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# Uneven Economic Overheating in a Transforming Party-State During the Global Crisis: The Case of China

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**CERS-IE WP – 2020/36**

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## ABSTRACT

We scrutinize the systemic consequences of state intervention triggered by external shocks in the transforming Chinese economy before and after the global crisis. We interpret investment dynamics using a comparative party-state model concept framework. We identify the overinvestment as an outcome of the dynamics of party-state power formed by relations of dependence and interest promotion between party, state and economic decision-makers and of emerging structural motivations inside of this network. Due to the structural and operational characteristics of the party-state network, which are self-similar in time, space and at various aggregation levels, overinvestment and economic overheating can also be detected on the provincial level. This local phenomena is intensified by the specific decentralized pattern of power distribution of the Chinese party-state system. Thus, local intensity of overheating is further increased by major state interventions reacting to external shocks. Overheating is further amplified during economic transformation by market actors adapting to network priorities. Investment swings in both heating and cooling periods hide different forms of behavior in enterprises with different ownership types.



JEL codes: 053, P12, P16, P2, P26, P31

**Keywords:** China; crisis; overheating; overinvestment; party-state; system transformation; enterprise behaviour



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# Az átalakuló pártállam és az egyenlőtlen gazdasági túlfűtöttség Kínában a globális válság idején

CSANÁDI MÁRIA – GYURIS FERENC

ÖSSZEFOGLALÓ

A cikkben az átalakuló kínai pártállamban a globáis válság okozta külső sokk hatására reagáló állami beavatkozás rendszerbeli következményeit tárjuk fel, válság előtt és után. A beruházási dinamikát egy összehasonlító pártállami modell keretében vizsgáljuk. A beruházás túlfütöttségét a pártállam hatalmi szerkezetéből és dinamikájából fakadó következményként értelmezzük. A túlfűtöttség motivációit a döntési folyamat során a pártállam hatalmi szerkezete – a párt, az állam és a gazdaság szereplői közötti függőségi és érdekérvényesítési viszonyból alakult hatalmi háló – és annak dinamikája kelti. A pártállamok önhasonló szerkezeti és működési sajátosságai következtében a túlfűtöttség térben, időben és különböző aggregációkban -- tehát lokálisan -- is megjelenik. Ezt a lokális jelenséget tovább erősíti a kínai pártállam hatalmi hálójának sajátos decentralizált szerkezete. A szerkezeti és egyedi sajátosságok következményeit a külső sokkra reagáló állami beavatkozások lokálisan is felerősítik. A túlfűtöttség intenzitását az átalakuló pártállamban tovább növelik a piaci aktorok, amelyek alkalmazkodnak a döntéshozók által a hálóbeli vállalatokra hozott prioritásokhoz. A beruházások ingadozása -- mind a gyorsuló, mind a lassuló időszakban -- a különböző tulajdoni hátterű vállalatok eltérő magatartását rejti.

JEL kódok: 053, P12, P16, P2, P26, P31

Kulcsszavak: Kína; válság; túlfűtöttség; túlberuházás; pártállam; rendszer átalakulás; vállalati magatartás

# Uneven Economic Overheating in a Transforming Party-State During the Global Crisis: The Case of China[1]

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## Abstract

We scrutinize the systemic consequences of state intervention triggered by external shocks in the transforming Chinese economy before and after the global crisis. We interpret investment dynamics using a comparative party-state model concept framework. We identify the overinvestment as an outcome of the dynamics of party-state power formed by relations of dependence and interest promotion between party, state and economic decision-makers and of emerging structural motivations inside of this network. Due to the structural and operational characteristics of the party-state network, which are self-similar in time, space and at various aggregation levels, overinvestment and economic overheating can also be detected on the provincial level. This local phenomena is intensified by the specific decentralized pattern of power distribution of the Chinese party-state system. Thus, local intensity of overheating is further increased by major state interventions reacting to external shocks. Overheating is further amplified during economic transformation by market actors adapting to network priorities. Investment swings in both heating and cooling periods hide different forms of behaviour in enterprises with different ownership types.

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## Introduction

The dynamics of investment in Communist party-states has constituted a fundamental issue in related scientific research since the emergence of these systems. The widely publicized ideological principle of “planned and proportionate development” confronted with investment

fluctuations and their underlying causes was hard to interpret even in scientific circles.[2] Broad debates emerged surrounding whether the experienced fluctuations were cyclical (thus repeating, regular and predictable) (Wiles 1982; Mihályi 1987; Nuti 1985) and whether they were caused by external or internal factors, so whether they were system-specific (Mihályi 1987). Early studies on investment fluctuations scrutinized the Soviet and East European party-states during the 1960s–1980s and focused on two periods: the command economy and the reform period (e.g., Bajt 1971; Bauer 1978, 1988; Bródy 1969; Kornai 1981; Soós 1975, 1978, 1986, 1987, 1989; Chavance 1987; Goldmann 1965; Grosfeld 1986; Ickes 1986; Winieczki 1982; Zou 1993). Seminal work was done 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.

Scholars agreed in that investment overheating existed in both periods and that it was a permanent phenomenon. They regarded investment cycles as systemic features; thus, they were a normal condition of party-state systems. In general, views about explanatory factors of investment cycles were also similar to each other, even if with regional differences. Scholars in the field considered permanent pressure from enterprises and the ministries to which they were subordinated as the reason for the investment drive. In their opinion, owing to the shortage of input and consumption, social planners repeatedly recognized accumulating tensions, increasing deficit and growing social unrest. Therefore, they occasionally slowed investment, before again removing the obstacles to growing investment as soon as tensions significantly decreased.

Either explicitly or implicitly, related studies identified the following reasons for steady overheating: the hierarchical structure of state decision-making (Bauer), preferences of the paternalist state (Kornai), and the dynamic causal interdependency between shortage and the investment cycle (Zou). All of these features are permanent engines of investments' cyclical development, which are brought into being by social planners' decisions aimed at optimizing

[2] Engels (1976[1878]) and later Lenin (1964[1899]) also referred to socialist production as having a necessarily planned character. The notion of "the planned and proportionate development of the people's economy" was introduced, and "planned and proportionate development" was first presented as an "objective law" of the socialist economy in Stalin's (1972[1952]) work on socialism's economic problems. The 1950s seminal political economic textbook in the USSR (Ostrovityanov et al. 1957[1954]), which had begun to be written on Stalin's command but was finished only after his death, played an important role in disseminating and "popularizing" the concept across the Communist Bloc and in anticolonial movements on other continents.

resource allocation. These reasons prevail in the mixed institutional system of the reform period as well (Soós). The endurance of systemic reasons was partly traced back to systemic characteristics, i.e., the soft reproduction constraint of state enterprises (Kornai) and the lack of interest in profit-seeking (Soós). Some other factors were also identified, such as the restless drive for economic growth, which results from the Communist ideology (Soós, Kornai), and some general (non-systemic) features of human behavior, including the identification of the self with the institution, and the enterprise directors' and managers' "atavistic instinct" for growth and power (Kornai). Continuous campaigns serve to mobilize these systemic, ideological and human factors with the incorporation of social organizations (e.g., trade union, party organization, youth organization) that have either direct or indirect links with enterprises. In Bajt's view, as planners' experiences with regulation improve over time, investment swings can be reduced in frequency. Soós takes a similar stance inasmuch as he regards the inconsistency of reforms as the reason for investment cycles. Contrary to these endogenous factors, other economists traced investment fluctuations to exogenous factors, which are independent from systemic, economic, and institutional ones. Such factors include, for instance, consequences of poor yield, external market effects and megalomaniac investments of authoritarian leaders, which all affect investment dynamics. The accidental occurrence of these factors also denies any regularity behind fluctuations (Mihályi 1992).

These theories and debates about investment cycles were based on investigating East European and Soviet party-state systems in the 1960s–1980s, during both their command economy and reform periods. They hardly included any analysis on investment dynamics in Asian party-state systems (Shimakura 1982; Chavance 1987; Salvini 1989). Neither scrutinized were the similarities and differences of investment dynamics in East European and Asian party-states. This fact may well be because a comparative analysis of the power structure, operation and transformation of communist systems, which provided the different investment context was also missing (Csanádi 2016).[3]

[3] This statement is generally true for studies with a spatial focus as well, which underscored the disproportionate geographical allocation of investments in East European party-states and that it is responsible for increasing spatial inequalities, especially along the urban-rural divide (e.g., Barta 2002; Beluszky 1999; Hajdú 1992; Meusburger 1997; Nemes Nagy 1987; Szelényi 1983; Vági 1982). Some exceptions, at least briefly, comparing the spatial disparities generated by Chinese and East European communist party-states are the works of Frolic (1976) and Gyuris (2014).

However, theories on East Europe, especially those of Kornai, strongly affected Western and Chinese scholars' studies on China. Their papers on the development of the party-state and on overinvestment, both occurring along with accelerated economic growth and transformation in the Chinese party-state, were published from the early 1990s onward.[4] The works of Western authors embrace various periods of Chinese economic growth (Zou 1991; Imai 1994, 1996; Huang, 1996; Oppers 1997; Brandt and Rawski 2008; Keidel et al. 2007; Ljungwall and Gao 2009; Ahuja and Nabar 2012; Chang et al. 2015). Their systemic approaches are based on a mixed use of categories mainly applied to market economies and those adopted from analyses of East European party-states.

Utilizing Kornai's theory on bureaucratic versus market coordination (1984), they confirm the existence of investment cycles not only for the command economy period (Naughton 1987) but also for the reform period since 1978 (Imai 1994, 1996; Brandt and Zhu 2000).[5] They also claim that overinvestment results from endogenous factors, i.e., the selective focus of economic policy and the specific behavior and incentives of central and local institutions, which follow or even reinforce this selectivity. The main consequences are prioritizing state-owned enterprises over privately owned ones, large enterprises over small ones, heavy industry over light industry, industry over agriculture, urban districts over rural areas, and, for the decentralized character of the Chinese party-state, local investments over central ones. The authors take a critical approach to the large share of state investment, the ongoing presence of bureaucratic bargaining mechanisms, the maintenance of poor financial accountability, and the selective allotment of bank credits (similarly to budget preferences) despite expanding market coordination. However, since these studies analyze the individual reasons for each investment cycle mainly along market and economic policy factors, they generally do not discuss why these peculiarities survive during the transformation and do not find a common systemic explanation for recurrences.

[4] We have overviewed the publications written by researchers in China with the assistance of our colleague Wanjun Wang (Nanjing University of Finance and Economics) from the 1990s to date.

[5] Brandt and Zhu (2000, 2001) find a positive correlation between GNP growth rate and inflation in transforming China, which is the opposite of the conventional pattern in market economies. They also identify a positive correlation between GNP growth rate and money creation. Thus, they argue that banks prefer to provide resources to private firms, so the central state has to rely on cheap credit and money creation in order to finance SOEs. Therefore, the actual—negative—correlation is between GNP growth rate and the share of SOEs in all investments. Brandt and Zhu, however, do not compare investment growth rate and inflation cycles, although a positive correlation between both would point to that inflation as a sign of overinvestment in transforming economies, similar to the accumulation of unfinished investments in 'classical' party-state systems.

