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BOSTON UNIVERSITY

The Institute for Economic Development (IED) is a research center within Boston University's Department of Economics focusing on development economics and related fields of finance, trade, foreign investment, health, education, political economy, organizations and economic history.

The Distortionary Effects of Incentives in Government: Evidence From China's Death Ceiling Program

By: Raymond Fisman and Yongxiang Wang

Discussion Paper 282

In both political and academic circles, the introduction of performance incentives to bureaucracies has been widely debated. Such incentives elicit a tradeoff between encouraging agents towards a desired outcome and misdirecting their efforts; a tradeoff that is worsened by outcomes that could be manipulated or are hard to observe (Holmstrom, 1979). This paper shows widespread manipulation of outcome measures can occur even in a setting where one would expect great difficulty in gaming the system, which may suggest an even more narrow view for the situations in which incentives may be beneficial in achieving a desired result.

Fisman and Wang analyze the introduction of province-level safety objectives, or `death ceilings,' by China's State Administration of Work Safety (SAWS) in February 2004. The rules' stated purpose was to curb the high number of accidental deaths, most of which were workplace-related. SAWS required each province to designate plans for lowering accidental deaths below the target and report deaths from traffic accidents, fire, or workplace-related incidents (for a subset of industries) on a quarterly basis. While on paper the reforms appeared to be a success, a careful analysis of the data by the authors shows that in reality the reporting of death statistics was rife with manipulation. The authors apply McCrary's (2008) test for manipulation to a running variable for the distributions of year-end deaths-to-ceiling ratios for each type of accidental death.

In contrast to cumulative deaths for the first three quarters of the year, in which the authors do not observe a discontinuity, the authors find a clear discontinuous drop in the ratio for accidental deaths at one. This result suggests 'sorting' of reported deaths around the ceiling, which the authors find to be more severe for industry-related deaths. The authors caution however that they cannot rule out that actual safety improvements also occurred. In a second analysis, the authors consider the cross-province variation in the outcome measure to assess the impact of tying the promotion of local officials to achieving targets. The authors find that provinces in which "no safety, no promotion" laws were enacted exhibit a stronger reduction in accidental deaths. Finally, the authors explain why the manipulation of reporting occurs at the ceiling as opposed to below. The authors cite the potential convex costs of manipulating results but also provide evidence that a ratcheting effect may be of concern to officials. The year-end deaths in a given year strongly predict the ceiling in the following year, meaning that if officials reported deaths well below the ceiling they would need to report significantly lower deaths in the following year to meet the target. In spite of this fact, the authors do not find that deaths are manipulated upward to reduce the ratcheting effect.

Financial Disclosure and Political Selection: Evidence from India

By: Raymond Fisman, Florian Schulz, and Vikrant Vig

Discussion Paper 283

Proponents for government transparency and accountability would argue that a well-informed public can lead to reduced moral hazard issues for incumbents (Barro, 1973; Ferejohn, 1986), induce positive selection among candidates (Dal Bó et al., 2016), and elect honest or competent officials (Besley, 2005). Based on this logic, a number of nations worldwide require asset disclosures for those running for political office. Where previous studies have relied on cross-country correlations to provide information on disclosure laws, this paper offers a more compelling identification strategy based on a natural experiment. In addition, the authors analyze the mechanisms driving the changes in government performance following mandated disclosure.

In November 2003, a Supreme Court ruling in India regarding citizens' right to information (RTI) imposed a requirement on candidates running for state or national office to make public the value and composition of their assets. The passing of these requirements occurred in the middle of the 2002-2004 state election cycle, creating a natural experiment in which 10 states held elections pre-RTI and 10 states held elections post-RTI. The authors find that there was no effect of the policy in the fraction of MLAs standing for reelection in the first post-RTI period, when only asset levels were publicly observed. However, in the second post-policy election cycle when asset growth was observable, the authors find a 13 percentage point decrease in the rerun rate. As further evidence that asset growth while in office, not levels, is the measure driving self-selection, the authors find that runner-up candidates are not less likely to stand for reelection. These results suggest that privacy issues are not driving self-selection of candidates; instead officials choose not to rerun to avoid perceptions of corruption caused by accumulating assets while holding office.

The authors then assess the effect of the RTI on voting behavior and find that voters prefer incumbents in the post-RTI period relative to politicians who ran again in the pre-RTI period. While the authors corroborate Linden's (2004) finding of an incumbency disadvantage in the pre-RTI period, the disadvantage disappears in the second post-RTI election. This further suggests self-selection, as candidates who would have otherwise been eliminated by voters choose not to run in a given election. Finally, the authors provide evidence that voters utilize disclosure as an additional source of information for evaluating candidates. The authors estimate that the relationship between recent economic growth and reelection of a candidate is attenuated following disclosure.

Reexamining an *Asiento* Between Phillip II of Spain and Tomás Fiesco

By: Carlos Álvarez-Nogal and Christophe Chamley

Discussion Paper 284

"Sovereign debt can be state-contingent in two distinct ways, implicit and explicit" (Álvarez-Nogal and Chamley, 2017). The former method involves a debt reduction, as a deviation from the terms of the contract, through activation of an implicit clause to the contract in situations where the lender observes an adverse shock to the debtor (Grossman and Van Huyck, 1988). The latter involves an explicitly stated contingency where debt reduction follows the terms of the contract (Lucas and Stokey, 1983). While in theory state-contingent debt contracts have an obvious appeal, particularly in cases where countries tend to experience large shocks, such contracts are rarely observed in practice (Griffith-Jones and Sharma, 2006).

Adding to the puzzle of why state-contingent debt contracts are seldom observed in the modern era, Drelichman and Voth (2015) (hereafter DV) analyze 393 sixteenth-century contracts and claim to find contingency clauses in 270 of the contracts. As evidence of contingent-debt contracts, in the sense previously described, DV cite an *asiento* signed by Tomás Fiesco on April 3, 1591 that provides Phillip II of Spain with continuous monthly cash deliveries needed for an army operation. DV argue that this *asiento* "showcases how multiple contingent clauses could be used to provide insurance for both king and bankers under a variety of scenarios."

