AUTHORITY, INCENTIVES AND PERFORMANCE: THEORY AND EVIDENCE FROM A CHINESE NEWSPAPER

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Abstract

This paper examines the incentive theory of authority using personnel data from about 200 journalists in a Chinese newspaper. Theory suggests that restricting workers' authority can alleviate the multi-tasking problem, but may depress their initiative. Relying on an unexpected organizational reform from delegating to centralizing editorial decision rights in some divisions of the newspaper, I find two main results: 1) centralizing authority improves the reporters' performance of their journalistic task, in terms of the newspaper's internal assessment and the external measures of news content, while reducing their activities for private gain; 2) centralizing authority decreases the number of articles originated by division editors, a measure of their initiative. Consistent with the theory, these findings shed light on the central trade-off between better control over opportunistic behavior and depressing initiative in a multi-tasking setting and in a multi-layer hierarchy.

Key Words: Authority, Incentives, Opportunistic Behavior, Multi-tasking, Decision Bias, Newspaper

JEL Classifications: D2 J5 L2 M5

1 Introduction

Authority, the power of a superior to select actions or decisions for her subordinates, is the core of hierarchy. Authority defines the boundary of the firm (Coase 1937), the nature of an employment contract (Simon 1951), and the structure of an organization (Simon 1947, Arrow 1974). Empirical studies have strongly supported that the internal allocation of authority affects firm performance.[1] However, systematic evidence at the level of an individual worker is lacking.

In this paper, I study monthly personnel data from about 200 reporters from 2004 to 2006 in a leading commercial Chinese newspaper (the Newspaper hereafter). I estimate causal effects of the distribution of authority on individual performance, relying on an unexpected organizational reform from delegating to centralizing editorial power in some divisions, but not others, of the Newspaper. The empirical findings shed light on two key theoretical mechanisms underlying the impact of authority on workers' incentives: 1) Restricting workers' authority in one task directs their efforts to the competing tasks (Holmstrom and Milgrom 1991); 2) Retaining authority achieves better control at the cost of depressing workers' initiative to utilize local information (Aghion and Tirole 1997).

In order to frame the empirical question and fit the institutional setting of the Newspaper, I develop a theory of authority with a multi-tasking agency problem and a three-layer, principal-manager-worker, hierarchy. The agents can allocate their efforts between production activities and private activities. Two agency problems may occur: 1) action distortion caused by the distraction of private activities, and 2) decision bias due to interest misalignment in conducting production activities. A change in authority from the middle to the top of the hierarchy allows the principal to restrict the agents' discretion and overrule their decisions. This exerts two opposite forces on the agents' incentives: an effort-directing effect due to restriction of their private activities and an initiative-depressing effect due to more strict control of their decisions in production activities. The overall effect of redistributing authority on the agents' behavior depends on two factors: 1) their preference matches with the principal; 2) their relative positions in the hierarchy.

The institutional setting of the Newspaper provides a rare opportunity to examine the theoretical mechanisms. The allocation of the rights to make editorial decisions regarding initiation of news coverage and selection of articles for publication determines the hierarchy of the Newspaper: chief editors at the top, division editors in the middle, and reporters at the bottom (See Figure 1). Along the hierarchical chain, a superior has the right to direct her subordinate's actions and ratify editorial decisions, but her effective control is limited by her monitoring ability and her information on specific news events. A subordinate, especially a

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[1] For the recent empirical studies on organizational structure and performance, see Rajan and Wulf (2006), Acemoglu et al (2007), Bloom and Van Reenen (2007), Bloom, Sadun and Van Reenen (2009), and Guadalupe and Wulf (2010). Numerous businesses cases and anecdotal evidence are discussed in Chandler (1962), Roberts (2004), Besanko et al (2010) and many other MBA textbooks.

reporter, has substantial discretion in his actions. He may deviate from production activities to establish social connections, expand career opportunities or even receive "grey incomes." These kinds of opportunistic behavior are pervasive in the media industry and prominent in China. Moreover, a subordinate who initiates news coverage usually has information advantages over his superior and will determine the actual editorial outcome. Then he may acquire and submit information that is not aligned with the Newspaper's interest. Through changing the extent of monitoring and the effective control over editorial decisions, the distribution of authority affects workers' incentives to allocate efforts between tasks and their initiative to utilize information.

With the commercialization of the Chinese media in early 2000, the Newspaper deployed a decentralized organization, in which editorial power was delegated to division editors (See Panel A in Figure 1). In September 2005, an exogenous appointment of one (among nine) chief editor by the government triggered the Newspaper to transfer editorial decision rights to the top (See Panel B in Figure 2) in four divisions – Economic and Business, Politics and Law, Education and Health, and General Reports, while leaving other divisions – Local and Regional News, Entertainment, Consumption-Guide, and Photographing – unchanged. Under the new organizational regime, an editing center, headed by chief editors, was created to closely monitor day-to-day editorial decisions. For expository simplicity, I will use centralizing (as opposed to delegating) authority to indicate the organizational change. The exogeneity of the reform, together with the adoption of different organizational forms inside the Newspaper, permits me to establish causality using a difference-in-differences estimator. Its validity is supported by the absence of differentiated trends between the treatment and the control groups over a long period before the reform.

The empirical analysis draws on rich personnel information and performance measures. Exploiting the Newspaper's records, I match the reporters' personal characteristics to the monthly observations of their performance in both quantity and quality, which are measured by an internal evaluation committee on a daily basis and tied to each reporter's pay. To directly measure the reporters' and the division editors' journalistic activities, a team of research assistants coded the news content of all the articles published on the Newspaper during the sample years. For example, I use the number of investigative reports and feature stories written by a reporter as a proxy for his production effort. I use the number of articles with a strong advertising element and authored by a reporter to capture his diversion of effort. As a proxy for their production initiative, I measure the number of reports originated or co-authored by the division editors. These external measures are constructed under the close supervision of experts in content analysis and Chinese journalism, and provide a reliable data source.

With regard to the impact of centralizing authority on the reporters, the difference-in-differences estimation shows three main results. First, centralizing authority on average improves the internal quality measure of the reporters' performance by 20%. Second, cen-

tralizing authority has a larger positive effect on the quality performance of those reporters who have access to more private benefits. For instance, the reporters specializing in economic and business coverage, who have more opportunities to obtain private benefits from companies, respond to the reform far more than those who report on public policies. Third, the pattern of individual fixed effects suggests that the reporters who leave the Newspaper after the reform, relative to those who remain, are more likely to have misaligned interests with the Newspaper. The last two results support the theoretical prediction that centralizing authority directs the reporters from pursuing private benefits to conducting desirable journalistic activities and thus mitigates the multi-tasking problem. This mechanism is confirmed by a triple-differences estimation, in which I exploit the fact that social norms condone rent seeking behavior and weaken the monitoring of the reporters' pursuit of private benefits in the Chinese New Year and the Mid Autumn Festival. In these special months, relative to other months, the impact of centralizing authority on the reporters' performance is muted. In addition, I find that centralizing authority significantly increases the number of investigative reports and feature stories, while reducing the number of advertising-type articles authored by a reporter.

For the division editors, however, I find that centralizing authority reduces the number of articles originated by them. Moreover, this negative impact is most pronounced in the Politics and Law division, in which news coverage usually involves public events and anticipated information, and the division editors initiate news reports more frequently than their counterparts in other divisions. These results suggest that centralizing authority bears a cost of reducing the division editors' initiative. The opposite impact of centralizing authority on the reporters and on the division editors is consistent with the theoretical prediction that retaining authority at the top decreases the initiative of middle managers, which may in turn promote the initiative of workers at the bottom.

The stability of the key institutional aspects, such as the pay scheme, the evaluation system and the composition of editors, during the sample period relieve concerns about several potentially confounding factors. I also conduct a series of econometric examination to exclude explanations that attribute the effects of the organizational reform to manipulation of the internal evaluation system, to changes in leadership, and to improvements in implementation and coordination.

A thriving body of empirical research in organizational and personnel economics has advanced the knowledge of how the wage system affects the provision of incentives inside the firm.[2] However, the literature is almost silent on the role of authority — the most fundamental non-price economic instrument and the defining factor of the firm.[3] To the best of my

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[2] The literature is too large to list here. See Lazear (2000), Lazear and Oyer (2009), Ichniowski and Shaw (2009), Oyer and Schaefer (2011), Bloom and Van Reenen (2011), Bandiera et al (2011) for excellent reviews and relevant references.

[3] A few exceptions include Csaszar (2008) who shows that the decision-making structure in mutual funds affects the fund managers' initiatives and errors in their decisions, and Liberti and Mian (2009) who present evidence that hierarchical distance influences the use of information in the decision making process in a multi-

knowledge, this paper provides the first causal evidence of how allocating authority moderates incentive incompatibilities inside an organization in either a multi-tasking or a multi-layer setting. The evidence that centralizing authority resolves multi-task conflicts lends strong support to the subeconomy view of the firm (Holmstrom and Milgrom 1991, 1994; Holmstrom 1999). The evidence of the opposing responses of the agents at different hierarchical layers enriches our understanding of an influential incentive theory of authority, which admits the non-contractibility of formal authority and emphasizes the impact of strategic competition for real authority among players with misaligned preferences on their incentives (e.g., Aghion and Tirole 1997).[4] The essential feature of the empirical setting of the Newspaper is common in many kinds of organizations, such as banking, R&D, professional service firms and universities, and the basic insights have much broader implications other than the Newspaper. I will discuss the issue of external validity in the conclusion section.

Additionally, my research makes a contribution to the economic analysis of media. An expanding literature has been developed to address the determinants of media content and bias.[5] The current paper is the first rigorous econometric investigation of the internal organization of the media. The evidence that organizational structure affects interest conflicts between journalists and the owner of the media, which in turn affects news content, is aligned with the theory of persistent media bias posed by Baron (2005). This complements the existing explanations for media bias that focus on ownership (Djankov et al 2003), and on consumer demand and market structure (George and Waldfogel 2003, Gentzkow and Shapiro 2006, 2010).

The rest of the paper is organized as follows. The next section describes the institutional setting. Section 3 presents a simple theoretical model of authority and incentives. Section 4 explains the data and empirical strategies. Section 5 presents the main results. Section 6 provides further evidence on the mechanism and discriminates between potential alternative explanations. Section 7 concludes. Proofs of the propositions and an extended theoretical analysis, details about data collection, and additional empirical results are provided in a web-based appendix.

2 Institutional Background

This section describes the institutional framework, drawing from numerous interviews and the internal documentation of various Chinese newspapers. The Newspaper is an industrial leader in a highly competitive provincial market in China. It employs more than 300 journalists

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national bank. The only direct empirical attack of the causal relationship between authority and incentives that I am aware is an unpublished manuscript by Liberti (2005).

[4]This incentives theory of authority dates back to Weber (1922[1968]), Fama and Jensen (1983), and Williamson (1985). It is formalized by Aghion and Tirole (1997), Baker, Gibbons and Murphy (1999) and Rajan and Zingales (1998, 2001). Recent theoretical studies have substantially extended this strand of literature, for instance Prendergast (1995, 2002), Dessein (2002), Zabojnik (2002), Marino and Matsusaka (2005), Rantakari (2008, 2010), Van den Steen (2010), and Friebel and Raith (2010) among others.

[5]See Prat and Stromberg (2011) for a recent survey and the references therein.

(reporters and editors) and has a constant daily circulation of about one million. Although owned by the state and regulated by the local government, the Newspaper is fully funded by advertising and sale revenues. After paying an annual fixed fee to the state, the board of the Newspaper – nine chief editors and two senior managers (CEO and CFO) during the sample period – has substantial freedom to distribute its residuals. A large component of their income is tied to the Newspaper's profitability. The Newspaper enjoys high autonomy in managerial practices and in editorial decisions except for reports about major political issues.

The content of the Newspaper includes a front section that covers important news, headlines and editorial articles, an Economic and Business section, a Politics and Law section, an Education and Health section, a General Reports section focusing on investigative reports, sudden events and miscellaneous topics, and then sections on Regional and Local News, Sports, Entertainment, and Consumption-Guide.[6] About 80% of the news content is provided by the employed journalists, the rest by news agencies, freelance writers and other media.

2.1   Production of News and Authority

In the Newspaper, journalists are organized in divisions corresponding to the news sections to produce news content. The production involves a series of editorial activities: collecting information and initiating news coverage, ratifying decisions, writing and editing reports, and monitoring and approving publication. The distribution of decision rights regarding these activities defines the hierarchy of the Newspaper: chief editors at the top, division editors in the middle, and reporters at the bottom. However, the distribution of effective control of editorial decisions rarely coincides with the distribution of decision rights. For example, a reporter who initiates and implements an investigative report usually determines the ultimate editorial outcome — an editor sitting in an office would not have the information to intervene even if she maintains the rights to ratify and monitor.

