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RESEARCH ARTICLE

Middle management involvement in resource allocation: The evolution of automated teller machines and bank branches in India

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***Research Summary*:** Managers at multiple levels of a firm influence resource allocation but most research focuses on senior rather than middle managers. We study involvement of middle managers in decision making, focusing on how rewards and controls shape resource allocation. We argue that higher income growth uncertainty (rewards) and lower monitoring (controls) increase resource allocation most strongly when middle managers are more involved in decisions. We test the arguments for ATM and bank branch allocations in Indian banks from 2011 to 2014. We assess causal mechanisms by comparing more and less favorable conditions for allocation, as well as considering a poststudy exogenous shock. The results suggest that the rewards and controls have different associations with resource allocation depending on the involvement of senior and middle managers.

***Managerial Summary*:** The study examines how rewards and controls shape resource allocation decisions by middle managers, focusing on rewards arising from uncertainty about employee income and controls based on monitoring. The work suggests that rewards and controls that influence resource allocation by one level of managers may have less effect for another level. Hence, a firm's plans for resource deployment need to include rewards and controls that are relevant for both senior and middle managers.

KEYWORDS
agency problems, incentives, middle managers, resource allocation, senior managers

1 | INTRODUCTION

A firm's rewards and controls shape resource allocation decisions by managers at multiple levels of the firm (Anand, 2004; Anand, Kim, & Lu, 2016; Maritan & Lee, 2017). Research argues that firms' rewards and controls need to align managerial and corporate incentives to allocate resources such as money and people, typically focusing on information asymmetry problems involving senior managers (Rajan & Reichelstein, 2004; Souder & Shaver, 2010; Wang, He, & Mahoney, 2009). Despite the importance of managers below senior levels (Burgelman, 1994; Noda & Bower, 1996; Wooldridge, Schmid, & Floyd, 2008), for whom information asymmetry problems may be even more acute, research has paid less attention to how rewards and controls affect resource allocation decisions involving middle managers. This paper argues that uncertainty of employee income and degree of monitoring, which are two aspects of a firm's rewards and controls, will have particularly strong impact on resource allocation decisions involving middle managers.

Along with environmental conditions that shape firms' resource allocation decisions (Lee & Parachuri, 2016; Sirmon, Hitt, & Ireland, 2007; Wu, 2013), the allocation process is crucially influenced by managerial agency. Allocation decisions are made by principals (e.g., headquarters staff), who depend on managers (agents) for information concerning dispersed resource requirements (Harris, Kriebel, & Raviv, 1982). Thus, managers have the ability to shape the allocation of resources that are relevant to their functions and careers. Managers may be motivated to provide information that improves their personal benefits. We consider how two firm-specific factors, uncertainty of employee income (Parker, Belghitar, & Barmby, 2005; Pistaferri, 2003) and degree of monitoring (Eisenhardt, 1985), affect the motivation and ability of managers to shape allocations. Our main argument is that the effects of these two factors are particularly strong when the resource allocation process requires greater involvement of middle managers.

The relevance of middle managers as decision makers has received some prior research attention. Institutional research on capability development has considered issues relevant to middle managers such as internal competition between teams (Taylor, 2010), social networks (Montealegre, 2002), and sequences of day-to-day activities (Salvato, 2009). The strategy process literature, meanwhile, highlights the importance of middle managers to resource allocation (Burgelman, 1996; Noda & Bower, 1996). However, there has been less attention devoted to understanding how managerial influence on resource allocation is affected by involvement of middle managers in the allocation process.

Information asymmetry commonly causes agency problems (Rajan & Reichelstein, 2004; Wooldridge et al., 2008). Importantly, greater involvement of middle managers (agents) in the allocation process increases information asymmetry in the allocation process because senior decision makers (principals) typically have limited information about activity conducted at lower levels of the organization. Thus, due to the higher information asymmetry, middle managers may possess greater ability to improve their personal rewards in the allocation process (Guth & MacMillan, 1986; Harris et al., 1982).

Managers gain personal benefits when resource allocation improves managerial visibility (Gerhart, Rynes, & Fulmer, 2009; Seibert, Kraimer, & Liden, 2001) but also does not, despite the visibility, threaten managers with personal losses if the allocation decisions fail to yield intended results. In the case of resources such as physical assets, poor allocation performance is often detected long after managers enjoy rewards and, moreover, it is difficult to attribute poor performance to individual managers; managers are likely to be motivated to provide information to decision makers to increase allocation of such resources. Since involvement of middle managers increases information asymmetry, we hypothesize that, the greater the involvement of middle managers in allocation, the more that allocation increases due to (i) higher uncertainty of employee income in a firm, (ii) lower degree of

monitoring in a firm, and (iii) conditions of higher uncertainty coupled with lower monitoring. The boundary conditions for our hypotheses are the availability of resources for allocation and reasonableness (face validity) of managers' allocation requests.

We test our arguments in the context of commercial banks in India, using a dataset that contains bank-level information on physical resources that differ in the involvement of middle managers. Banking in India has seen tremendous growth over the past decade and is set to expand further, with more than 600 million potential new customers. Banks need to invest in their infrastructure to support this potential growth; there is significant heterogeneity in the deployment of banking infrastructure across banks, which makes this setting ideal to test our arguments. We obtained data from regulated reports that banks need to submit to the banking regulator, the Reserve Bank of India (RBI). In our study, middle managers are involved to a greater extent for allocations of automated teller machines (ATMs) than they are for allocations of bank branches, which depend primarily on corporate executives. Despite extensive growth in IT-based bank services in India, both ATMs and branches remain key parts of banking services, with growth in such physical services being highly relevant parts of bank strategy and national goals for expansion of financial services.

The results show that income growth uncertainty (rewards) has a direct effect on differences in resource allocation decisions by senior and middle managers, while monitoring (control) has an effect in combination with rewards. The results are robust to multiple alternative specifications. Finally, a poststudy exogenous shock, the demonetization of Indian currency in late 2016, provides the basis for a difference-in-difference analysis that further demonstrates reliability.

This work contributes to the resource allocation literature, with implications for the strategic roles of middle managers. The paper shows that differences in allocation across firms reflect differences in internal rewards and controls within the firms. We show that the degree of involvement of middle managers in resource allocation influences the effects of rewards and controls. This insight adds a nuance to discussions of allocation by distinguishing resources that primarily involve senior managers from resources that have greater involvement of middle managers. More broadly, the paper joins strategy research that evaluates the role of managerial agency in shaping the use of resources within firms (Anand, 2004; Anand et al., 2016), highlighting agency issues arising due to middle managers.

2 | BACKGROUND

2.1 | Managerial benefits from resource allocation

Resource allocation within a firm can be conceptualized as a process in which a principal (for example, a senior leader in a firm's headquarters) procures information from managers (agents) and then allocates resources to these managers (Harris et al., 1982; Rajan & Reichelstein, 2004). Information asymmetry between the principal and managers can lead to agency problems. By shaping information provided to principals, managers can influence resource allocation decisions with an objective of improving their personal benefits.

Greater allocation of resources to activities that a manager is responsible for (for simplicity, we will refer to this as allocation to a manager) can, under some conditions, improve the manager's personal benefits. Allocation of resources to a manager can increase the manager's visibility within the firm. Visibility within the firm is important for a manager to be considered for rewards such as annual raises (Seibert et al., 2001), especially in situations where other managers compete for the rewards. Visible actions of a manager can be more easily measured and evaluated when considering rewards

such as raises (Gerhart et al., 2009). The flip side is that, while higher visibility may boost a manager's prospects of income growth, higher visibility may also increase the manager's risks of losses when allocation decisions lead to poor results for the firm. Therefore, the net benefits for managers will be higher when an increased allocation improves managerial visibility but also poses only limited risks of loss when allocations fail to yield intended results for the firm.

In the case of many resources, poor allocation performance is usually detected well after managers enjoy rewards; moreover, it is difficult to attribute poor performance to individuals. For example, in our empirical context, pay raises for managers are decided annually, but poor ATM performance, which occurs due to multiple reasons, cannot be ascertained until 18 to 24 months after ATM allocation. Therefore, managers are likely to be motivated to provide information to principals to increase allocation of ATMs. However, such an increase in allocation is likely to occur within limits. The limits depend on the availability of resources for allocation and on the reasonableness (face validity) of managers' allocation requests; seemingly unreasonable allocation requests are likely to invite intense scrutiny and rejection.

Even if managers are motivated to increase allocation of resources that raise their personal visibility, managers' abilities to do so depends on the extent of information asymmetry in the allocation process. The higher the information asymmetry between principals and managers, the greater the ability of managers to shape resource allocation. While research mainly evaluates information asymmetry in senior managers (Rajan & Reichelstein, 2004; Souder & Shaver, 2010; Wang et al., 2009), middle managers are often crucial in the allocation process. The importance of middle managers in the use of resources within firms warrants a greater understanding of how their involvement in the allocation process affects information asymmetry.

2.2 | Middle managers and information asymmetry

The strategy process literature argues that middle managers crucially affect resource allocation (Noda & Bower, 1996). In many cases, resource use cannot be fully centrally planned, so that middle managers make decisions that affect patterns of resource allocation. Burgelman (1994) found that middle managers played key roles during Intel's exit from the computer memory business. Salvato (2009) showed that microlevel processes at lower managerial levels influence new product development. Taylor (2010) showed that middle managers in product development groups compete with each other and shape the allocation of resources for new technologies. In our empirical context, middle managers assess opportunities for ATMs. Overall, such middle management roles are common.

