated in Table 4.

This clear difference between the market and the network until 2009 also underlines our arguments about the systemic background of overheating: the cause is selective allocation towards the network and larger enterprises within it. This result also supports our argument on the reasons for politically rational economic behavior, i.e., both selective distribution and the drive for resources within the network, as well as on its effects on overheating.

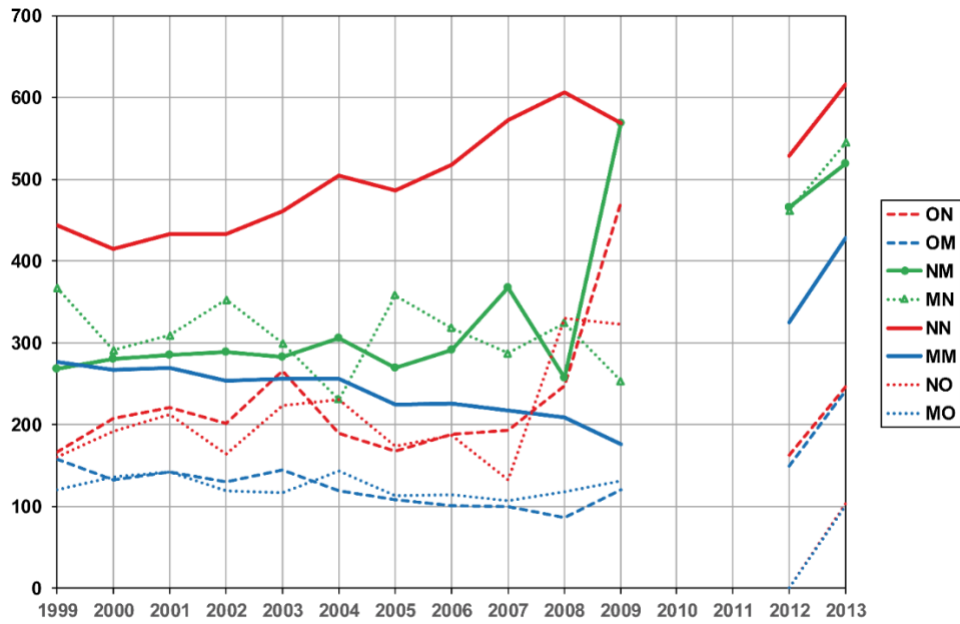


Figure 9. Average number of employees per enterprise for 8 movement types (1999–2013). Authors' own calculations based on data from the industrial enterprise database. Due to data problems, NO is missing from the 2012-2013 calculations.

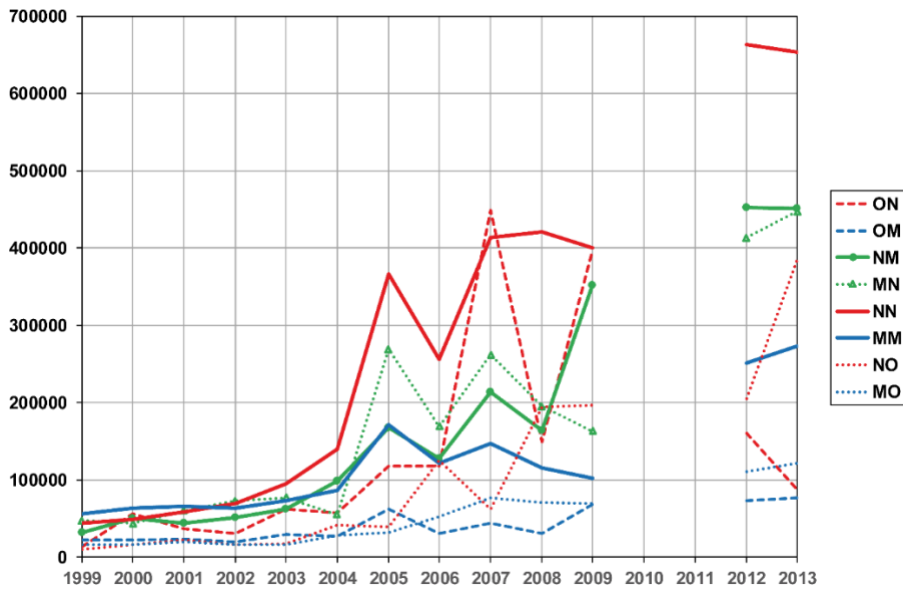


Figure 10. Average sales revenue per enterprise for 8 movement types (10,000 yuan, 1999–2013). Authors' own calculations based on data from the industrial enterprise database.