The effective control over editorial decisions is largely determined by the initiation of news coverage. The person who initiates a report usually has informational advantages over other persons. An editor who hasn't acquired enough information about a news event has to rubber stamp the submission from a reporter who initiates the coverage. This is particularly true when the publishing time is immediate. Two alternative procedures prevail in the production of news content. One is editor-oriented: an editor takes the initiative and assigns a task to a reporter, who then implements the task. The other is reporter-oriented: a reporter initiates and writes a news report, and his superior editor then ratifies and edits the report. Which procedure is used depends on the nature of tasks and the information obtained by each

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[6]The Consumption-Guide is a section on consumer products and service, for example, fashion, housing, luxuary goods etc. There are two supplement sections, one on international news, in which articles are mainly provided by news agencies, and the other on culture and literature, in which articles are provided by freelance writers.

party. In general, the reporter-oriented procedure dominates in investigative reports, in-depth analysis of industries or government sectors, feature stories, and on-the-scene reports, which require task-specific expertise and/or direct contact with news sources. The editor-oriented procedure is more important in the reports on regular government activities, anticipated events, publicly accessible information, and columns designed in advance.

The chief editors, whose job spans from designing corporate strategy, general management to establishing relationships with local governments, usually do not initiate news coverage except for propaganda. Their intervention in editorial decisions heavily relies on ex post monitoring, the intensity of which depends on whether the decision rights are delegated.

2.2   Agency Problems

Since the authority over editorial decisions is not fully enforceable, agency problems occur when a journalist has misaligned interests with the chief editors who represent the owner. In the Newspaper, the reporters initiate and implement most of the news coverage, as they have direct contact with information sources and interviewees.[7] The human capital intensity nature of journalism gives a reporter substantial discretion in his actions. A reporter is likely to deviate from production activities (initiation and implementation of news coverage) if his outside benefit is large.

Chinese reporters have large rent-seeking opportunities. The "hongbao" (grey incomes) phenomenon that people receive money, gifts or other benefits from those who request their favors is pervasive in the Chinese media industry.[8] Moreover, reporters may spend time and effort establishing "guanxi" (social connections) to expand career and business opportunities. These benefits detract reporters from production activities, and may invite them to misuse the resources of their employers. A prevalent example is that a reporter submits information in favor of interviewees. Some of this information, such as an advertising-type report, is particularly detrimental to the Newspaper, as it not only harms news content but may also crowd out advertising revenues.

In contrast, a division editor has far fewer opportunities to seek rents, as her activities are restricted in office and easier to monitor. The agency problem with a division editor is more likely to occur in ratifying decisions, when she has different preferences for a news report than the chief editors or when she cares about perks or favoritism in the workplace.

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[7]Compared to their Western counterparts, reporters in Chinese newspapers play a more active role in editorial decisions, as editorial staff are largely regarded as civil servants and many of them lack the journalism expertise.

[8]In Chinese culture, "hongbao" is a red envelope with a monetary gift that Chinese people give to their employees, children and relatives on occasions such as new year celebrations, birthdays, weddings etc. It has become popular to give a "hongbao" to request a favor or exchange benefits. According to the regulation of Chinese media, journalists receiving "hongbao" from interviewees is considered to be corruption. But unless the amount of money is large and verified, such misbehavior is hardly ever punished. Anecdotal evidence suggests that the monetary private benefits (e.g., "hongbao") accounts for a significant proportion of their income for some reporters.

2.3 Incentive Schemes and Evaluation

To curb the potential agency problems, The Newspaper adopts a high-powered payment scheme for the reporters. Besides a fixed base salary accounting for about one third of his wage, a reporter receives a piece-rate type pay directly tied to his monthly performance, which is measured by a score with two components: quantity and quality. The former is a composite measure of the numbers of published articles and words. The latter is assigned by an Evaluation Committee on a daily basis and aggregated up at a monthly level. When the published articles are authored jointly with other reporters or editors, the scores are adjusted by a sharing rule designed to distinguish between the contribution of each individual reporter. The evaluation of the quality score is based on well-defined rules, and claimed to be "an accurate measure of a reporter's individual contribution" and "fair to every employee."[9] I will show that it is imitable with the external measures that I construct. This internal evaluation system may not perfectly measure the objective quality of journalism, but it captures the preferences of the chief editors who operate the Newspaper under certain political constraint and defines a clear measure to which the reporters react.

The pay to other employees is relatively low-powered. The division editors receive a flat wage, together with a small bonus component based on an internal assessment of the performance of the whole team in a news section. The difficulty of rewarding division editors with a high-powered performance pay is because their jobs involve multi-tasks and cooperative teamwork. The chief editors are paid a salary according to their positions in the government hierarchy, and a bonus depending on the yearly profits of the Newspaper.

2.4 Organizational Reform

After employing a highly centralized organizational structure for a long period, the Newspaper experimented with a decentralized structure from January 2002. Under this arrangement, the editorial authority was formally delegated to the editors in each particular division (e.g. Economic and Business News). In particular, the division editors possessed the rights to ratify editorial decisions, monitor reporters and approve publication of reports. The chief editors committed not to intervene except in exceptional situations. This delegation of authority was caused by the rapid expansion of the Newspaper and the lack of journalism expertise for some chief editors who were appointed by the government.

In September 2005, the Newspaper decided to transfer editorial power to the top in four divisions: Economic and Business, Politics and Law, Education and Health, and General

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[9]The Evaluation Commitee is headed by a chief editor and operated by 9 senior editors and reporters who are not involved with day-to-day news coverage and editing. Every day, the members of the Evaluation Committee select good articles from a list of published articles recommended by division editors and assign a quality rank (convertable to a score) to each selected article. A list of all the evaluated articles is posted in a public area on the next day. If the authors do not agree with the evaluation of the committee, they can apply for reevaluation by providing evidence (e.g. readers' feedback). A chief editor acts as an arbitrator to settle disputes at the end of each month. The finalized scores aggregated at a monthly level are then converted to money by computer software.

Reports. An editing center, headed by two chief editors and several associate editing directors, was created to examine the editorial decisions proposed by division editors and to monitor closely the editing process to clean up low quality or even harmful news content (e.g., advertising-type information). The other divisions, Regional and Local News, Entertainment, Consumption Guide and Photographing remained unchanged.[10] Recall Figure 1 for a comparison of the two forms of distributing authority.

The reform was imposed by the Board, who claimed that centralizing authority would "enhance control" and "improve competency." However, the reform was described as "a surprise" in the interviews, as "no obvious problems had been perceived." Insider information suggests that the reform was triggered by the appointment of one chief editor in June 2005, who was a former government official and might have a tendency to control power.[11] The new chief editor reformed the four divisions that he took over from the retired chief editor.

I restrict attention to the period from 2004 to 2006, because the operating environment and the internal structure of the Newspaper were very stable during this sample period. There was no significant change in regulation and politics in Chinese newspapers. The Newspaper remained an industry leader in the local market, and there was no entry and exit of competitors. The volume of news content (the number of pages) of the Newspaper was stable. The pay schemes and the evaluation system, in terms of both the members of the Evaluation Committee and the evaluation procedure, did not change.

3   A Theory of Authority and Incentives

The decision process in the production of news content can be classified into four general steps: initiation, ratification, implementation, and monitoring. Fama and Jensen (1983) argue that the initiation and implementation of decisions (bundled as decision management) are separated from the ratification and monitoring of decisions (bundled as decision control), and this separation leads to agency problems. In the similar spirit, Aghion and Tirole (1997) distinguish formal authority (nominal control) and real authority (effective control), and argue that the distribution of real authority is determined by the structure of information, which in turn depends on the distribution of formal authority.

I combine these two ideas to frame the empirical questions.[12] The initiation of news

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[10]The Newspaper does not have a separate photographing section. But the chief editors usually do not intervene the photographers' work. Therefore the photographing division is regarded as decentralized and will be included in the control group. During the reform, the Sports division received a different treatment, which allowed the sports reporters to involve editoral decision making. The analysis of the Sports journalists is relegated to the web-based appendix.

[11]The new chief editor was selected by the local Party among a list of candidates who had the same position in the governmental hierarchy as the retired chief editor. Unlike the chief editors that were promoted within the newspaper, the external appoinment is to a large extent random depending on the availability of external candidates.

[12]Baker et al (1999) develop a theory to reconcile the theoretical argument by Fama and Jensen (1983) and the one by Aghion and Tirole. But they neglect the role of monitoring, which is one important aspect of authority in my paper.

coverage requires a journalist to acquire and process specific knowledge and private information. Thus the right of initiation is allocated to the person who has advantageous access to information sources. In the Newspaper, both the reporters and the editors have the right to initiate news coverage. What distinguish their hierarchical positions is the right of decision control – ratification and monitoring. That is, a superior has formal authority to ratify/veto her subordinate's proposal and monitor/direct his actions. However, the execution of formal authority largely depends on who initiates news coverage and the distribution of information between a superior and a subordinate. I will neglect the stage of implementation, which always goes hand-in-hand with initiation in the Newspaper.

To fit the empirical setting, I introduce two new features. First, the agents are multitasking: they can allocate their efforts between two competing tasks. Second, there are three layers in the hierarchy. I focus my analysis on how the distribution of authority affects the agents' incentives, leaving the discussion of optimal organizational design and the interplay between organizational structures and pay schemes to the appendix.

3.1 The Model

An organization owned by a principal (chief editor, she) selects one project (a news report) to implement at a time.[13] A manager (division editor, she) and a worker (reporter, he) are employed to search for projects. This principal-manager-worker hierarchy is defined by the distribution of formal authority — the rights of ratification and monitoring.

Projects. A variety of projects exist, each generating different values to each party. For instance, a chief editor, a division editor and a reporter may have a different preference ordering of the following three types of reports: an investigative report, a sensational story, and an article about a government official. The misalignment of interests can be also due to non-verifiable on-the-job benefits such as job satisfaction, perks and favoritism.

Information and authority. The selection of projects first of all depends on formal authority. The superior party decides which project to implement and has the right to overrule her subordinate's decision. However, being able to make proper decisions requires information about the projects. An uninformed principal will give authority to a manager, who then makes decisions if informed, but will pass authority downwards to the worker if uninformed. The worker effectively decides which project to implement whenever he has information advantages over his supervisors. Hence, what the allocation of formal authority defines is "the right to the last word" to resolve decision conflicts. Moreover, the allocation of formal authority permits a superior to direct and restrict her subordinate's actions along a certain dimension. This is the monitoring aspect of authority.[14]

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[13]Strictly speaking, the chief editors are not the principal of the Newspaper, as it is the state who is the ultimate owner. But the outcome we are interested in is news content, instead of profitability. The chief editors define the editorial objective of the Newspaper and construct an evaluation system to which their subordinates respond. In this sense, the chief editors are the principal in the hierarchy.

[14]Effective monitoring may also depend on the structure of information. I explore this possibility and

Contracts and organizational forms. In the spirit of the theory of incomplete contract a là Grossman and Hart (1986) and Hart and Moore (1990), the input and output of production are assumed to be observable but non-verifiable so that the contractible allocation of formal authority plays a central role in inducing ex ante investments — the acquisition of information in this model. I focus on two organizational forms that are relevant to the empirical setting: 1) M(iddle)-authority, under which the principal delegates formal authority to the manager; 2) T(op)-authority, under which the principal retains formal authority.

Timing of the game. At T_o, the three parties contract on one of the two organizational alternatives and agree on the allocation of formal authority. At T_1, the manager and the worker simultaneously and independently exert efforts to acquire information and develop the projects. At T_2, both agents initiate and propose their projects. Under *M-Authority*, the manager selects among the projects and ratify the proposals. Under *T-Authority*, the principal makes the selection decision after she has acquired information and reviewed the proposal by an informed manager or the worker's proposal passed on by an uninformed manager. At T_3, the selected project is implemented without further costs, output of the organization is produced, and all the benefits are realized with no uncertainty.

Agency problems. An agent can conduct two tasks — a main task related to production activities and a side task related to private activities. For example, a journalist can collect information to develop and initiate valuable news reports, but he can also collect information to obtain grey incomes ("hongbao") or to establish social connections ("guanxi").

Two types of agency problems may arise in the production process. The first type is action distortion at T_1, when the agents divert their efforts to private activities. This is the classical moral hazard problem. The second type is decision bias at T_2, when the agents, after acquiring information, initiate and propose their preferred projects that are in conflict with the principal's interest. This is distortion in decision making due to ex post information asymmetry, as highlighted by Aghion and Tirole (1997).[15]

Payoffs. Let $i \in \{m, w\}$ denote the manager or the worker. Agent i expends efforts E_i to acquire information about the projects, and $1 - E_i$ to conduct private activities. E_i is also assumed to be the probability of agent i being informed of the projects. The implementation of a project proposed by agent i delivers $\alpha_i \in (0, 1)$ to the principal, one unit of on-the-job benefit to the agent, and zero to the other agent.[16] Thus α_i is a congruence parameter measuring the interest alignment between the principal and agent i in project selection. An agent with a higher α_i is more likely to select a project at the principal's interest. Alternatively, when conducting private activities, agent i obtains a non-verifiable benefit $b_i \in (0, 1)$, referred

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analyze more sophisticated monitoring in the appendix.

[15]The timing of the agency problems is to match the empirical setting, and is not essential for the analysis. The main results would remain unchanged if two agency problems occur simultaneously.