Greater involvement of middle managers in allocation is likely to exacerbate agency issues in the allocation process, for three reasons. First, because middle managers operate at lower hierarchical levels, senior managers possess only limited information about their activities (Noda & Collis, 2001), which exacerbates information asymmetry (Guth & MacMillan, 1986; Wooldridge et al., 2008). Second, since senior and middle managers are often evaluated and compensated differently (Rajan & Reichelstein, 2009), a firm's rewards and controls may differentially affect allocation when the process involves middle managers.

Third, middle managers often face less external scrutiny; stakeholders such as boards, analysts, and actors in the market for corporate control often pay less attention to middle managers than to senior executives (Jensen & Ruback, 1983; Zajac & Westphal, 1994). In the next section, we develop hypotheses concerning how greater involvement of middle managers in the allocation process affects the way that allocation is affected by (i) uncertainty of employee income (rewards) and (ii) degree of monitoring (control).

3 | HYPOTHESES

3.1 | Rewards: uncertainty of employee income growth

Employee income constitutes a significant share of operating costs for most firms and is an important strategic lever that firms can use to incentivize behavior (Gerhart & Milkovich, 1990). Income is the total amount of money paid to employees, which includes fixed (e.g., salary) and variable (e.g., bonus) components (Gibbons, 1998). Income growth is the yearly increase in total amount of money a firm pays to its employees and is an important form of managerial reward (Tekleab, Bartol, & Liu, 2005). Managers commonly anticipate changes in future income based on their previous experience (Pistaferri, 2003). Major variation of income growth within a firm in the past implies that managers cannot easily predict future changes (Parker et al., 2005), making future income growth uncertain and thereby affecting managers' efforts (Block & Heineke, 1973).

Our baseline expectation is that higher uncertainty about income growth is associated with increased allocation. When uncertainty about income growth is higher, managers are more likely to pursue actions that improve their prospects of income growth (Kochar, 1999; Parker et al., 2005; Pistaferri, 2003) and so prevent possible losses to future income (Kahneman & Tversky, 1979). One such action to help improve personal rewards is improving their own visibility by managing more resources. Therefore, higher income uncertainty in a firm is likely to associate with increased allocation of resources; we consider the role of middle managers in this relationship.

Greater involvement of middle managers in the allocation process is likely to influence how income uncertainty affects allocation. Greater involvement of middle managers increases information asymmetry. Higher information asymmetry, in turn, makes it easier for managers to influence resource allocations. Moreover, middle managers tend to be evaluated and rewarded on specific tasks such as management of resources (Gerhart et al., 2009); this implies that management of a larger portfolio of allocated resources is comparatively more useful for income growth of middle managers. Therefore, increased resource allocation that is motivated by high uncertainty of employee income is likely to be particularly strong when middle managers have greater involvement in the allocation process. We note that a firm's growth strategy may both increase resource allocation (Anand & Singh, 1997) and affect employee income. Any relationship between higher uncertainty and increased allocation, rather than being unambiguously causal, will be associational.

> **Hypothesis 1 (H1).** *The more that middle managers are involved in allocation decisions, the more that higher uncertainty of employee income growth will associate with increased resource allocations in a firm.*

Such managerially influenced allocation may be beneficial or costly for a firm. Firm benefits would dominate if uncertainty leads managers to take on initiatives that are consistent with their understanding of local market conditions, while costs would dominate if the managerial actions simply reflected their own needs. Because of the potential firm-level costs of managerial-level actions, at any level of income growth uncertainty, firms often create mechanisms to regulate the influence of managers. We now turn to how degree of monitoring within a firm will affect resource allocation within that firm.

3.2 | Control: degree of monitoring

We focus on the degree of monitoring within a firm (Ouchi, 1980), which is an important form of organizational control when tasks carried out by managers cannot be completely defined or evaluated

(Eisenhardt, 1985). We explained earlier that information asymmetry plays a crucial role in the resource allocation process, by giving managers more leeway to influence allocation. Increased monitoring can reduce effects of information asymmetry by reducing managerial influence on the allocation process.

Our baseline expectation is that lower monitoring will be associated with increased allocation. Monitoring leads to greater scrutiny, which makes it difficult for managers to deviate from established procedures to pursue personal goals. Monitoring also gives cues to managers on acceptable and unacceptable forms of behavior (Glaser, Stam, & Takeuchi, 2016), so that managers have less need to rely on their own judgments (Floyd & Lane, 2000). Moreover, stronger monitoring may impose a stricter set of internal processes, forcing managers to coordinate more with other managers and share information with their peers. By increasing scrutiny and imposing stronger coordination requirements, greater monitoring reduces information asymmetry, thereby reducing the ability of managers to use allocation to improve personal benefits. Conversely, lower monitoring is likely to be associated with higher allocation of resources in the firm.

Lower monitoring within a firm is likely to influence increased allocations most strongly when information asymmetry in the allocation process is higher. We argued earlier that information asymmetry tends to be higher in allocations with a greater involvement of middle managers. Therefore, when monitoring is lower, we expect particularly higher allocation for visible resources that involve more middle managers. Hence, we expect the low monitoring-high allocation relationship to strengthen with increasing involvement of middle managers in the allocation process.

> **Hypothesis 2 (H2).** *The more that middle managers are involved in allocation, the more that lower degree of monitoring will associate with increased resource allocations in a firm.*

3.3 | Joint effects of high uncertainty and low monitoring

The underlying mechanism in the previous hypotheses was that managers have greater ability to influence allocation when information asymmetry is high. We argued that increased involvement of middle managers in resource allocation exacerbates information asymmetry, increasing managerial influence on allocations. H1 considered how the involvement of middle managers in resource allocation shapes how income growth uncertainty affects allocation. We now hypothesize joint effects with the degree of monitoring within a firm, in the form of an interaction between H1 and H2.

Income growth uncertainty will have particularly pronounced association with allocation when managers have a greater leeway to shape allocation, such as the condition of low monitoring that H2 addressed. Hence, greater involvement of middle managers in allocation is likely to have greater association with allocations under the joint condition of high uncertainty coupled with lower monitoring. This logic leads to H3.

> **Hypothesis 3 (H3) (Interaction)** *The relationship in H1 becomes stronger as the degree of monitoring within a firm declines.*

Firms pursuing active growth might have higher employee income uncertainty, lower monitoring, and greater resource allocation. If growth strategy systematically affects resource allocation depending on the involvement of middle managers, it would be difficult to infer causality in our

predictions. We address empirical issues related to causality in the next section, while the discussion considers whether such an argument is plausible.

4 | DATA AND METHODS

4.1 | Empirical context

Our setting is the commercial banking industry in India. Following economic liberalization in 1991, India's central bank, the RBI, stimulated growth in commercial banking through regulatory changes. In 1990, 80 nonrural commercial banks with 60,000 branches operated in India; as of 2012, 87 banks had more than 90,000 branches with over a million employees. Potential banking growth in India remains large, with opportunities to capture the business of almost 600 million people.[1] Figure A1 in the Supporting Information Appendix S1 shows geographic expansion trends.

The growth of the banking sector in the last two decades in India has been supported by easing regulations related to expansion and technology adoption. Postliberalization, banks have greater flexibility in adding branches. ATMs also have greater ease of deployment. Before the 1990s, banks needed to get prior authorization from the RBI to set up an ATM; banks are now allowed to choose the locations and number of ATMs they wish to deploy.[2]

Resource deployment for branches and ATMs are important for bank strategy and for India's national goals. Adding branches allows a bank to reach new customers throughout the country. ATMs, meanwhile, help banks serve existing customers more effectively as well as attracting new customers. Banks also use other forms of expansion such as point-of-sales terminals, Internet banking, and mobile phone applications. Nonetheless, expansions via branches and ATMs are key parts of banks' growth strategies and of the country's goals to provide financial services to a broader base of the population. Focusing on branch and ATM deployment in India allows us to examine the conceptual underpinnings of incentives for resource reconfiguration while studying resource allocation in a high-growth environment undergoing rapid technological transformation and evolution of social goals.

4.1.1 | Allocation process of ATMs and branches in Indian banks

In order to gain insight into the allocation of ATMs and branches, we interviewed four managers with different levels of seniority: two middle managers, a general manager of an ATM service provider, and an ex-senior manager of a leading private Indian bank. The interviews revealed that middle managers play a greater role in allocation of ATMs as compared to branches. Expansion of both branches and ATMs is usually coordinated by a central planning team, with regional and local staff doing surveys and making recommendations. Hence, middle managers are involved in assessing both types of expansions. At the same time, the interviews highlighted the point that opening off-site ATMs involves less rigorous senior-level review than opening branches, such that there is more latitude for middle managers to exercise their judgment. Moreover, during allocation, banks also need to estimate future usage ("number of hits") of ATMs, which is usually difficult to estimate without strong local knowledge (e.g., banks need to assess both the visibility of an ATM location to pedestrians and the riskiness of the location). Therefore, for ATM allocations, banks need greater reliance on the judgments of local managers.

[1] https://www.rbi.org.in/scripts/BS_SpeechesView.aspx?Id=871.

[2] RBI Master Circular on Area of Operation, Branch Authorization Policy, Opening/Up-gradation of Extension Counters, ATMs and Shifting/Splitting/Closure of Offices, June 2015.

