RESEARCH REVIEW

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A THEORY OF MONITORING AND INTERNAL LABOR MARKETS

By Gautam Bose and Kevin Lang
Discussion Paper 235

This paper lays out a model of monitoring and internal labor markets based on two key departures from the existing literature. First, firms use monitoring to catch errors and evaluate workers, rather than to deter shirking, cheating or stealing. Second, worker quality is primarily about the ability to handle the non-routine elements of the job, which the authors call crises. Workers can either be good or bad and only good workers can solve crises. Workers may be assigned to either of two tasks, one of which is more productive under routine circumstances but is also subject to more costly crises.

Initially abstracting from wages and the external labor market, the authors show that if the cost of monitoring is finite but sufficiently small, there are four assignment tiers. Workers whom the firm believes are very good are placed in the high task and are not monitored (group A). Those with a somewhat lower probability of being good are allocated to the low task and not monitored. After some time, if they have not been observed to mishandle a crisis, they are placed in the high task (group B). Below this tier, workers are placed in the low task and monitored. Once a crisis occurs, worker quality is known and the worker is assigned to the appropriate task (group C). Finally if the probability that the worker is good is sufficiently low, the firm places him in the low task and again does not monitor him (group D).

The authors then introduce wage and external labor market considerations. They assume that the wage is an increasing function of the probability that the worker is good, and that the worker and firm separate whenever the probability that the worker is good falls below its initial value. Then provided there is no separation, a worker who is initially placed in the low no-monitoring range receives continuous wage increases until the probability that he is good rises sufficiently so that the firm monitors him. At this point, he reaches the top of the scale for his task and does not receive a wage increase until he is promoted.

Wages, then, are explained by the initial probability that a worker is good, task assignment and seniority. The model is consistent with the empirical finding that, in many jobs, wages are determined solely by objective measures that are only very imperfectly related to productivity, such as tenure and education, where education can be seen as an imperfect proxy for the initial probability that a worker is good. The results are also consistent with both the steady increase in wages that frequently accompanies seniority and the large jumps in wages often associated with promotions. Neither empirical finding is easily explained by existing literature.

BREAKS, TRENDS AND THE ATTRIBUTION OF CLIMATE CHANGE: A TIME-SERIES ANALYSIS

By Francisco Estrada and Pierre Perron
Discussion Paper 236

Climate change detection and attribution have been the subject of intense research and debate over at least four decades. However, direct attribution of climate change to anthropogenic activities using observed climate and forcing variables through statistical methods has remained elusive. Earlier attribution studies were based on the assumption that temperatures and forcing variables are integrated processes, but recent work has shown that this assumption was not soundly tested and that there are strong reasons from both statistical and climate physics perspectives for questioning it. This paper investigates the time-series properties of temperatures and forcing variables using recent advances in unit root tests for non-stationarity to determine what type of data generating process best describes the series.

The authors show that both temperature and different combinations of the radiative forcing variables can be best represented as trend stationary processes with a one-time structural change in the slope of the trend functions. Multivariate models indicate that the long-term movements of all these variables are so closely related that the observed temperature and forcing trends cancel out, producing stationary residuals. The results show a clear anthropogenic

fingerprint on both global and hemispheric temperatures. The long-term trends in the temperature series cannot be reproduced in a physically acceptable way unless the well-mixed greenhouse gas series is included as a forcing variable; the other forcing variables by themselves cannot explain the observed warming.

The temperature series show a delayed but more than proportional response to the change in the slope of the forcing trend. The delay in response was estimated to be 8 years in the Southern Hemisphere temperature and 37 years in the Northern Hemisphere, possibly because of complex ocean-atmosphere dynamic processes documented elsewhere in the literature. The post-break trend slope of the first principal component of the forcing variables is two times larger than its first slope value and the resulting post-break trend slopes of global, Northern and Southern Hemisphere temperatures are up to 7, 9 and 10 times larger than their pre-break slope values, respectively.

The authors also estimate the contribution of the different forcing variables and show that the warming experienced during the last century was mainly due to the increase in greenhouse gases and partially offset by the effect of tropospheric aerosols. Other forcing sources, such as solar irradiance, are shown to only contribute to shorter-term variations around the greenhouse gas forcing trend.