[16]I normalize the on-the-job benefit to one, as what matters is its comparision with the private benefit that will be discussed. I also assume that the implementation of one agent's preferred project delivers zero on-the-job benefit to the other agent, to sharpen the conflict between the agents.

to as private benefit.[17] The realization of b_i relies on the ignorance of agent i's superiors, because an informed superior can direct her subordinate to implement her selected projects or prevent the subordinate from using the assets of the organization for his private purpose.[18]

For simplicity, all the parties are assumed to be risk neutral. As performance is not contractible, the principal pays a fixed salary s_m to the manager and s_w to the worker, regardless of which project is implemented. All cost functions of effort will take a quadratic form.

M-Authority. Under this regime, the principal delegates formal authority to the manager and commits not to intervene. The manager has the right to ratify decisions and monitor subordinates, which affects the distribution of real authority between the manager and the worker. The resulting payoffs to the principal, the manager and the worker (indicated with the subscripts p, m, w respectively) under *M-Authority* (denoted with the superscript M) are as follows:

$$U_p^M = E_m \alpha_m + (1 - E_m) E_w \alpha_w - s_m - s_w;$$

$$U_m^M = s_m + E_m + (1 - E_m) b_m - \frac{1}{2} E_m^2 ; \tag{1}$$

$$U_w^M = s_w + (1 - E_m)[E_w + (1 - E_w) b_w] - \frac{1}{2} E_w^2. \tag{2}$$

With probability E_m, the manager is informed and has real authority to select her preferred project, which yields α_m to the principal and one to herself, but zero to the worker. With probability $1 - E_m$, the manager is distracted by the private benefit b_m and gives authority to the worker; then the worker, with probability E_w, will select his preferred project that yields α_w to the principal and one to himself, but zero to the manager, and, with probability $1 - E_w$, will realize the private benefit b_w. Note that although an informed manager will prevent the worker's realization of private benefits, she has no direct intention to monitor the worker's private activities. This captures the idea that it is costly to motivate the middle manager to monitor the worker, possibly because of the time constraint, measurement problems, favoritism or social connection among agents.

T-Authority. Under this regime, the principal can exercise his formal authority in two ways: she inspects an agent's proposed project and controls the agent's pursuit of private benefit. If agent i has acquired information and proposed a project, the principal, after spending an effort E_p^i, is informed with probability E_p^i, and able to modify the proposed project to obtain one unit of output; with probability $1 - E_p^i$, the principal is uninformed,

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[17] For simplicity, I assume the agents' private task does not bring about any value to the principal. In reality, while undertaking private activities (e.g., establishing social connections) a journalist may collect useful information or propose an inferior but still valuable news report. In this sense, conducting private activities is a task. Moreover a principal may condone private activities and treat them as a task to facilitate participation.

[18] The current model would be equivalent to the one in which the superior and the subordinate pursue more than one project and there exist conflicts between projects. See Rantakari (2010) for a treatment along this line.

and will rubber stamp the proposal. For simplicity, I assume that the principal, by retaining formal authority, is able to fully prevent the agent's realization of private benefit.

The payoffs to the three parties under *T-Authority* (denoted with the superscript T) are:

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\begin{aligned}
U_p^T &= -s_m - s_w + E_m[E_p^m + (1 - E_p^m)\alpha_m - \frac{1}{2}(E_p^m)^2] \\
&\quad + (1 - E_m)E_w[E_p^w + (1 - E_p^w)\alpha_w - \frac{1}{2}(E_p^w)^2]; \\
U_m^T &= s_m + E_m(1 - E_p^m) - \frac{1}{2}E_m^2 \ ; \\
U_w^T &= s_w + (1 - E_m)E_w(1 - E_p^w) - \frac{1}{2}E_w^2.
\end{aligned}
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$$(3)$$

$$(4)$$

Note that in the above specification, an agent obtains zero on-the-job benefit if his or her proposed project is overruled by the principal. This assumption can be relaxed easily.

3.2 Analysis

Assume interior solutions throughout. Under *M-Authority*, the first order conditions of (1) and (2) produce a pair of Nash equilibrium efforts of the manager and the worker:

$$
E_m^M = 1 - b_m; \ E_w^M = b_m(1 - b_w).
$$

Agent i' production initiative is motivated by the on-the-job benefit, but diverted by the private benefit b_i. The worker's initiative increases in b_m, which indicates the manager's ignorance due to the distraction of private benefit.

Under *T-Authority*, the principal's optimal inspection effort is

$$
E_p^i = 1 - \alpha_i.
$$

The principal inspects agent i's proposed project to counter their selection distortion, the severity of which is measured by the congruence parameter α_i. Anticipating the principal's responses, the agents optimize their allocation of efforts according to (3) and (4), leading to the Subgame-Perfect-Nash equilibrium:

$$
E_m^T = \alpha_m; \ E_w^T = (1 - \alpha_m)\alpha_w.
$$

3.2.1 Trade-off between Control and Initiative

An organizational change from *M-Authority* to *T-Authority* yields two opposite effects on each agent's incentives. On the one hand, the restriction of private benefit directs the agent's effort to production activities. On the other hand, the principal's ratification of project selection restricts an agent's real authority to choose his or her preferred project, and thus depresses the agent's initiative. Which effect dominates depends on the relative severity of

each agency problem.

Definition 1 *Agent i is distracted if $b_i > 1 - \alpha_i$: the distraction of the private benefit is large, relative to the interest misalignment in project selection; alternatively, agent i is biased if $1 - \alpha_i > b_i$: the interest misalignment in project selection is large, relative to the distraction of the private benefit.*

The relative position of each agent in the hierarchy generates another trade-off: a decline (or an increase) in the manager's initiative in turn promotes (or depresses) the worker's initiative, resulting in subtle effects on the worker's incentives.

Proposition 1 *(Average Treatment Effect) The effect of organizational structure on the agents' incentives depends on the nature of their agency problems and their relative positions in the hierarchy, as follows:*
1) (Biased Manager and Distracted Worker) T-Authority, compared to M-Authority, decreases the manager's initiative, but increases the worker's initiative.
2) (Distracted Manager and Biased Worker) T-Authority, compared to M-Authority, increases the manager's initiative, but decreases the worker's initiative.
3) (Biased Manager and Biased Worker) T-Authority, compared to M-Authority, decreases the manager's initiative, but has an ambiguous impact on the worker's initiative.
4) (Distracted Manager and Distracted Worker) T-Authority, compared to M-Authority, increases the manager's initiative, but has an ambiguous impact on the worker's initiative.

The impact of organizational structure on the manager's incentives simply depends on her type: biased or distracted. This result would also hold in a two-layer hierarchy. However, the impact on the worker's incentives rests on both the type of manager and the preference match between the two agents. In the first two cases of Proposition 1, the relative severity of agency problems with the manager is opposite to that with the worker. The effect of organizational structure on the worker's incentives is amplified by the effect on the manager's, and thus is unambiguous. In the last two cases, both agents have the same dominant agency problems; the effect on the worker is no longer clear-cut, because the manager's initiative substitutes the worker's.

The access to private benefit b_i is likely to vary across agents, as it depends, to a large extent, on the agent's job assignment and working environment. Therefore the impact of transferring authority from the middle to the top may differ across agents.

Proposition 2 *(Heterogeneous Treatment Effect) Consider the effect of an organizational change from M-Authority to T-Authority on an agent's initiative.*
1) The effect on the manager's initiative increases in her access to private benefit;
2) The effect on the worker's initiative increases in his access to private benefit, and the

increase is enhanced by the manager's access to private benefit.

This heterogeneous treatment effect is a corollary of the effort-directing mechanism: transferring authority to the top has a larger effort-directing effect on agents who have more access to private benefit and who would allocate more effort for private activities.

3.2.2 Participation and Selection

The above analysis illustrates the incentive view of authority. When the participation constraint is taken into account, the agent who loses private benefit under *T-Authority* may demand more compensation to participate in the organization.

Proposition 3 *(Selection Effect) Consider an organizational change from M-Authority to T-Authority, and suppose that the agents' salary is fixed.*
1) The manager always becomes worse off;
2) A worker with more access to private benefit and/or lower interest alignment with the principal in project selection is more likely to leave the organization; conversely, a worker with less access to private benefit and/or higher interest alignment with the principal in project selection is more likely to participate in the organization.

The proposition stresses a cost of retaining authority at the top: hindering the participation of incumbent employees and increasing turnovers if the compensation policy is not adjusted. In other words, delegating authority can encourage participation, as discussed in Aghion and Tirole (1997) and Baron (2005).

3.3 From Theory to Test

Based on fairly general assumptions, the above theoretical framework pins down two mechanisms that underlie the impact of transferring authority to the top (or centralizing authority) on an agent's incentives. First, through restricting an agent's discretion in performing the less desirable task, centralizing authority mitigates the multi-tasking agency problem at the cost of monitoring. This is labelled as the effort-directing effect. Second, restricting an agent's authority over production activities achieves better control, but may dampen the agent's incentives to acquire valuable information. This is labelled as the initiative-depressing effect. The overall effects depend on their preference matches, their relative hierarchical positions, and the monitoring technology. Without further restrictions on the structural parameters, the theory is not falsifiable. However, the empirical setting suggests that the dominant agency problem with the reporters is more likely to be distraction of private benefits while that with the division editors is decision bias. Therefore I will examine the theory with such a prior belief.

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First, I will estimate the impact of centralizing editorial power on the reporters. Proposition 1 predicts a reduced-form average treatment effect of centralizing authority on a reporter's initiative and performance. However, such an average treatment effect is mute about the underlying mechanisms, and can be interpreted in various ways. Thus it is crucial to test Proposition 2 — the heterogeneous treatment effect: with controls of ability, the reporters with larger private benefits should respond more to the reform if the effort-directing effect dominates. I will exploit institutional factors such as job assignment and social norms, which reveal information on a reporter's access to private benefits, to test this prediction. Proposition 3, the selection effect, also casts light on the effort-directing mechanism, as it is another way to demonstrate heterogeneous treatment: reporters with large private benefits or low interest alignment will respond in an extreme manner to select themselves out of their job. I will infer the selection pattern by estimating the individual fixed effects of the entries, stayers and exits. Empirical results that are jointly consistent with these three propositions lend support to the mechanism that centralizing authority alleviates the multi-tasking problem.

Furthermore, I will estimate the impact of centralizing authority on the direct measures of news content and editorial activities so as to shed further light on the basic trade-off between better control and depressing initiative. In particular, the effort directing mechanism would result in a negative relationship between the effect on the measures of a reporter's journalistic initiative and the effect on the measures of his private benefits. Furthermore, the initiative-depressing effect on the managers would lead to a negative impact of centralizing authority on the measures of the division editors' initiative. This negative effect, associated with the positive effect on the reporters' journalistic initiative, provides suggestive evidence on the initiative substitution between agents in the two layers. Empirical verification of these hypothetical results would favor my prior belief, the first case in Proposition 1.

4   Data and Empirical Strategy

4.1   Data Collection and Sample Construction

To measure the reporters' incentives and performance, I construct a unique data set by combining the Newspaper's internal personnel records and external measures of news content. The Newspaper provided personal information of all its employees, and monthly performance measures, including the number of articles, the number of words, the quantity score, and the quality score, of all the reporters. A team of Chinese research assistants were hired to classify all the articles collected from the Newspaper's on-line archives over the sample period into categories of news content. Together with an experienced journalist, I specified a set of coding rules according to the evaluation system of the Newspaper with reference to the evaluation of the Association of Chinese Journalists. The research assistants were trained to master the basic skills of content analysis in journalism. Then they coded every article by reading its title, authorship, byline, lead paragraph and other information such as formats and pictures.

The appendix explains in detail the data collection and variable coding.

In the baseline sample, I exclude the observations of the sports reporters, because they experience a different organizational reform, and their performance is highly volatile due to exogenous shocks such as the Olympic Games and the World Cup. To reduce potential noise, I also exclude the following observations: 1) new recruits in the first three months who are not paid by performance; 2) division editors who cover news occasionally; 3) regular reporters who wrote very little in some unusual situation, for instance, being ill or on holiday. All the excluded observations account for about 15% of the overall observations. The main empirical results presented below are robust in the samples when these observations are included (reported in the appendix).

4.2   Personnel Information

Panel A of Table 1 summarizes the personnel information of 183 reporters in the baseline sample. Among the reporters, 60 percent are men, more than 80 percent have at least a college education, and about half are members of the Chinese Communist Party. The reporters are on average about 33 years old with an 8 year tenure at the Newspaper. Position is an indicator ranking from 1 to 3, representing reporter, chief reporter and senior reporter respectively in the hierarchy of the Newspaper. Qualification is a certificate authorized by the Association of Chinese Journalists to indicate one's expertise and experience in journalism, with 1 referring to assistant journalist, 2 to journalist, and 3 to senior journalist. The average levels of position and qualification are both about 1.5. Together with the tenure information, these imply that most reporters are mature enough to understand well the preferences and the evaluation system of the Newspaper, and have the skills and ability to work independently.

Panel B of Table 1 reports the summary statistics of 56 division editors during the sample period. The gender ratio, education level and fraction of Party members of the division editors are fairly similar to those of the reporters. They are on average older and more experienced than the reporters. The means of their positions and qualification are about 2.2, both substantially higher than those of the reporters'.