We used two other sources of information to verify that ATMs are important aspects of local managers' jobs: employee CVs and bank request for proposal (RFP) documents. First, we searched for CVs of bank employees on the professional networking site LinkedIn. We found that managers of both state-owned and private banks in India often highlight ATM responsibilities within their job descriptions. Second, we checked RFP documents from a mid-sized bank and a large bank. Both RFPs detailed activities to be performed by agencies that undertake ongoing cash-management for ATMs, under the direction of branch managers who are contact points for the agencies. The two sets of evidence imply that ongoing ATM management, including location planning, is important for middle managers.

Increased allocation of ATMs appears to be more incentive compatible than branch expansion for middle managers. One of our interviewees pointed out that middle managers usually desire more ATMs in their localities because ATMs help nearby branches perform better, telling us that "Optimum ATM availability helps a bank branch in both old customer retention and new customer acquisition. So, ATM deployment means more customer satisfaction and hence will have an indirect impact on the performance (and growth) of the branch manager." In contrast with ATMs, opening new bank branches near existing branches tends to increase internal competition for middle managers.

Hence, our interviews and reviews suggest two points. First, middle managers are more involved in ATM allocations as compared to branches. Second, middle managers tend to prefer allocation of new ATMs.

4.2 | Data

We used reports issued by the RBI. Banks have mandatory reporting requirements to the RBI. By using data from such regulatory reports, we have confidence in the quality of our data. Other studies use similar information (e.g., Burgess & Pande, 2005; Kozhikode & Li, 2012).

We obtained the directory of branches of all commercial banks in India, which is a list of the addresses of all commercial bank branches in the country set up from 1934 to 2015. We omitted regional rural banks and cooperative banks because they are much smaller and serve niche customers (state-owned regional banks provide basic banking services in rural areas of India; cooperative banks provide services to specific communities). Next, we collated quarterly data releases of the RBI with statistics for ATMs, point-of-sales machines, debit cards, and credit cards. We used the internet archiving website https://archive.org to hand collect data for previous years if the data were not directly available from the RBI website. We collected bank-specific performance indicators from annual RBI reports.

We constructed a bank-year panel dataset using branch, ATM, and bank performance data. The sample covered the years 2011 to 2014; ATM data is available only for this period. This time frame was appropriate because regulatory liberalization occurred before the period; hence, the key environmental changes that led to the observed deployment took place before the start of the study rather than during the study period. Since some banks do not provide ATMs (typically foreign banks focusing on corporate lending), our final sample comprises 50 banks over the 4-year period. Lagged variables reduced observations for 1 year. The final sample used in regressions comprised 141 bank-year observations, which are almost evenly split between private and state-owned banks.

4.3 | Variables

4.3.1 | Dependent variable

Our dependent variable measures resource allocation in a given year. We are interested in measuring allocation across resources that differ in the involvement of middle managers. In this empirical

context, as our interviews confirmed, middle managers are more involved in ATM allocations than in branch allocations. Although banks are not mandated to report the breakdown of expenses for ATMs and branches, we can observe allocation because information on physical deployment of ATMs and branches is available from the RBI.

ATMs can be deployed either within premises of a branch (on-site ATMs) or in locations where there are no branches (off-site ATMs). Middle managers have greater control over off-site than on-site ATMs (on-site ATMs commonly are deployed along with a branch; hence, local managers have less influence on deploying them). Therefore, we use off-site ATMs to calculate the variable. For a given bank, *allocation of resources with higher involvement of middle managers* is the number of off-site ATMs deployed in a year, computed as the increase in the total number of ATMs from 1 year to the next. Branch deployment depends more on central managers. *Allocation of resources with lower involvement of middle managers* is computed as the increase in the total number of bank branches from 1 year to the next. Both variables are counts taking on non-negative integer values (there were no cases of year-on-year reductions in branches or ATMs).

4.3.2 | Explanatory variables

Uncertainty: *Uncertainty of income growth* is computed as the standard deviation of employee income growth in the previous 3 years (Parker et al., 2005). Employee income (pay, remuneration, and compensation) may be measured for individuals (Feldman, 2016; Wulf, 2002) or firms (Zenger & Marshall, 2000). Conceptually, a manager's income depends not only on the manager's own performance, but also on firm-specific factors such as the firm's compensation policy and corporate performance. Uncertainty of income growth implies that it is difficult for the manager to predict future income. Since managers can observe their own performance, income uncertainty crucially depends on firm-specific factors.

We use changes in a bank's aggregate expenditure on employee compensation to derive income growth of employees, assuming that changes in total compensation expenses reflect changes in income of managers involved in resource allocation. While uncertainty about commissions may affect functions such as sales, uncertainty related to salary raises is likely to affect a broader range of managers, including those engaged in resource allocation. Using the measure based on *SD* in income growth, we expect that income uncertainty for managers involved in resource allocations will be high (low) when a bank's aggregate expenditure on employee compensation exhibits high (low) variation.

Two conditions might create bias in the uncertainty measure: if managers involved in resource allocation actually face high income uncertainty when variation in aggregate expenditure is low, or if these managers face low income uncertainty when variation in aggregate expenditure is high. In the section on robustness tests, we discuss the plausibility of these conditions and provide additional empirical evidence to demonstrate reliability.

We note that income growth uncertainty is relevant in our empirical context. We compared macroeconomic features of India with other countries during the period. High inflation coupled with low social security is particularly significant in India, based on comparisons from the World Bank's database of country development indicators. Employee income growth will be especially relevant in such conditions, because employees need higher income to maintain their standard of living and savings. A KPMG survey of compensation[3] as well as news reports[4] highlight uncertain income growth as a source of dissatisfaction for Indian managers in the banking industry. At the same time, income growth uncertainty is a general concept that will be relevant for managers in any context.

[3]KPMG (March 2017): KPMG in India's Annual Compensation Trends Survey 2017–2018.

[4]For example, LiveMint.com (May 05, 2018): "Bank employees' unions reject 2% salary hike, threaten strike".

We also examined the data to determine how long employees tended to remain with a bank, with the idea that longer tenure would indicate greater concerns about income and career progression. To do this, we procured information about the Bank of Baroda, including data about 33,069 managers (bank officers) in 2014. The mean tenure of an employee who joined the bank before 2012 is 22 years. This long tenure provides further evidence that managers are likely to be motivated by prospects about their career growth within a bank.

Monitoring: Degree of monitoring is operationalized based on the time taken to travel from a bank's headquarters to its branches. Conceptually, we are interested in how monitoring shapes the decision to deploy ATMs. Even though ATMs can be managed remotely in the postdeployment period, allocation decisions involve the predeployment period. Before ATMs are installed, local managers play a crucial role by providing senior managers with information about local conditions. While senior managers may gather information about local conditions by traveling to branch locations, a larger distance between headquarters and branches increases the difficulty of carrying out such inspections. It is often difficult for headquarters to monitor geographically distant units because of the time taken to travel to these units. While some studies use geographic proximity between a monitoring unit and a monitored unit as an indicator of monitoring (Berger & DeYoung, 2001; Lerner, 1995), the underlying assumption is that proximity increases monitoring by reducing travel time between units (Giroud, 2013). Therefore, we use travel time between a bank's headquarters and its branches to create a proxy for monitoring (Giroud, 2013).

Railways are a crucial part of the transportation infrastructure in India. The government-owned Indian Railways transverses the length and breadth of the country, employing more than 1.4 million people and transporting more than 8.1 billion passengers in a year.[5] Since bank branches are geographically spread across the country, train travel time provides a reliable assessment of travel time between bank headquarters and branches.

We procured the Indian Railways' rail timetable, which covers 2,810 trains and 4,340 railway stations. The dataset contains detailed information about the time of arrival and departure at each station that a train stops at between its origin and destination. For example, the Vivek Express takes more than 3 days to run from Kanyakumari, which is located at the southernmost tip of peninsular India, to Dibrugarh, which is in the north-east, stopping at more than 50 intermediate stations.

We identified locations of banks' headquarters from corporate websites and branch locations from the RBI directory. We then matched each bank's headquarters and branches to railway stations in their locations. From railway timetables, we estimated the time to travel by rail from a bank's headquarters to each of its branches. *Travel time from headquarters to branches* is the average time taken to travel from a bank's headquarters to its branches.

4.3.3 | Control variables

Four controls addressed related customers and competition. (1) *Number of customers* is the number of debit cards issued by the bank. Customers with bank accounts are issued debit cards for electronic transactions; the number of such cards is a good indicator of bank size in terms of customers. We control for the number of customers in the previous year because a bank with a larger customer base may need to deploy ATMs and branches to a greater extent than smaller banks. (2) *Market share* captures a bank's competitive position. This variable is computed as a focal bank's average branch share across all districts of its operations in the prior year. For every district, we compute the ratio of a focal bank's branches to the number of branches of all banks operating in the district. We then compute the

[5]http://www.indianrailways.gov.in/railwayboard/uploads/directorate/stat_econ/IRSP_2015-16/Summary%20Sheet_Eng_pdf_pdf.pdf.

mean for this ratio across all districts in which the focal bank operates. (3) Entry of new competitors will create competitive pressures. *New competitors* measures the difference in the number of competitors a bank faces in a given year from the previous year. (4) Banks that expand in new territories have to deal with competitive responses from incumbents and often have to employ specific entry tactics, which may affect resource allocation. *Expansion in new districts* is the number of new districts that a bank enters for the first time in a particular year.