STATISTICAL EVIDENCE ABOUT HUMAN INFLUENCE ON THE CLIMATE SYSTEM

**By Francisco Estrada, Pierre Perron
and Benjamin Martínez**
Discussion Paper 237

Two main statistical approaches are used for investigating the attribution of climate change. The first is the optimal fingerprinting method, which consists of searching for spatial and/or temporal patterns consistent with an anthropogenic forcing signal that are common in both observed and externally forced simulations of climate variables. The second is a cointegration framework that permits testing

for the attribution of climate change directly from observed temperature and radiative forcing data based on the assumption that the series are non-stationary but related. The authors of this paper show that none of the temperature and radiative forcing series are integrated once trend breaks are accounted for because they are all stationary around a trend, rendering the latter approach inappropriate. Instead, the authors focus on establishing evidence for the presence of breaks in the trend function that are common to observed temperatures and anthropogenic forcing, thereby establishing direct evidence for the effect of human factors in altering the long-run path of global and hemispheric temperatures. Once the breaks are accounted for, all remaining variations in temperature are stationary with different durations that can be accounted for by non-human factors.

The authors use data for global, Southern Hemisphere and Northern Hemisphere temperatures from a NASA database covering the period from 1880 to 2010 and the Climatic Research Unit's HadCRUT3 dataset, covering 1850 to 2010. They filter the Global and Northern Hemisphere temperature series of the effect of the Atlantic Multidecadal Oscillation, ocean-atmosphere processes naturally occurring in the North Atlantic and producing 60- to 90-year natural oscillations that distort the warming trend. After filtering, the authors document a marked increase in the growth rates of temperatures and anthropogenic greenhouse gases occurring for all series around 1955, which marks the start of sustained global warming.

The authors also show that human interventions effectively slowed global warming on two occasions. First, the Montreal Protocol and technological change in agricultural production in Asia are shown to be major drivers behind the slowdown in warming since 1994, providing evidence for the effectiveness of reducing emissions of greenhouse gases other than CO2 in mitigating climate change in the shorter term. Second, the two World Wars and the Great Depression contributed to global cooling in the mid-20th century. While other radiative factors have modulated their effect, greenhouse gases defined the secular movement in both the total radiative forcing series and the global and hemispheric temperature series. The authors show that deviations from this anthropogenic trend have transitory effects.

INCOMPLETE CONTRACTS AND INDUSTRIAL ORGANIZATION: A SURVEY

By Patrick Legros and Andrew Newman
Discussion Paper 238

While most researchers in industrial organization agree that the neoclassical, cost-minimizing, unitary view of the firm is restrictive, it is still the main object of analysis in the literature. This paper reviews the literature in industrial organization and the place occupied by a richer view of the firm.

The authors first discuss papers revisiting the conjecture that competition provides discipline on managers, increasing managerial effort and, therefore, firm performance. A common theme in these papers is that changing market conditions, like a downward pressure on prices, may have the effect of increasing effort provision assuming that the incentive scheme is kept constant. But it may also have the effect of discouraging owners from offering strong incentives to managers. If the latter effect is strong enough, it may overturn the benefits of competition for the provision of effort in manager-operated firms.

Next, the authors turn to a review of ownership issues. They comment that cross-ownership of assets generates a commitment by the owner to favor high levels of profit for all firms he owns. This will weaken competition between firms if the same owners have control of multiple firms. They also address a series of papers considering the possibility that owners delegate strategic decisions to managers while at the same time controlling these decisions by using incentive schemes. Finally, they turn to papers integrating efficiency motives for integration and market foreclosure or raising rivals' costs as strategic considerations.

The authors subsequently discuss two roles for the distribution of liquidity. First, surplus in a relationship between two enterprises may be increasing in the cash of one of the firms and, second, cash in an industry can create a negative contracting externality on firms. They argue that the general idea that financial structure has consequences for the strategic behavior of firms represents an important message for industrial organization.

Finally, the authors investigate the role that the theory of the firm can play in perfectly competitive environments. They give an example where integration of enterprises means management by a coordinating entity and show that the choice of ownership structure depends on the market price. The competitive market equilibrium condition, equality of quantity supplied and quantity demanded, then determines not only price but also the ownership structures of all the enterprises. A shift in demand may cause all firms to reorganize, resembling a merger (or divestiture) wave.