4.3   Internal Measures of Quantity and Quality

I will use the internal quantity and quality scores as baseline outcome variables, because they are accurately measured to serve as a basis for performance pay, and thus good proxies for the reporters' performance. Moreover, these scores are comparable across different types of journalism given the consistency of evaluation, permitting a difference-in-differences identification strategy. Simple regressions show that the variations in the number of articles and the number of words jointly explain more than 95% of the variation in the quantity score. The R-squared in the regression of the quality score on the quantity score is only about 40%, because the quality score captures the subjects of news content other than the number of articles and words. The quality score has another advantage in that it avoids the concern

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of article selection, as a high quality article is unlikely to be screened out.[19] Therefore, I regard the quality score as a reliable measure of the quality of news content and a reporter's production initiative. The basic information on these performance measures is summarized in Panel A of Table 2. In an average month, a reporter writes 32 articles and 18434 Chinese words, and earns a quantity score of 2080, and a quality score of 1477.

4.4   External Measures of News Content and Editorial Activities

I classify the direct measures of news content into the following mutually exclusive categories: investigative report, feature story, special report[20], advertising[21], propaganda, government officials, on-the-scene report, sensational/entertaining report, and others. Investigative and feature reports correspond to the common sense of good journalism. Special reports indicate that they are unique or unusual in news subjects, or different in some important aspects from other newspapers' coverage of similar subjects. I use these three types of articles, particularly the first two, as proxies for a reporter's good journalistic activities and production initiative (journalistic initiative hereafter), since they require both substantial effort to collect original information and direct contact with news sources. Advertising articles capture the existence and extent of private benefits, and are usually regarded as bad journalism. Propaganda is the report of propaganda campaigns originated by the Party. Reports about government officials indicate the influence of governments on news content. The input information conveyed by other types of journalism, such as on-the-scene and entertaining/sensational reports, is less clear and will be only briefly discussed.

Parallel to the classification of news content, I also categorize articles according to their authorship, which reveals information on editorial activities. For example, an article authored by a reporter jointly with a division editor indicates that the report is originated and organized by the managing editor. Some articles directly spell out the role of a division editor as a chief reporter. I classify these articles as "joint with editor." The articles written by reporters but assigned by a division editor to fit columns designed in advance are classified as "column by content." These two types of articles are used to approximate the division editors' initiative. The articles that contain the names of external authors, who provide news sources to reporters and may participate in news coverage, also convey information on editorial decisions. There are three sources of external authors: government and public sector, private sector, and freelance writers. Usually the division editors directly contact the freelance authors, while

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[19] According to the interviews, on average about 20% articles submited to the editors are rejected. Most rejections are low quality articles. The rejection rate is much higher for junior reporters. A mature reporter is able to anticipate the probability of rejection, and will usually only spend substantial efforts on reports that are very likely to get published.

[20] An article is coded as special report if it is a long article that contains key words like "special", "unique" and "first report", but not identified as an investigative report or a feature story.

[21] An article is coded as advertising if it is a promotion of products and/or image of a particular company. Most of the advertising articles are about local firms. The advertising articles are distinguished from those soft advertisement articles for business clients assigned by the Newspaper. These articles are provided by the advertising department and not authored by reporters.

the reporters work with the other two types. The articles with external authors from the private sector may also indicate a reporter's opportunities and intention to establish business relations. Finally, some articles are coauthored with other reporters either within the same division or across divisions.

One advantage of these external measures is that they are less sensitive to changes in the quality evaluation of the Newspaper. The major drawback is the incompatibility between different types of journalism. For instance, it does not make sense to compare business news with entertainment news. Therefore the constructed external measures only apply to the treatment group, in which common measures are plausible. Panel B of Table 2 summarizes the basic statistics of the external measures. A few features are worth pointing out. First, propaganda reports on average account for only about 1% of all the articles written by a reporter in a month, implying that the newspaper is not propaganda driven. Second, a reporter on average only writes 2.5 investigative and feature reports per month, as they require substantial effort. Third, the number of articles "joint with editor" and "column by content" is small, showing that the reporters play a key role in initiating news coverage and determining editorial decisions. Fourth, the small number of "coauthor across division" articles suggests that across-division cooperation and coordination is not a big concern in the production of news content.

In the regression of the quality score on the external measures, the R-squared exceeds 75%, supporting their credibility as reliable measures of the reporters' initiative and effort. The main contributing factors to the quality score are investigative reports, feature stories, special reports, and propaganda articles. This confirms that subjects are crucial for news quality. As expected, the advertising articles and articles with external authors are negatively correlated with the quality measure. Due to score sharing, the articles with internal coauthors, the "joint with editor" articles, and the "column by content" articles all reduce the quality score.

4.5 Empirical Strategies

4.5.1 Identification

The organizational reform in the Newspaper creates empirical counterparts of the two organizational forms in the theory: four divisions (Economic and Business News, Politics and Law, Education and Health, and General Reports) experience an organizational change that transfers authority from the middle to the top of the hierarchy. Even though the timing of the reform is arguably exogenous, there may be unobservable factors associated with the reform that could cause serious bias. This is of particular concern for the quality measure, which can be sensitive to explicit or implicit changes in editorial and evaluation policy. Fortunately, the remaining decentralized divisions (Regional and Local News, Entertainment, Consumption Guide, and Photographing) can serve as a control group to mitigate potential bias. The identification, therefore, hinges on a valid difference-in-differences (D-I-D hereafter) estimator.

Figure 3 plots the average quantity and quality scores in logarithm of the treatment group and that of the control group over time. Despite the fairly volatile time series[22], two features strongly support the validity of the D-I-D estimator. First, there is no trend in the performance of the treatment group before the reform, confirming that the reform is exogenous to the reporters' performance. Second, the performance of the treatment and that of the control groups are very similar in terms of levels and co-movement pattern before the reform, suggesting that the treatment group would behave similarly as the control if there were no treatment.

One potential concern is that the effect of the reform would be contaminated if reporters transfer between the treatment and the control after the reform. There are only 6 reporters switching between the two groups over the sample period, and the estimates from the sample that excludes these switchers are virtually the same as from the baseline sample.

4.5.2   Econometric Specification

The baseline D-I-D regression estimates the following panel specification:

$$Log(P_{it}) = \alpha_t + \lambda_i + \theta(C_i * R_t) + X_{it}\beta + \varepsilon_{it}, \tag{5}$$

where i indicates individual, and t indicates time at the $year \times month$ level. The dependent variable is the logarithm of a reporter's performance in terms of either the quantity score or the quality score. α_t is time fixed effects to control for aggregate fluctuations of the Newspaper. λ_i is individual fixed effects to control for unobservable individual ability and preferences, which also helps to overcome the potential selection bias due to the entries and exits of reporters associated with the reform. C_i is a dummy that equals one for the reformed divisions, and zero for the remaining decentralized divisions. R_t is a reform dummy equal to one if a reporter's performance is observed after the reform. The coefficients of both C_i and R_t are not identifiable in the presence of both individual/division fixed effects and time fixed effects. $C_i * R_t$ is the interaction term between the two variables, and its coefficient θ identifies the average treatment effect on the treated. X_{it} is a set of covariables including division fixed effects (some reporters switch across divisions), and time-variant individual characteristics such as age-squared, tenure-squared, position, and qualification. These covariables help to control for ability, career concerns, and other factors that may affect the reporters' performance.[23] ϵ_{it} is the stochastic error term, which may be correlated over time or within certain clusters in the D-I-D estimation with many periods (Bertrand et al 2004, Angrist and Pischke 2009). I will cluster the standard errors at the individual level to cope with potential time serial correlation. The main results are robust using other

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[22]The volatility across time is caused by seasonality and exogenous shocks in the industry. For example, the high performance in March 2005 and March 2006 is driven by the Chinese National People's Congress.

[23]The variables age and tenure are not identified due to collinearity in the regression with both individual fixed effects and time fixed effects.

clustering strategies.[24]

5 Main Results

This section presents the main empirical results to investigate the impact of the organizational reform on the internal measures of the reporters' quantity and quality scores. I start with an investigation of the average treatment effect, then explore the heterogenous treatment effect with regard to the reporters' access to private benefits, and finally analyze the individual fixed effects to examine the treatment on distribution and the selection pattern.

5.1 Average Treatment Effects

5.1.1 Descriptive Results

Table 3 displays the reporters' average performance before and after the reform in the treatment (retaining authority at the top) group and the control (delegating authority in the middle) group, and the comparison between the two groups. To focus on the impact of centralizing authority on the intensive margin: the change in the average performance of the same reporters before and after the reform, I restrict the sample to a balanced panel that includes 113 reporters who are observed both before and after the reform, and do not switch between treatment and control. Consistent with Figure 3, before the reform, there are no significant differences in either the quantity score or the quality score between the treatment and the control. Panel A shows that the differences in the quantity score under the two organization schemes in both the treatment and control groups are negligible, and the difference-in-differences comparison is small and statistically insignificant. These results are not surprising, given that the Newspaper's volume of content is basically fixed and the space to accommodate more articles and words is limited.

However, the comparison of the log quality score (Panel B) suggests that the organizational reform has a strong effect on the reporters' quality performance. The quality score of the treated reporters is only slightly above that of the control before the reform, but the gap widens dramatically after the reform, amounting to a difference-in-differences comparison of 0.151 in the mean with a standard error of 0.075. It is important to recognize that the result is mainly driven by the negative impact of the reform on the performance of the control group, which suggests that there may exist negative common shocks to all the reporters in the Newspaper.[25]

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[24]The results in the regressions that cluster the standard errors at the division level are considerably less precise because the small number of clusters (9 divisions) substantially inflates the standard errors. But the main results are still significant at the 10% level. The results that cluster the standard errors at the *division × quarter* level are more precise than those that cluster at the individual level.

[25]One potential common shock is implicitly tighter evaluation of the quality score due to budget constraint. The internal documentation shows that the Newspaper puts more emphasis on shorter articles and better writing after the reform. Evidence suggests that the evaluation may be more strict for the categories of articles that contribute most to the quality score after the reform, as will be shown.

The lack of response of the reporters' quantity performance rules out the potential spurious relationship between the timing of the reform and the expansion of the Newspaper. Rather, the organizational reform is likely to affect a reporter's journalistic initiative that determines the quality of news content.

5.1.2 Baseline Estimates

Using the D-I-D approach specified in Equation (5), I estimate the average treatment effects of the reform on the logarithm of the quantity and quality scores. The findings in Panel A of Table 4 confirm the descriptive evidence. The simplest estimation, controlling for only individual fixed effects (Column 1 and 5), shows that the average effect of centralizing authority on the reporters' quantity score is economically small (5.4%) and statistically insignificant. But the effect on the quality score is statistically significant at the 1% level and economically large (20.7%), which amounts to a 5% increase in wages. The results hardly change after adding the time dummies (Column 2 and 6), and additional controls including division fixed effects and the time-variant personal characteristics (Column 3 and 7).[26]

When the individual fixed effects are replaced with controls for time-invariant personal characteristics such as gender, education and Party membership, together with age and tenure (Column 4 and 8), the R-squared is reduced almost half. The estimated effect on the quality score declines dramatically from 19.4% to 6.1% and becomes statistically insignificant. The effect on the quantity score becomes negative, though statistically insignificant. These results suggest a negative selection associated with the organizational reform, which I will analyze later.

5.1.3 Dynamic Effects

Panel B of Table 4 presents the dynamics of the average treatment effects. I replace the interaction term between the treatment dummy and the reform dummy with a set of dummy variables. "$reform start$" is a dummy equal to one if a reporter works in the treatment group in the month of the reform (September 2005) and zero otherwise, "$August 2005$" a dummy for a reporter in the treatment in August 2005 (one month before the reform), and "$October 2005$" a dummy for a reporter in the treatment in October (one month after the reform). Similar definitions apply to "$July 2005$", "$November 2005$" and "$December 2005$". The regressor "$January 2006 onwards$" is a dummy that equals one for a treated reporter from January 2006 and onwards. The dynamic effects are consistent with the previous findings. The insignificant estimates of both the quantity and quality scores before the reform confirm that there is no pre-trend effect. The effects on the quantity score are always insignificant. The response of the quality score is not significant until November 2005 (two months after the reform). The effect becomes larger and more pronounced four months after the reform. The

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[26]The results are robust when division trends are included in the regression.

gradually increasing effect rules out the concern that the reformer deliberately increases the quality score to reward (or compensate) the treatment group or to demonstrate the success of the organizational reform, in which case the response would be stronger in the short run. The lack of response in September and October of 2005 may be because these two months are among the special period, in which social norms condone rent seeking behavior and offset the effect of the reform. I will examine this argument in the next subsection.

5.2 Heterogenous Treatment Effects

To test the heterogenous treatment hypothesis, I estimate the effects of the organizational reform across different groups of reporters whose task assignment exposes them to different levels of private benefits, and across different periods in which the extent of a reporter's access to private benefits varies.