Three controls address bank operations that may affect resource deployment and managerial incentives. (1) Performance affects the availability of financial resources; better performance may lead to more managerial rewards and greater capital availability. *Return on assets* measures bank performance in the previous year, computed as net income divided by average total assets in a year. (2) In addition to income earned from interest charged on disbursed loans, banks may also earn noninterest income such as commission, exchange, and brokerage,[6] which might influence resource allocation of branches and ATMs. Fees charged to customers when they use ATMs form part of such noninterest income. *Importance of noninterest income* is the ratio of income from noninterest sources to the bank's total assets, lagged on year. (3) *Cash-deposit ratio* indicates how much of a bank's core funds are being used for the main banking activity of lending, which controls for the utilization of capital; this lagged variable is computed as cash-in-hand divided by total deposits for a bank.

We consider four other factors that may affect bank capabilities and resource allocation strategies. (1) The composition of a bank's workforce may influence managerial capabilities related to the use of resources. *Proportion of nonclerical staff* is computed as the ratio of officer-grade employees to total number of employees. (2) An organization's age may shape adaptation tendencies as well as affect its capabilities to conduct resource allocation. *Bank age* is computed as the number of years elapsed since deployment of its first branch. (3) Prior research on banks in emerging markets shows that type of ownership may shape resource allocation (Carvalho, 2014; Dinç, 2005; Porta & Lopez-de-silanes, 2002; Sapienza, 2004). *State-owned bank* is a dummy variable that is equal to one if a bank is owned by the government and zero if a bank is privately owned, while *Foreign bank* is a equal to one if a bank is owned by foreign entities. *Private domestic* banks form the omitted category in the regression models. (4) We control for temporal changes that might affect resource deployments by including year dummies.

4.4 | Estimation

Since our dependent variable, *allocation of resources*, takes non-negative integer values, we use a count model for estimating allocation of ATMs and allocation of branches. For allocation of ATMs, the mean of the variable is much less than the *SD*, violating the necessity of equality of mean and *SD* for a Poisson model. Therefore, we use a negative binomial model in order to deal with over-dispersion in the data (Cameron & Trivedi, 2010). We use a pooled model with robust standard errors. Even though we have a panel, we do not use a fixed-effect estimator because using a fixed-effect estimator does not remove the effect of all time-invariant unobserved heterogeneity in negative-binomial models (Allison & Waterman, 2002). Instead, our main models use year dummies; robustness tests supplement the analysis with bank dummies. Our estimation equation for bank (i) in period (t) is:

$$\begin{aligned}\text{Allocation of Resources}_{it} = {} & \text{Constant} + \beta 1 * \text{Income growth uncertainty}_{it-1} + \beta 2 * \text{Monitoring}_{it-1} \\ & + \text{Controls} + e_{it}\end{aligned}$$

[6]https://www.rbi.org.in/Scripts/Glossary.aspx.

We estimate allocation of ATMs and branches in separate models. To test our hypotheses, we then test differences between coefficient estimates. Recall that H1 and H2 predicted that the effects of income growth uncertainty and monitoring on allocation will be higher for ATMs than for branches. Therefore, the null hypothesis is that the coefficient estimates for ATMs are less than or equal to those for branches (for $\beta 1$ and $\beta 2$, H_0: $\beta_{\text{ATMs}} \leq \beta_{\text{Branches;}}$ H_a: $\beta_{\text{ATMs}} > \beta_{\text{Branches}}$). We test differences between coefficient estimates of ATMs and branches using a statistical test from Paternoster, Brame, Mazerolle, and Piquero (1998).

For testing H3, one difficulty in using a negative binomial model is that interpretation of interaction terms is not straightforward. This is because the magnitude of the interaction effect does not equal the marginal effect of the interaction term due to the presence of a cross-partial derivative term, which cannot be estimated easily (Ai & Norton, 2003; Karaca-Mandic, Norton, & Dowd, 2012). Therefore, we conduct subsample analyses, which allow more direct interpretation (Greene, 2010).

5 | RESULTS

We develop the results in sequence. We first report descriptive statistics. We next report results including the tests of the hypotheses, robustness tests for the predicted effects, and tests of the underlying mechanisms. We then report analyses on allocation across banks that differ in ownership and slack resources. Finally, we take advantage of a poststudy exogenous shock to assess the reliability of the results.

5.1 | Descriptive statistics

Table 1 reports correlations and summary statistics for the variables. The final sample is almost evenly split between private and state-owned banks. Allocation of resources correlates positively with number of customers. We observe a high correlation between number of customers and market share, as well as between ROA and importance of noninterest income.

We deal with potential multicollinearity between customers and market share in two ways. First, we compute the variance inflation factor (VIF) and find that the mean VIF is lower than the accepted rule-of-thumb (mean VIF: base model = 3.13 and full model = 3.20, vs. cut-off value = 10) (Kutner, Nachtsheim, Neter, & Li, 2004). This indicates that multicollinearity is unlikely to pose a problem in estimation. Second, robustness tests that drop market share and importance of noninterest income show that results are consistent.

5.2 | Results: hypothesis tests

Table 2 reports the main results. Models 1 to 6 contain resources with higher involvement of middle managers (ATMs), while Models 7 to 12 contain resources with lower involvement of middle managers (branches). Models 1 and 7 are baseline models. The baselines show that expansion in new districts associates with allocation of both types of resources. Foreign banks tend to allocate less of each resource, likely owing to a focus on corporate customers.

H1 argues that an increase in uncertainty of income growth will increase allocation more in resources that have higher involvement of middle managers. Models 2 and 4 show that an increase in income growth uncertainty strongly increases allocation of resources when middle managers are more involved (ATMs—Model 2: $\beta = 3.55$, $p < 0.01$; Model 4: $\beta = 2.67$, $p < 0.01$). By contrast, the effects of income growth uncertainty are weaker when middle managers are less involved in

TABLE 1 Correlations and summary statistics

	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Allocation of resources with high-middle manager involvement (ATMs)	1														
2	Allocation of resources with low middle manager involvement (branches)	0.52	1													
3	Income growth uncertainty	−0.10	−0.12	1												
4	Travel time between bank headquarters and branches (in minutes)	0.26	0.24	0.02	1											
5	Number of customers	0.76	0.63	−0.15	0.23	1										
6	Market share	0.46	0.50	0.001	−0.07	0.75	1									
7	New competitors	−0.03	0.11	−0.12	0.001	−0.01	0.07	1								
8	Expansion in new districts	0.02	0.42	−0.14	0.23	−0.08	−0.12	0.27	1							
9	Return on assets	0.07	−0.05	−0.30	0.12	−0.01	−0.10	0.05	−0.16	1						
10	Importance of noninterest income	0.15	−0.05	−0.04	0.38	0.05	−0.20	−0.03	−0.16	0.69	1					
11	Cash-deposit ratio	0.04	−0.09	0.07	0.20	0.01	−0.02	0.23	−0.08	0.22	0.32	1				
12	Proportion of nonclerical staff	−0.01	−0.19	0.06	0.51	−0.15	−0.39	−0.12	0.01	0.32	0.58	0.18	1			
13	Bank age	0.01	0.20	−0.07	−0.36	0.17	0.32	0.04	−0.08	−0.24	−0.38	−0.25	−0.77	1		
14	State-owned bank	0.02	0.36	−0.04	−0.07	0.20	0.35	0.19	0.32	−0.43	−0.53	−0.07	−0.58	0.49	1	
15	Foreign bank	−0.11	−0.28	0.25	0.35	−0.13	−0.25	−0.31	−0.29	0.15	0.37	0.31	0.52	−0.33	−0.34	1
	Mean	306.8	183.4	0.22	1,101.5	5,943,299	0.04	7.00	16.2	1.10	1.10	6.30	0.58	78.62	0.55	0.09
	SD	842.2	197.2	0.13	494.2	13,766,267	0.04	3.80	16.6	0.50	0.50	1.90	0.24	32.34	0.50	0.28
	Minimum	0	0	0.02	94.6	1,167	0.00	1	0	−0.90	−0.40	2.80	0.31	9	0	0
	Maximum	8,110	1,111	0.65	1851.5	112,200,000	0.28	15	93	3.00	3.40	18.0	1.00	114	1	1

Note. Bank-year observations = 141.