This paper offers a different view by highlighting inconsistencies between DV's claims and the text of the contract. As an example, DV interpret the main contingent clause as imposing a heavy penalty on the king if the fleet arrives and the king does not pay a contractual amount at that time. In fact, the clause "states that in this good event, the king may choose to reduce the size of the contract: both the disbursements by Tomás Fiesco and the payments by the king are reduced in equal amounts with no penalty" (Álvarez-Nogal and Chamley, 2017). Furthermore, according to the computations of the authors, the one percent monthly interest that is included in the contingent clause on the fleet is the same as for the entire credit part of the contract. This interest rate cannot be referred to as a "penalty," which is done by DV repeatedly. The authors allow readers to verify their alternative interpretation by providing the transcription of the entire contract (24 pages) as well as the translation of the first 14 pages.

Agricultural Diversity, Structural Change and Long-Run Development: Evidence from the U.S.

By: Martin Fiszbein

Discussion Paper 285

Over the course of a country's development, there are certain periods in which agriculture is the primary source of employment. Particularly during these stages, how the economy evolves is largely dependent upon the characteristics of agricultural production. Existing research has focused primarily on either the effect of productivity on development (Matsuyama, 1992; Restuccia et al., 2008; Gollin, 2010; Hornbeck and Keskin, 2015; Bustos et al., 2016) or the impact of specific types of agricultural products (Goldin and Sokoloff, 1984; Engerman and Sokoloff, 2002; Nunn and Qian, 2011; Vollrath, 2011; Bruhn and Gallego, 2012). This paper studies the role of agriculture in the development process from a new vantage point, considering the effects of agricultural diversity. The author utilizes data from U.S. counties over 140 years to estimate the effect of early diversity, in 1860 when the economy was predominantly agricultural, on economic outcomes following the commencement of the Second Industrial Revolution.

In theory, the effect of production diversity on development is ambiguous. Diversity may encourage development if, for example, it reduces risk or complementarities exist among skills or inputs. Alternatively, it may impede development if it involves foregoing the benefits to specialization. Results from ordinary least square regressions indicate a positive correlation between development outcomes and early diversity, robust to controlling for state fixed effects, geo-climatic features, socio-economic conditions, and the dominance of certain agricultural products. However, the relationship between development and agricultural diversity may suffer from reverse causality and omitted variable bias, as a number of third factors can affect both.

To determine the causal relationship between production diversity and development, the author employs a novel identification strategy based on an instrumental variable (IV) approach. First the author estimates a fractional multinomial logit model in which county-level crop shares is a function of climate-based potential yields, estimated using high resolution spatial data for multiple crops from the Food and Agriculture Organization of the United Nations. The predicted shares are then used to construct an index of potential diversity to instrument for actual diversity. To alleviate concerns regarding the exclusion restriction, the IV regression includes controls for geographic and climatic features. From this regression, the author finds a robust, positive effect of agricultural diversity on development.

The author's proposed mechanism for this effect is that diversity encourages industrial diversification and leads to new ideas and skills. In support of this explanation, the author shows that early agricultural diversity has a positive effect on patent activity, industrial diversity, and the percentage of new occupations that are in manufacturing. Further, this mechanism would suggest greater effects in activities where skill complementarities and information spillovers are more pertinent; the author finds support for this prediction, showing diversity increased the share of manufacturing workers in such industries.

College Admission and High School Integration

By: Fernanda Estevan, Thomas Gall, Patrick Legros, and Andrew F. Newman

Discussion Paper 286

Following the phase out of affirmative action policies in the late 1990s, a number of U.S. states adopted top-*N* percent laws (hereafter top-*n* policies) in order to maintain racial or ethnic balance in higher education. Under these laws, high school students in the top *N* percent of their graduating class are guaranteed university admission. However, even when the when these policies were broadly applied -- in its tenth year, Texas's top-10 law accounted for 81 percent of first year students at the University of Texas at Austin -- they did not achieve the same level of diversity experienced under affirmative action. For the University of Texas flagship campuses, the end of affirmative action led to a one third drop in representation of minority students and remained at a one-quarter drop four years after the top-10 policy was enacted.

To explain the inability of the policy to reach its desired outcome the paper introduces the Top-*N* Percent Neutrality Theorem: if individuals incur a sufficiently low private cost to moving among high schools, then the set of students admitted to university is the same with and without a top-*n* policy. These policies encourage arbitrage by students, since a student in a competitive high school who would miss the *N* percent cutoff may have a chance of exceeding the cutoff my moving to a less competitive school. But though this arbitrage undermines campus diversity at the university, it can impose a salutary effect on the ethnic composition of the high schools.

The authors introduce the Unbiased Mixing Theorem: *ethnically unbiased* movement across schools (meaning arbitragers ignore ethnic makeup in targeting schools and are ethnically representative of their source school) will decrease ethnic segregation, as defined by the mutual information index and other commonly-used indicators. A further prediction of their theory is that the increase in high school transfers should occur among students with higher grades, on the borderline of benefiting from a top-*n* policy; in addition, if students value their source school they will delay transfer, leading to a policy effect only in the latter years of high school.

To test these predictions, the authors estimate the effects of Texas' top-10 policy, enacted in 1998, on the ethnic composition of Texas high schools. The authors find a significant reduction in segregation across Texas high schools for the 11th and 12th grade as compared to 9th grade following the introduction of the policy. The results also indicate a doubling in the number of transfer students and an increased likelihood of students who were not economically disadvantaged transferring to schools with lower performance. Consistent with theory, the findings indicate a stronger effect among students with higher grades. The findings of this paper suggest that while top-*n* policies may not achieve their intended outcomes, they may have the capacity to act as instruments for voluntary re-integration of the high schools.

Enhancing the Diffusion of Information About Agricultural Technology

By: Kyle Emerick, Alain de Janvry, Elisabeth Sadoulet, and Manzoor H. Dar

Discussion Paper 287

Technology adoption is a key driver of growth for small agricultural households in developing countries and yet adoption of new technology is often low. An impediment to adoption often put forth is a lack of credible information (Jack, 2011). Research has shown that information from peers is often considered credible (Foster and Rosenzweig, 1995; Bandiera and Rasul, 2006; Conley and Udry, 2010; Krishnan and Patnam, 2014). However, farmers themselves may not identify private benefits from providing information to peers and therefore may not act in the absence of external incentives. Previous studies have shown that possible strategies for improving technology adoption include providing incentives for early adopters and strategically selecting the earliest adopters to optimize information spillovers (Beaman et al., 2015; BenYishay and Mobarak, 2015). This paper provides an alternative solution known as the "farmer field day." The farmer field day is a meeting designed to encourage learning through providing information on the technology and experiences of adopters and visiting a field where the technology is in use.