5.2.1 Access to Private Benefits across Task Assignments

It is not unusual that the exposure and access to private benefits systematically vary across task assignments within an organization. Well known in the Chinese media industry, economic and financial reporters have access to large pecuniary private benefits and business opportunities, as they specialize in covering news about companies and products. As in other transitional economies, rent seeking behavior is particularly active in the sectors that experience drastic commercialization and privatization. Education institutions, hospitals and pharmacies in China since 2000 fall into this category.[27] The reporters in these two divisions are more likely to divert their efforts to pursue private benefits. In contrast, the reporters in the Politics and Law division and the General Reports division, who focus on government policies and routines, investigative reports and sudden events, have far more limited access to private benefits.[28] These conjectures are supported by the distribution of the number of advertising articles across news divisions in the sample: 1145 in Economic and Business, 72 in Education and Health, but only 28 in Politics and Law, and 11 in General Reports. A natural proxy for the extent of the reporters' access to private benefits is their allocation to divisions, which are based on task assignment.[29]

I extend the D-I-D estimation of the effects of centralizing authority on the scores to incorporate the heterogeneous treatment across reporters in the four treated divisions: Eco-

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[27] Corruption in the education industry and the healthcare sector is frequently reported in media and widely debated in public.

[28] The task assignment of the General reporters is fairly similar to the Politics and Law reporters, except that the former focuses more on exceptional events. It might be possible that reporters receive private benefits from governments or from interviewees who are involved in scandals. But these activities are regarded as serious journalism corruption and are risky for a reporter to undertake. Anecdotal evidence suggests that such misbehavior is unusual in leading Chinese newspapers, though it may be more common among reporters working for lower quality newspapers.

[29] The task assignment to a reporter usually stabilizes after a two or three year tenure in the Newspaper. For most reporters, their tasks are assigned before the sample year.

nomic and Business, Education and Health, Politics and Law, and General Reports, with the control group unchanged. Table 5 presents the results. As expected, the Economic and Business reporters improve their performance substantially, about 20% in quantity and 35% in quality after the reform. The Education and Health reporters improve their quantity score by more than 12% and the quality scores by more than 28%, although the effect on quantity is insignificant. On the contrary, the reporters in Politics and Law respond negatively to the organizational reform, although the effect is not statistically significant in the presence of individual fixed effects. The effect on the General reporters' quality score is positive, but economically modest and statistically insignificant; the notable decline in their quantity score may result from the increases in the quantity score of their colleagues in Economic and Business and Education and Health, whose increased publications crowd out the General reporters'. Note that the pattern of negative selection found in the average treatment effect is also present within each division except for General Reports, and is most pronounced in Politics and Law, which experiences the largest exits and entries.

5.2.2 Private Benefits Condoned by Social Norms

In China, the Spring Festival (the Chinese New Year) and the Mid-Autumn Festival (also the mid financial year for companies) are two special time periods, in which Chinese people conventionally seize opportunities to exchange "hongbao", establish social connections, and expand business networks. Therefore, social norms condone rent seeking behavior in these periods. Anecdotal evidence suggests that the restriction of reporters' private activities is much more relaxed than usual, and some editors may also be involved in pursuing private benefits. Moreover, the chief editors are usually overloaded as they are engaged in numerous external activities in the local Party and government, in addition to the management of internal activities. As a result, one should expect little impact of the organizational reform in these periods, if effort directing is the mechanism underlying the reporters' response.

The Spring Festival is often in late January and sometimes in early February, and the Mid-Autumn Festival is usually in September and occasionally in early October.[30] Private activities are likely to take place a few weeks before the festivals. Therefore I construct a "special months" dummy equal to one for January and September, and zero for all the other months. Table 6 reports the regressions, in which I add to the baseline estimation specified in (5) an additional interaction between reform_treatment and the dummy of "special months." This triple difference estimation shows that the effect of centralizing authority on the quality score is a 16.5% reduction in the special months, relative to the effect in the normal months, which is a 22% increase. The F-test cannot reject that the sum of these two coefficients equals to zero, and supports that the effect of centralizing authority in the special months is negligible. The impact on the quantity score is insignificant in either the special or the normal

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[30]The Spring Festivals in 2004, 2005 and 2006 are 22nd January, 9th February and 29th January respectively, and the Mid-Autumn Festivals are 28th September, 18th September and 6th October respectively.

months, suggesting that the result is more likely to be driven by the reporter's adjustment of efforts, instead of changes in the volume of the Newspaper and editorial policies during these special periods. The above results are robust if February and October are included in the "special months" to consider the lasting influence of social norms.

5.3 Estimates of Individual Fixed Effects

To complement the above evidence, I estimate the effects of centralizing authority for each individual reporter using the following panel data specification,

$$Log(P_{it}) = \alpha_t + \sum_i D_i[\lambda_i^{before}(1 - R_t) + \lambda_i^{after}R_t] + X_{it}\beta + \varepsilon_{it}, \tag{6}$$

where D_i equals one for worker i, and zero otherwise, and all the other variables are defined as in equation (5). λ_i^{before} and λ_i^{after} are the estimates of the fixed effects for each individual before and after the reform respectively. I refer to the individual fixed effects from the regression of the log quantity score as quantity residuals, and the ones from the regression of the log quality score as quality residuals. Since the regressions control for variables that measure time-variant experience and expertise, these residuals, to some extent, capture the unobservable individual incentives.

5.3.1 Effect of Treatment on Distribution

To show the impact of centralizing authority on the distribution of the reporters' response, I plot the kernel density of the estimated individual fixed effects in Figure 4, using the balanced panel that only includes those reporters who appear during the whole sample period and do not switch (66 stayers in the treatment and 47 in the control). Panel A shows that in the treatment group, the distribution of the quality residuals after the reform shift to the right of that before the reform, and the p-value of the Kolmogorov-Smirnov test for the null of equality of distributions is 0.001. However, such a pattern is not observed in the control group, in which the Kolmogorov-Smirnov test does not reject that the two distributions of the quality residuals are equal. Given that the stayers are mostly experienced reporters even before the sample period, the changes in the quality residuals are more likely to reflect improvement of the reporters' production incentives instead of their ability. Moreover, the distribution of the quality residuals in the treatment becomes more concentrated around a higher value after the reform. This is consistent with the intuition that centralizing authority restricts the reporters' pursuit of private benefits and thus homogenizes their incentives.

Panel B shows that the distributions of the quantity residuals before and after the reform are statistically different in the treatment group, but not so in the control group. Interestingly, in the treatment group, the distribution of the quantity residuals shifts to the left after the reform, as opposed to the change in the distribution of the quality residuals. This contrasting result suggests that a reporter's quality-enhancing effort may substitute his quantity-

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enhancing effort. Overall, the results of the stayers' individual fixed effects are in line with the previous estimates of the average treatment effects, and confirm that the organizational reform improves the reporters' production initiative.

5.3.2 Selection Pattern

As noted, the effect of centralizing authority on the quality measure decreases from about 20% to less than 7% when the individual fixed effects are excluded, probably because of the exits and entries of reporters in both the treatment and the control. To examine the selection pattern, Table 7 compares the estimated individual fixed effects of the exits, the stayers and the entries.[31] In Panel A, the after-before reform difference in the quality residuals of the stayers in the treatment group is significantly greater than that in the control group. However, the difference in the quality residuals of the entries and the exits in the treatment group is much smaller than that in the control group, and thus offsets the positive effect of centralizing authority on the stayers, causing the negative selection in the regression results in Table 3. Panel B finds a similar pattern in the comparison of quantity residuals.

Since the individual fixed effects, particularly the quality residuals, are highly correlated before and after the reform, I compare the individual effects between the exits and the stayers before the reform to infer their differences in unobservable individual characteristics such as incentives and ability. Table 7 shows that both the quantity and quality residuals of the exits are remarkably lower than those of the stayers in the treatment group.[32] In contrast, in the control group, the average quantity residual of the exits is larger than that of the stayers before the reform, and the difference in the quality residuals is small. These results suggest that the preferences of the exits may be less aligned with the Newspaper's interests than those of the stayers. Then, I compare the entries and the stayers after the reform. Not surprisingly, the quality residuals of the entries in the treatment group are of similar magnitude to their counterparts in the control group, because the new recruits usually rotate their task assignment in a few divisions in the two years. In the treatment group, the entries' quality residuals are very similar to the stayers', while in the control group, the entries' quality residuals are substantially larger than the stayers'. The quantity residuals also display the same pattern. These results suggest that the entries have higher interest alignment with the Newspaper than the exits. To summarize, the findings in Table 7 support the participation view of authority (Proposition 3), which implies that transferring authority from the middle to

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[31]In the reported results, I define exits as the reporters whose performance is only observed before the reform, and entris as the ones whose performance is only observed after the reform. I also estimate the effects using other samples, in which I include the ones whose observations are absent three months after the reform in the exit group and those who enter the Newspaper three months before the reform in the entry group, but exclude those whose observations are absent a long period before the reform. I also use the personnel information to construct another exit and entry sample. All the results are qualitatively the same.

[32]In the regression of the quantity residuals on a dummy that equals one for exits and zero for stayers in the treatment group before the reform, the coefficient is -.562 with a bootstrapped standard error .291. In the similar regression of the quality residuals, the coefficient is -.544 with a bootstrapped standard error .403.

the top hinders the participation of the reporters with larger private benefits and/or stronger decision bias, but facilitates the participation of the ones whose interests are more aligned with the Newspaper's preferences.

6   More Evidence on Mechanism

According to the theory, centralizing authority may improve a reporter's initiative and performance through two channels: the effort-directing effect through better control of the reporters' pursuit of private benefits, and the initiative substitution between the middle managers and the reporters. The results presented above have indicated the effort-directing channel. This section presents evidence to strengthen this argument and examine the other channel, using the external performance measures, which capture more directly the reporters' incentives and convey information on the division editors's initiative. I will also provide further evidence to discriminate between a number of alternative explanations.

6.1   Effects on External Performance Measures

As the external performance measures only apply to the treatment group due to the incompatibility in measuring different journalism between the treatment and the control, I will estimate the following specification:

$$EP_{it} = \alpha_m + \gamma_y + \lambda_i + \theta R_t + X_{it}\beta + \varepsilon_{it}. \tag{7}$$

The dependent variable EP_{it} is an external measure of monthly individual performance without taking logarithm. Since a set of $year \times month$ dummies are collinear with the reform dummy, I only include the month dummies α_m to control for seasonality, and the year dummies γ_y to control for business cycles over years. λ_i is individual fixed effects, R_t the reform dummy, and X_{it} the time-variant covariables, all defined as before. The absence of a control group is less of a concern than when the dependent variables are the internal measures, because the external measures mainly capture the subjects of news content and are less sensitive to changes in evaluation. Table 8 reports the estimates.

6.1.1   Trade-off between Production Initiative and Private Benefits

Panel A of Table 8 presents the impact of the organizational reform on news content. The effects on the measures of journalistic activities are positive and statistically significant. In particular, the number of investigative reports increases by .325 standard deviations, and the number of feature stories increases by .247 standard deviations, both at the 1% significance level. At the same time, the organizational reform reduces the number of advertising articles by .411 standard deviations, and the result is statistically significant at the 1% level. Consistently, the number of articles with the external authors from private sectors, which

may indicate a reporter's opportunities to attain private benefits, decreases after the reform. These findings demonstrate a substitution between the reporters' journalistic initiative and their attainment of private benefits, confirming the effort-directing effect.

The effects of centralizing authority on the number of propaganda articles and the number of reports about government officials are positive, but small and statistically insignificant. These findings rule out the potential confounding factor that the governments, for the purpose of ideological control, influence the Newspaper to increase these two types of articles. The effects on the other measures of news content are negligible and insignificant.

6.1.2 Initiative of Division Editors

Panel B of Table 8 reports the estimates of the reform on the external measures of editorial decisions. Centralizing authority reduces the number of articles "joint with editor", the most robust proxy for the division editors' initiative, by 0.162 standard deviations and in a statistically significant way. The effects on the number of "column by content" articles and the number of articles jointly with freelance external authors, whom the managing editors contact directly, are all negative, though statistically insignificant. This evidence, together with the results in Panel A that centralizing authority improves the reporters' journalistic initiative, indicates the existence of initiative substitution between the reporters and the division editors.

6.1.3 Heterogenous Treatment Effects

Panel C of Table 8 reports selective results from the regressions that split the treatment group into the four divisions as before. The trade-off between the reporters' journalistic initiative (measured by the number of investigative reports and feature stories) and their attainment of private benefits (measured by advertising articles) only appears in two divisions: Economic and Business and Education and Health, in which the quality score increases substantially after the reform, as shown in Table 5. The pattern is most pronounced for the Economic and Business reporters, who also experiences the largest improvement in their performance.

With regard to the effect on the division editors' initiative, centralizing authority reduces the number of "joint with editor" articles in Education and Health, suggesting that the improvement in the reporters' production initiative after the reform is partially driven by the depression of the division editors' initiative, which amplifies the effort-directing effect. However, such an initiative substitution effect is muted in the Economic and Business division, possibly because the division editors in this division may also have notable access to private benefits, and centralizing authority directs their efforts to production initiative as well. This result is consistent with Proposition 2, which posits that the effort-directing effect on the worker is reinforced by that on the manager. The effects on the General reporters are qualitatively similar to those on the Education and Health reporters, but most estimates are statistically insignificant.