A PRICE THEORY OF VERTICAL AND LATERAL INTEGRATION

By Patrick Legros and Andrew Newman
Discussion Paper 239

This paper challenges the view that imperfection in the market is the source of all industry-level distortions by laying out a model where imperfections within firms can, by themselves, affect industry conduct and performance within a perfectly competitive market setting. In the model, two complementary suppliers, each consisting of a manager and his collection of assets, must enter into a relationship to produce a unit of the consumer good. The managers operate the assets by making non-contractible production decisions. Technology requires mutual compatibility of the decisions made for different parts of the enterprise. But decisions that are convenient for one supplier are costly for the other, and vice versa.

The main organizational decision the managers make is whether to integrate. If they retain control over their assets and subsequently make their decisions independently, this may lead to low levels of output, since they overvalue their private costs and are apt to be poorly coordinated. Integration addresses this difficulty via a transfer of control rights over the decisions to a third-party "HQ," who enjoys profit, but has no direct concern for the decisions. HQ maximizes the enterprise's output by enforcing a compatible decision, which is inconvenient for both managers.

At low prices, managers do not value the increase in output brought by integration since they are not compensated sufficiently for the high costs they each have to bear. At higher prices, managers value output so much that they are willing to forgo their private interests in order to achieve coordination, and therefore choose to integrate. Thus, demand matters for the determination of equilibrium ownership structure, because it helps determine the market price. Empirical results in the airline industry support this finding, as integration between major airlines and regional carriers is more common when routes are more valuable.

The price mechanism correlates reorganizations across firms and generates external effects of technological shocks: productivity changes in some firms may induce changes of ownership in the rest of the industry. The model generates coexistence of different ownership structures, even among firms facing similar technology, because of the productivity difference between integration and non-integration. If per-firm demand is between the output levels associated with each ownership structure, there must be a mixture of the two in equilibrium. Prior empirical work in many industries shows that enterprises with identical technology can make different integration decisions. The model also identifies a "re-organizational dampening" effect, wherein technological improvements by some firms fail to raise industry output because other firms reorganize in productivity diminishing ways.

The model is amenable to welfare calculations and the authors find that, as long as managers have full claim to enterprise revenues, the competitive equilibrium is efficient. When managers have less than a full claim on revenue, equilibrium can be inefficient, with too little integration. These welfare losses are unlikely to be mitigated by instruments that reduce frictions, including positive cash endowments for managers and free entry into the product market.

THE EFFECTS OF SOCIAL INTERACTIONS ON FEMALE GENITAL MUTILATION: EVIDENCE FROM EGYPT

By Karim Naguib
Discussion Paper 240

Female genital mutilation (FGM) is a traditional procedure of removing the whole or part of the female genitalia for non-medical reasons – typically as a signal of 'quality' in the marriage market. Unsurprisingly, FGM has been found by the World Health Organization to be harmful to the health of women, and is internationally recognized as illegal. Nonetheless, it is still prevalent to different degrees in Western, Eastern, and Northern Africa. The paper studies the causal factors that determine a household's FGM decision for their daughter, particularly the social effects.

The paper employs data from a georeferenced nationally representative survey of 9,963 Egyptian households, undertaken in 2008 (EDHS 2008). This is trimmed to a subsample of 4,619 households with 6,563 appropriately-aged daughters. Each daughter's peer group is approximated as the set of neighbors' daughters in the sample that are both: within 1 year of age-difference, and living within 10 kilometers. The author estimates the causal social effect of average peer-group FGM on a daughter's FGM outcome. An additional, novel contribution is estimation of the effect of whether peers received FGM treatment via medicalized or traditional FGM providers. The reciprocity of all peer effects suggests the use of instrumental variables. The instrument exploits intransitivities in the peer-group relation: the peer of my peer may not be my peer as well.

The paper finds a strong, robust, positive reinforcing effect of peers' FGM. However, a predominantly negative effect is found for the medicalization social effect. This second finding implies that a neighbor's move to medicalized FGM helps dissuade a household from subjecting their own daughter to FGM. Further nuance is provided for this result: in the sub-population of urban households with difficulty accessing health care services, the neighbor's choice of medicalization encourages a household toward FGM. A theoretical model of marriage markets and pre-marital investment provides a potential theoretical

explanation of the medicalization result: as FGM moves away from the traditional sphere into that of professional healthcare, FGM's links to the marriage-market may weaken, diminishing the incentives for FGM.