TABLE 2 Negative binomial models of the impact of uncertainty of income growth and degree of monitoring on allocation of resources with lower and higher involvement of middle managers (H1 to H3)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ATMs	ATMs	ATMs	ATMs	ATMs	ATMs	Branches	Branches	Branches	Branches	Branches	Branches
Dependent variable: count of number of new allocations	**Controls only**	**H1**	**H2**	**H1, H2**	**H3: Low monitoring**	**H3: High monitoring**	**Controls only**	**H1**	**H2**	**H1, H2**	**H3: Low monitoring**	**H3: High monitoring**
Uncertainty of income growth (H1, H3)		3.55		2.67	8.00	1.81		0.91		0.70	0.65	−0.90
		(0.96)		(0.90)	(1.63)	(1.56)		(0.46)		(0.47)	(0.69)	(0.61)
		[0.00]		[0.00]	[0.00]	[0.25]		[0.05]		[0.14]	[0.34]	[0.14]
Travel time between bank headquarters and branches (in min) (H2)			9.2e–04	7.4e–04					2.6e–04	2.2e–04		
(Higher travel time implies lower monitoring)			(3.0e–04)	(3.2e–04)					(1.3e–04)	(1.4e–04)		
			[0.00]	[0.02]					[0.05]	[0.12]		
Number of customers	7.1e–08	7.5e–08	5.1e–08	6.2e–08	1.0e–07	2.1e–07	1.9e–08	2.3e–08	1.5e–08	1.9e–08	2.1e–08	1.5e–07
	(4.4e–08)	(2.6e–08)	(3.5e–08)	(2.7e–08)	(1.2e–08)	(7.6e–08)	(1.1e–08)	(1.1e–08)	(1.1e–08)	(1.1e–08)	(8.0e–09)	(2.0e–08)
	[0.11]	[0.00]	[0.15]	[0.02]	[0.00]	[0.00]	[0.09]	[0.04]	[0.15]	[0.08]	[0.01]	[0.00]
Market share	−0.46	−4.55	1.73	−1.88	−21.87	4.36	3.74	2.31	4.13	2.99	−2.70	8.05
	(4.11)	(4.04)	(3.55)	(3.93)	(6.10)	(4.77)	(1.97)	(2.05)	(1.98)	(2.11)	(2.47)	(2.42)
	[0.91]	[0.26]	[0.63]	[0.63]	[0.00]	[0.36]	[0.06]	[0.26]	[0.04]	[0.16]	[0.27]	[0.00]
New competitors	−0.06	−0.10	−0.09	−0.11	−0.50	0.12	0.003	−0.01	−0.002	−0.01	−0.17	0.07
	(0.08)	(0.08)	(0.07)	(0.07)	(0.15)	(0.09)	(0.03)	(0.03)	(0.03)	(0.03)	(0.07)	(0.03)
	[0.47]	[0.18]	[0.22]	[0.12]	[0.00]	[0.15]	[0.91]	[0.88]	[0.94]	[0.82]	[0.02]	[0.04]
Expansion in new districts	0.01	0.02	0.01	0.02	0.01	0.02	0.03	0.03	0.03	0.03	0.02	0.04
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
	[0.01]	[0.00]	[0.02]	[0.00]	[0.41]	[0.31]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Return on assets	0.05	0.55	0.57	0.81	−1.64	1.48	0.62	0.71	0.70	0.76	−0.03	0.11
	(0.38)	(0.37)	(0.35)	(0.34)	(0.93)	(0.59)	(0.17)	(0.19)	(0.17)	(0.18)	(0.37)	(0.19)
	[0.90]	[0.14]	[0.11]	[0.02]	[0.08]	[0.01]	[0.00]	[0.00]	[0.00]	[0.00]	[0.93]	[0.56]
Importance of noninterest income	0.59	0.37	0.32	0.15	0.32	−0.34	0.87	0.79	0.71	0.68	0.92	0.45
	(0.45)	(0.46)	(0.41)	(0.42)	(0.48)	(1.12)	(0.25)	(0.25)	(0.24)	(0.25)	(0.27)	(0.51)
	[0.19]	[0.42]	[0.44]	[0.73]	[0.51]	[0.76]	[0.00]	[0.00]	[0.00]	[0.01]	[0.00]	[0.38]

TABLE 2 (Continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ATMs	ATMs	ATMs	ATMs	ATMs	ATMs	Branches	Branches	Branches	Branches	Branches	Branches
Dependent variable: count of number of new allocations	**Controls only**	**H1**	**H2**	**H1, H2**	**H3: Low monitoring**	**H3: High monitoring**	**Controls only**	**H1**	**H2**	**H1, H2**	**H3: Low monitoring**	**H3: High monitoring**
Cash-deposit ratio	−0.08	−0.16	−0.13	−0.18	−0.07	0.02	−0.06	−0.07	−0.07	−0.08	−0.01	−0.04
	(0.09)	(0.08)	(0.09)	(0.09)	(0.07)	(0.10)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
	[0.32]	[0.05]	[0.12]	[0.04]	[0.33]	[0.88]	[0.11]	[0.05]	[0.07]	[0.04]	[0.82]	[0.32]
Proportion of nonclerical staff	0.16	−0.20	−0.71	−0.64	2.12	−2.71	−0.22	−0.17	−0.39	−0.32	−0.30	−0.10
	(1.07)	(1.01)	(0.89)	(0.86)	(1.18)	(2.23)	(0.50)	(0.47)	(0.47)	(0.46)	(0.49)	(0.86)
	[0.88]	[0.84]	[0.43]	[0.46]	[0.07]	[0.22]	[0.66]	[0.72]	[0.41]	[0.50]	[0.54]	[0.91]
Bank age	−2.2e–04	−3.1e–03	−8.9e–04	−2.0e–03	2.9e–03	4.8e–02	3.5e–03	3.3e–03	3.4e–03	3.3e–03	7.7e–03	8.3e–03
	(7.9e–03)	(7.4e–03)	(7.0e–03)	(6.8e–03)	(9.3e–03)	(1.1e–02)	(2.8e–03)	(2.8e–03)	(2.6e–03)	(2.6e–03)	(3.6e–03)	(4.4e–03)
	[0.98]	[0.67]	[0.90]	[0.77]	[0.76]	[0.00]	[0.20]	[0.23]	[0.19]	[0.21]	[0.03]	[0.06]
State-owned bank	−0.05	0.07	−0.11	−0.03	−1.47	−0.94	1.02	1.06	0.96	1.00	0.24	0.20
	(0.46)	(0.42)	(0.41)	(0.39)	(0.53)	(0.39)	(0.15)	(0.15)	(0.16)	(0.16)	(0.26)	(0.15)
	[0.92]	[0.86]	[0.79]	[0.94]	[0.01]	[0.02]	[0.00]	[0.00]	[0.00]	[0.00]	[0.36]	[0.19]
Foreign bank	−5.19	−5.53	−5.60	−5.80	−9.78		−5.41	−5.48	−5.42	−5.47	−6.73	
	(0.93)	(0.92)	(0.84)	(0.81)	(1.04)		(0.47)	(0.48)	(0.46)	(0.46)	(0.46)	
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]		[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	
Year dummy—2013	−0.64	−1.09	−0.60	−0.94	−1.11	−0.24	0.16	0.08	0.15	0.08	0.28	−0.16
	(0.33)	(0.34)	(0.31)	(0.33)	(0.33)	(0.37)	(0.14)	(0.14)	(0.14)	(0.14)	(0.20)	(0.16)
	[0.05]	[0.00]	[0.05]	[0.00]	[0.00]	[0.52]	[0.25]	[0.57]	[0.29]	[0.55]	[0.16]	[0.32]
Year dummy—2014	−0.75	−1.42	−0.89	−1.31	−5.28	1.30	0.17	0.02	0.11	0.01	−1.37	0.21
	(0.61)	(0.65)	(0.63)	(0.66)	(1.35)	(0.48)	(0.28)	(0.29)	(0.27)	(0.29)	(0.66)	(0.25)
	[0.22]	[0.03]	[0.16]	[0.05]	[0.00]	[0.01]	[0.54]	[0.94]	[0.68]	[0.97]	[0.04]	[0.40]
Constant	0.45	5.75	0.37	5.40	10.88	−2.32	2.14	−1.30	2.24	−1.32	5.09	2.03
	(1.76)	(1.71)	(1.67)	(0.13)	(0.31)	(1.93)	(0.10)	(0.11)	(0.11)	(0.11)	(0.22)	(0.26)
	[0.00]	[0.00]	[0.00]	[0.01]	[0.00]	[0.02]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.03]
Observations	141	141	141	141	47	47	141	141	141	141	47	47

Note. Robust standard errors reported in parentheses; *p*-values reported in brackets.

allocation (branches). Models 8 and 10 show that the coefficients for income growth uncertainty are much lower, with the coefficients turning statistically insignificant in Model 10 (Branches—Model 8: $\beta = 0.91$, $p = 0.05$.; Model 10: $\beta = 0.70$, $p = 0.14$). The comparisons of Model 2 to 8 (3.9× difference) and Model 4 to 10 (3.8× difference) show that income growth uncertainty affects allocation most strongly when middle managers are more involved in allocation, which is consistent with our expectation. We test whether the coefficients differ by computing *Z*-scores for differences between models (Paternoster et al., 1998), and confirm that the coefficients are at least moderately statistically different (*Z*-score for Models 2 v. 8 = 2.47, $p = 0.014$; *Z*-score for Models 4 v. 10 = 1.94, $p = 0.052$). Hence, the results support H1.

H2 argues that lower monitoring will have greater impact on allocation for resources that have higher involvement of middle managers. Models 3 and 4 show that lower monitoring, based on greater travel time between a bank's headquarters and branches, increases allocation of resources when middle managers are more involved (Model 3: $\beta = 9.2e{-}04$, $p < 0.01$; Model 4: $\beta = 7.4e{-}04$, $p = 0.02$). By contrast, the effects of monitoring become smaller when middle managers are less involved in allocation. Models 9 and 10 show that the coefficients for travel time are lower, although with the coefficients turning statistically insignificant in Model 10 (Model 9: $\beta = 2.6e{-}04$, $p = 0.05$; Model 10: $\beta = 2.2e{-}04$, $p = 0.12$). The comparisons of Model 3 to 9 (3.5× difference) and Model 4 to 10 (3.4× difference) show that a lower degree of monitoring affects allocation most strongly when middle managers are more involved in allocation, which is consistent with our expectation. We compute *Z*-scores for differences between models (Paternoster et al., 1998), finding significance in the initial models (*Z*-score for Model 3 v. 9 = 2.01, $p = 0.044$) but insignificance in the fully specified models (*Z*-score for Model 4 v. 10 = 1.49, $p = 0.136$). Thus, the results in the more conservative assessment of H2 (the fully specified models 4 v. 10) lose statistical significance.