The negative impact of centralizing authority on the division managers' initiative is most pronounced in the Politics and Law division: the number of "joint with editor" articles declines substantially after the reform. This is not surprising, as the coverage of politics and law news often involves anticipated events and public information, and the division editors play a more important role in the initiation of reports. Interestingly, the depression of the division editors' initiative does not promote the reporters' production incentives: centralizing authority reduces the number of investigative reports. These results are consistent with the previous argument that the Politics and Law reporters have much more limited access to private benefits. They are suggestive evidence against Case 1 (biased manager and distracted worker), but in favor of Case 3 (biased manager and biased worker), in Proposition 1.

I also examine the effects on the external measures in the special months, in which social norms condone the attainment of private benefits. (Results are reported in Table A6 in the appendix.) Consistent with the previous findings, the increase in the number of articles that represent journalistic initiative in these special months is substantially smaller than in other months, whereas the effect on the number of advertising articles is positive. Notably, the negative effect on the number of articles, initiated by the division editors (the sum of "joint with editor" and "column by content" articles), is significantly alleviated in the special months, confirming that the chief editors fail to intervene effectively in the special months.

6.2 Alternative Explanations

This subsection examines a number of alternative explanations. All the related empirical results are collected in the appendix.

6.2.1 Manipulation of the Evaluation System

The positive effects of centralizing authority on the reporters' quality performance could be spurious if the chief editors manipulate the evaluation system to inflate the quality score for the reporters in the treatment group. I examine this possibility by testing the stability of the correlation between the quality measure and the external measures of news content before and after the reform. Specifically, I regress the quality score on the measures of news content and their interactions with the reform dummy, controlling for measures of editorial decisions that affect the assignment of scores. None of the interactions between news content and the reform dummy is statistically significant. This result strongly supports the stability of the Newspaper's evaluation system over the sample period, and rules out the possibility that the increase in the quality score is caused by a relaxation in the evaluation. In fact, evaluation for some types of journalism may become tighter after the reform, as the coefficients of the interaction terms between reform and the number of investigative, feature and propaganda reports are negative, though statistically insignificant. A tighter evaluation explains why the external measures of the reporters' journalistic initiative increase substantially after the reform, but their quality scores do not in the absence of the control group.

6.2.2 Changes in Editorial Policies

One potential concern is that the Newspaper may change its editorial policies after the reform, either because the reform is in part intended to or because the Newspaper takes the opportunity to grow certain sections (e.g. Economic and Business, and Education and Health), or to encourage certain types of reports (e.g. investigative reports and feature stories). This explanation is unlikely for the following reasons. First, the data show that there is no differentiated trend in the performance between each treated division and the control group before the reform. Second, a change in editorial policies is likely to be associated with a change in the quality evaluation system, which serves as the basis for pay and promotion for reporters. As I have shown, the Newspaper's evaluation of quality score remains stable before and after the organizational reform. Third, an effective change in editorial policies in favor of certain divisions often requires reallocation of resources, in particular human capital. However, the distribution of the number of division editors and reporters across divisions hardly changes over time.[33] The number of supporting staff such as copy-editors and proofreaders remains the same for each division.[34]

6.2.3 The Role of the New Chief Editor

If the appointment of the new chief editor causes systematic bias towards the treatment group after the reform, then the D-I-D estimate will capture this bias. To evaluate this potential confounding factor, I conduct a placebo test, using the fact that the appointment was in June 2005, and the reform took place in September 2005. Specifically I include in the baseline regression (5) a dummy that equals one if a reporter is observed after the appointment of the new chief editor and in the treatment group. As shown in Table A8, the difference-in-differences estimation of the impact of the appointment on the treated reporters is negligible in both the quantity and quality scores, conditional on the impact of the true reform.

Consistent with this result, several institutional features suggest that the new chief editor is unlikely to have the leadership quality or the mission to reform the Newspaper. He is the only replacement among nine chief editors, among whom the chairman has the largest influence on the Newspaper. He is appointed by the government, whose primary concern is to fill in the position, rather than being selected by the Newspaper from the market. He lacks journalism expertise and is regarded as "a transitional guy."[35]

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[33] Interestingly, I find a slight decline after the reform in the number of reporters allocated to the Education and Health division, whose reporters improve their quality score significantly, but a slight increase in the number of reporters allocated to the General Report division, whose quality performance experiences little change.

[34] In terms of other resources such as information technology and financial budget, every division in the Newspaper used the same information and computer technology; in the conversations with many reporters, none of them complained that financial budget was a major concern for their journalistic activities.

[35] The personal profile of this new chief editor shows that he had no working experience in journalism at all before he joined the Newspaper, and he stepped down from the Newspaper after two years.

6.2.4 Contributions of Division Editors

I have focused on the project selection function of the division editors. But some senior division editors, as middle managers, may also play other roles, such as instruction and supervision of how to implement projects. If the organizational reform systematically affects the division editors in these dimensions, the previous estimates are potentially biased.

Changes in the composition. Even though the division editors' initiative is reduced after the reform, a more able editorial team may improve the reporters' performance through better instruction and editing, which may not be purged from the quality score. An examination of the composition of the division editors limits the possibility of this explanation. First, the division directors, who among the division editors have the largest influence on the reporters' performance, remain the same people. Second, there are 18 turnovers (including exits and entries) among 56 division editors during the sample period, with 12 in the treatment and 6 in the control. However, the turnovers mostly take place among junior editors who have a limited impact on the reporters, and their personnel characteristics, including education, working experience and expertise, are fairly similar. Third, the Economic and Business division, on which the organizational reform has a largest impact, experiences the smallest turnover of division editors.

Improvement in implementing projects. When the division editors lose their initiative to acquire information, they may divert their attention to implementing projects. For instance, a division editor may spend more effort revising and editing a reporter's articles to improve their readability and style, which may contribute to the reporter's quality score. Insider insights from the Newspaper suggest that the help from the division editors is far more important for junior reporters who have yet to accumulate sufficient firm specific expertise. Therefore, I estimate the effects of centralizing authority on the junior reporters who have working experience equal to or fewer than 3 years in the Newspaper (Table A7).[36] Relative to the impact on the more senior, the effects on the junior's quantity and quality scores are significantly negative in the treatment group, whereas such differences in the control group are not obvious. Moreover the negative effect of centralizing authority on the number of articles "joint with editors" and "column by content" is particularly strong for the junior reporters. These findings show that the reporters may learn more slowly or receive less support from the division editors after the reform — a result that goes against the explanation that centralizing authority improves implementation.

6.2.5 Improvement in Coordination

One important aspect of authority is to provide coordination. In the context of the Newspaper, centralizing authority may allow for more concentrated information processing, and improve the coordination between the division editors and the reporters or the coordination

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[36]Most interviewees agree that it takes usually 2 to 3 years to acquire the newspaper specific expertise to cover news efficiently and write well.

between the reporters. For example, a chief editor, after gathering relevant information, can better coordinate reporters across different divisions to cover an event.

However, empirical evidence does not support the hypothesis that coordination is improved in the Newspaper after the organizational reform. The measure of the division editors' initiative, to some extent, captures their coordination activities, because a division editor is most likely to publish their names together with reporters when they organize the coverage of a news event that requires more than one reporter and take the responsibility of coordination. I have shown that this measure significantly declines after the organizational reform. Another measure of coordination is internal coauthorship. Since the sharing rule reduces the performance pay for a report with internal coauthors, the reporters have a tendency to avoid coauthorship if their journalistic activities are not strongly complementary to each other and not coordinated by their superiors. Coordination is particularly important for cooperation across divisions. The last column in Panel B of Table 8 shows that the number of articles with internal coauthorship across divisions declines, though statistically insignificant. Interestingly, centralizing authority significantly increases the number of articles that reporters coauthor within the same division. This is mainly driven by the Politics and Law division, in which the initiative of the division editors declines dramatically after the reform and the reporters may cooperate to compensate the depressed initiative of their superiors.

6.2.6 Improvement in Soft Environment

Research on social psychology of organization suggests that redistributing authority inside an organization may change the working environment, such as corporate culture, morale, workers' intrinsic motivation, peer pressure and other soft factors. It is not evident that the organizational reform affects the working environment in the treated divisions in a systematically different way than in the control divisions within the same newspaper. Moreover, this explanation cannot rationalize the heterogenous treatment effects in the various dimensions such as across divisions, across months (when social norms condone rent seeking behavior), and along seniority. Finally, this argument cannot explain the opposite impact of the organizational reform on the reporters and on the division editors.

7 Conclusions

This paper has presented coherent evidence of the impact of organizational structure, determined by the distribution of formal authority, on workers' incentives and performance in a Chinese newspaper. The accidental organizational reform in some divisions of the Newspaper provides an unusual chance to estimate causal effects. The detailed personnel data, combined with institutional information, allow me to make a dialogue between theory and empirics.

The research studies a specific Chinese newspaper, which certainly limits its external validity. However, the Newspaper is largely a profit maximizer, and its employees are regular

industrial workers. The organizational structure and agency problems in the Newspaper are common in the commercial Chinese newspapers and in the mainstream Western media.[37] More importantly, the essential features of the empirical setting, the multi-tasking problem and decision bias, are pervasive in a large number of organizations, in which the production involves intensive human capital and information asymmetry. For instance, moral hazard is a big concern for loan officers and fund managers; conflicts in decision making are common in R&D activities; many university professors have a side job that detract them from research and teaching. Therefore the empirical results have broad implications for understanding the role of authority inside organizations. Three results are most relevant for general implications.

First of all, the empirical findings illustrate the importance of authority in the provision of incentives inside the firm. Despite the high-powered incentive scheme used for the reporters, centralizing authority still has a significant impact on the alleviation of their opportunistic behavior. This highlights one essential function of authority: when an ex ante contract, most notably a wage scheme, is limited to motivate workers, the allocation of authority that allows a superior to intervene in a subordinates's actions and decisions can effectively affect workers' incentives to achieve better control – resolving the multi-tasking agency problem in this case.

Second, the main results support the incentive view of authority, in which agents strategically optimize their effort allocation in response to a given distribution of formal authority, and thus the preference alignment between the principal and the agent underlies the impact of authority on incentives. As supported by strong evidence, the reporters direct their efforts from private to production activities when authority is transferred from the middle to the top. This effort-directing effect takes place because the chief editors whose preferences are more aligned with the Newspaper than the division editors have a stronger incentive to monitor the reporters' opportunistic behavior.[38] If the chief editors' interest is distorted, the organizational reform, triggered by an exogenous force, may not become a sustainable commitment to enhance monitoring. On the other hand, if the Newspaper is able to motivate the division editors through high-powered incentive pay or other means, the distribution of authority would not matter. Several pieces of evidence show that centralizing authority depresses the division editors' initiative. The opposite impact of centralizing authority on the reporters and on the division editors reflects a general real world situation, in which a middle manager's interest alignment with the organization tends to lie in between her superior's and her subordinate's. A middle manager is not as motivated as a top manager (or even a principal) to monitor workers' opportunistic behavior and is likely to disagree with her superior in decision making, but she is less likely to distort her actions to pursue private benefits at

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[37]DuBick (1978) and Carter (1984) provide a detailed description of the organizational structure in the US media. Herman and Chomsky (1998) discuss the impact of organizational structure on media performance. Baron (2005) provides anecdotal evidence of the interest conflicts between journalists and the media and how they affect media bias.

[38]Recall the fact that the chief editors receive a pay tied to the profitability of the Newspaper and design the evaluation system, while the division editors receive a flat wage with a small team bonus that has no direct relevance to the evaluation system.

the cost of the organization. It should be noted that neither the effort-directing effect on the reporters nor the initiative-depressing effect on the division editors per se hinges on the three-layer hierarchical structure. The presence of both effects raises subtle issues concerning the provision of incentives in a multiple layer hierarchy.

Finally, the suggestive evidence that centralizing authority induces reporters with less aligned interest to exit sheds light on the participation view of authority. This partially explains the Newspaper's adoption of the decentralized structure and more generally the prevalence of condoning private benefits in organizations. The magnitude of selection depends on the rigidity of the compensation scheme and the mobility of labor market. I expect to find a stronger selection effect if the labor market of Chinese journalists is more competitive. The adjustment at the extensive margin, in addition to that at the intensive margin, reveals further benefits and costs associated with an organizational change, as also emphasized in the recent studies of personnel economics (e.g., Lazear 2000; Bandiera et al 2007).

Although being able to cast clear light on the underlying mechanism, this paper is limited in welfare analysis as most studies using personnel data. Transferring authority from the middle to the top in the Chinese newspaper overall improves the quality of its news content, which may attract a larger readership and more advertising revenues.[39] However, the costs associated with this reform are largely unobservable, and the profitability of the Newspaper may not necessarily increase. I am attempting to collect data from a number of Chinese newspapers and to investigate the impact of organizational strategies on firm performance in greater detail.