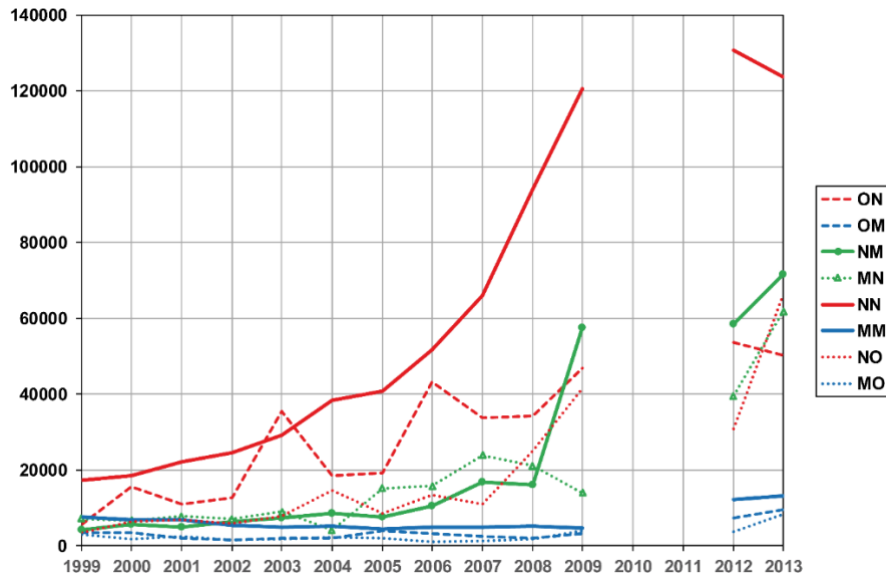


Figure 11. Average volume of long-term liability per enterprise for 8 movement types (10,000 yuan, 1999–2013). Authors' own calculations based on data from the industrial enterprise database.

Between 2012 and 2013, we can observe a slight decline, which is parallel to the increasing resource allocation to and indebtedness of the enterprises remaining in the network. This decline in long-term liabilities in the network field may be at least partially attributed to the impact of the institutionalized anticorruption campaign from 2012 onwards throughout the whole system, which temporarily paralyzed conventional resource attraction (bargaining) methods and drives through the channels of the network because actors were afraid of being dragged in the campaign as culprits (Li & Wang, 2019; Li, 2016; Csanádi, 2019). Enterprises that left the network (NO) also had, on average, higher and more steeply increasing debts than those who survived in the network (NN). Some of those that left might have been privatized, as our figure confirms the increase in the average debt of those that entered the market (OM). The indebtedness of firms in the network was much higher than those in the market, though there was an increase in the latter in 2012–2013, when banks—due to uncertainties in stable collaterals for network enterprises due to the anticorruption campaign—began to reallocate credits to private firms (Li, Wang, and Zhou, 2017).

6 Conclusions

Our systemic approach (Csanádi, 2006) allowed us to conduct a complex firm-level analysis of the system dynamics of economic transformation in China. It also allowed us to detect the impact of radical economic policy turns from 1998 to 2013. With our systemic approach, we have brought together several dispersed and formerly mostly individually analyzed issues and dimensions. Two major interdependent issues were examined: (1) the consequences of enterprise activity on economic transformation and (2) the adaptation of enterprises to major state interventions.

We have nested national-level statistical data and a firm-level dataset from 1998 to 2013 in this structural and dynamic context. Accordingly, we separated enterprises in the transforming economy into those that, in a given year, were overwhelmingly held to the power network by stronger institutional ties (measured by ownership structure) and those that instead pertained to the market. We specifically measured firm level activity through exits and entries into the network and the market that would either contribute to or hinder the transformation process. We analyzed 8 movement types for the period of 1998 to 2013: enterprise entries to the network/market (ON, OM), exits from the network/market (NO, MO), transfers from network to market and vice versa (NM, MN), and enterprises staying within the network/market for more than one year (NN, MM) (Figure 1).