Chinese authors working in China tend to focus on overcapacity and underutilization as consequences of investment patterns, which they consider to be permanently present. They also assume a link between these highly relevant challenges in the People's Republic of China on the one hand, and overinvestment, political cycles, the politically sensitive behavior of local governments (i.e., local protectionism and the pressure to maximize output until the political mandate ends), cheap resources, guarantees provided by local governments and the prioritization of large state enterprises. For them, in alignment with Western scholars' views, economic policy is not only the major reason for these problems but also potentially the fundamental solution to them, inasmuch as it promotes marketization, the transformation of government incentives, and a better allocation of resources.

In general, both groups of authors refer to systemic features in their papers, but they do not analyze either the system-specific reasons for the criticized phenomena or those of the recurring failure of measures that are taken to manage the problem. It remains unclear why investment fluctuations, overinvestment, pressure to increase investment, constant state intervention into the economy, the fluctuations of GDP and investment growth as well as the link between the two prevail in both the command economy and the reform periods. Likewise, although authors refer to some systemic features while analyzing investment dynamics in China, they do not clarify why prioritizing state enterprises, large enterprises, heavy industry and urban areas recurs in the intervention and investment allocation of both central and local organs of the state, including state-owned banks. Furthermore, except for the explanation of Brandt and Zhu (2000, 2001),[6] they do not analyze (1) the systemic and structural background of how resources are becoming more decentralized as investment accelerates, while they are becoming more centralized in phases of investment slowdown (Naughton 1987; Huang 1996); (2) the structural background for an increased role of local governments in overinvestment; (3) the motivation behind ongoing investment prioritization of state enterprises over non-state ones at both the national and local levels; or (4) how, in their terms, bureaucratic bargaining

[6] Brandt and Zhu (2000, 2001) describe the tension between the consequences of economic decentralization and state preferences of resource allocation. They present this tension through growth and inflation cycles. The center's imperfect control over the decentralized indicative credit plan, which impacts cheap loans to SOEs, enables local banks to divert resources from local SOEs to more profitable private ventures. This forces the central state to resort to money creation and thereby to growing inflation in order to keep financing the investments and wages of SOEs. When hyperinflation becomes a threat, the center intervenes with a kind of temporary austerity program. It shifts indicative plans from banks to a centralized administrative loan plan that simultaneously controls resource distribution and slows down inflation that allows a new shift towards indicative (decentralized) loan plans. Such centralized shifts were introduced in 1985, 1989–90, and 1993–94. After the 1994 tax reform, this method shifted to other austerity measures.

mechanisms and poor financial accountability survive in spite of improved market coordination. Additionally, the systemic background of the link between political and investment cycles is not revealed.

To fill this void, in the coming chapters we shed light on the systemic background and Chinese specificities of these issues before operationalizing the categories of overinvestment and overheating and quantitatively investigating them at the national and provincial levels. Considering the aforementioned debates and categories, we employ a comparative party-state model (Csanádi 1997, 2006, 2011, 2016) to span divergent approaches and define our own systemic considerations.

## The systemic structural and dynamic background of overinvestment in party-states

We consider the analysis of investment dynamics as a new opportunity to empirically test the system paradigm's applicability, gradually refined (Csanádi 1997, 2006, 2015, 2016; Csanádi and Lai 2003; Csanádi, Lai, and Gyuris 2009) since the 1970s.[7] This system paradigm is represented by the interactive party-state model (IPS) that describes the common elements and the connecting and operating principles of communist systems as well as their structures, their structural and operational differences and the dynamics of their transformation. The IPS model interprets as a party-state system the politically monopolized power network evolving from the institutionalized and informal dependency and interest promotion relationships between party, state, and economic decision-makers. This network, starting from the party hierarchy, stretches out and overlaps (integrates) non-party decisions through their organizational, activity and positional structures and party members as individual decision-makers (Csanádi 1997). With the help of the previously described components, the model defines the general features of party-states, thereby creating a common ground for the comparative analysis of individual communist systems. It also reveals those system-specific characteristics that result in the variegated structure, operation and transformation of party-state systems. In this approach, we interpret the Chinese party-state as a specific variant of party-state systems during

[7] This approach implies that we consider state interventions and overinvestment as the systemic specifics of communist systems and not as 'anomalies' of economic policy or other factors.

transformation. Our interpretation does not fit any of the multiple 'system paradigm' classification categories frequently discussed in mainstream literature (Csanádi 2016).[8]

Our model is also different from the causal one based on Kornai's (1992, 569–571) concepts of bureaucratic and market coordination (Kornai 1984). Since our dynamic comparative model embodies (represents) a system paradigm, the way we apply certain terms shows similarities with how the same terms are used, for example, by Kornai (2000, 2016) in his system paradigm. However, similar terms hide concepts that differ in interpreting both the principles of the structure and the dynamics of party-states.

Based on empirical studies carried out since the 1970s, we have concluded that the political rationality of economic behavior is one of the essential features of actors within the party-state power network. This behavior is characteristic to both the selectively soft distribution of resources, which repeatedly prefers actors more deeply integrated into the power network and to the incessant drive for resources through growth, accumulation of resources and integration into the power network through multiple connections. This structural behavior triggers the selective rather than the general softness (Kornai 1998) of the budget constraint for large enterprises and those deeply integrated in the power network as well as the structure-conforming selectivity of overinvestment. In consequence, politically rational economic behavior and respective processes intensify the occasional resource shortage, thereby hardening the constraints of the power network's reproduction. Moreover, the shortage accelerates the occasional loosening of cohesion and increases the intensity of state intervention aimed at restoring cohesion.

Unlike Kornai's system paradigm, we consider the power network's operation—composed of the relationship between decision-makers of the party, the state and the economy—as the basic element of party-state systems (Csanádi 1997). We interpret in this context the evolution of the communist party as the transformation of a political entity into a politically monopolized system. We explain the politically monopolized character of the power network and its integrative function over all sub-spheres of the social system (including the economy) through the dependency and interest promotion relationships between party, state, and economic decision-makers. We reveal its self-similarities in space, time and at different

[8] Examples include the developmental state, state capitalism, the socialist market economy, the emerging system, the hybrid system, variegated capitalism, the polymorphous state, fragmented authoritarianism, the centralized developmental autocracy, the instrumental developmental state, the clientele developing state, etc.

aggregation levels; the decisive role of the politically monopolized power network in the distribution of resources and in the politically rational economic behavior in both the distribution of and the drive for resources; and the politically rational selectivity in the softness of the budget constraint according to bargaining position in the network. Still, we use several important terms from Kornai (e.g., soft budget constraint, shortage, the background of actors' motivation.), but we reinterpret them in line with our model, namely, in the context of the operation of the party-state system.[9]

On the basis of our theoretical and empirical research results from the 1970s onward, we argue that overinvestment is a general feature of communist party-state systems.[10] We consider investment fluctuations an inherent feature of system dynamics that result from the system's structural characteristics and explain it through the process of the power network's reproduction and this process' periodic pulsation. The IPS model reveals the features this interpretation regards as underlying structural causes (Csanádi 1997, 2006, 2016). This model interprets the network as the intertwining of several layers of dependency and interest promotion among actors in the party, the state (non-party), and the economy. These layers are threefold. First, they include the dependency lines within the party and state hierarchy, which monopolize the political and the economic subsphere, respectively. Second, they incorporate the interlinking lines that start from the party hierarchy and reach out to overlap decisions outside the party hierarchy by embracing the structure of positions, organizations, and activities, as well as individual party members. The third integral part of the intertwined layers is the structural feedback both within and across the hierarchies that shortcuts the institutionalized lines of the decision-making process through hierarchical and/or interlinking dependency lines attached to the actors. Shortcuts allow privileged actors to integrate more deeply into the complex power network, to meet decision-makers at higher levels, look into documents, make new connections, promote interests and prepare unavoidable decisions that otherwise would never be possible in their formal position in the hierarchy.

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[9] Although the IPS model has been based on a systemic approach since its very first version in the 1970s we introduced the term 'system paradigm' only after Kornai's papers were published (Kornai 2000, 2016) to shed light on the essential differences between his approach and ours.

[10] This statement evidently does not question whether other systems, including capitalist countries in the center of the global economy, might also suffer occasionally from overinvestment and overcapacity. Yet whereas these challenges do not last there for more than a few years (especially right before and during economic crises), in communist party-state systems the same phenomena constitute steady and enduring features of the system's 'normal' operation.

In this network, individual actors simultaneously hold and are captured by such dependency lines. As holders of dependency lines, they are simultaneously able and forced to intervene into the operation of the politically monopolized network to keep and reproduce their bargaining capacity in extracting and distributing resources. As captives of such lines, they are simultaneously exposed to and interested in keeping those lines, and they adapt to expectations mediated through these lines to keep their bargaining capacity to attract resources and resist intervention. Capacity and force, exposure and interest create the actor's politically rational economic behavior, which is aimed at maintaining their bargaining position. This mechanism and motivation result in the permanent drive for intervention and application for resources, whereas it ensures the cohesion and reproduction of the party-state network.

Actors in this network are in a dual position: they have the capacity of resource extraction and allocation since they hold dependency threads, and they have the capacity of attracting resources and resisting to interventions for they are captured by such threads. These capacities, also interacting with each other, determine a given actor's bargaining position and constrain its reproduction. Actors show politically rational behavior in both positions. This fact becomes manifest in selective resource allocation on the one hand (including budgetary, bank, central and local resources), where large, state-owned enterprises with a densely woven network of political and state connections are privileged. Due to politically rational selection, the actors' reproduction constraint in budgetary terms and in reproducing the bargaining capacity inside the power network are not generally soft (Kornai 1981) but selectively so. For preferred actors, the constraint is "softer" than for others.

In the meantime, actors as captives of dependency lines also show politically rational economic behavior by responding to selection criteria, i.e., by stockpiling, driving for growth, and making new connections for deeper integration into the network. All these structural factors form the background of a constant investment pressure. Thus, adaptation to politically rational selection criteria leads to overinvestment. Due to this structural behavior the selective "softness" of the reproduction constraint and overinvestment become permanent system features. This structural motivation, which ensures the network's cohesion, occasionally results in hardening the constraints of reproduction for the whole system and in resource shortage, which loosens the network's cohesion, leads to investment fluctuations, and motivates repeated intervention for finding and mobilizing new resources to restore cohesion.

The IPS model conceives the network's power structure as self-similar in space, time, and at different aggregation levels. One can find its specific principles of connection and operation as well as its structural motivations in any communist party-state and in any period

of its functioning (from the Soviet Union in the 1930s to Hungary and China in the 1950s to China around the end of the 20th century and to contemporary North Korea), in any region of a given country, in any state enterprise, and even at the level of international integration (the COMECON) (Csanádi 2006). This fact explains the self-similarity of politically rational structural motivations, bargaining mechanisms and selection mechanisms as well as the occurrence of systemic overinvestment and temporary investment downturns when cohesion fades and the system reaches its hardening reproduction constraints in time, space, and at aggregation levels (both central and local).