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[39] The circulation number and advertising revenues are somehow top secrets in the Chinese media. With limited information, I find that the Newspaper announces higher advertising prices after the reform, which indicates that the quality of the Newspaper may improve.

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Figure 1: Organizational Structure and Allocation of Formal Authority

Panel A: Authority Delegated to the Middle (Division Editors)

Panel B: Authority Retained at the Top (Chief Editors)
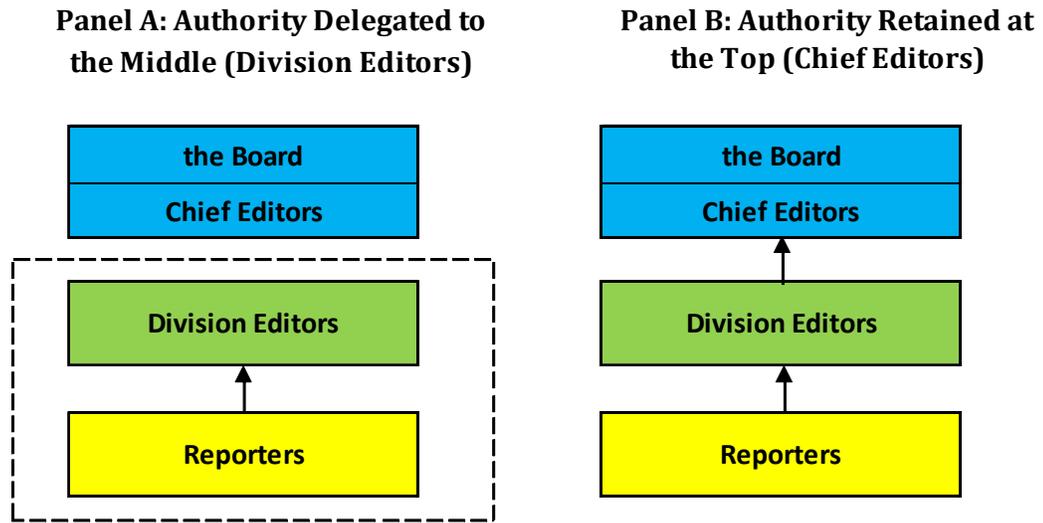
Notes: The hierarchy of the Newspaper is determined by the allocation of the formal authority of ratifying editorial decisions and monitoring editorial activities. The chief editors, representing the Board, are at the top, the division editors (managing editors in each division) are middle managers, and the reporters are at the bottom. The Newspaper experienced an organizational reform from delegating authority to the middle (Panel A) to retaining authority at the top (Panel B).

Figure 2: Timing of the Game

T_0	T_1	T_2	T_3
Contract on organizatioal structure	Agents acquire information.	Agents initiate projects. Under M-Authority, the manager ratifies proposals. and makes decisions. Under T-Authority, the principal monitors, ratifies proposals and makes decisions.	Implement selected projects
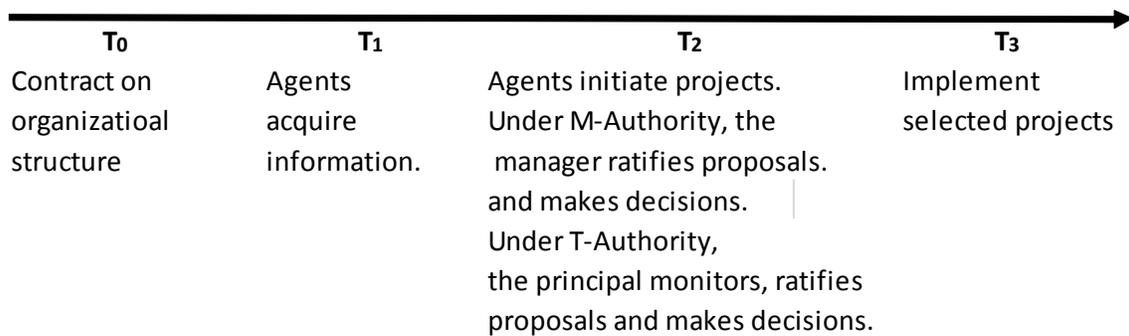
Figure 3: Comparison in Performance between Treatment and Control

Panel A: Log Quantity Score
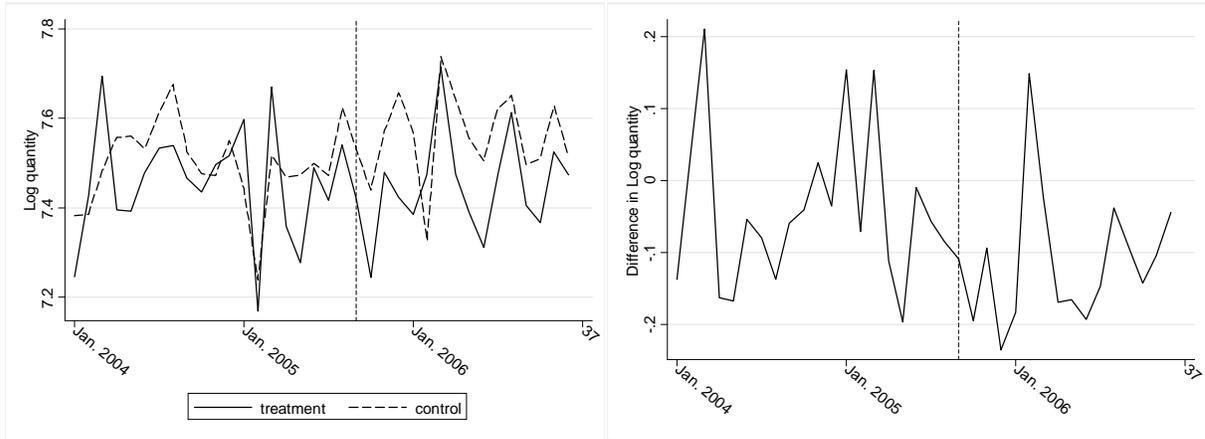
Panel B: Log Quality Score
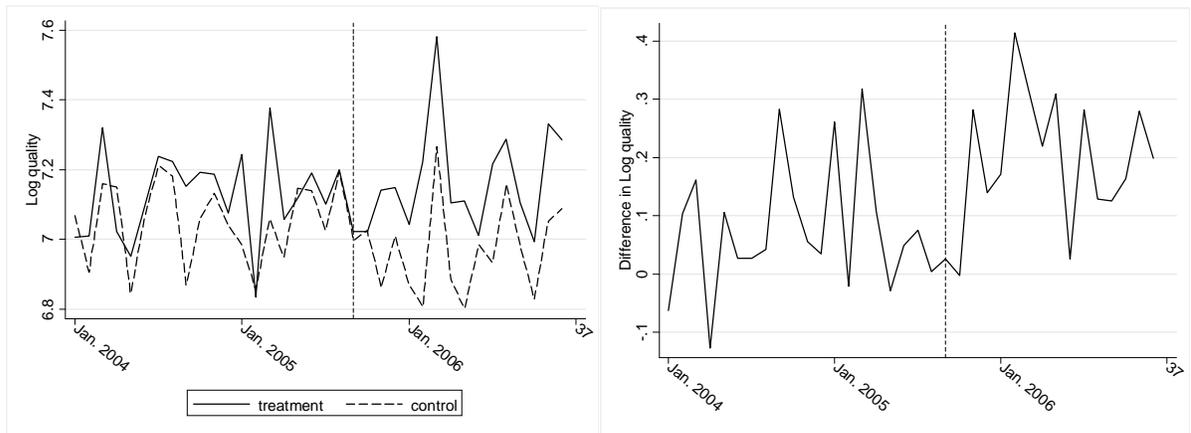
Notes: Panel A (and B) plots the average of the logarithm of the monthly quantity (and quality) score for the treatment and the control respectively from January 2004 to December 2006 (left panels) and the difference of the log quantity (quality) between these two groups (right panels). The vertical dotted line indicates the timing of reform: September 2005. Treatment is the reporters from the divisions that transferred authority from the middle to the top: Economic and Business, Politics and Law, Education and Health and General Reports. Control is the reporters from the divisions that remained decentralized: Regional and Local News, Entertainment, Consumption-guide and Photographing.

Figure 4: Kernel Density of Estimated Individual Fixed Effects under the Two Organizational Forms

Panel A: Quality Residuals
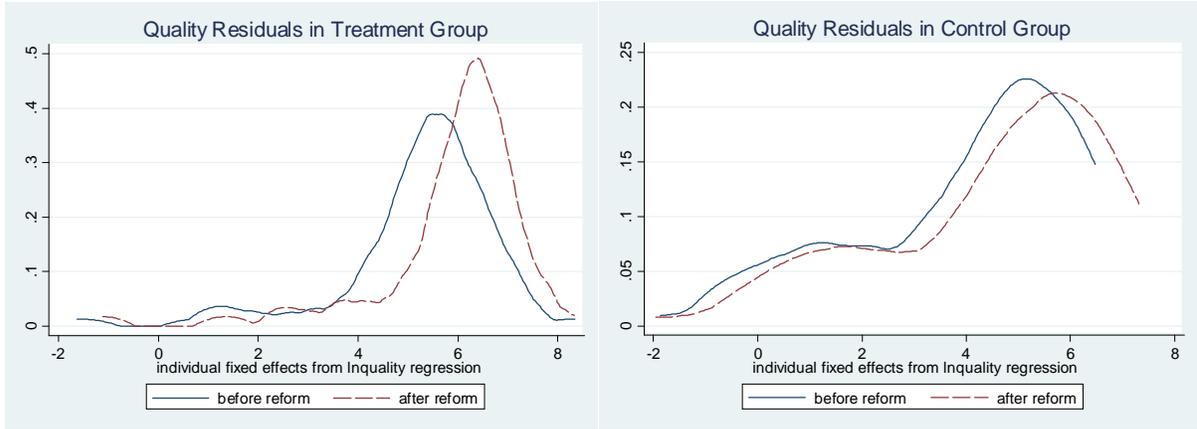
P-value of K-S Test: 0.001   *P-value of K-S Test: 0.177*

Panel B: Quantity Residuals
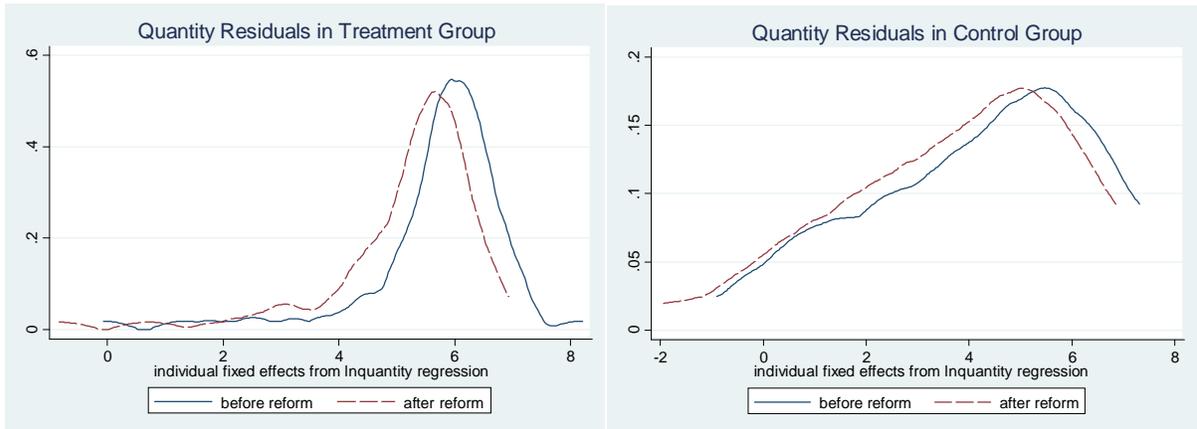
P-value of K-S Test: 0.001   *P-value of K-S Test: 0.595*

Notes: The sample used is a balanced panel, including only the reporters observed before and after the reform and excluding the 6 reporters who switch between the treatment and the control. Reform is the timing dummy equal to one after (including) September 2005. Treatment is a dummy for the reporters from the reformed divisions: Economic and Business, Politics and Law, Education and Health, and General Reports. Control indicates the reporters from the divisions that remained decentralized. The individual fixed effects are retrieved from running a regression of the log quantity score or the log quality score on the individual dummies and their interactions with the reform dummy, controlling for time dummies, division fixed effects, age-square, tenure-square, positions and qualifications as in the baseline regression. The kernel density uses the Epanechnikov kernel. The P-values of K-S test are the corrected P-values of the combined Kolmogorov–Smirnov tests of equality of distributions reported in Stata.