We assessed two tests of H3, which focuses on the joint effects of income growth uncertainty and degree of monitoring and argues that the effects of H1 will be stronger when the degree of monitoring is lower. First, we compared ATM allocation models based on subsamples of firms with low monitoring (Model 5) and high monitoring (Model 6). We split the sample ($n = 141$) into three equal parts ($n = 47$) based on the monitoring variable. The subsamples with low and high monitoring comprise observations in the bottom and top one-third of the monitoring variable (i.e., the subsample with moderate monitoring is omitted). The coefficient estimate of uncertainty is largest for allocation of ATMs when monitoring is low (Model 5: $\beta = 8.00$, $p < 0.01$) and substantially smaller for allocation of ATMs when degree of monitoring is high (Model 6: $\beta = 1.81$, $p = 0.25$); the difference between the coefficients in Models 5 and 6 is statistically significant ($Z = 2.74$, $p < 0.01$). The results were similar with low and high monitoring cut-off at the fiftieth percentile (not reported due to space constraints).

Second, the difference between ATM and branch allocation is larger with low monitoring (Model 5 v. 11: $\Delta\beta = 7.35$) compared to high monitoring (Model 6 v. 12: $\Delta\beta = 2.71$); the difference between these two values is moderately significant ($Z = 1.85$; $p = 0.064$). The conceptual implication of these two tests is that middle managers have most latitude to respond to income growth uncertainty when their organization monitors them to a lesser degree. The pair of tests provides moderate to strong support of H3.

To assess the materiality of these results, we computed elasticity for income growth uncertainty and degree of monitoring for Models 4 and 8. Elasticity is computed at the mean value for an independent variable, conditional on all other variables at their sample means (Cameron & Trivedi, 2010). We find that a 1 % increase in uncertainty of income growth increases allocation of ATMs in Model 4 by more than half a percent (elasticity = 0.58%), while a 1 % increase in travel time between bank headquarters and branches has even more material impact on ATM allocations (elasticity = 0.81%), although with

lower significance for H2 as we note above. By contrast, in the case of branch deployment (Model 8), elasticity is insignificant and substantially lower compared to ATMs. These results are consistent with our hypotheses that involvement of middle managers in the resource allocation process plays an important role in shaping the influence of income uncertainty and degree of monitoring on resource allocation.

5.3 | Alternative explanations and robustness tests

Table 3 reports tests for alternative explanations and robustness. We begin with three tests of the main explanatory variables, in Models 1 to 5. First, our income growth uncertainty measure assumes that variation in firms' aggregate wage expenses closely reflects income variation for managers involved in resource allocation. Even though a firm's wage expenses are directly linked to employees' incomes, our measure might primarily reflect income of managers not involved in allocation. In Models 1 and 2, we test this argument by controlling for recruitment of new employees. Recruitment activity is likely to drive variation in a firm's overall wage expenses, reflecting income variation driven by managers not involved in allocation. If our measure of income growth uncertainty primarily reflects income of managers not involved in allocation, then we should find weaker results. However, we find no substantial changes in the magnitude and significance of the coefficient of income growth uncertainty, which increases our confidence in the validity of our measure. Finally, we also ran a sensitivity test using income uncertainty rather than income growth uncertainty as the explanatory variable (not reported due to space constraints). Results remained mostly consistent, with the differences between ATMs and branches continuing to be statistically significant in partial models ($p = 0.05$) although insignificant in full models ($p = 0.11$).

Second, even if a bank's branches are located far from headquarters, these branches might be located close to each other, which would facilitate monitoring by headquarters. Models 3 and 4 control for spatial concentration of branches to check if geographic closeness of branches affects the main results; the results remain consistent. Moreover, we find that greater spatial concentration of branches significantly reduces allocation of ATMs (Model 3: $\beta = -6.12$; $p < 0.01$). Since one may expect monitoring to be easier when branches are more concentrated, this result provides additional evidence that greater monitoring reduces allocation of resources. As an additional check, we constructed a monitoring index that considers the spread of a bank across rural, semi-urban, urban, and metropolitan areas (not reported due to space constraints). Results remained consistent with the main regressions.

Third, an alternative explanation for the control results is that ATM allocations might increase due to lower market saturation rather than because monitoring is lower when travel time is high. In Model 5, we control for a bank's ATM opportunity, which is measured as the availability of ATMs for customers in regions of a bank's operations. In another test (not reported in the table), we directly controlled for the number of on-site ATMs in a bank, finding consistent results. In addition, ATMs might be the only economically viable option in distant locations, which may be underdeveloped. To assess the plausibility of this explanation, we procured additional data on business-friendliness of Indian states and checked whether less market-oriented states have more installed ATMs compared to branches; we did not find evidence for this alternative explanation.

Robustness checks in Models 6 to 10 assess model choice, control variables, and model specification. Model 6 finds similar results with Poisson models for bank branches, where the mean of the dependent variable is almost equal to its *SD*. Models 7 and 8 found similar results when we dropped the variables for market share and importance of noninterest income, which had high correlations with number of customers and return on assets. Models 9 and 10 included bank dummies as fixed

TABLE 3 Alternative explanations and robustness tests

Dependent variable: count of number of new allocations	(1) Employee growth ATMs	(2) Employee growth Branches	(3) Branch spatial concentration ATMs	(4) Branch spatial concentration Branches	(5) ATM opportunity ATMs	(6) Poisson Branches	(7) Drop controls ATMs	(8) Drop controls Branches	(9) Bank FE ATMs	(10) Bank FE Branches
Uncertainty of income growth (H1, H3)	2.86	0.69	1.91	0.60	2.47	0.80	2.19	0.34	8.47	−0.05
	(0.96)	(0.47)	(0.89)	(0.49)	(0.84)	(0.40)	(0.83)	(0.47)	(2.24)	(0.74)
	[0.00]	[0.14]	[0.03]	[0.22]	[0.00]	[0.05]	[0.01]	[0.47]	[0.00]	[0.94]
Travel time between bank headquarters and branches (H2)	6.9e–04	2.2e–04	5.8e–04	2.0e–04	5.9e–04	2.4e–04	7.2e–04	2.5e–04	−6.2e–03	−1.3e–03
(higher travel time implies lower monitoring)	(3.1e–04)	(1.4e–04)	(3.1e–04)	(1.4e–04)	(3.2e–04)	(1.9e–04)	(3.0e–04)	(1.3e–04)	(2.8e–03)	(1.4e–03)
	[0.03]	[0.12]	[0.06]	[0.14]	[0.06]	[0.21]	[0.02]	[0.05]	[0.03]	[0.36]
Number of customers	6.2e–08	2.0e–08	4.8e–08	1.9e–08	7.1e–08	7.4e–09	5.0e–08	2.8e–08	4.0e–08	−5.9e–09
	(3.7e–08)	(1.1e–08)	(2.1e–08)	(1.1e–08)	(1.8e–08)	(4.9e–09)	(1.8e–08)	(8.8e–09)	(3.0e–08)	(1.9e–08)
	[0.09]	[0.08]	[0.02]	[0.09]	[0.00]	[0.13]	[0.01]	[0.00]	[0.18]	[0.75]
Market share	1.07	2.75	0.92	3.09	−10.39	3.43			−40.47	1.61
	(4.49)	(2.13)	(3.54)	(2.07)	(4.13)	(1.53)			(29.05)	(20.98)
	[0.81]	[0.20]	[0.80]	[0.14]	[0.01]	[0.02]			[0.16]	[0.94]
New competitors	−0.10	−0.01	−0.09	−0.01	−0.12	−0.03	−0.12	−0.02	−0.05	−0.01
	(0.07)	(0.03)	(0.06)	(0.03)	(0.07)	(0.03)	(0.07)	(0.03)	(0.06)	(0.03)
	[0.17]	[0.84]	[0.18]	[0.81]	[0.06]	[0.35]	[0.08]	[0.50]	[0.36]	[0.80]
Expansion in new districts	0.02	0.03	0.01	0.03	0.02	0.02	0.02	0.03	0.002	0.02
	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
	[0.00]	[0.00]	[0.02]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.51]	[0.00]
Return on assets	0.54	0.77	0.54	0.74	0.74	0.69	0.75	0.85	−0.11	−0.30
	(0.42)	(0.18)	(0.32)	(0.17)	(0.31)	(0.18)	(0.29)	(0.15)	(0.57)	(0.26)
	[0.20]	[0.00]	[0.09]	[0.00]	[0.02]	[0.00]	[0.01]	[0.00]	[0.85]	[0.24]
Importance of noninterest income	0.57	0.67	0.42	0.65	−0.07	1.00			1.68	−0.62
	(0.41)	(0.24)	(0.39)	(0.24)	(0.42)	(0.25)			(1.20)	(0.45)
	[0.16]	[0.01]	[0.28]	[0.01]	[0.88]	[0.00]			[0.16]	[0.17]

TABLE 3 (Continued)