Using the model, we also explain why the fluctuation frequency is unstable in time, space and at various aggregation levels. Fluctuation's existence and persistence as well as overheating's repetition are caused by general self-similar structural features of the party-state network. However, instruments of resource extraction and distribution, overheating frequency and the endurance of investment booms are determined by peculiarities of power distribution[11] in a given self-similar unit, and these peculiarities might be different and altering in time, space and at various aggregation levels (Csanádi 2006, 2011, 2016). If resource distributing and extracting capacities are centralized in the power structure (like they were in most party-states during the 1950s, in Romania until 1990, and in North Korea even contemporarily), the bargaining capacity of actors inside the network is weak (i.e., their resource attracting, extracting and distributing capacity as well as their capacity of resisting to interventions). In this case, the network's reproduction at the national level, i.e., the extraction and distribution of resources rarely meets the resource constraint, so the boom period of investment fluctuation is longer. If capacities of resource allocation and extraction, resistance, and resource attraction are relatively decentralized in the given power structure (such as in China after Mao's decentralization campaigns and the decentralizing reforms inside the network, which institutionally intensified the impact of these campaigns) (Csanádi 2006), the whole system meets resource constraints and the network loses its cohesion more frequently, so the upward periods are shorter.

Structural specifics of power distribution also define the location of more intense investment acceleration. In the case of a centralized power network, intensity grows primarily at the higher levels, while in the case of a more decentralized power structure investment acceleration and spillover are more emphasized locally. This structural property of the power

[11] Dominant structure specific mechanisms and instruments of resource extraction and distribution vary from forced resource reallocation to reforms inside and outside the network.

network prevails not only during the decentralizing reforms within the network but also during the process of system transformation, despite the network's gradual retreat from overlapped sub-spheres (absolute retreat) and the expansion of the sphere outside the network (relative retreat).

Differences in power distribution determine not only the frequency with which constraints are met, the locations at which overinvestment is the most intensive, the length of boom periods and the time-span of each fluctuation, but also the different amplitude of fluctuation. Hence, although fluctuation is endogenous, it cannot be regarded as cyclical but it is structurally dependent.

Different power structures also determine the sequence, speed and circumstances of the system's transformation, but system-specific distribution characteristics and thereby investment characteristics prevail. Moreover, in the transforming party-state, even actors' behaviors located in the sphere outside the network influence both the duration and intensity of fluctuations, as well as the characteristics of its downturn, for actors outside the network adapt to distribution priorities inside the network.

Although investment fluctuation results from inherent structural motivations, systemic overinvestment can occasionally "swing" if shocks hit the system. Therefore, we also consider exogenous impacts on fluctuation, but these impacts result in fluctuation neither on their own nor independent from systemic specificities. Instead, they might intensify the dynamics caused by structural motivations. External constraints may be either hard or soft. Combined with either hard or soft structural (pattern-conforming) internal constraints, the external constraints will have different effects on adapting state reactions. If external constraints are hard but structural ones are soft, new resources are injected into the economy and no reforms are initiated. It is similar if structural constraints become hard while external ones remain soft. In our perspective, the amplitude of overinvestment increases under such conditions because the state reacts to the shock with intensified intervention to strengthen the cohesion of the power network, which weakened due to the shock through allocating new resources (Csanádi 2015). Differences emerge if both constraints are simultaneously hard. In this case, austerity measures are applied and decentralizing reforms are initiated that might lead first to the slowdown of overinvestment, which is followed by a new investment drive due to systemic motivations. If the simultaneous presence of external and structural constraints is persistent, more drastic austerity measures (e.g., an anti-corruption campaign) might be implemented to slowdown overinvestment. It is again pattern dependent whether overinvestment is accompanied by the accumulation of unfinished investments in centralized party-states or by inflation in decentralized and

economically transforming ones. Systemic motivation for overinvestment, however, will be present independent from these factors.

In line with the considerations mentioned previously we explain repeated overinvestment as resulting from the dynamics of the power network and the structural motivation of actors within the network (the political rationality of economic behavior), which are general features of these systems (Csanádi 1997, 2006, 2016). Fluctuations in time, space and at different aggregation levels are the self-similar structural characteristics of this power network. Differences in the frequency, length, and intensity of fluctuations are the results of structural differences in time, space and at different aggregation levels. The amplitude increases temporarily due to state interventions that react to external shocks while internal reproduction constraints are soft. The increase is also fueled by the private sphere, which takes advantage from the increasing input requirements of actors prioritized by the party-state, meaning that the private sphere indirectly adapts to politically rational distribution priorities.

On the basis of these considerations we seek answers to a complex set of questions in the current paper, namely, how investment dynamics are changing in a given power distribution and a given period of the system transformation process in case of an external shock and a central intervention reacting to this shock. How do selective resource distribution and actors with different ownership backgrounds influence the characteristics of investment dynamics and their spatial focus, and what is the effect of their interaction on system dynamics? We test our, so far theoretical, arguments empirically on the decentralized power structure of the Chinese party-state in a selected period of its transformation, starting from the 2008 global crisis.

## Measuring the extent of fluctuation in practice

We scrutinize the functioning of the transforming power network in China and investment fluctuation in a period when the Chinese economy witnessed three external shocks: the 1997 Asian crisis, the WTO accession, and the global crisis emerging in 2008. We focus on the shock following the global crisis, since we have investigated this one in detail. Our calculations are mainly based on national- and provincial-level statistics published in the China Statistical Yearbooks of the National Bureau of Statistics of China (NBSC).

The extent of overinvestment is defined as a relative category; thus, it is compared to the dynamics of another indicator. Theoretically, (1) *overcapacity* is capacity above actual utilization, which is the result of overinvestment, (2) *overproduction* is production exceeding actual sales. Overcapacity can also be defined as (3) stocks increasing faster than sales. These

measures would also be meaningful in theory, but data on enterprises' full capacity and stock are not available for the Chinese economy. The *extent* of overinvestment can be quantified by a dynamic indicator, e.g., investment growth rate relative to GDP growth, both at constant price.[12] We have chosen the latter metric. In the dynamics of the two indicators, one exceeds the other occasionally. *Overinvestment* occurs when the investment growth rate is higher than GDP growth, while economic *overheating*[13] means the amplitude of overinvestment. If investment growth is slower than GDP growth, investment is relatively slowed and the economy is cooling. In this case, the difference of both indicators reveals the cooling grade. Investment dynamics and, consequently, overheating or cooling are also calculated in this paper considering investment by enterprises both inside and outside the network. The relative share of enterprises outside the network increases as the transformation of the system (the absolute and relative retreat of the network) proceeds.

Quantifying the dynamics of the network is another goal of our paper. Enterprises directly linked to threads of the network through their positions, activities and institutional settings are considered enterprises of the network. NBSC distinguishes 11 enterprise ownership types. From these we regard state-owned, collectively owned, share-holding enterprises and cooperatives as constitutive parts of the network; whereas other enterprises are treated as being outside the network. In several NBSC datasheets, some of the eleven categories are not presented separately, including ownership types strongly connected to the party-state network. However, data for state-owned enterprises (SOEs) are always provided separately, and the vast majority of investment inside the network is attributed to these enterprises (Figure 1). Therefore, we focus on investment by SOEs, which we consider a robust indicator of the existence of the network. Changes in their statistics can thus refer to the dynamics of the network, and its temporary expansion and retreat due to the activity of actors in the network. Figure 1 explicitly demonstrates the declining share of state-owned and state-controlled enterprises as well as other enterprises directly dependent on the network; moreover, it indirectly mirrors economic transformation, including the gradual retreat of the network

[12] See, for example, Borio's (2012) theory and empirical calculations on financial cycles comparing the extent of loan fluctuation to the long-term average.

[13] Although the term 'overheating' is widely used in both common and professional texts, there is no generally accepted methodology to quantify it. We use the previously presented 'self-constructed' indicator, based on constant prices, in our study.

through privatization, enterprise close-down and bankruptcy, and through competitive activities, organizations and the labor force fleeing from (and emptying) the network.

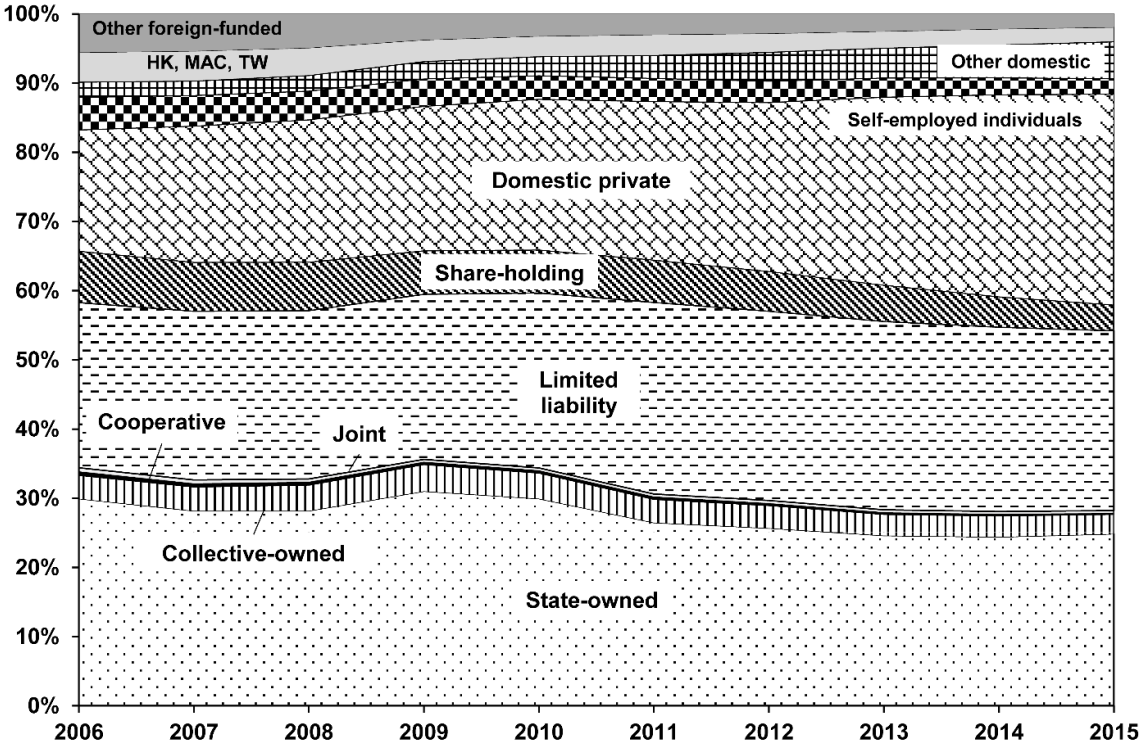



*Figure 1. Fixed asset investment by enterprise ownership types (2006–2015).*
Source: Own calculation based on data from volumes of the China Statistical Yearbook

The other important segment of the economy embraces enterprises that institutionally do not or hardly depend on the influence of the network. We call this segment the sphere outside the network, which includes domestic private enterprises, limited liability enterprises, foreign enterprises (where official statistics distinguish between enterprises with Hong Kong, Macao and Taiwan funds on the one hand, and enterprises with other foreign funds on the other hand), self-employed individuals, and other non-state enterprises with moderate economic importance. In our analysis the number of enterprises inside and outside the network in comparison to each other and differences in their investment dynamics indicate either the shrinking or the expansion of the network and thus shifting dynamics in the economic subsphere of the system.