Table 1: Summary Statistics of Personnel Data

Panel A: Reporters

variables	gender (male)	education (college)	Party member	age	tenure	position (1-2-3)	qualification (1-2-3)
mean	0.60	0.83	0.47	32.80	8.20	1.50	1.47
min	0.00	0.00	0.00	22.00	1.00	1.00	1.00
max	1.00	1.00	1.00	57.00	27.00	3.00	3.00

Panel B: Division Editors

variables	gender (male)	education (college)	Party member	age	tenure	position (1-2-3)	qualification (1-2-3)
mean	0.57	0.73	0.49	38.30	13.30	2.20	2.20
min	0.00	0.00	0.00	25.00	2.00	1.00	1.00
max	1.00	1.00	1.00	54.00	27.00	3.00	3.00

Notes: These tables summarize personnel information of 183 reporters and 56 division editors in the sample from January of 2004 to December of 2006. The means of the reporters' personal characteristics are weighted by monthly observations; the means of the division editors' personal characteristics are weighted by yearly observations. Party_member is a dummy indicating the membership of the Chinese Communist Party. Tenure is the number of years of working experience in the Newspaper. Position is an indicator ranking from 1 to 3, representing reporter, chief reporter and senior reporter respectively in the hierarchy of the Newspaper. Qualification is a certificate authorized by the Association of Chinese Journalists to indicate the expertise and experience in journalism, with 1 referring to assistant journalist, 2 to journalist and 3 to senior journalist.

Table 2: Summary Statistics of Individual Performance Measures

Panel A: Internal Measures

variables	mean	std dev	median	min	max
#articles	32.60	21.50	28.00	2.00	241.00
#words	18,434	13,223	16,188	230	144,280
quantity score	2,080	1,273	1805	140	14,850
quality score	1,477	1,097	1,200	0	12,300

number of reporters: 183; number of observations: 4,461

Panel B: External Outcome Measures

variables	mean	std dev	median	min	max
measures of news content					
# investigative reports	1.42	1.62	1.00	0.00	19.00
# feature stories	1.00	1.35	1.00	0.00	11.00
# special reports	4.88	8.19	3.00	0.00	136.00
# propaganda articles	0.32	0.90	0.00	0.00	14.00
# reports on government officials	3.89	5.08	2.00	0.00	33.00
# advertising articles	0.51	1.16	0.00	0.00	11.00
# sensational/entertaining	1.14	2.60	0.00	0.00	24.00
# on-the-scene reports	0.71	1.41	0.00	0.00	10.00
measures of editorial activities					
# articles joint with editor	0.98	1.96	0.00	0.00	27.00
# articles column by content	1.27	3.01	0.00	0.00	29.00
# external author (government)	8.84	9.63	6.00	0.00	79.00
# external author (private sector)	0.53	1.82	0.00	0.00	23.00
# external author (freelance)	0.49	1.34	0.00	0.00	15.00
# coauthor (within division)	3.75	9.16	2.00	0.00	164.00
# coauthor (across division)	0.68	6.20	0.00	0.00	160.00

number of reporters: 103; number of observations: 2,446

Notes: Observations are at the individual-month level. Observations in Panel A include the reporters in all the divisions. Observations in Panel B only include the reporters in the reformed divisions, namely, Economic and Business, Politics and Law, Education and Health, and General Reports.

Table 3: Reporter Performance in Balanced Panel by Treatment and Reform

Panel A: Average Log Quantity Score

	treatment group	control group	difference (treatment-control)
before reform	7.504	7.524	-0.020
	(0.508)	(0.549)	(0.076)
after reform	7.513	7.516	-0.003
	(0.556)	(0.481)	(0.077)
difference	0.009	-0.008	0.017
(after-before)	(0.047)	(0.053)	(0.070)

Panel B: Average Log Quality Score

	treatment group	control group	difference (treatment-control)
before reform	7.199	7.155	0.044
	(0.598)	(0.647)	(0.077)
after reform	7.235	7.040	0.195**
	(0.610)	(0.727)	(0.092)
difference	0.036	-0.114*	0.151**
(after-before)	(0.043)	(0.062)	(0.075)

 Notes: The tables report the mean and standard deviations (in parentheses) of the reporters' performance in terms of the logarithm of the quantity and quality scores at the individual-month level in the constructed balanced panel, which includes only the reporters who are observed both before and after the reform and excludes 6 reporters who switch between treatment and control. Reform is the timing of the organizational change. The treatment group is the reporters from the reformed divisions: Economic and Business, Politics and Law, Education and Health, and General Reports; the control group is the reporters from the remaining decentralized divisions: Regional and Local News, Entertainment, Consumption-guide, and Photographing. The standard errors on the difference and the difference-in-differences are estimated from running the corresponding OLS regression, clustering the standard errors by individual. *** denotes significance at 1%, ** at 5%, and * at 10%.

Table 4: D-I-D Estimates of Average Treatment Effects of Centralizing Authority on the Internal Performance Measures

Panel A: Baseline Results

	log quantity score				log quality score			
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
reform× treatment	0.054	0.052	0.053	-0.066	0.207***	0.205***	0.194**	0.061
	(0.074)	(0.074)	(0.067)	(0.066)	(0.072)	(0.073)	(0.076)	(0.070)
reform	-0.040				-0.152			
	(0.052)				(0.057)			
individual fixed effects	yes	yes	yes		yes	yes	yes	
time fixed effects		yes	yes	yes		yes	yes	yes
time-variant covariates			yes	yes			yes	yes
#observations	4,461	4,461	4,461	4,461	4,442	4,442	4,442	4,442
adj-R²	0.489	0.518	0.542	0.278	0.372	0.402	0.404	0.206

Panel B: Dynamics

	July 2005	August 2005	**Reform Start**	October 2005	November 2005	December 2005	Jan-06 onwards	#obs	adj-R²
log quantity	0.057	-0.006	-0.017	-0.031	0.075	-0.053	0.080	4,461	0.543
	(0.066)	(0.080)	(0.074)	(0.078)	(0.084)	(0.087)	(0.072)		
log quality	0.013	-0.068	0.050	-0.023	0.224*	0.103	0.229***	4,442	0.405
	(0.980)	(0.110)	(0.114)	(0.108)	(0.124)	(0.115)	(0.082)		

Notes: Reform is a timing dummy that equals one if an observation is in and after the month of the organizational change that transfers the authority from the middle to the top of the hierarchy. Treatment is a dummy for the reporters from the reformed divisions: Economic and Business, Education and Health, Politics and Law, and General Reports. The time-variant covariates include age-squared, tenure-squared, position, qualification, and division fixed effects. When a regression excludes individual fixed effects (Column [4] and [8]), time-invariant personal characteristics (gender, education and Party membership) and the factors that are collinear with individual and time fixed effects (age and tenure), are now included. The regressions in Panel B are based on the D-I-D specification including individual fixed effects, time fixed effects and time-variant personal characteristics, with the reform×treatment dummy replaced by a series of interactions between the timing dummies and the treatment dummy. In particular, "Reformstart" is a dummy for a reporter in the treatment group in the month of the reform (September 2005), "August2005" a dummy for a reporter in the treatment in August 2005, and "October2005" a dummy for a reporter in the treatment in October 2005. Similar definitions apply to "July2005", "November2005" and "December2005". "Jan-2006onwards" is a dummy for a treated reporter working from January 2006 and onwards. Standard errors (in parentheses) are clustered by individual. ***denotes significance at 1%, **at 5% and * at 10%.

Table 5: D-I-D Estimates of Heterogeneous Treatment Effects of Centralizing Authority on Internal Performance Measures across Task Assignment

	log quantity score				log quality score			
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
reform×	0.191***	0.192***	0.191***	0.120	0.350***	0.349***	0.345***	0.218**
Economic and Busines	(0.069)	(0.069)	(0.069)	(0.081)	(0.081)	(0.081)	(0.083)	(0.089)
reform×	0.142	0.139	0.120	0.005	0.293**	0.290**	0.278**	0.171
Education and Health	(0.121)	(0.122)	(0.125)	(0.117)	(0.129)	(0.129)	(0.134)	(0.118)
reform×	-0.062	-0.065	-0.031	-0.224**	-0.082	-0.087	-0.088	-0.277**
Politics and Law	(0.107)	(0.107)	(0.102)	(0.098)	(0.082)	(0.083)	(0.091)	(0.117)
reform×	-0.299**	-0.307**	-0.322**	-0.316***	0.056	0.062	0.038	0.086
General Reports	(0.140)	(0.140)	(0.134)	(0.085)	(0.120)	(0.120)	(0.122)	(0.082)
individual fixed effect	yes	yes	yes		yes	yes	yes	
time fixed effects		yes	yes	yes		yes	yes	yes
time-variant covariates			yes	yes			yes	yes
#observations	4,461	4,461	4,461	4,461	4,442	4,442	4,442	4,442
adj- R^2	0.515	0.545	0.552	0.293	0.380	0.410	0.411	0.218

Notes: The reported independent variables are interaction terms between division dummies and the reform dummy. The control group is the remaining decentralized divisions. Time-variant covariates include age-squared, tenure-squared, position, qualification and division fixed effects. When a regression excludes individual fixed effects (Column 4 and 8), time-invariant personal characteristics such as gender, education and Party membership and the factors that are collinear with individual and time fixed effects such as age and tenure are now included. Standard errors (in parentheses) are clustered by individual. ***denotes significance at 1%, **at 5% and * at 10%.

Table 6: Impact of Social Norms on the Effects of Centralizing Authority

	log (quantity score)	log (quality score)
reform × treatment	0.062	0.220***
	(0.068)	(0.079)
reform × treatment × special months	-0.058	-0.165**
(January and September)	(0.054)	(0.080)
p-value of F-test on zero sum of two coefficients	0.956	0.575
Covariates include individual fixed effects, time fixed effects and the time-variant individual characteristics.		
#observations	4,466	4,447
adj-R^2	0.543	0.405

Notes: Reform is the timing of the organizational change in September 2005. Special_months is a dummy for January and September, in which social norms condone rent seeking behavior. The standard errors (in parentheses) are clustered by individual. ***denotes significance at 1%, **at 5% and * at 10%.

Table 7: Comparison of Individual Fixed Effects: Exits, Stayers and Entries

Panel A: Quality Residuals

	treatment group			control group		
	exits	stayers	entries	exits	stayers	entries
before reform	4.067	4.611		3.442	3.550	
	(1.467)	(1.452)		(0.860)	(1.815)	
after reform		5.245	5.120		4.033	5.082
		(1.360)	(1.049)		(1.937)	(1.461)

Panel B: Quantity Residuals

	treatment group			control group		
	exits	stayers	entries	exits	stayers	entries
before reform	3.353	3.915		3.004	2.760	
	(1.129)	(0.831)		(1.166)	(1.506)	
after reform		3.357	3.231		2.248	3.465
		(0.853)	(0.679)		(1.495)	(1.480)

Notes: In the statistics of all the variables, the first line reports the mean values, and the second line reports the standard errors (in parentheses). Reform is the timing dummy equal to one after (including) September 2005. Treatment is the reporters from the divisions that transfer authority from the middle to the top: Economic and Business, Politics and Law, Education and Health and General Reports. Control is the reporters from the divisions that remained decentralized: Regional and Local News, Entertainment, Consumption-Guide and Photographing. The "quantity residuals" are individual fixed effects retrieved by running a regression of the log quantity score on the individual dummies and their interactions with the reform dummy, together with a bunch of controls including time dummies, division fixed effects, age-squared, tenure-squared, positions and qualifications in the unbalanced panel as in the baseline regression. The "quality residuals" are retrieved from a similar regression with the log quality score, instead of the log quantity score, as the dependent variable. In the regressions, the standard errors are clustered by individual. The stayers exclude 6 reporters who switch between the treatment and the control. The results are qualitatively similar when these observations are included.

Table 8: Effects of Centralizing Authority on News Content and Editorial Activities

Panel A: News Content

	reporters' initiative		private benefits		government influence	
	#investigative reports	#feature stories	#advertising articles	#external authors (private sector)	#propaganda	#government officials
reform	0.528***	0.332***	-0.479***	-0.189*	0.021	0.465
	(0.186)	(0.127)	(0.139)	(0.109)	(0.086)	(0.375)
#obs	2,446	2,446	2,446	2,446	2,446	2,446
adj-R²	0.224	0.238	0.535	0.707	0.191	0.655

Panel B: Editorial Activities

	initiative of division editors		external authors		internal co-authors	
	#joint with editors	#column by content	#freelance writers	#public sector	#within division	#across divisions
reform	-0.318*	-0.294	-0.065	0.605	2.180***	-0.569
	(0.185)	(0.279)	(0.176)	(0.666)	(0.633)	(0.558)
#obs	2,446	2,446	2,446	2,446	2,446	2,446
adj-R²	0.145	0.637	0.283	0.640	0.252	0.037

Panel C: Heterogenous Treatment Effects by Task Assignment

	Economic and Business	Education and Health	Politics and Law	General Reports
#investigative reports	0.847***	0.890**	-0.580	0.952
	(0.258)	(0.352)	(0.432)	(0.676)
#feature stories	0.213	1.020***	0.175	0.468
	(0.208)	(0.276)	(0.265)	(0.471)
#advertising articles	-1.050***	-0.206	0.035	-0.068
	(0.289)	(0.240)	(0.052)	(0.043)
#joint with editors	0.025	-0.354	-0.777*	-0.197
	(0.241)	(0.755)	(0.398)	(0.220)
#observations	1,019	345	628	454

Notes: All the regressions include individual fixed effects, time (month and year separately) fixed effects, time-variant individual characteristics defined as before. The standard errors (in parentheses) are clustered by individual. ***denotes significance at 1%, **at 5% and * at 10%.