Dependent variable: count of number of new allocations	(1) Employee growth ATMs	(2) Employee growth Branches	(3) Branch spatial concentration ATMs	(4) Branch spatial concentration Branches	(5) ATM opportunity ATMs	(6) Poisson Branches	(7) Drop controls ATMs	(8) Drop controls Branches	(9) Bank FE ATMs	(10) Bank FE Branches
Cash-deposit ratio	−0.13	−0.08	−0.14	−0.07	−0.14	−0.003	−0.14	−0.04	0.03	−0.06
	(0.09)	(0.04)	(0.08)	(0.04)	(0.08)	(0.05)	(0.08)	(0.04)	(0.08)	(0.03)
	[0.14]	[0.04]	[0.08]	[0.05]	[0.08]	[0.95]	[0.08]	[0.29]	[0.74]	[0.04]
Proportion of nonclerical staff	−1.55	−0.11	−0.54	−0.33	−1.22	−0.12	−0.87	−0.28	−3.52	−1.49
	(0.85)	(0.53)	(0.87)	(0.46)	(0.79)	(0.49)	(0.81)	(0.43)	(0.81)	(0.47)
	[0.07]	[0.84]	[0.54]	[0.46]	[0.13]	[0.81]	[0.28]	[0.52]	[0.00]	[0.00]
Bank age	−2.1e–04	3.6e–03	−2.0e–03	2.9e–03	−3.5e–03	7.8e–03	−2.1e–03	1.9e–03	−2.0e–01	6.8e–03
	(6.7e–03)	(2.7e–03)	(6.1e–03)	(2.6e–03)	(6.4e–03)	(2.5e–03)	(6.5e–03)	(2.5e–03)	(2.7e–01)	(1.1e–01)
	[0.97]	[0.19]	[0.75]	[0.28]	[0.58]	[0.00]	[0.75]	[0.45]	[0.46]	[0.95]
State-owned bank	−0.08	1.00	−0.26	0.96	−0.55	0.94	−0.58	0.65		
	(0.42)	(0.16)	(0.35)	(0.16)	(0.35)	(0.19)	(0.36)	(0.15)		
	[0.84]	[0.00]	[0.45]	[0.00]	[0.11]	[0.00]	[0.11]	[0.00]		
Foreign bank	−5.45	−5.64	−4.90	−5.21	−5.34	−6.38	−5.43	−4.91		
	(0.86)	(0.52)	(0.78)	(0.53)	(0.80)	(0.48)	(0.86)	(0.47)		
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]		
Year dummy—2013	−0.99	0.09	−0.82	0.10	−0.50	0.26	−0.56	0.31	−0.46	0.09
	(0.34)	(0.14)	(0.31)	(0.14)	(0.34)	(0.16)	(0.34)	(0.15)	(0.33)	(0.12)
	[0.00]	[0.54]	[0.01]	[0.50]	[0.14]	[0.11]	[0.10]	[0.04]	[0.16]	[0.44]
Year dummy—2014	−1.30	0.03	−0.96	0.01	−0.86	0.09	−0.93	0.21		
	(0.62)	(0.29)	(0.58)	(0.28)	(0.60)	(0.26)	(0.63)	(0.28)		
	[0.04]	[0.91]	[0.10]	[0.97]	[0.16]	[0.75]	[0.14]	[0.44]		
Average employee growth in past 3 years	4.33	−0.72								
	(1.97)	(0.69)								
	[0.03]	[0.30]								
Spatial concentration			−6.12	−0.77						
Of branches			(1.74)	(0.88)						

TABLE 3 (Continued)

Dependent variable: count of number of new allocations	(1) Employee growth ATMs	(2) Employee growth Branches	(3) Branch spatial concentration ATMs	(4) Branch spatial concentration Branches	(5) ATM opportunity ATMs	(6) Poisson Branches	(7) Drop controls ATMs	(8) Drop controls Branches	(9) Bank FE ATMs	(10) Bank FE Branches
			[0.00]	[0.38]						
ATM market opportunity					3.3e–04		2.3e–04	1.4e–04		
					(1.1e–04)		(1.1e–04)	(4.8e–05)		
					[0.00]		[0.03]	[0.00]		
Constant	4.67	2.15	7.16	2.60	0.28	1.27	0.30	1.46	37.50	7.96
	(1.59)	(0.65)	(0.13)	(0.11)	(0.13)	(0.55)	(1.76)	(0.12)	(30.65)	(0.13)
	[0.00]	[0.00]	[0.00]	[0.00]	[0.07]	[0.02]	[0.02]	[0.00]	[0.00]	[0.53]
Observations	141	141	141	141	141	141	141	141	141	141

Note. Robust standard errors reported in parentheses; *p*-values reported in brackets.

effects. Both explanatory variables—income growth uncertainty and monitoring—vary between banks and within a bank over time. The models show that income growth uncertainty had stronger effects on ATM allocation as compared to branches (Z-score for Model 9 v. 10 = 3.78, $p < 0.01$), with statistically insignificant differences between ATMs and branches for the monitoring variable (Z-score for Model 9 v. 10 = −1.56, $p = 0.12$).

5.4 | Mechanism tests

We argued that the combination of uncertainty of income growth and degree of monitoring can create favorable or unfavorable conditions for managers to increase allocation of resources within firms. A combination of low uncertainty with high monitoring creates the most unfavorable condition for increasing allocation. In contrast, a combination of high uncertainty with low monitoring creates the most favorable condition for increasing allocation. Combining high uncertainty with high monitoring or low uncertainty with low monitoring creates moderately favorable conditions for increasing allocation. We examine how the effects of these conditions on allocation vary across banks. Our intuition is that moderately favorable conditions may be sufficient to increase allocation in some banks, while strongly favorable conditions may be required to increase allocation in other banks.

We expect moderately favorable conditions to increase allocation particularly when managers can derive greater net benefits of increasing allocation. We also expect moderately favorable conditions to increase allocation particularly when there is greater availability of slack resources within the bank. Table 4 reports collated results for five models of the underlying mechanisms. We report coefficient estimates for the variables of interest. Full tables with controls are available on request.

Bank ownership in India—privately or state-owned banks—plays a particularly important role in shaping net benefits of managers from resource allocation. Managers are likely to derive lower benefits for individual action in state-owned banks compared to privately owned banks. State-owned firms normally are governed by strict rules of compensation and rewards that are often decided by politicians (Peng, Bruton, Stan, & Huang, 2016). Moreover, resource allocation within state-owned banks in emerging markets such as India is often driven by political considerations (Carvalho, 2014; Dinç, 2005; Porta & Lopez-de-silanes, 2002; Sapienza, 2004). These features of state-owned banks in our study suggest that managers in state-owned banks are likely to be less sensitive to favorable conditions increasing allocation, compared to managers in private banks.

We evaluate these arguments in Table 4. We conduct subsample analyses because of the difficulty in interpreting interaction terms in the case of negative binomial models (Ai & Norton, 2003; Greene, 2010). The results show support for our arguments: moderately favorable conditions increase allocation in private banks (Model 2: $\beta = 1.33$, $p < 0.01$). In contrast, moderately favorable conditions do not increase allocation in state-owned banks (Model 3: $\beta = -0.28$, $p = 0.53$). State-owned banks require highly favorable conditions for an increase in allocation (Model 3: $\beta = 1.50$, $p = 0.01$), which indicates that managers in these banks are less sensitive to conditions that favor allocation.

Next, we test the influence of slack resources. We categorize banks as having high and low slack resources depending on their capital adequacy ratio (CAR). The CAR reflects the amount of capital banks possess to absorb losses before turning insolvent; higher CAR implies that a bank has more slack. We find that moderately favorable conditions increase allocation in banks with higher CARs (Model 4: $\beta = 0.96$, $p = .02$). In contrast, moderately favorable conditions do not increase allocation in banks with low CARs (Model 5: $\beta = -0.38$, $p = 0.12$.); such banks require strongly favorable conditions for an increase in allocation (Model 5: $\beta = 2.10$, $p < 0.01$). These results lend support to our theorized mechanisms.

TABLE 4 Tests of mechanisms

	(1)	(2)	(3)	(4)	(5)
	Ownership			Slack resources	
Dependent variable: count of number of new allocations	All banks	Private banks	State-owned banks	High-capital adequacy ratio	Low-capital adequacy ratio
Highly favorable conditions for increasing allocation	1.43	1.11	1.50	0.88	2.10
(v. unfavorable conditions)	(0.48)	(0.54)	(0.54)	(0.58)	(0.34)
	[0.00]	[0.04]	[0.01]	[0.12]	[0.00]
Moderately favorable conditions for increasing allocation	0.36	1.33	−0.28	0.96	−0.38
(v. unfavorable conditions)	(0.41)	(0.39)	(0.44)	(0.42)	(0.37)
	[0.38]	[0.00]	[0.53]	[0.02]	[0.31]
Controls included	Yes	Yes	Yes	Yes	Yes
Observations	94	49	45	43	38

Note. "Highly favorable conditions" for increasing allocation is the combination of high uncertainty and low monitoring. "Moderately favorable conditions" is the combination of (a) high uncertainty with high monitoring or (b) low uncertainty with low monitoring. The omitted category in the model is "Unfavorable conditions" for increase in allocation, which is the combination of low uncertainty and high monitoring.
Robust standard errors reported in parentheses; *p*-values reported in brackets.