**Analytical results**

In the first round, our objective was to measure overinvestment and economic overheating. Therefore, we compared the annual growth rates of fixed asset investment and GDP from 1997

to 2015, a period when the Chinese economy was exposed to three external "shocks": the Asian crisis of 1997–1999, the WTO accession in 2002, and the global crisis beginning in 2008. All these events induced massive state intervention (Wong 2011a, 2011b; Yuan 2015). Central as well as local budgetary expenditures and credit lending considerably increased in the selected period. Remarkable measures aimed at stimulating investment were taken, which resulted in the influx of a great deal of foreign capital and an extensive utilization of monetary reserves. In consequence, investment showed sudden growths in 1998, 2003 and 2009, although GDP growth did not accelerate considerably in the same years but slowed in 1998 and 2009 (Figure 2).[14]

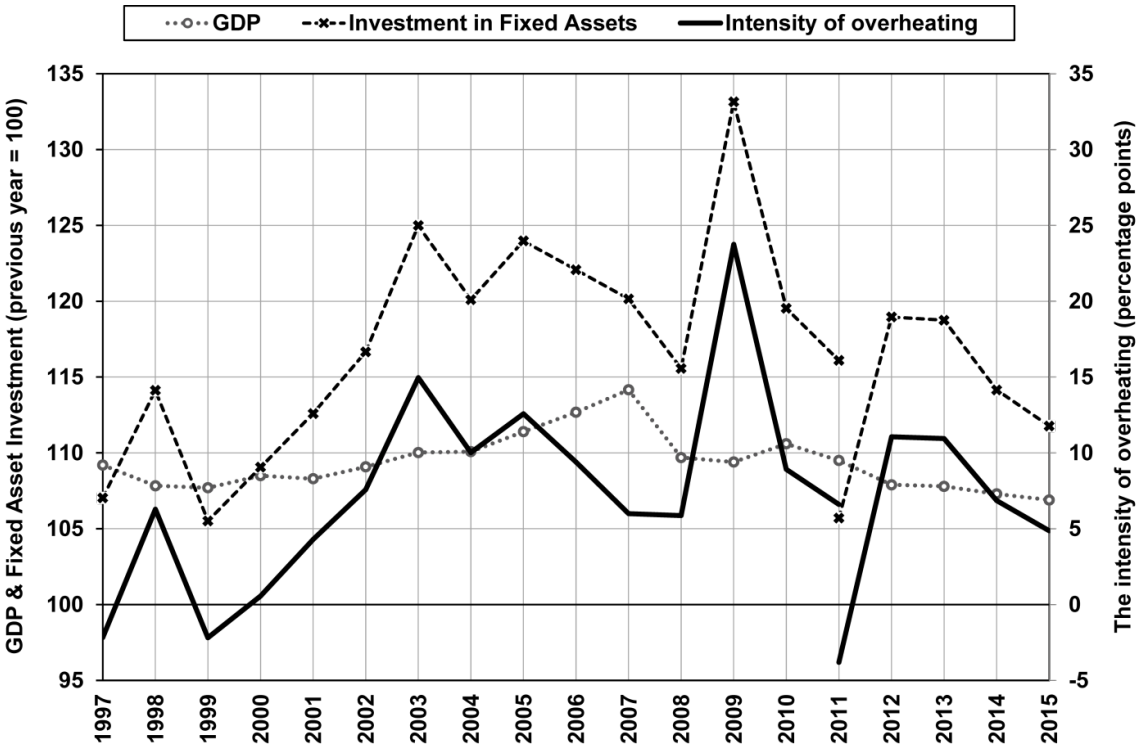



*Figure 2. Annual change of GDP and fixed asset investment in China at constant prices, and the intensity of economic overheating (calculated as subtracting GDP growth rate from investment growth rate) in percentage points (1997–2015).*

Source: Own calculation based on data from the China Statistical Yearbook 2006 and 2016.

Note: The "rupture" in 2011 results from changing method of collecting investment data. Until

[14] NBSC introduced a new methodology of collecting investment data in 2011. Until then, every investment above 500,000 yuan was considered; whereas in 2011 the limit shifted to 5 million yuan. Statistics for 2010 were published using both methods, so adopting the new limit resulted in excluding less than one-tenth, 9.5%, of the investments considered by the old method. This fact means investment data before and after the shift in methodology can still be roughly compared to each other.

2011 the curve shows values according to the old method, whereas since 2011 according to the new one.

Figure 2 shows the fixed asset investment and GDP growth rates and the difference among those; thus, the overinvestment level was nearly constantly positive between 1997 and 2015. In other words, overinvestment is a permanent feature of the transforming Chinese party-state system. The only definite exceptions were 1997 and 1999. (There was no economic overheating in 2011, either, according to the old method of gathering investment data. However, according to the new method, there was.) These results are in line with the findings of the IPS model, which claim that overinvestment is a structural and therefore permanent characteristic of the system.

Figure 2 also confirms that economic overheating increases during shocks, since systemic politically rational economic behavior intensifies in these periods in resource allocation attraction. This behavior strengthens the drive for growth, accelerates investment growth, and increases the amplitude of economic overheating (see Csanádi 1997, 2006, 2015). We regard this as a major feature distinguishing communist party-states from their capitalistic counterparts because similar structural features and motivational patterns cannot be confirmed in the longer term on the basis of investment and GDP data in the European Union, in the Euro area, in the most developed Western European member states of the EU, or in the USA (Figure 3). In the 20-year period from 1997 to 2016, the Euro area had overheating for only 13 years, the European Union for 12 years, and the USA for only 7 years, with the intensity of overheating always falling short of 4 percentage points. However, in China, the persistence of overheating can be detected for 17–18 years with the only exception of 1997, 1999 (and, depending on methodology, 2011), and its intensity was usually above 5 percentage points; in 6 years, it was above 10; and in 2009, it was above 20.

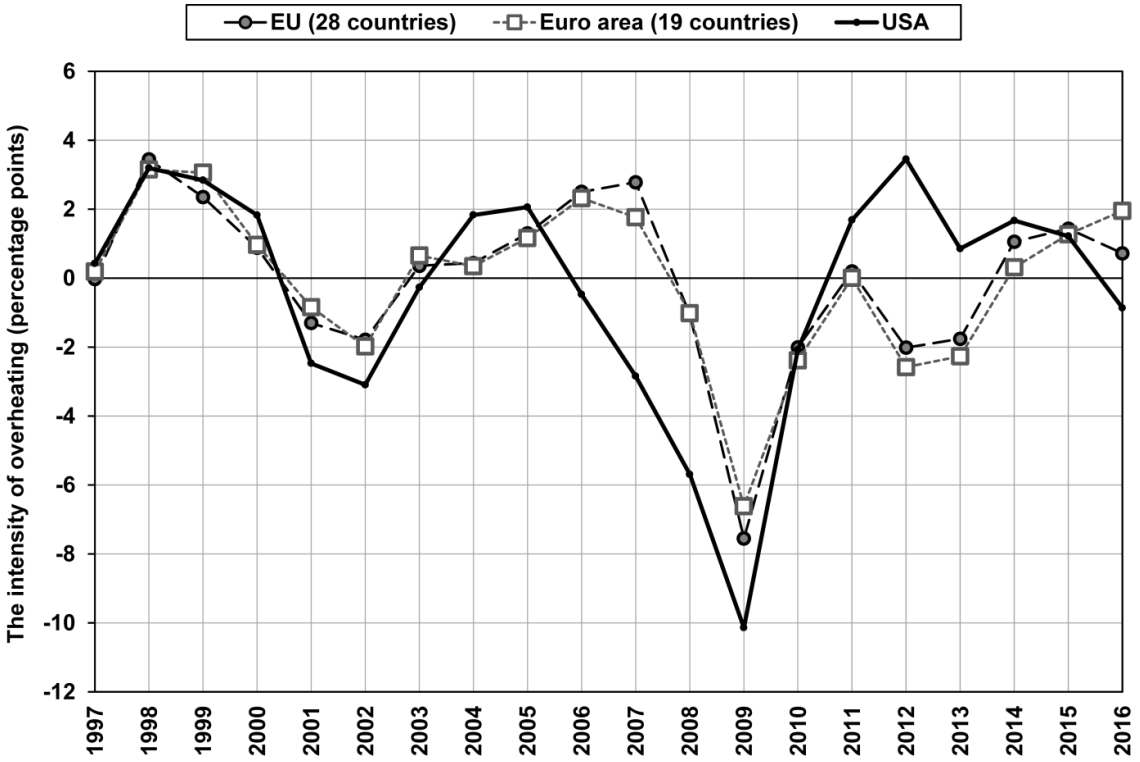



*Figure 3. The intensity of economic overheating in the European Union, the Euro area, and the United States of America (calculated as subtracting GDP growth rate from investment growth rate, at constant prices) in percentage points (1997–2016).*

Source: Own calculation based on data from World Bank Open Data and the US Department of Commerce, Bureau of Economic Analysis.

Note: "European Union" and "Euro area" include the data of all countries that were members as of 2016.

The intensity of the presented overheating processes in party-state systems begins to decline as reproduction constraints of the systems are getting harder, and shortage emerges; thus, the quantity of resources flowing into the system decreases. As we stressed in the theoretical chapters, the distribution of power in the party-state network determines not only how often the system experiences overheating and meets resource constraints but also at which aggregation level or scale these swings become most accentuated. We hypothesize that when the power structure is more decentralized, swings at the local level are larger. To confirm or refute this suggestion, we analyzed the volume and temporal dynamics of economic overheating from 2007, the last year before the global crisis, to 2015 at the provincial level. Our results, presented in the map series of Figure 3, reveal that economic overheating is an inherent feature of not only the Chinese economy in general but also the vast majority of the Chinese provinces. In years of economic overheating at the national level, 23 to 29 (but usually 27 to 29) of 30

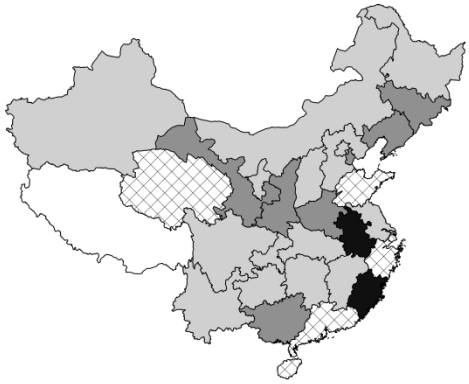
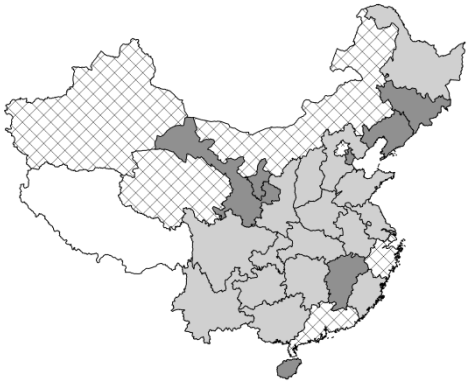
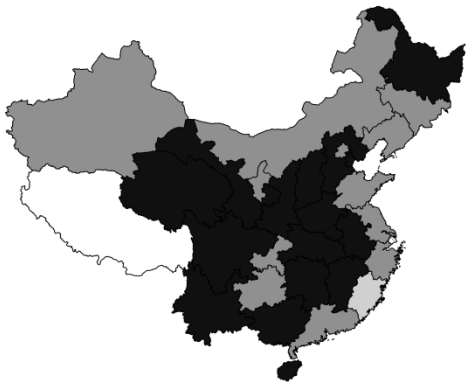
provinces showed economic overheating.[15] This result is in accordance with our theoretical claims and means that economic overheating is a universal (self-similar) feature of the dynamics of the Chinese party-state system, which prevails at every aggregation level.