The positive effect of peers' FGM suggests that governments' or other social actors' direct action to influence households' FGM decisions could be a fruitful policy, as social networks could provide a multiplier effect impacting FGM decisions. The negative effect of peers' medicalization shows that perhaps institutions should not be over-eager to prevent medicalized FGM, as it may help decrease overall levels of FGM through peer effects. However, an additional nuance is the positive peer effect of medicalization on poor urban households' FGM decisions. This may imply that institutions should avoid going too far in allowing medical FGM, so as not to appear as endorsing the practice.

MAJORITY RUNOFF ELECTIONS: STRATEGIC VOTING AND DUVERGER'S HYPOTHESIS

By Laurent Bouton and Gabriele Gratton
Discussion Paper 241

Majority runoff elections are currently the most common method of electing presidents and other important government officials within democracies. It is believed that runoffs hold a pair of distinct advantages over plurality elections. They may incentivize individuals to vote sincerely in the first round since they will always be able to change their vote to a lesser choice in the second round, thereby improving information aggregation. And they may confer democratic legitimacy by requiring that the winner receive a majority of the voting population in at least the final round. On the other hand, there are fears that voters may strategically try to "push over" weak candidates into the second round in order to secure victory for their preferred candidate. Despite the prevalence of this system and these arguments, the empirical literature is mixed and the theoretical work either weak or non-robust.

The authors seek to improve upon this by characterizing the full set of strictly perfect equilibria in large population, three-candidate runoff elections. In order to avoid the trap of non-robust results, they consider all possible distributions of preference orderings and cardinal intensities in the electorate, as well as non-strategic voters who always vote their preference. To achieve this, the authors take the intuitive assumption that for any pair of candidates in a potential second round the probability of victory is fixed and known.

The authors show that there always exist three "Duverger's Law" equilibria, in which all voters vote for one of two candidates, with the third candidate receiving no votes. The only other equilibrium that may exist is one in which all voters who prefer the front runner vote for her, while some but not all of the voters preferring the "weaker" opponent vote strategically for the stronger opponent. A corollary, therefore, is that there are no equilibria of this game where everyone votes sincerely. This means that runoff elections do not necessarily improve information aggregation. In fact, the Condorcet winner may not even advance to the second round. Worse still, the presence of heterogeneous preference intensities actually makes the non-Duverger's law equilibrium, in which some voters vote sincerely, less likely. The only strong positive result is that runoffs prevent a Condorcet loser from winning. The authors' results indicate that the benefits of majority runoff elections have been vastly exaggerated.

DIVIDED MAJORITY AND INFORMATION AGGREGATION: THEORY AND EXPERIMENT

By Laurent Bouton, Micael Castanheira, and Aniol Llorente-Saguer
Discussion Paper 242

Ever since the groundbreaking work of Condorcet, one of the principal rationales for the democratic election is that it allows voters to aggregate diffuse information. However, in multiple-candidate frameworks, Duverger's Law has shown that plurality elections may lead to a majority that is divided over which of two candidates they prefer, and therefore coordinates behind only one to prevent a third, minority candidate from being elected. It therefore seems quite reasonable that information aggregation may fail in this case. One proposed improvement is approval voting (AV), which allows voters to "approve" of as many choices as they wish instead of giving everyone just one vote. AV makes it easier to coordinate against a Condorcet loser. However, this refinement has not yet been theoretically examined closely.

The authors fill this gap in the literature by examining the issue both theoretically and experimentally. They consider a case where a majority of the population shares a common value, but each voter receives a noisy but informative signal over which of two candidates best represents this value. Meanwhile, a minority of the population strictly prefers a third candidate over the other two, and vote passively for their preferred candidates. When the minority is sufficiently large, it is possible for plurality voting to lead to the Condorcet loser emerging victorious. AV, by contrast, allows for both information aggregation and coordination by having an equilibrium strategy where common value voters always vote their signal and then mix between approving and not approving of their second choice. Therefore AV should lead to strictly higher welfare of active voters in expectation.