To test the efficacy of this alternative approach, the authors undertake a two-step randomized experiment in Odisha, India. In the first step, the authors introduce a new flood-tolerant and high-yielding rice variety to 100 villages, randomly assigning three approaches to identify the early adopters. The authors deliver seeds to individuals chosen by villagers through a participatory meeting, farmers identified in meetings with women's self help groups (SHG), or locally-elected officials who then distribute the seeds. In the second step, the partner NGO institutes the farmer field day four months after introduction of the seeds, as the fields approach harvest, in half of the villages. Then, in the planting stage of the following growing season a random sample of 15 households in each village are given the opportunity to purchase the new rice variety at a price just below market price.

The authors find that the farmer field day increased adoption from 30 to 42 percent, with the effect being the strongest in the purchase of a single seed package and among households that are in lower caste groups or below the poverty line. Importantly, the results show that the impacts of field days on adoption are not statistically different across villages based on which approach was used to identify early adopters. The two approaches that involved meetings with villagers did reduce patronage but were no more effective than the third approach in encouraging adoption. Finally, the authors identify the channel through which adoption is improved. Based on the data, the authors conclude that the effect of field days is driven by strengthening existing knowledge or providing additional information as opposed to improving demand among farmers anticipated to not interact with the early adopters. Considering the villages where SHG meetings identified adopters, the authors find that increased adoption occurs among SHG member households and connected households. The authors estimate the cost and benefits of the farmer field day to show that it is cost effective but caution that this may not hold in cases where the technology being promoted is less profitable.

The Cost of Favoritism in Network-Based Markets

By: Kyle Emerick

Discussion Paper 288

The importance of social relationships in determining how goods, services, and even information are allocated in developing countries is well established in the literature (Anderson, 2011; Conley and Udry, 2010; Banerjee et al., 2013a; Beaman et al., 2015; BenYishay and Mobarak, 2015; Cai, de Janvry, and Sadoulet, 2015; Fisman, Paravisini, and Vig, 2017; Mazzocco and Saini, 2012; Munshi and Rosenzweig, 2016). In these settings, a possible role of network-based transactions is to facilitate contract enforcement or reduce asymmetric information (Anderson, 2011; Fisman, Paravisini, and Vig, 2017). An alternative explanation is that these network-based transactions reflect social preferences for interactions within a social group or favoritism between connected individuals (Bandiera, Barankay, and Rasul, 2009; Banerjee et al., 2013b). If favoritism drives within-network transactions, allocation based on network connections as opposed to optimizing benefits may lead to large costs.

The primary contribution of this paper is to provide estimates of the economic losses due to favoritism by considering the village-level, informal seed market. In 82 Indian villages, the author randomly assigns 5 households in each village to receive seeds for a profitable, new variety of rice. The output produced by the selected farmers is sufficient to allow for diffusing seeds to other farmers in the following year. In these informal markets, transactions tend to be based on network relationships, or caste in this setting. To estimate the demand of other farmers for the seeds, the author utilizes a revealed preference approach; in half of the villages demand is revealed by selling seeds door-to-door at three possible prices. The author then estimates the difference between revealed demand and the observed adoption of the new seed variety. The seed market is based on one-off transactions, leaving little room for moral hazard or contract enforcement to explain the prevalence of within-network transactions. This market characteristic combined with the fact that the selected farmers only share seeds with those of the same sub-caste or shared surname allows the author to attribute any adoption gap to caste-based favoritism.

The author finds a significant gap between demand and adoption in villages where seeds were diffused only in the informal market, with demand estimated at 40 percent but only 7 percent of households adopting in the first year. While the gap is reduced in subsequent years, it is still significant two growing seasons later. The author then utilizes experimental evidence of the technology’s impact to monetize the losses due to the adoption gap (Emerick et al., 2016). The results show that over the 3-year study period, the loss to an average farmer is equal to about 8 percent of the annual rice harvest or 20 days of casual work. In order to show that these losses are driven by favoritism, the author estimates that having the same surname as a selected farmer doubles the likelihood of adoption while being in the same sub-caste increases adoption by about 53 percent. Furthermore, farmers that are connected to a selected farmer see a significant reduction in predicted losses. The author rules out competing explanations for the gap, such as better alternatives to diffusing seeds for selected farmers or the prices of door-to-door sales being lower than those of the informal market.

Social Ties and Favoritism in Chinese Science

By: Raymond Fisman, Jing Shi, Yongxiang Wang, and Rong Xu

Discussion Paper 289

Beginning with Romer's (1986) seminal paper, endogenous growth models have underscored the importance of knowledge production as a key driver in increasing returns to stimulate long-run economic growth. China, an emerging player in the global economy, has recognized the importance of knowledge production and has dedicated more than a trillion dollars towards scientific education and research in the past two decades (China Statistical Yearbooks of Science and Technology, 1996-2014). Currently, only the U.S. outspends China in R&D funding (Ni, 2015). While at first glance there appears to be strong support for knowledge production in China, the news media has pointed to inefficiencies in such funding as money is misallocated due to favoritism and corruption. As an example, the authors consider the selection process for membership in the Chinese Academies of Sciences and Engineering (CAS and CAE), which is thought to suffer from issues of corruption. As motivation for the importance of the CAS/CAE for resource allocation, the authors estimate that membership in the CAS/CAE more than doubles a scientist's likelihood of obtaining a position as dean or president of a university and that employment of a CAS/CAE member increases an institution's government funding by US $9.5 million.

To assess the existence and severity of favoritism in the selection process, the authors estimate the impact of being connected on a nominee's likelihood of being elected to the CAS/CAE. The authors use hometown ties as their measure of connectedness as it is an important facet of the culture of favor-exchange in China. The authors find that if a candidate shares a hometown with a standing committee member for the department for which he or she is nominated, the candidate is 39 percent more likely to be elected. The result is robust to controls for department-year, city, undergraduate college, and employer fixed effects. The authors also conduct placebo analyses, showing that there is no effect of hometown connections to individuals who are not members of the candidate's department standing committee. The effect for hometown ties does not appear to be indicative of increased probability of election due to "soft" information, as there is not a robust effect for current employer or undergraduate institution. The authors also find that hometown ties are only relevant in the second stage of the nomination process, where in-person meetings are held to assess candidates and personal lobbying may be more effective. Further, the authors show that the effect of hometown ties disappears after 2007, when external pressure for transparency and fairness led to alterations in the selection process.