5.5 | Analysis of H3 using a post-study exogenous shock

In late 2016—after the end of the study period and after we had completed our base analysis—India underwent a monetary shock that provided an opportunity for a quasi-natural experiment to test our logic. The shock had direct implications for the favorable conditions for allocation created by the combination of uncertainty and monitoring. Therefore, we can use the shock as an exogenous test of our logic concerning the conditions that emerge by combining high uncertainty and low monitoring (H3).

On the 8th of November 2016, the Government of India withdrew almost 85% of bank notes in circulation (all 500-rupee and 1,000-rupee bills, the most common units of circulating currency) and replaced them with new currency. The announcement occurred via a televised address at 8:00 p.m. by Prime Minister Narendra Modi, with the notes ceasing to be legal tender 4 hr later, at midnight. The goal was to inhibit corruption because bribes were commonly made in these bills and then kept out of the formal financial system. The demonetization was completely unexpected and therefore serves as an exogenous shock.

Due to the demonetization, banks needed to recalibrate all their ATMs to use the new currency. As the following quote illustrates, the challenge was particularly strong for the off-site ATMs that are central to our analysis. According to a senior State Bank of India official, "We could maintain cash flow for on-site ATMs and replenish on regular intervals but for the off-site ATMs it was a difficult proposition."[7] Thus, bank headquarters needed to pay greater attention to activities involving off-site ATMs.

The shock created a particularly unfavorable environment for managers to increase ATM allocation during the adaptation period. After the shock, banks increased their central control over ATM deployment, as they dealt with the operational challenges related to recalibrating ATMs for the new currency after the shock. If our logic concerning the combination of uncertainty and monitoring

[7]Quoted in FirstPost.com (November 18, 2016): http://www.firstpost.com/india/demonetisation-data-from-sbi-shows-how-public-sector-banks-are-saving-the-day-for-modi-govt-3112640.html.

TABLE 5 Difference-in-difference analysis of H3 for effect of exogenous demonetization shock

		Effects of shock		Postshock: effects by period since shock		
		Preshock	Postshock	Month 1–4	Month 5–8	Month 9–12
Conditions for increasing allocation	Favorable conditions	1.49	−0.44	−0.94	−1.38	0.68
		(0.73)	(0.40)	(0.56)	(0.66)	(0.65)
		[0.04]	[0.27]	[0.09]	[0.04]	[0.29]
	Unfavorable conditions	−0.56	−0.91	−0.34	−1.52	−0.58
		(0.52)	(0.37)	(0.51)	(0.53)	(0.35)
		[0.28]	[0.01]	[0.50]	[0.00]	[0.10]

Note. "Favorable conditions" for increasing allocation is the combination of high uncertainty and low monitoring. "Unfavorable conditions" for increase in allocation is the combination of low uncertainty and high monitoring.
Robust standard errors reported in parentheses; *p*-values reported in brackets.

holds, we should expect favorable conditions for allocation to become less favorable for some adjustment period after the shock.

To test this idea, we collected monthly ATM deployment data for 44 banks in the 6-month period (May to October 2016) before and 12-month period (November 2016 to November 2017) after the November 8 shock. We then conducted a difference-in-difference analysis. Table 5 reports that effect of favorable conditions in increasing allocation was less in the postshock period (*Z*-score of difference = 2.31; $p = 0.02$). The results also suggest that the reduction of the influence of favorable conditions in allocation was short-term, lasting until around 8 months after the shock; the transient impact of the shock was confirmed by our interviewees and by an RBI report on demonetization.[8] Thus, the exogenous shock that occurred after our study period and after our initial analysis helps demonstrate the reliability of our logic concerning the influence of the combination of income uncertainty and monitoring on resource allocation in firms.

6 | DISCUSSION AND CONCLUSION

We began by noting that resource allocation is susceptible to agency problems due to information asymmetry between decision makers and the managers who provide decision makers with information about resource requirements. Allocation is more susceptible to agency problems when information asymmetry is higher. Information asymmetry is likely to be exacerbated by greater involvement of middle managers. Since rewards and controls are tools that firms can use to drive change, understanding the links between managerial involvement in allocation and effectiveness of these tools is important when firms undertake programs related to strategic renewal (Agarwal & Helfat, 2009).

We argue that while higher resource allocation is associated with higher uncertainty of income growth and lower degree of monitoring, the effects of these forms of rewards and controls on allocation differ depending on the involvement of middle managers in the allocation process. Higher income growth uncertainty increases managers' motivations to increase allocation for personal benefits while lower monitoring improves their ability to do so. Our core argument is that these effects are stronger for resources that require greater involvement of middle managers because information asymmetry in the allocation process is higher for decisions about these resources.

[8]Macroeconomic Impact of Demonetization—A Preliminary Assessment (accessed on January 22, 2018) Available at: https://rbidocs.rbi.org.in/rdocs/Publications/PDFs/MID10031760E85BDAFEFD497193995BB1B6DBE602.PDF.

We show that both rewards and control have differential impact on resource allocations decisions that have greater involvement of middle managers, although with differences in whether the effects apply independently or jointly. Income growth uncertainty (rewards) has an independent effect, while monitoring (control) has an effect in combination with rewards. Three sets of tests assess the mechanisms, based on the idea that a boundary condition for our arguments is the degree to which managers can improve their benefits through individual performance: (1) stronger conditions for increasing allocation are required in state-owned than in private banks; (2) stronger conditions for increasing allocation are required when banks possess fewer slack resources; and (3) an unexpected demonetization shock that increased the need for central involvement reduced the impact of favorable conditions for increasing allocation.

6.1 | Contributions

This work contributes to research on resource allocation, evaluating how the influence of rewards and controls on allocation are associated with the involvement of middle managers in the allocation process. Most studies that evaluate rewards and controls for allocation do not distinguish between senior and middle managers (Rajan & Reichelstein, 2004; Souder & Shaver, 2010; Wang et al., 2009). While it may be sufficient to focus on only senior managers in certain contexts, such as resources used for diversification or M&As, our results show that rewards and controls may not work in a similar manner for resources that require a greater involvement of middle managers.

The paper also engages with the broader literature on resource allocation that evaluates how managerial agency shapes the use of resources inside firms (Anand, 2004). Since allocation is usually conceptualized at the corporate level (Anand & Singh, 1997; Helfat & Eisenhardt, 2004; Sakhartov & Folta, 2015), most work pays less attention to agency involving middle managers. Moreover, recent conceptual work on allocation proposes that firms are more likely to adopt internal resource redeployment when agency assumes greater importance (Anand et al., 2016, p. 174). Our paper provides empirical evidence that indicates support for this proposition. Although we focus on allocation, as opposed to resource redeployment, our results support the idea that internal redeployment is likely to be higher when agency issues are prominent. Importantly, we highlight that information asymmetry in allocation is an important source of agency problems for redeployment.

A key part of this contribution is that the work demonstrates differences between senior and middle managers with respect to resource allocation. In order to understand middle managers and their influence on performance, it is important to compare their influence on outcomes versus senior managers; even so, few studies consider outcomes determined by middle as well as senior managers. Our paper represents a step in this direction.

It is useful to consider what the work might say about firm performance. Although the arguments by themselves do not have direct implications for performance, by extension, when combined with knowledge of a firm's competitive context, the arguments can help a firm design effective incentive strategies that in turn shape performance. For instance, firms in homogeneous environments with little need for middle managers to be involved in resource allocation may prefer high monitoring and low income growth uncertainty; by contrast, firms in heterogeneous environments with strong needs for local resource allocation may prefer lower monitoring and higher income growth uncertainty. Thus, the work provides a base for firms to design strategies that are appropriate for their competitive context.

Three limitations in the paper provide opportunities for future research. First, as we note above, although the analysis has implications for links between allocation and performance, we do not test these arguments directly. Instead, we focus on the antecedents of allocation, because it is necessary

to first understand underlying processes that may lead to differences in resource allocation, which ultimately manifest as interfirm performance differences. Future research can examine performance directly.

Second, different social and psychological influences (Huy, 2011; Montealegre, 2002) may operate at the level of individual managers or small teams. Our empirical design does not account for these influences since we conduct analysis at the aggregate firm level. Future studies focusing on individual managers or teams may be able to incorporate these influences.

Third, we cannot rule out potential endogeneity arising from omitted variables. Our measure for degree of monitoring is likely to be exogenous because travel time depends on the railway infrastructure. Moreover, in a growing market such as India, it is likely that firms' growth aspirations will supersede firms' preferences for reducing travel times, leading to an independently determined degree of monitoring. However, our measure for uncertainty of income growth may be affected by omitted variables such as a firm's growth strategy or environmental factors that shape income growth and allocation. To the extent that strategy correlates with bank type, our models deal with such problems; most state-owned banks are likely to have similar strategies. By including dummies for bank type in our regression models, we reduce any bias created by unobservable strategic plans. Our models also include year dummies that address changes in growth strategy due to environmental factors. Finally, while we acknowledge that some common factors may influence income growth and allocation, we recall that our main focus is to evaluate differences between resources depending on the involvement of middle managers in allocation. It is more difficult to argue that omitted factors will mainly affect allocations in which middle managers are involved, which gives us confidence in our results.

We conclude by noting the managerial implications of the study. The results suggest that firms' resource allocation activities reflect the intentional or emergent design of inducements. The key insight is that inducements that shape resource allocation at one level of management may apply more weakly at another level. Hence, plans for the timing and nature of resource deployment need to include rewards and controls that are relevant for both senior and middle managers. The study provides a base for further research on how rewards and controls shape resource allocation decisions by different levels of managers.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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