They test these predictions in a laboratory setting, where the state of the world is represented by the color of a jar, red or blue, where the majority of balls in a jar are of the same color. The voters draw a ball (signal) and are then asked to vote according to either a plurality or AV system,

with the game repeated multiple times. The payoffs reward correct prediction of the jar, while punishing election of a minority computer "candidate".

The theoretical predictions hold up in the lab. Under plurality, when the minority is small, people vote sincerely and the informative outcome tends to carry the day. When the minority is large, however, the voters start by voting sincerely and then converge over time to a Duverger's Law outcome of uniting behind one candidate. Under AV, as expected, people sometimes double vote, with the amount of double voting increasing with the size of the minority. Interestingly, there are fewer strategic mistakes under AV, and convergence to payoff maximizing equilibrium play is quicker under AV. Therefore, as expected, AV provided higher payouts than plurality.

INTERGENERATIONAL TRANSMISSION OF HUMAN CAPITAL IN EUROPE: EVIDENCE FROM SHARE

By Luca Stella
Discussion Paper 243

An important component of human capital can be assessed by the extent of individuals' academic careers as students, measured by years of education. When considering policies to improve education outcomes of new generations, a key question concerns the inter-generational transmission (IGT) of human capital: specifically, the causal role of parents' education in influencing education outcomes for their children. Does increased education of parents cause increased education of their children? Or is the naïvely observed correlation between parents' and children's levels of education mainly due to unobserved covariates, such as "innate ability?" Are there differences between the various education effects of mothers versus fathers, on daughters versus sons?

The author estimates local average treatment effects by including observations on individuals and their families from nine European countries, across the 20th century. He employs data from the 2004 and 2006 waves of the Survey of Health Ageing and Retirement in Europe (SHARE). From this data frame describing more than 30,000 respondents aged fifty and above and their families, the dataset is trimmed to include married or cohabiting respondents with at least one biological child born between 1920 and 1956. This results in a sample of 6,184 biological children born between 1956 and 1980. For identification, the paper exploits exogenous variation in parental education due to nine countries' differently-timed reforms in compulsory schooling. Between 1936 and 1969, these countries and their provinces implemented 26 different reforms changing the minimum school leaving age. Thus, the estimated effect represents a treatment effect over a large portion of Europe.

The paper finds significant evidence for strong causal IGT effects. A child's education is caused to increase by approximately 0.44 years of schooling for each marginal additional year of a parent's additional education caused by changes in compulsory schooling laws. Also, an additional year of a mother's education causes an effect that is 0.05 years stronger than an additional year of a father's education. This finding of a large causal role of parents' education in childrens' outcomes could suggest policies to encourage adult education of parents with the additional goal of achieving multiplier effects on their children's education. It affirms the long-term effectiveness of compulsory education policies in increasing education levels. The additional finding about mothers' education having a stronger influence over childrens' education highlights the relevance of women's education.

WOMEN'S INCOME AND MARRIAGE MARKETS IN THE UNITED STATES: EVIDENCE FROM THE CIVIL WAR PENSION

By Laura Salisbury
Discussion Paper 244

Marriage patterns in the United States changed significantly over the course of the nineteenth century. For example, the average female age at first marriage rose from roughly 20 during the colonial period to a peak of 23.6 in 1890. Competing explanations for this pattern have been proposed, including declining land availability and falling male-female ratios, but a virtual absence of micro data following women over this period has made it difficult to test these hypotheses empirically. One potential explanation which has hitherto received insufficient attention is the role of women's expanding economic opportunities in changing their preferences for marriage. Identifying the causal effect of economic opportunities on marriage markets is a challenge since women's choices about marriage and career are jointly determined.

This paper tests this explanation by estimating the effect of U.S. Civil War pension income given to Union Army widows on their subsequent marriage outcomes. The pension law, widely considered America's first large-scale social assistance program, entitled a widow to a monthly pension as long as her late husband died due to injury or disease sustained in the service and she had not remarried subsequently. Since pension eligibility was terminated as soon as the widow remarried, it could plausibly influence her decision about whether and whom to remarry. Receipt of the pension was not automatic, however. A widow needed to apply, and claims often took months or even years to adjudicate. The author exploits this variation in processing time to estimate the effect of a widow's transitioning from a pending to settled claim on her duration until remarriage, as well as the quality of her new "match" conditional on remarrying. To undertake her analysis, she collected detailed archival records from the Civil War pension files on widows' pension and marriage histories.