After establishing the importance of favoritism in selection to the committee, the authors demonstrate that while a connected nominee does not appear to be of lower quality, among connected candidates the quality of elected fellows, given the candidate pool, is lower. This result is largely driven by positive selection in the election process of unconnected candidates. The authors estimate a 20 percentage point increase in the fraction of elected officials with a homerun (100+ published citations) when moving from a hypothetical situation in which all candidates have hometown ties to one in which none do. This paper therefore finds the existence of favoritism in the CAS/CAE selection process and suggests possible costs to knowledge production and economic growth resulting from the misdirection of resources.

Bypassing Intermediaries Via Vertical Integration: A Transaction-Cost-Based Theory

By: Dilip Mookherjee, Alberto Motta, and Masatoshi Tsumagari

Discussion Paper 290

A primary motive for vertical integration is to bypass intermediaries and contract directly with workers or customers, to reduce the double marginalization of rents (DMR). More sophisticated contract design is an alternative to integration which has been shown, in theory and practice, to overcome the DMR problem. A contribution of this paper, however, is to show that contract enforcement problems or collusion can prevent these contracts from achieving this improved efficiency. Explaining the costs of integration has also proved difficult. "Why isn't the entire economy organized as a single firm?" Posed by Williamson (1985), this question speaks to the fact that if integration were costless one would expect to only observe vertically integrated enterprises. In response, Williamson and others have pointed to various 'transaction' or 'bureaucracy' costs of internal organization that appear relevant in practice. However, a clear theoretical explanation of the source of such costs remains elusive.

This paper seeks to develop a theory that addresses these puzzles. The authors develop a model for a multinational firm located in a Northern country that chooses between vertical integration, investing in an enterprise in a Southern country to contract directly with production workers, and outsourcing to a local supplier who hires workers. The model incorporates measures of 'specificity,' firm-level attributes, and contextual attributes (e.g., distance between countries, governance/contract enforcement in the Southern country) which determine the efficacy of sophisticated contracts and likelihood of integration. The model shows that in the absence of verifiable costs/revenues of vertical subordinates, or in cases where prospects of collusion exist between subordinates at different layers, sophisticated contract design with separately owned intermediaries does not eliminate DMR inefficiencies. The costs of controlling collusion constitute an endogenous cost of integration, besides exogenous fixed costs of additional communication channels and contracting with a larger set of workers and customers. Reducing DMR distortions represent the primary benefits of integration. This yields a theory of vertical integration, with predictions concerning the circumstances under which it does and does not arise, and the resulting welfare implications.

The main predictions are that increased vertical integration occurs where specificity is high, fixed costs of set up are low, and in industries/products which are high value and more specialized. Combined with the result that gross profit is higher with integration, the model predicts that foreign direct investment (FDI) will be higher in countries with superior communication and legal infrastructure. The main model also predicts improved welfare and prices offered to workers in the Southern country following integration. However, extensions to the model show that this result is dependent upon the context and may not obtain where integration could be accompanied by increased monopsony power. In addition, the main results indicate increased rents to both the worker and local supplier under integration, with the improvement in aggregate efficiency increasing in the extent of specificity. Many of the model's predictions are consistent with existing empirical findings in the literature; it also generates other new predictions that await empirical testing.

The Effects of Education on Financial Outcomes: Evidence from Kenya

By: Kehinde F. Ajayi and Phillip H. Ross

Discussion Paper 291

The joint issues of ensuring access to and take-up of formal financial services though globally relevant are especially pervasive in developing countries where the average rate of financial inclusion is 54 percent, in comparison to 91 percent for high income economies. Further, demographics for developing countries show populations skewed towards youth and research has shown that young adults are especially vulnerable to poor financial outcomes (Agarwal et al., 2009; Demirguc-Kunt et al., 2015; Lusardi and Mitchell, 2014). Previous research has either found limited effects or inconclusive effects (e.g., increased savings combined with increased use of expensive debt) of financial literacy and financial education programs for students on financial outcomes (Berry, Karlan and Pradhan, 2015; Bruhn et al., 2016). Likewise, research has shown that financial training programs for adults have been ineffective in improving financial outcomes (Cole, Sampson and Zia, 2011; Bruhn, Ibarra and McKenzie, 2014).

In this study, the authors exploit exogenous variation in schooling, by geography and cohort, introduced by the institution of Kenya's Free Primary Education (FPE) in 2003 to measure the impact of increased schooling on financial outcomes for young adults. Where existing studies focus on financial market participation and the use of credit, the authors utilize rich survey data to estimate the causal effect of education on financial inclusion as well as on several measures of financial capability and economic self-sufficiency in order to investigate the channels driving these effects.

The authors find a positive causal effect of education on financial literacy, savings, and the use of formal financial services but estimate no associated changes in effective numeracy, retirement planning, or subjective financial well being. The authors also examine labor market outcomes and find a significant positive association between FPE and income and employment. Controlling for income substantially attenuates the estimated effects on financial outcomes, indicating that the increased use of formal financial services may largely be driven by increased income. Importantly, while financial inclusion was not the primary goal of FPE, the authors provide a back-of-the-envelope estimate of the program's cost effectiveness in improving financial inclusion. The authors' results imply a cost of $173 per financial account opened which, based on the few available estimates of alternative strategies, situates the program above financial literacy training and below subsidizing the opening of new bank accounts in terms of cost effectiveness. Where previous research on the effect of education on financial inclusion has focused on the United States and other high income settings, this paper focuses on a developing country context. The results of this paper suggest that programs to improve access to primary education in developing countries, in addition to their primary goals, may be an effective tool for improving financial outcomes for young people.

Unity in Diversity? Ethnicity, Migration, and Nation Building in Indonesia

By: Samuel Bazzi, Arya Gaduh, Alexander Rothenberg, and Maisy Wong

Discussion Paper 292

In the post-colonial era, many developing countries have employed nation building policies in an effort to reduce civil conflict through a shared national identity (Alesina and Reich, 2015; Miguel, 2004). These policies enjoy continued relevance even today as increased mobility exposes diverse groups to one another. While some believe that negative attitudes towards outsiders result from these new exposures, especially in the short term, others argue that the development of intergroup relationships in the long run help mitigate such sentiments (Allport, 1954; Fearon and Laitin, 2011; Putnam, 2007; Weiner, 1978). The extent to which policies of integration are able to mitigate civil discontent along ethnic lines is unknown: diverse communities tend to be unstable due to segregation and tipping forces (Schelling, 1971) and where such diversity is preserved it is often confounded by issues of endogenous sorting and geography (Michalopoulos, 2012).