However, the spatial pattern of economic overheating changes over time, reflecting the effect of state intervention during the crisis as well as its spatial priorities. While overheating did not have a remarkable geographical pattern before the crisis, it definitely did during the 2009 stimulus package of 4,000 billion RMB. The main beneficiaries of resource allocation were the central and western provinces, which consequentially witnessed largest level of overheating.[16] Overheating was relatively moderate in coastal provinces, which had been the main engines of national economic growth before the crisis and the main contributors to national export. As the stimulus package gradually ran out by 2010, the remarkable spatial pattern of economic overheating diminished again. In fact, not only geographical concentration of the overheating, but the spatially uneven pace of investment slowdown also mirrored the priorities of resource allocation, since it was slower in preferred provinces. The next national overheating wave in 2012–2013 became more accentuated again in the western and central provinces. Moreover, its gradual decline differed in speed in various regions: it was faster in the eastern region, and slower in other parts of the country, especially in the western and northwestern provinces where strong mining industries were prioritized by state investment. Notably, while the economic overheating level decreased to below 10 percentage points in almost all eastern provinces by 2013 (with the only exception being Fujian), the same situation emerged in many inner provinces only by 2014, and in the western-northwestern district with a strong mining industry-based profile (including Xinjiang, Qinghai, Gansu, Ningxia and Inner Mongolia) only by 2015. The spatial and temporal peculiarities of economic overheating also

[15] China Statistical Yearbooks of the NBSC do not provide annual price index data for Tibetan investment. Hence, calculating the real growth rate of investments is impossible, as is the difference between investment and GDP real growth rates.

[16] Preference was given to the central and western provinces, mainly in infrastructure development, some branches of manufacturing, and large state-owned enterprises. The regional priorities of the stimulus package and the resulting overheating intensified migratory redirection away from the coastal provinces, although the majority of internal migrants continued working in the eastern region. As another important new phenomenon, migrants in all three regions increasingly opted to stay in the province where they had their *hukou* instead of migrating to another province. This spatial shift in migrant flows shortened the migration routes both regionally and within provinces, reducing interprovincial migration in general and eastward migration in particular. The regional and sectoral shift in investment priorities and the inclination for long-term migration toward the central and western regions (also resulting in more intra-provincial and less interprovincial moves) and the construction sector contributed to a structural labor shortage at specific education levels and age groups as well as in certain provinces. This, in turn, led to a rapid wage increase and a narrowing regional income gap among migrants (Csanádi, Nie and Li 2015).

suggest our theory-based claim that the overinvestment and economic overheating level varies according to investment preferences, and this selectivity occurs in slowdown phases as well.

| | |
|---|---|
| **2007** | **2008** |
|  |  |
| **2009** | **2010** |
|  |  |
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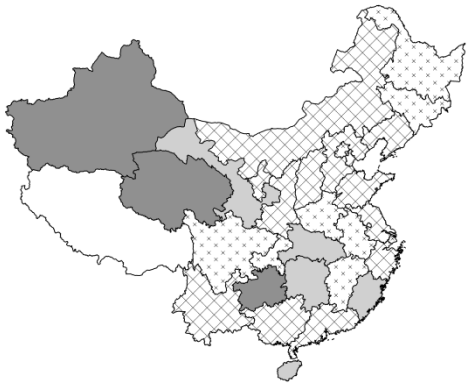
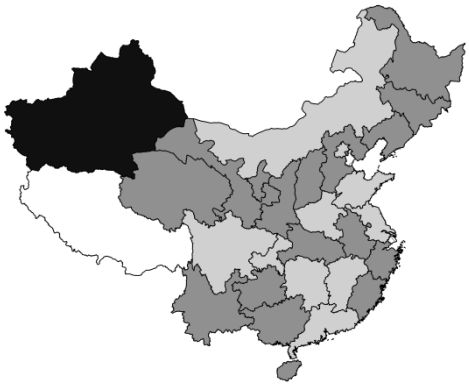
|  |  |
| **2013** | **2014** |

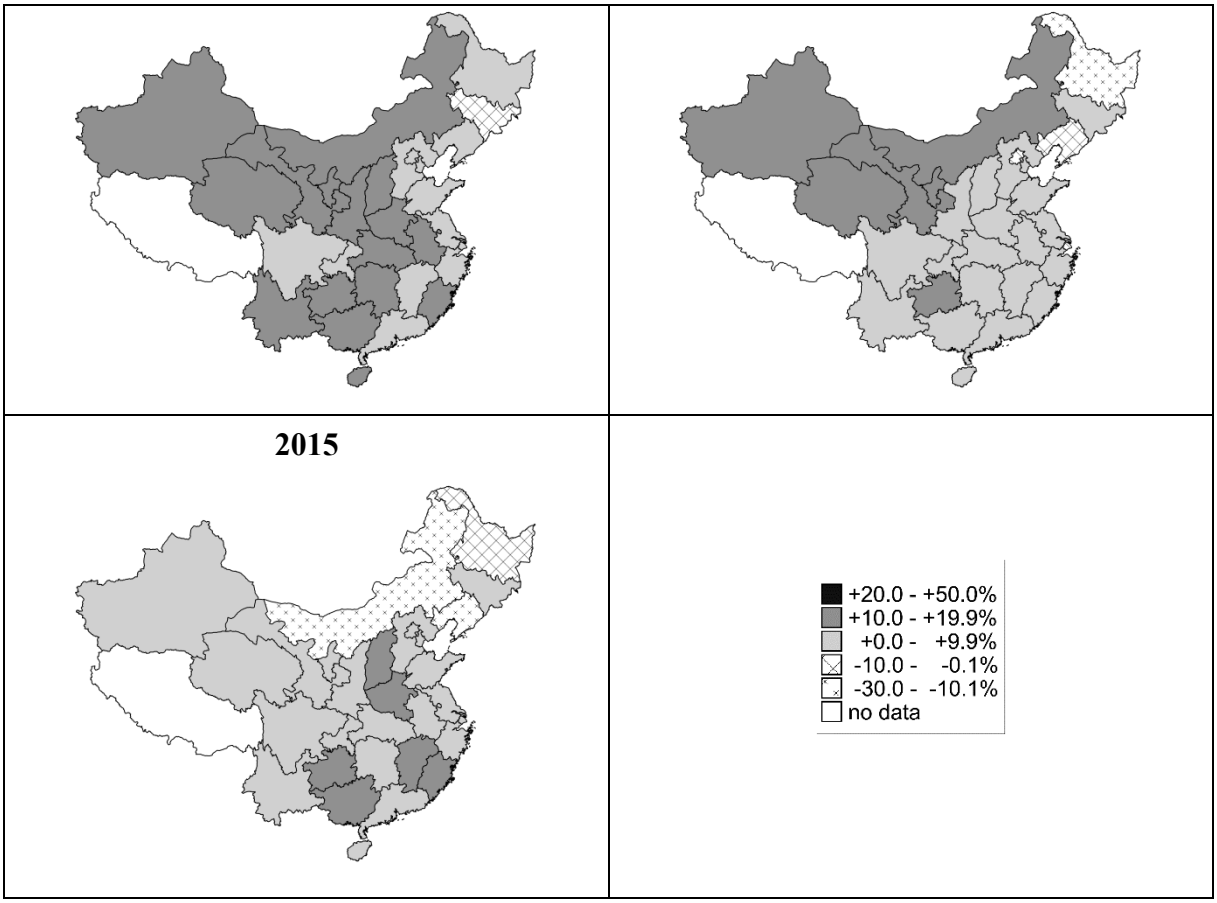



*Figure 4. The difference of fixed asset investment and GDP growth rates on annual basis, at constant prices, in percentage point (2007–2015).*

Source: Own calculation based on data from volumes of the China Statistical Yearbook

We assume that this phenomenon results from various factors. First, the input demand of provinces and enterprise types preferred by state investment (mainly western and central provinces and enterprises belonging to the party-state network) remained high even during the deceleration of state investment, and non-state enterprises reacted to this fact with some delay and carried out additional investments. Therefore, non-state investments ultimately counteract overheating decline, and in times of increasing state investment they intensify overheating and increase its amplitude, especially in provinces and enterprises preferred by state investment.[17]

[17] Liu and Spiegel (2017) underpin this hypothesis quantitatively while proving that increases in the cash reserve ratio and consequently narrowing on-budget credits to state enterprises lead to increasing off-budget, shadow banking types of financing to private enterprises.

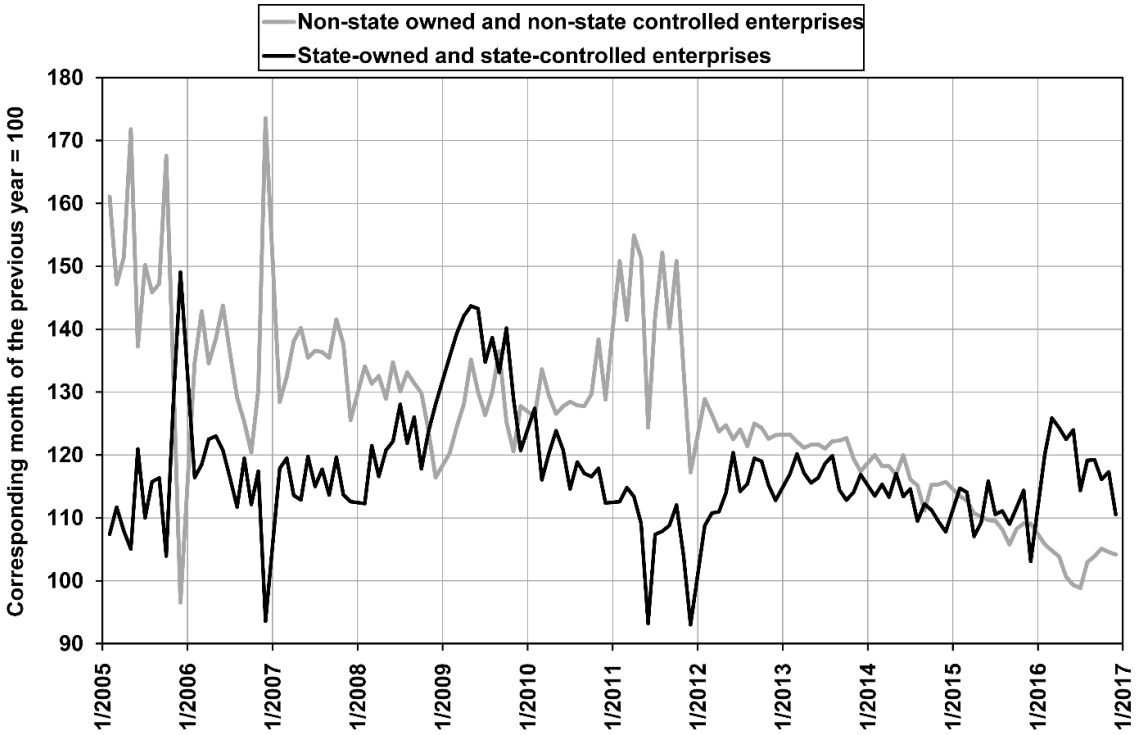



*Figure 5. Monthly investment dynamics for state-owned and state-controlled, and other enterprises. Monthly values are compared to corresponding month of the previous year as 100 (January 2005–December 2016).*

Source: Own calculation based on data from volumes of the China Statistical Yearbook

Likewise, the slowdown of investment dynamics by 2011 was mainly due to the sphere inside the network, in which overinvestment dropped to a minimum and even ceased to exist for a few months; whereas investment by enterprises outside the network was booming. Increased overheating at the national level in 2012 and 2013 hid a new increase in investment growth rates by enterprises outside the network, but the slowdown during the next years was witnessed by enterprises both inside and outside the network. An initially stronger decline of investment growth outside the network might indicate that enterprises not preferred by the interventions reacted faster to "cooling down". (Investment by enterprises inside the network remarkably boomed again in 2016, while investment by enterprises outside the network continued to decrease slowly but steadily. This phenomenon resulted from a new economic stimulus by the national government, financed from budgetary deficits and foreign credit (Tsugami 2017; yet the detailed analysis of this phenomenon will become possible only after the 2016 statistical datasets for economic branches and provinces are released.)