Our systemic approach confirms that the process of economic transformation is *not uniform*. The network shows a steady decline in the number of enterprises as well as in those enterprises' employment counts and sales revenues, while the market is expanding in terms of these indicators. However, a different tendency evolves in the distribution of resources due to systemic selectivity, which prioritizes (1) state-owned and state-controlled enterprises that belong to the network at the expense of market firms (Figures 5.1, 5.2 and 11), (2) enterprises belonging to the central government at the expense of those belonging to local governments, and (3) large companies at the expense of small ones (Figures 3, 4, 11). Thus, tendencies regarding the different distributive and market factors also involve *different speeds* in the transformation.

Moreover, the process of transformation is not *unilinear*. The retreat of the network and the expansion of the private field have their temporary setbacks and even reversals, which are strongly connected to major state interventions. State interventions are aimed at restoring the cohesion of the network that occasionally declines due to decreasing resources along with the boom of systemic

overinvestments. These latter, in turn, occur due to the systemic behavior of enterprises in the network and the adapting behavior of private firms outside of it to selective distribution of resources (Figures 2, 3, 4). Overheating and state interventions occur in different external conditions, which determine the nature of the intervention (e.g. whether new resources are pumped into the economy, or restrictive measures and decentralizing reforms are taken) and its consequences. Activity increases in the case of both soft external constraints accompanied by hard domestic constraints (2001) and soft structural (domestic) constraints accompanied by hard external constraints (2008), as well as when both external and structural constraints become hard (2004 and 2012). External resources pumped into the system in 2001 stopped overheating by 2004, restrictions and the selective resource distribution of 2004 caused overheating again by 2007, the stimulus package of 2008 caused overheating by 2010-2011, and all of these required new state interventions to halt them.

Pulsation in the system is strongly connected to the temporary halts and reversals of transformation. This process is reflected even on the firm level in the robust indicators of entries, exits and transfers. Such enterprise activity dramatically increases after restrictive-distributive state interventions (Figures 9, 10, 11).

Movements reveal not only the systemic bias in resource distribution towards large enterprises but also the strength and nature of interdependence between enterprise activity and systemic state intervention. Entries (ON), transfers to the network from the market (MN), and growth in numbers in the network (NN) reached their apex, while exits (NO) and transfers from the network to the market (NM) declined to the lowest values of the examined period in 2005, 2009 and 2013, all of which were years that followed radically restrictive but selective state interventions aimed at halting the overheating of 2004, 2008, 2012 (Table 3). This process underlines our arguments that selective—politically rational—intervention, in both restriction and allocation, activates enterprises, pointing towards a new overheating process. Thus, pulsation in transformation is connected to systemic state intervention in reaction to overheating.

We can perceive two hidden processes in the retreating network. One is the reason of the decrease in the number of enterprises, which apparently contributes to the gradual loss of their overall position compared to the market enterprises (Figure 6). An examination of dynamics by movement types suggests that mergers, rather than exits, are behind this process: the number of

network enterprises (NN) is decreasing from one year to the next even while entries (ON), transfers (NM) and exits (NO) have very low numbers. The same is suggested by the fact that the distribution bias towards large enterprises is increasing (Figures 5.2, 9, 10 and 11). The other hidden dynamic within the network is the advancement of the state ownership share of state-controlled firms within the network (Figure 7). Considering these hidden dynamics of resource allocation, its selectivity based on political rationality and slower retreat in resource allocation, the evident advancement of the market compared to the network in China becomes questionable. Instead, we may argue that selective distribution based on political rationality and according enterprise economic behavior in the drive for resources is conserved by the power network, fed by resources extracted from the expanding market field.

Our results, organized by movement type, show that sensitivity to state interventions stands for both network and market enterprises. For example, the highest and most allocation-sensitive market movement per enterprise was MN, which increased in number of enterprises and sales revenue and employment count per enterprise in the years of major interventions. In 2012, the fastest increase among all movement types was the number of enterprises leaving from either the network or the market during the economic policy context of the anti-corruption campaign. However, a characteristic difference among them was that the firms leaving the market were mostly small, indebted enterprises, while those leaving the network were large, indebted enterprises (Table 3 and Figures 9 to 11). We assume that in this case, a process similar to the one accompanying resource centralization during the 1994 tax reform that boosted the privatization of smaller indebted SOEs occurred. Radical restrictions from 2012 onwards were parallel to the stricter selection in allocation, mergers and the centralization of the level of allocation. We argue that the result of this move was the reallocation of burdens and larger, indebted SOEs to lower levels and the sucking up of SOEs and private enterprises registered at lower levels (prefectures and counties) to higher levels.

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