This paper analyses Indonesia's Transmigration program in order to shed light on how government-backed integration can encourage the adoption of a shared national identity. The Indonesian archipelago is home to a number of culturally diverse ethnic groups, often geographically segregated from one another. A primary ethnic division in the country is between Inner and Outer Islanders. As part of a broader nation building policy, the Indonesian government instituted this program to relocate two million volunteers (trans migrants) from the Inner Islands of Java and Bali to newly-developed communities in the Outer Islands. In an effort to improve intergroup relationships, these settlements consisted of households from both groups and were endowed with a consistent set of institutions.

The authors evaluate the efficacy of the program by leveraging the quasi-random assignment of trans migrants to settlements (and individual plots), the scale of the policy, and an exogenous shock that left hundreds of settlements without state-sponsored trans migrants (control group). The results indicate that the settlements that received trans migrants exhibit significant and persistent demographic shifts, tending to be more ethnically diverse and less segregated relative to the control group. In line with the policy's objectives, the treated villages show increased use of the Indonesian language at home and a rise in intermarriage beyond that explained by supply-side changes in exposure to trans migrants. The authors also shed light on how a settlement's level of diversity impacts integration incentives utilizing program-induced variation. The authors find that the use of Indonesian in the home exhibits a nonlinear dependency on ethnic shares: the national language is more often adopted where ethnic group shares are roughly equal while in cases of strong majorities individuals tend to retain/adopt the majority language. Furthermore, the results indicate that ethnic identity transmission across generations is more neutral in mixed communities. In concluding, the authors find that certain facets of individual identity are influenced by social interactions, a positive result for the potential efficacy of nation building policies.

Finding the Poor vs. Measuring Their Poverty: Exploring the Drivers of Targeting Effectiveness in Indonesia

By: Adama Bah, Samuel Bazzi, Sudarno Sumarto, and Julia Tobias

Discussion Paper 293

“Social assistance programs targeted to low-income groups cover nearly two billion people in developing countries (Honorati et al., 2015). Identifying and reaching the intended beneficiaries of these programs can be challenging, especially where a large part of the population works in the informal sector and there are no official income registries” (Bah et al., 2017). Traditionally, low- and middle-income countries have relied on program-specific targeting methods but in recent years there has been a movement towards development of single registries. These registries are meant to identify households potentially eligible for multiple social assistance programs and collect data to rank households in terms of eligibility. According to Honorati et al. (2015), 92 developing countries either fully operating or developing single registries.

This paper first seeks to evaluate the targeting performance of these new unified registries in terms of reducing leakage (inclusion of non-intended program beneficiaries) and under coverage (exclusion of intended beneficiaries) through analyzing one of the world’s largest single registries: Indonesia’s Unified Database for Social Protection Programs (UDB). The UDB has registered over 25 million households using a two-step process. The enumeration step is based on a pre-listing of households to be surveyed, developed using census-based poverty mapping, and local community suggestions. Ranking of eligibility is then determined by district specific proxy-means testing scores (Elbers et al., 2003). The authors match data from an auxiliary, independent survey to the UDB administrative data to estimate targeting effectiveness under the traditional and new targeting regimes. The analysis shows that UDB is more progressive than previous approaches, substantially reducing leakage with more limited improvements in under coverage.

The authors point to *misenumeration* errors (issues in determining who to survey) and *misclassification* errors (incorrectly assessing eligibility of those surveyed) as the cause of these limited reductions in under coverage. While previous research has focused on the latter issue, this paper provides the first attempt to assess the relative contribution of each error in determining the overall accuracy of a centralized targeting registry. Counterfactual analyses indicate that alternative enumeration methods for developing the registry lead to more significant reductions in under coverage than improved ranking processes. The authors find that utilizing scarce public resources for alternative enumeration methods can lead to large benefits through reduced under coverage, though these results depend on the social planner’s welfare function. Furthermore, under certain assumptions about the generalizability of the survey sample, the authors show that the increased cost of enumerating the full population in the study area is equivalent “to about 11 percent of the value of additional benefits that would be received annually by the poorest 30 percent of households” (Bah et al., 2017). In addition to clearly identifying the issues in efficient design of targeting registries, the authors’ results also highlight the potential cost effectiveness of employing methods that survey an adequate portion of the population for inclusion in single registries.

Identifying Productivity Spillovers Using the Structure of Production Networks

By: Samuel Bazzi, Amalavoyal Chari, Shanthi Nataraj, and Alexander D. Rothenberg

Discussion Paper 294

Though important in theoretical work, research has yet to identify important characteristics of agglomeration externalities, such as their nature, size, and extent. Improved knowledge of these externalities is especially relevant in developing countries where the scope of these externalities is likely large but high quality data is rarely available. A particularly important source of agglomeration externalities among firms is productivity spillovers. Productivity spillovers, if significant enough, can justify subsidizing firms to locate in a specific region in order to encourage welfare-enhancing development and growth.

This paper provides a novel method for identifying productivity spillovers using information on the network in which firms interact. The authors offer an identification strategy that relies on firm-level panel data to control for fixed effects and eliminate the endogeneity issues in estimating production functions (Olley and Pakes, 1996; Levinsohn and Petrin, 2003). With firm-level productivity estimated, the authors then consider the relationship between a firm's own productivity and the average productivity of connected firms using a linear-in-means model. Following Bramoullé et al. (2009), the authors utilize relationships among firms defined by supply chain networks, measured with input-output tables, to overcome the model's inability to separate the effect of one firm's productivity on that of other firms. The main contribution of this new identification strategy is it can be applied in other contexts where firm-level panel data, geographic data, and input-output tables are available.

The authors implement their strategy using the Indonesian Manufacturing Survey plant-level data. To construct the network of firms, the authors first utilize data on the products that are either utilized as inputs or produced by Indonesian firms to identify forward and backward linkages. Firms then are assumed to be connected if they are in the same industry, located in proximity to one another, or in an industry connected through forward and backward linkages. Finally, the authors rely on exchange rate shocks to obtain additional variation. The results indicate positive average spillover effects among firms in Indonesia. While the impacts are significantly smaller in magnitude relative to those found for U.S. and European firms they are consistent with other studies of Indonesia's agglomerations. Furthermore, the authors find that the positive productivity spillover effects are caused by a small subset of industries. Importantly, the authors suggest that knowledge spillovers, an important facet of agglomeration externalities, do not function well in Indonesian cities.