The previously described trends can also be interpreted from the perspective of party-state transformation dynamics. If we regard the tendencies in Figure 5 as the dynamics of the

transforming network, they show that transformation is a long-term tendency, but not a unilinear process, in which the network is gradually retreating, while the field outside the network is expanding. Instead, there are temporary setbacks and advances during the process.

Figure 5 also reveals that the type of transformation dynamics may vary. We may witness absolute retreat, when the growth rate of state investment slows, while that of investment outside the network increases (2007–2009 and 2011–2012). In other years, relative retreat occurs, meaning that the speed of growth outside the network is higher than inside (e.g., 2012–2014). The network can also expand when the investment rate in the state-owned domain is higher than outside the network (2009–2010), and this expansion might be absolute when the investment rate in the state-owned domain increases; whereas in the private domain it slows (e.g., in 2016).

Macro-level investment fluctuations hide the behaviors of different enterprise ownership types. We scrutinized this phenomenon through Pearson product-moment correlation analysis for per capita GDP versus per capita investment by various enterprise ownership types, continuing the studies of Gyuris (2015) (Figure 6). Our goal was to reveal the extent to which various enterprise ownership types maintained the dominant trend until the global crisis, namely, that state investment was disproportionately focused in, and other investments were tendentiously channeled to, the most developed coastline provinces (Meng 2003; Wu 2017). We paid special attention to state-owned, limited liability and domestic private enterprises, which, as Figure 1 shows, provide the vast majority of all fixed asset investments (more than 70% in the mid-2000s and more than 80% in 2015).

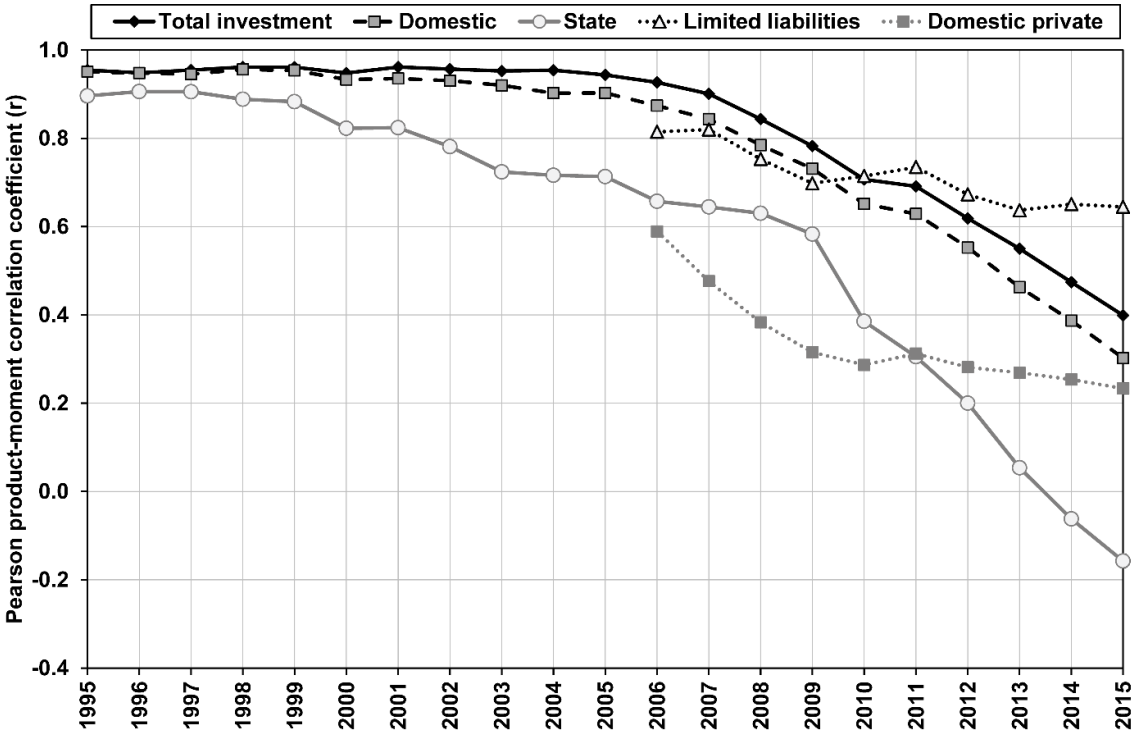



*Figure 6. Pearson product-moment correlation coefficient for per capita GDP versus per capita investment by various enterprise ownership types based on province-level datasets (1995–2015).*

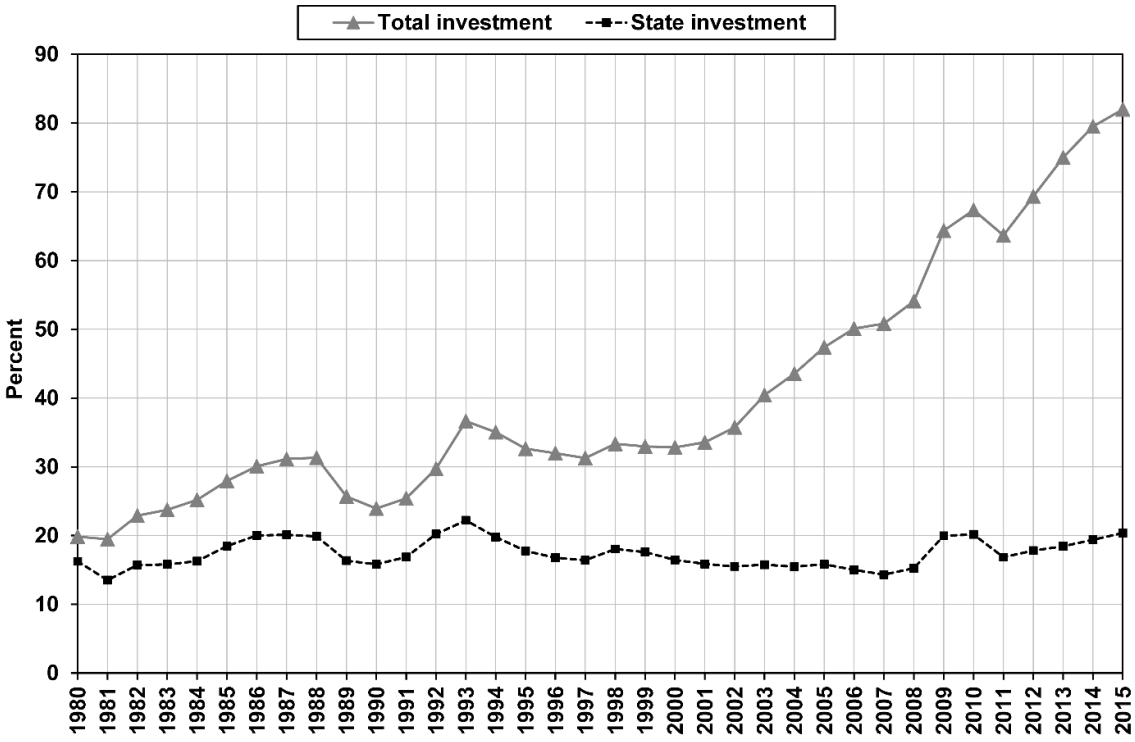
Source: Own calculation based on data from volumes of the China Statistical Yearbook

Our results show that every important enterprise ownership type concentrated its investment in more developed provinces until the mid-2000s. State enterprises were no exception. Although their investments were not so radically channeled toward developed provinces from the turn of the millennium onward, when state projects were launched to accelerate economic growth in western provinces (Goodman 2004; Jin and Qian 2003), a significant shift toward a less unequal investment distribution among the provinces began only after 2009.[18] However, since the introduction of the stimulus package and due to its regional preferences, state enterprises increasingly and tendentiously steered their investments toward less developed regions, and since 2014 they have preferred provinces with GDP per capita

[18] The only exception were domestic private enterprises, which decreasingly concentrated their investments in the most developed provinces as early as before the global crisis, mainly due to developing traffic and telecommunication infrastructure in inland regions and improving accessibility of some landlocked provinces, especially in China's central region. Yet their investments continued to prioritize more developed provinces over less developed ones.

below the national average to more developed ones with above-average values.[19] Meanwhile, domestic private enterprises also reacted to regional priorities and moved slightly toward less extremely preferring more developed provinces after 2006. Limited liability enterprises did the same after 2007, but their investments are still rather focused on developed provinces (especially in the case of limited liabilities).

These findings underpin that transformation is not a one-way process in the short term, nor does it have the same pace in different enterprise ownership types. From the perspective of the party-state network, it hides phases of absolute and relative retreat following each other, and sometimes even the coexistence of both. These peculiarities of the Chinese transformation result from the network's internal selection mechanisms, the general dynamics of investment swings and waves of economic overheating, and the different economic behavior of various enterprise ownership types. Still, the network usually witnesses relative retreat in terms of investment compared to the growth rate of all investments, even when it temporarily expands in absolute terms, for investments of the private sphere are expanding even faster (Figure 7).