The author finds a significant effect of the pension on the timing of remarriage; receiving the pension caused

a widow's rate of remarriage to drop by 40 percent on average, implying an increase in the median time to remarry of roughly three years. Her estimation strategy allows for the possibility that a widow's pension claim processing time could be endogenous to her remarriage prospects, ensuring her results are not driven by spurious reverse causality. On the other hand, she finds no evidence that the pension improved match quality among widows who did remarry.

While this paper considers a very specific setting, its results shed light on evolving marriage markets more broadly. The late twentieth century has seen an enormous expansion in women's economic opportunities and a concurrent decline in the marriage rate, but existing empirical studies have been unable to disentangle the roles of changes in women's preferences for marriage and changes in cultural norms. This paper provides convincing evidence that American women did respond to economic opportunities when making their choices about marriage in the late nineteenth century.

TECHNICAL CHANGE AND THE RELATIVE DEMAND FOR SKILLED LABOR: THE UNITED STATES IN HISTORICAL PERSPECTIVE

By Lawrence F. Katz and Robert A. Margo
Discussion Paper 245

While technology has been an engine of economic growth for the U.S. since the Industrial Revolution, the extent to which it displaces or complements different skill groups of labor has been debated. Preceding this paper, the conventional wisdom was that the relationship between capital and skill displayed a sharp discontinuity around the turn of the twentieth century. As the story goes, the increase in mechanization following the Industrial Revolution was "de-skilling" in that it largely displaced skilled artisans in favor of capital and unskilled labor. But by the twentieth century the increasing need for managers and other "white collar" skilled labor facilitated a capital-skill complementarity, which persisted throughout the twentieth century.

This paper provides evidence that the nineteenth century relationship between capital and skill in fact displayed a broad continuity with the twentieth century. Drawing on establishment-level data, the authors find that investment in capital like steam power by manufacturing establishments was indeed associated with a more intensive use of unskilled labor. But a closer look at changes in the occupational distribution from 1850-1910 reveals that manufacturing employment also increased for skilled white-collar workers like managers and clerical workers. Turning to the aggregate economy, the authors find no evidence of de-skilling but also find an increase in skilled-labor employment.

While the increase in employment in skilled white-collar occupations is consistent with capital-skill complementarity, the authors concede this pattern could instead be explained by supply factors. Rising educational attainment throughout the latter half of the nineteenth century increased the supply of white-collar workers over the period. To disentangle these stories, the paper uses a novel dataset on occupational wages from 1820 to 1880 and finds that wages of white-collar workers increased relative to other groups, suggesting relative demand for white-collar workers outpaced their relative supply.

The secular rise in relative demand for white collar workers over the period suggests the skill bias of technical change observed over the twentieth century has its roots as earlier as 1850, and possibly earlier. But the concurrent de-skilling in nineteenth-century manufacturing also has a counterpart in a more recent phenomenon, as rapid increases in computing power since the 1980s has largely displaced middle-skill occupations. This nuanced relationship between capital and skill can be explained with a model in which technical change reduces demand for skilled labor in certain "tasks," but increases it in others.

Accountability of Local and State Governments in India: An Overview of Recent Research

By Dilip Mookherjee
Discussion Paper 246

This paper seeks to update a previous collection of essays by the author on governance reforms in India by surveying recent literature emerging on this topic over the past decade. The survey takes a systematic approach, moving through the dual dimensions of model specifications and theoretical/empirical methodologies. It organizes around the "departure point" of the Downsian model of electoral competition, and then successively relaxes different categories of its underlying assumptions. Within each extension, the paper first considers theoretical literature relevant to the Indian context, and then connects this with the results of related empirical studies.