FACULTY PROFILES

Kehinde Ajayi continues to focus her research on economic development and the economics of education. She is particularly interested in how information affects decision-making and in understanding the resulting implications for policies aimed at reducing inequality. Her current research projects examine school choice, educational mobility, youth employment, and financial inclusion in Africa.

Marianne Baxter's research is in the fields of macroeconomics and international economics. In research related to her prior work on macroeconomic consequences of home production, she has been engaged in a large-scale econometric analysis of household expenditures and household time use as they pertain to home production. She is also working with a data set using IKEA catalogs from many countries and up to twenty years to study the determinants of departures from the law of one price.

Samuel Bazzi is a development economist whose research spans labor and political economy. His published research examines the role of labor mobility in the process of economic development, the effect of commodity price shocks on civil war, and best practice in identifying the causes of economic growth. In ongoing projects, Bazzi investigates why ethnic diversity causes conflict, the role of diversity and migration in nation building, how information on recruitment agency quality affects migration choices and outcomes, and the long-run effects of the American frontier on political culture in the United States. Other ongoing research explores firm dynamics and drivers of productivity in Brazil and Indonesia.

Christophe Chamley's research is on social learning, coordination of expectations and markets in macroeconomics, and in the history of states' finances from 5000 BC to the 19th century.

Francesco Decarolis specializes in industrial organization with a focus on auctions, health insurance, and anti-competitive behavior. His recent research concerns the effects produced by different auction formats in the context of public procurement auctions and the effects on insurers competition of government subsidies in Medicare.

Randall Ellis' recent research focuses on how health care payment systems affect consumers, health care providers, and health plans. He is actively using big data to address policy issues and consumer demand and to understand market behavior. He continues to conduct research on risk adjustment and predictive modeling, which resulted in the payment models used in the US since 2000 and Germany since 2009, with similar models being evaluated in other countries. During the past year Ellis has given talks in the US, France, and Germany. He is currently collaborating with researchers in the US, Australia, and Brazil, as well as with BU graduate students on US and developing country topics.

Raymond Fisman has completed his second year in the BU economics department. He works in two main areas of political economy: the causes and consequences of inequality, and corruption. His recent work on the consequences of social ties in Indian banking was published in the *American Economic Review*, and his research on social ties and favoritism in Chinese science is forthcoming in the *Journal of Political Economy.* His book on corruption, with political scientist Miriam Golden, was published in April of this year.

Martin Fiszbein joined Boston University in 2015 after completing his doctoral studies at Brown University. His interests lie in the fields of economic growth, development, history, and urban economics. In particular, his research seeks to understand the dynamics of structural change, human capital formation and economic growth. In a series of current projects, he studies the effects of the production structure on patterns of long-run growth. This works examines predictions from a variety of macro-development and urban economics models using rich subnational data from the United States and from Argentina.

Ivan Fernandez Val specializes in theoretical and applied econometrics. He has recently been working on nonlinear panel data and distributional methods with applications to labor economics and other fields.

Stefania Garetto is an applied trade theorist with a strong interest in multinational corporations. Her research is devoted to understanding the formation of multinational corporations, their operations, and their linkages with other aspects of economic activity. Her most recent publications analyze the risk implications of firms' international operations. She integrates new trade theory and theoretical asset pricing models to analyze both qualitatively and quantitatively the economic drivers of international activity and their consequences. In a series of related papers, she analyzed the relationship between export/FDI status and financial indicators. Her current work focuses on the dynamic behavior of multinational corporations, and on the activities of global banks.

Simon Gilchrist's research examines the effects of financial market imperfections and financial crises on real economic activity, with particular focus on the implications for investment behavior, business-cycle dynamics, and the conduct of monetary policy. Recent work explores the predictive content of credit spreads for macroeconomic activity, and the effect of uncertainty on investment and output, and the consequences of financial frictions for firm-level price setting and aggregate inflation dynamics. He will be leaving to join New York University this Fall.

John Harris works on issues of applied macroeconomic theory, regional and urban economics, and migration theory. His recent research includes comparative analysis of economic development in Africa and Southeast Asia. He also has extensive field experience in Africa and Asia, with emphasis on Indonesia, Uganda, Botswana, Kenya, Nigeria, Sudan, and Tanzania.

Leroy Jones specializes in policy-oriented micro issues in developing countries. Particular areas of interest include public enterprise, privatization, government-business solutions and industrial organization. He has substantive experience in Indonesia, Korea, Pakistan, Venezuela and thirteen other countries. Professor Jones directs the Institute's Program in Public Enterprise.

Robert King focuses his research on monetary policy and macroeconomics. Particular areas of current interest are the nature of price dynamics, the influence of reputation and credibility on optimal monetary policy, and the history of banking markets.

Kevin Lang's research concerns education and labor markets, with a particular focus on discrimination. While his work is primarily centered on the United States, he is currently involved in projects in Israel (on the motherhood pay penalty among university graduates) and Singapore (on discriminatory behavior among street sex workers).

Laurence Kotlikoff specializes in fiscal policy, macroeconomics, money and banking, computational economics, healthcare, and personal finance. He also works on the economics of robots. The author or co-author of 17 books and hundreds of journal articles, Kotlikoff is also a prolific columnist and a #1 NY Times Best Seller author. His columns have appeared in the New York Times, the Wall Street Journal, Bloomberg, Forbes, PBS.org, and many of the other top newspapers and magazines in the U.S. and overseas. His recent work has focused on generational policy, banking reform, corporate tax reform, social security reform, healthcare reform, computing large scale life-cycle models with aggregate shocks, and modeling the economic impacts of robots.

Robert Lucas's recent work focuses on migration. In the last couple of years his chapter on African migration appeared in the North-Holland Handbook series and he edited a handbook on international migration and economic development, which was published by Elgar during 2015. For that volume Lucas prepared a chapter on the link between bilateral trade and international migration, including fresh evidence derived from the most extensive data available to date. In May 2015 Lucas gave the key-note speech on "Migration and Economic Development" at the United Nations, NY, leading to adoption of the UN Post-2015 Development Agenda in September. Lucas's current work is on internal, rural-urban-rural migration in developing countries using a very large, micro data set on some 60 countries. He also continues to act as a member of the advisory committee on remittances to G8 countries.