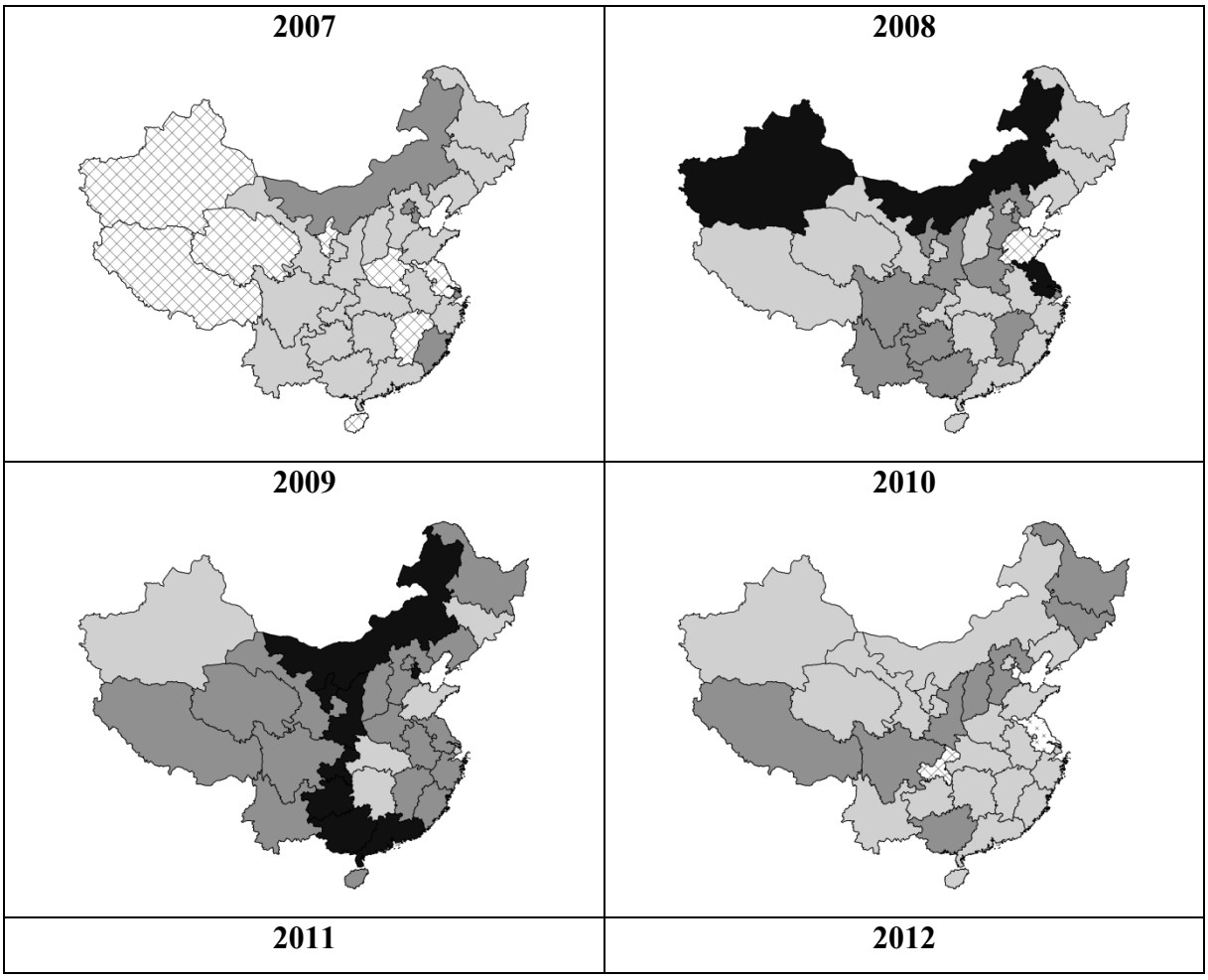



[19] From this strategy, the Chinese leadership expects increasing domestic purchase power, which should counterbalance declining international demand for Chinese products and the decreasing regional inequalities with their accompanying social and political tensions.

*Figure 7. Total and state investment in percent of the GDP (including ongoing investment projects that began in previous years) (1980–2015).*

Source: Own calculation based on data from volumes of the China Statistical Yearbook

Specific features of the self-similar functioning of the party-state network do not change during the tendentious retreat of the network. The same occasional fluctuation as well as the spatial and ownership type preferences of the stimulus package can be seen during the transformation at the provincial level as well (Figure 8). The gradual retreat of state enterprises is a general trend here, too, and provincial-level trends are closely related to national ones. When the share of state investment decreased at the national level (especially in 2007 and 2010–11), 23–27 of the 31 provinces showed a similar trend. Similarly, when the share of state investment increased in the national economy (in 2009 and to some extent in 2015), 22–25 provinces witnessed the same tendency, with the most robust growth in inland regions strongly preferred by state investment.



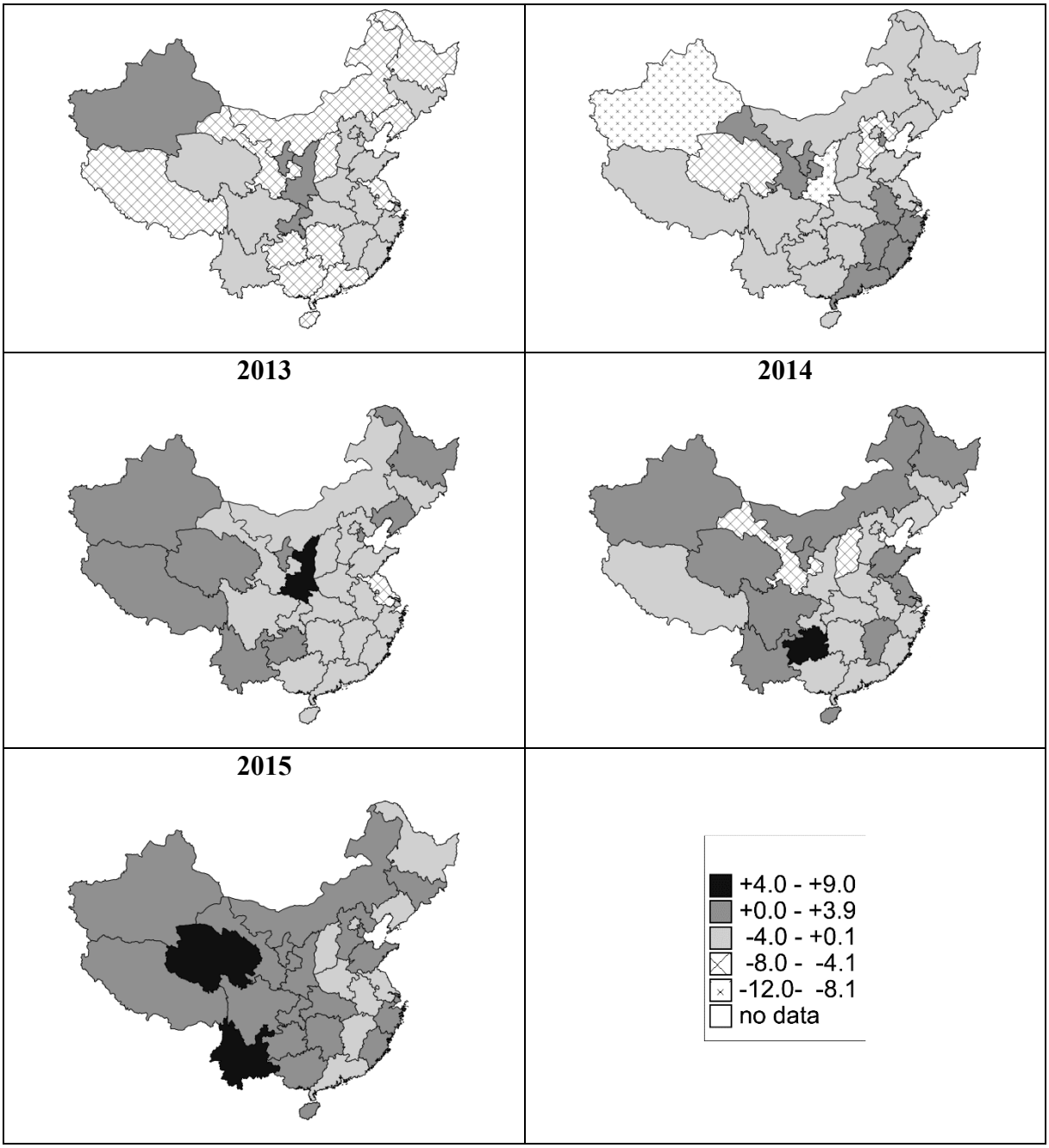



*Figure 8. Annual change of the share of state enterprises from all fixed asset investment, compared to the previous year, in percentage point (2007–2015).*

Source: Own calculation based on data from volumes of the China Statistical Yearbook

Our results so far indicate that overheating's amplitude increased by 2009 (Figure 2), its expansion embraced most of the provinces (Figure 3), and it reached particularly high levels in provinces preferred by the national economic policy (Figures 4 and 8). Investments of the party-state network increased faster during this short period than those of enterprises outside the network (Figures 1 and 5). In 2010, the network continued to increase only in central provinces, where the decline of overinvestment was slower because these provinces were preferred by the

2009 stimulus package and were dominated by enterprise ownership types that were also prioritized during state intervention. After investment was slowed centrally in 2010, the network was further expanding only in one central and three western provinces in 2011; whereas it expanded again in the eastern provinces in 2012 and in western ones in 2013. This timeline shows that state investment preferences hindered the retreat of the network.

Investment by source of funding also mirrors the trend of the retreat of the network. The share of investments from self-raised funds constantly increased between 2004 and 2015, significantly outpacing investments from domestic loans and the state budget because the sphere outside the network continued to expand and the network both absolutely and relatively retreated (Figure 9).

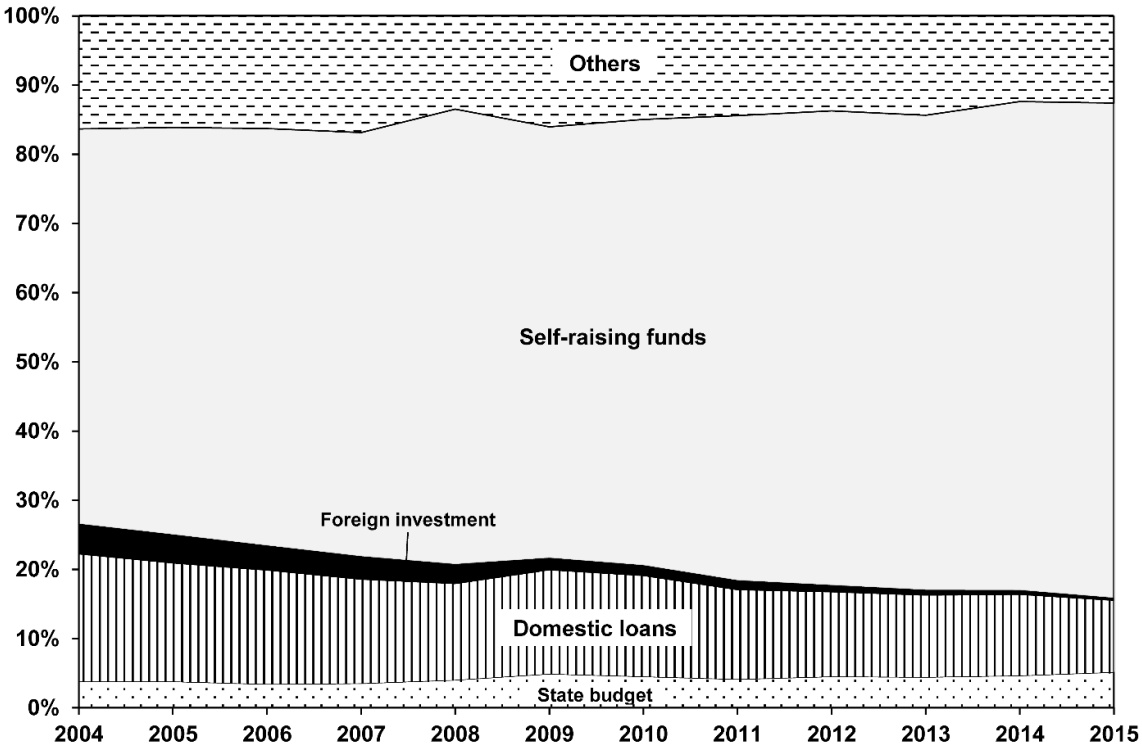



*Figure 9. Fixed asset investment in China by source of funding (2004–2015).*
Source: Own calculation based on data from volumes of the China Statistical Yearbook

During the constant absolute and relative retreat of the network at the national level in terms of funding sources, the decentralized power structure strengthened because of decentralizing reforms and the expansion of the non-network sphere at the local scale. This fact is underpinned by the central and local governments' investment growth rates, with the increasing share of the sub-national level. As Figure 10 indicates, despite the tax reform in 1994 aimed at centralizing resources from local governments (Csanádi and Lai 2003), the share of

investment by local governments and the pace of its growth has continuously increased since the turn of the millennium.