Robert A. Margo's presidential address to the Economic History Association, entitled "Obama, Katrina, and the Persistence of Racial Inequality," was published in the June 2016 issue of the *Journal of Economic History*. He authored a chapter entitled "Labor and Labor Markets in the United States: An Historical Perspective" in the *Handbook of Cliometrics*, also published in 2016.

Jianjun Miao continues to work on two lines of research. The first concerns macroeconomic implications of financial frictions, specifically business cycle and growth implications of bubbles and credit constraints. The second involves new models of ambiguity sensitive preferences and applications to macroeconomics and finance.

Dilip Mookherjee works on a combination of theoretical and empirical topics related to development economics. Current empirical projects include agriculture and environment, political economy, financial development, entrepreneurship and marketing supply chains in Asia; theoretical topics include inequality, globalization and organization design. He is a Lead Academic for the India program of the International Growth Centre, which disseminates development economics research for a broad audience (including the blog Ideas for India) and promotes research-policymaker interactions, and for the State, Bureaucracy and Justice RA4 Program of the Economic Development and Institutions (EDI) network based at University of Namur and Paris School of Economics. He is a fellow of BREAD, CEPR and the NBER Development group.

Andrew Newman is currently engaged in several research projects pertaining to development, organizational economics, inequality, and the economics of the household. Recent work involves developing a testable competitive equilibrium framework for studying how firms' internal organization decisions such as outsourcing or vertical integration interact with markets and how those decisions in turn affect product market performance, particularly in the face of globalization. He has been contributing to the economic theory of matching markets and applying that to affirmative action policies. He is also exploring how the processes by which people learn about their economic environment can lead to organizational dysfunction and change.

Daniele Paserman specializes in labor, applied microeconomics, political economy and behavioral economics.

Pankaj Tandon concentrates on technological change, microeconomics, public enterprises, and food policy. He has worked on evaluating privately financed infrastructure projects and privatization programs. His main field experience has been in Egypt, India, Mexico, and Venezuela.

Professors Emeriti: Peter Doeringer, Shane Hunt, Gustav F. Papanek, Paul P. Streeten and Andrew Weiss

IED Research Visitors

Dyotona Dasgupta, a PhD student at the Indian Statistical Institute in New Delhi, received a Robert S. McNamara Fellowship at the World Bank to visit IED for the academic year 2016-17. She worked on the role of progressive lending and mandatory savings requirements imposed by microfinance institutions in South Asia.

Kyle Emerick, Assistant Professor of Economics at Tufts University, visited IED for the entire academic year 2016/2017. He is working on a field experiment in Jharkhand India that aims to measure labor market impacts of improved rice varieties. Another research project studies economic gains from rural electrification in the Philippines.

Pinar Keskin, Assistant Professor of Economics at Wellesley College, visited IED January through May 2017. She is an applied micro-economist focusing on environmental challenges facing decision makers in developed and developing countries, as well as issues concerning gender, education and intra-household conflicts in Turkey.

Masatoshi Tsumagari, Associate Professor of Economics at Keio University, Japan visited IED from March 2015 to March 2017. He has been working with Dilip Mookherjee on theories of organizational design in the presence of costs of communication and corruption, with applications to foreign direct investment and distributive impacts of globalization in developing countries.

Jianlin Niu, a research fellow from the Institute of Pupulation and Labor Economics at the Chinese Academy of Social Sciences (CASS), visited IED through a bilateral exchange agreement between Boston University and the Chinese Academy of Social Sciences from November 28th through December 11, 2016.

Funding Opportunities for Research

Junior Faculty and PhD Students continued to receive Weiss Foundation research grants this year. The Weiss Family Program Fund for research in development economics was established last year by the generosity of past IED Affiliate and Emeritus Professor of Economics, **Andrew Weiss**. **Kevin Lang** helps manage it along with faculty members in the Harvard and MIT economics departments, and it is administered by Harvard University. The Fund supports research by undergraduates, graduate students, and junior faculty at Harvard, MIT, and Boston University working on development economics.

Assistant Professor Kehinde Ajayi was awarded $64,448 to continue her research "Short Run Effects of Guidance and Information for Improved Decisions in Education".

Assistant Professor Samuel Bazzi was awarded $38,000 to continue his research project in Brazil "Firm Entry Barriers, Growth Constraints, and Job Creation: Theory and Evidence from Brazil".

Ph.D. candidate Mesay Melese Gebresilasse was awarded $4,800 in support of his research project "Priority Sector Targeting and Structural Transformation in Ethiopia" which enabled him to spend a month in Ethiopia to gather data necessary for the project, and fund a MA Research Assistant for 2 months.

Assistant Professor Stefania Garetto submitted an NSF grant application on "The Dynamics of the Multinational Firm" a three year project for a total of $399,789.

Distinguished Visitors 2016/17

Melissa Kearney (University of Minnesota) visited the week of October 3th, 2016. She gave one seminar and two lectures on Labor.

Oriana Bandiera (London School of Economics) visited from October 24 - 27, 2016. She gave one seminar and two lectures on Development.

Imran Rasul (University College London) visted from October 31 - November 3, 2016. He gave one seminar and two lectures on Development.

Susan Athey (Stanford University) visited from November 28 - December 2, 2016. She gave one seminar and two lectures on Theory/Econometrics.

Faith Guvenen (University of Minnesota) visited from December 5 - 9, 2016. She gave one seminar and two lectures on Macroeconomics.

Kate Bundorf (Stanford University) visted from March 27 - 31, 2017. She gave one seminar and two lectures on Health.

Erik Hurst (University of Chicago) visited from April 3 - 6, 2017. He gave one seminar and two lectures on Macroeconomics.

Whitney Newey (Massachusett Insitute of Technology) visited from April 18 - 21, 2017. He gave one seminar and two lectures on Econometrics.

2017 Rosenstein-Rodan Prize

This year's winner of the Rosenstein-Rodan Prize for the best original research on development economics or a related discipline among PhD students in Boston University is Christoph Walsh (Economics), for his paper "Liberalizing the Airwaves in Ghana: A Dynamic Model of Radio Station Competition."

The paper was selected from a very high quality set of submissions. Using a variety of empirical methods and data sources, it studies the spread and effects of commercial radio broadcasting in Ghana following a deregulation in 1992 that broke the state broadcasting monopoly. From entry data of all radio stations, it estimates their coverage areas to construct a dataset of which stations are available at every point in the country. It then structurally estimates a dynamic model of commercial station entry. Geographic regression discontinuity techniques applied to the coverage data combined with demographic health survey data yield estimates of the effects of radio coverage on night lights, malaria incidence, and mosquito bed net usage. The entry of commercial radio resulted in a 2% five-year increase on night light activity, a 2% reduction in malaria and a 16% increase in bed net usage. Finally, the structural model is used to evaluate the effects of alternative regulations on transmitter strengths and broadcasting fees on entry in rural areas, which would increase the positive externalities of radio.

Annual Distinguished Alumni Award

The Institute for Economic Development and the Department of Economics continued the annual award to honor a distinguished alumnus. The Department Chair and IED Director, along with a few senior faculty, established this award to recognize the remarkable accomplishments of our alumni and to inspire and motivate current students in the department.

2017 recipient of the Distinguished Alumni Award is **Jin-Yong Cai.** He earned a Bachelor of Science degree from Peking University in 1982 and his PhD in Economics at Boston University in 1990. Jin-Yong started his career as a Young Professional at the World Bank, from 1990-93, where he worked as an Economist in Central Europe and South Asia. He then joined Morgan Stanley, and in 1994 was seconded as Managing Director to the China International Capital Corporation, at its inception as China's first joint- venture investment bank. In 2000 Jin-Yong became a Participating Managing Director in Goldman Sachs Group and Chief Executive of Goldman Sachs Gao Hua in China. Twelve years later, Jin-Yong was appointed as the Executive Vice President and Chief Executive Officer of the International Finance Corporation, a member of the World Bank Group and the largest global development institution focused on private sector development. After serving four years in this position, Jin-Yong became a partner of Texas Pacific Group (TPG) Capital, one of the largest private equity investment firms in the world, where he is based in HongKong, leading the firm's infrastructure investment with a particular focus on emerging markets. Jin-Yong is also on the board of Aon, a leading global insurance broker, the Policy Commission of the Asia Society Policy Institute and the International Advisory Board of King Abdullah Petroleum Studies and Research Center.

Seminars

IED organizes a weekly seminar during the academic year where visiting speakers present their research. The following is the list of seminars for the 2015-16 year:

FALL 2016

9/15/16
Kyle Emerick, Tufts/visiting BU
"Agricultural Productivity and the Sectoral Reallocation of Labor in Rural India"

9/26/16
Esther Duflo, MIT
"Gossip: Identifying Central Individuals in a Social Network" (with Abhijit Banerjee, Arun G. Chandrasekhar and Matthew O. Jackson)

10/3/16
Nick Ryan, Yale
"Is There An Energy-Efficiency Gap? Experimental Evidence from Indian Manufacturing Plants"

10/17/16
Ameet Morjaria, Northwestern Kellogg
"Understanding Interactions between Family and School Environments in Human Capital Formation" (joint w/ Ofer Malamud and Miguel Urquiola)

10/24/16
Oriana Bandiera, LSE - Distinguished Visitor
"The Evolution of Culture and Institutions: Evidence from the Kuba Kingdom"

10/31/16
Imran Rasul, University College London
"Nation-Building Through Compulsory Schooling During the Age of Mass Migration"

11/7/16
Emily Breza, Columbia GSB
"The Equilibrium Effects of Credit: Evidence from the Andhra Pradesh Crisis"

11/14/16
Stephane Straub, TSE, visiting World Bank
"The Value of Revolving Doors in Brazilian Public Procurement" (joint with Klenio Barbosa, FGV Sao Paulo)

11/28/16
Paul Novosad, Dartmouth
"Educational Investment Responses to Economic Opportunity: Evidence from Indian Road Construction"

12/5/16
Paola Giuliano, UCLA, visiting Harvard
"Long-Term Orientation and School Performance"

12/12/16
Felipe Campante, Harvard Kennedy School
"Long-Range Growth: Economic Development in the Global Network of Air Links" (joint with David Yanagizawa-Drott)

Spring 2017

3/27/17
Joe Kaboski, Notre Dame
"Growth Policy, Agglomeration, and (the Lack of) Competition" (joint with Wyatt J. Brooks and Yao Amber Li)

4/3/17
Francesco Amodio, McGill
"Improving Regulatory Transparency in Business Tax Collection: An RCT in the Kyrgyz Republic" (with Jieun Choi, Giacomo De Giorgi and Aminur Rahman)

4/10/17
Ethan Lewis, Dartmouth
"Immigration Restrictions as Active Labor Market Policy: Evidence from the Mexican Bracero Exclusion" (with Michael A. Clemens and Hannah M. Postel)

4/24/17
Nico Voigtlaender, UCLA, visiting Harvard
"The Medieval Origins of Democratization"

5/1/17
Claudia Steinwender, HBS
"Drivers of Fragmented Production Chains: Evidence from the 19th Century" (with Reka Juhasz)

5/8/17
Pinar Keskin, Wellesley, visiting BU
"Breaking the Cycle: Education and Intergenerational Transmission of Violence" (with Bilge Erten)

Student Activity

This year, eleven graduating BU Ph.D. students accepted job offers. They received support from IED with regard to their preparation for the job market. Seven of them will be starting in academic positions, one is joining an international organization and three are joining private companies as research economists. Ten of the eleven jobs are located in the United States. Congratulations to our Ph.D. graduates!

Seth G. Benzell, post doc, MIT Initiative on the Digital Economy; **Costas Cavounidis,** Assistant Professor, University of Warwick, Department of Economics; **Jonathan Hersh,** Assistant Professor, Chapman University, Argyros School of Business and Economics; **Matthew Klepacz,** Assistant Professor, The College of William and Mary, Department of Economics; **Guillermo Lagarda,** Inter-American Development Bank; **Michael Lipsitz,** Assistant Professor, Miami University, Department of Economics; **Calvin Luscombe,** Amazon; **Talal Rahim,** Digonex Technologies; **Svetoslav Semov,** Amazon; **Peter Huaiyuan Wang,** visiting Assistant Professor, Wesleyan University, Department of Economics; **Wenjia Zhu,** post doc, Harvard Medical School, Department of Health Care Policy.

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