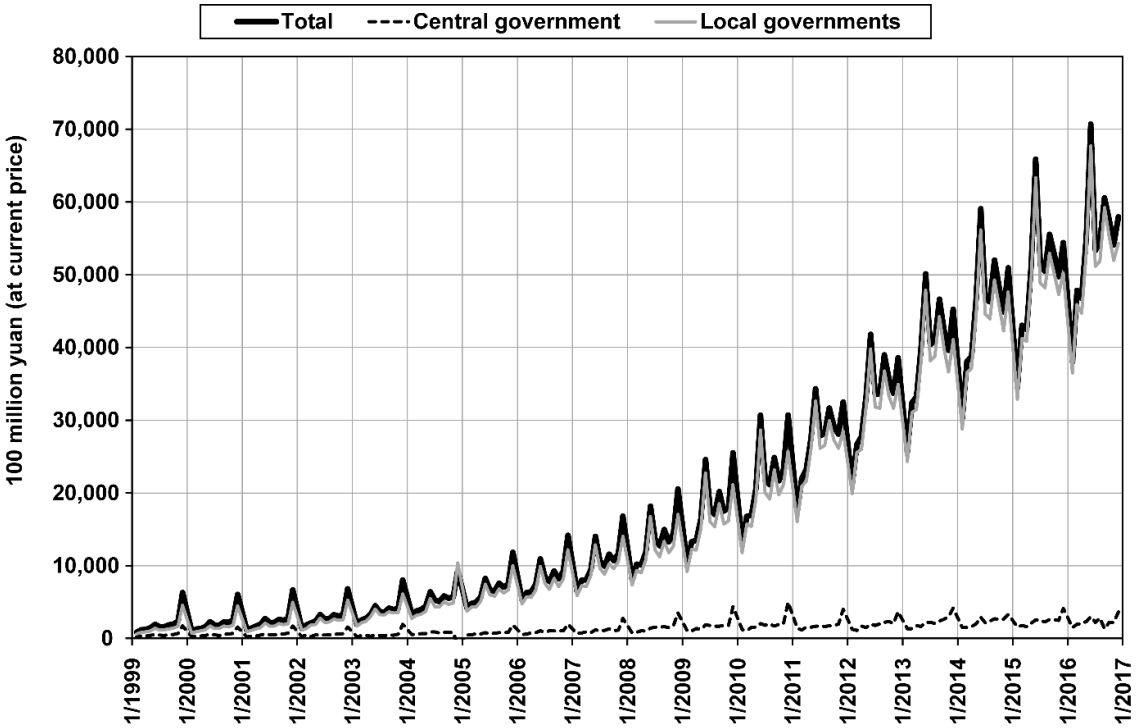



*Figure 10. Fixed asset investment by the central and local governments in China on monthly basis (in 100 million yuan, at current prices) (January 1999–December 2016).*

Source: Own calculation based on data from the National Bureau of Statistics of China Statistical Database (online)

Figure 11 also reveals that, unlike in 2004, when economic overheating was the result of state overinvestment, between 2010 and 2012, the central state tried to compensate for overheating by slowing the growth rate of central investments and introducing a more rigorous control of credit lending by banks and various regulations, and increasing the minimum capital requirement (Wong 2011b; Csanádi 2015). However, for the decentralized power structure of the party-state network, these measures affected only central investments (as is especially striking on the figures for 2011 and 2012), resulting in central resource allocation weakening compared to its counterpart at the local scale. Remarkably, 2011 and 2012 were also the years when investments within the network suddenly slowed, as Figure 7 revealed. After checking Figure 11 as well, it appears that this slowdown was due to the deceleration of central investments, which could well be one of the reasons why local governments relied on the investment boom of the private sphere rather than promoting investments inside the network.

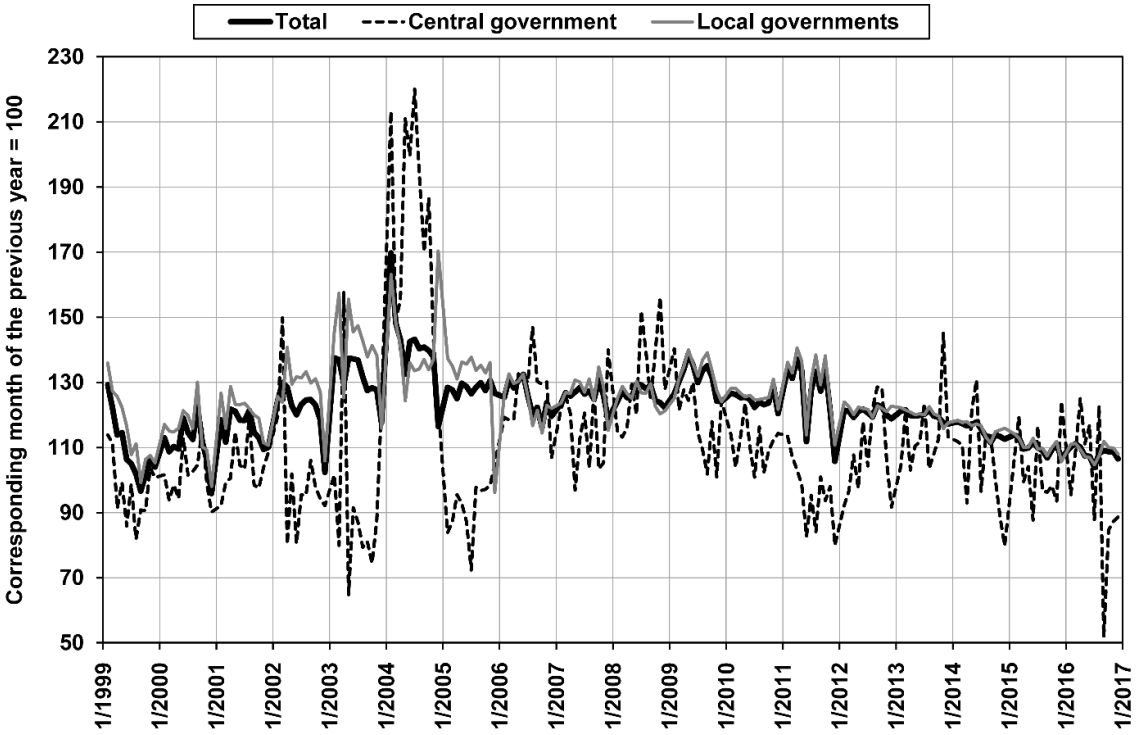



*Figure 11. Fixed asset investment by the central government and by local governments as well as the sum of both in China, on monthly basis, compared to corresponding month of the previous year as 100 units (January 1999–December 2016).*

Source: Own calculation based on data from the National Bureau of Statistics of China Statistical Database (online)

However, provincial-level overheating of the economy (Figure 4) and resulting investment expansions by the party-state network in sum prove to be temporary in the long run because the power network gradually retreats at the provincial level as well, in terms of investment during increased decentralization (Figure 8). Because power structures are decentralized, this retreat is slower in the case of investments by local governments than those by the central government (Figure 11) and is uneven in space.

## Conclusion

We scrutinized investment dynamics and economic overheating in the transforming Chinese party-state system on the basis of a comparative party-state model. Our conclusions regarding the Chinese system may be divided into two parts. The one refers to general characteristics of party-state systems, including former communist party-states in East Europe, whereas the other describes the Chinese specifics, reflecting the decentralized feature of the Chinese power

structure, which leads to economic transformation first as opposed to the European counterparts of the Chinese party-state, where economic transformation did not precede the political.

Concerning general characteristics, we underscored that overinvestment and the resulting economic overheating are caused by the party-state power network, which evolves from the relationship between decision-makers in the party, the state and the economy and by the structural motivations and behaviors of the actors resulting from the dynamics of the network. Therefore, overinvestment and overheating are permanent features of the party-states. These characteristics are systemic and inherent to the party-state network, so they prevail independently from the network's absolute and relative retreat in the Chinese party-state. Since the properties of the system are self-similar in time, space and at different aggregation levels, we have revealed these general features in the Chinese party-state and in its different aggregation levels in any time period. Based on the Chinese data we found that these peculiarities intensify during external shocks (e.g. the global crisis), when the amplitude of overheating temporarily increases due to stronger state intervention to adapt the party-state network to the impact. Owing to the self-similarity, the same phenomenon occurs at the local level as well.

Our results also demonstrate the Chinese specifics, regarding both the decentralized power structure and the transformation dynamics resulting from it. We have revealed that such swings are stronger at the provincial level than at the national one due to the decentralized power network in China, and they are most accentuated in provinces preferred by state investments. Our results revealed that the dynamics of increasing and decreasing overheating as well as the expansion and retreat of the party-state network are connected. When overheating increases, the network temporarily expands at both the national and provincial levels, mostly in provinces preferred by state investment. Furthermore, the sphere outside the network adapts itself in transforming the Chinese economy to the preferences of the network, both spatially and in terms of enterprise ownership types, which further intensifies overheating and increases it to an even higher level.

As soon as overheating declines, the network retreats in absolute and/or relative terms at both the national and provincial levels. However, this decline is uneven. Because power distribution is decentralized, the decline is slower in the case of investments by local governments than central investments. Central investment reduction barely affects local investments, the indebtedness of local governments and internal motivations of the self-similar power structure. In addition, overheating's slowdown and the retreat of the network are even slower in provinces that are preferred by central government investments.

Likewise, different enterprise ownership types take different trajectories. During transformation, enterprises belonging to the network and those outside of it behave differently during overheating and cooling down periods. In overheating periods, even influential domestic enterprises outside the network tend to allocate more investment in provinces preferred by the state, but this move is far less accentuated than for enterprises inside the network. As soon as either the overheating level begins to decline, or investment distribution becomes less polarized along certain central preferences, enterprises outside the network return to their former investment spatial preferences (favoring more developed provinces mainly); whereas enterprises of the network hardly, if ever, do the same. Finally, in spite of short-term pulsations in the trend caused by central measures to compensate for the global crisis, the network in the long run retreats in absolute and relative terms; thus, economic transformation occurs at both the national and provincial levels.

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