The first extension involves the possibility of uneven patterns of political participation and information across various socio-economic classes. Evidence from multiple studies shows that more educated voters have higher rates of political participation and awareness, while other voter demographics are insignificantly related to these. Some recent experiments providing information to voters regarding candidates find significant effects on subsequent vote shares. A second extension concerns voters with heterogenous ethnicities and ideologies voting partly on the basis of their perceived affinities with candidates on these dimensions, rather than past performance or objective attributes. Empirical studies turn out to differ on whether caste-homogenous electorates worsen or improve elected officials' performance in office. A third extension accommodates intrinsic policy preferences of candidates, and their inability to commit to policies espoused in their electoral platforms. The evidence for the role of these departures from the Downsian model is mixed. The context of implementation of land reforms shows limited evidence of the role of candidates' ideologies. On the other hand, reservations of local government seats for scheduled castes and scheduled tribes (SC/ST) shows evidence that these candidates did implement policies toward the interests of their own caste groups while in office.

Other extensions concern the role of interest groups, campaign finance and clientelism. Empirical studies show increased inequality in landownership is related to poorer management of public education systems, thus providing evidence that elite capture is enhanced by land inequality. Inter-village resource allocations for local governments show greater evidence of capture than the more visible intra-village allocations. While it is difficult to quantitatively identify clientelistic vote buying, multiple studies find that election years feature increased provision of short-term recurring benefits and increased losses in electricity distribution.

The survey affirms India's robust democratic participation, while identifying relevant areas for policy improvements toward efficient and progressive governance. Increasing accountability can be achieved through various channels, including increasing education and political information, support for deliberative local councils, minority reservations, increased transparency of revenue allocations across different levels of government and regions, and devolving social service spending autonomy to local governments. While local governments can play an increasingly important role in coordinating local programs, increasing their influence and autonomy needs to be weighed in each situation against risks of elite capture, corruption and clientelism.

FIREWOOD COLLECTIONS AND ECONOMIC GROWTH IN RURAL NEPAL 1995-2010: EVIDENCE FROM A HOUSEHOLD PANEL

By Jean-Marie Baland, Francois Libois, and Dilip Mookherjee
Discussion Paper 247

During the 1980s and 1990s Nepal was subject to serious deforestation, with forest cover declining at an average annual rate of 1.9%. Then from 1995 to 2010, Nepal experienced a reduction in firewood collections by rural households. During this latter period the country underwent substantial economic growth, demographic change, and changes in forest management policies. The nature of causal relationships between these three trends and household use of common property resources is a matter of considerable debate. The Poverty-Environment Hypothesis (PEH) asserts that firewood is an inferior good, so economic growth and poverty reduction will result in a decrease in firewood collections. In contrast, the Environmental Kuznets Curve (EKC) hypothesis claims that firewood is a normal good at lower wealth levels, and becomes inferior only after a household passes an income threshold. This paper tests between the EKC and the PEH, and assesses the roles of economic growth, demographic changes, and peer effects in explaining changes in firewood collections in Nepal between 1995-2010.

The paper uses data from longitudinal household data extracted from successive World Bank's Living Standards Measurement Surveys (LSMS). Part of the purpose is to explore the robustness of findings of past literature, which have been entirely based on cross-sectional evidence. The LSMS provides a representative subset of longitudinally linked surveys, including 634 households. Thus, the panel comprises 195 households surveyed in all three waves of 1995, 2003, and 2010, with the remaining 439 households each surveyed in two consecutive years. Semi-parametric and parametric Engel curve regressions with household and time fixed effects show that firewood is a normal good except for approximately the top 5% wealthiest households in the sample, for whom it is an inferior good. Similar to the findings of previous literature based on cross-sectional studies, the evidence strongly supports the EKC, against the PEH.

To avoid unobserved variable bias, the paper elaborates a second model relating firewood collection to households' assets, instead of consumption. The authors also consider peer effects of villages' average assets and characteristics. Accounting for village-average spillover effects turn out to produce more accurate predictions.

While consumption growth was found to increase firewood collections of individual households, the spillover effects dominated this effect overall. Over 1995-2010, mean household size decreased by 0.6 members and mean adult education increased by 1.1 years, with both trends decreasing firewood collections. Reinforcing social peer effects from these and other demographic changes further augmented the direct effects on collections. This augmentation accounts for the overall decrease in collections despite consumption growth. While proximity of Forest User Groups did not significantly relate to changes in collections, the authors are unable to draw more definitive inferences concerning the role of forest management reforms.

Faculty Profiles

**The following paragraphs summarize the projects and
development-related research being conducted by
Institute affiliates from the Department of Economics at Boston University**

Kehinde Ajayi's current research focuses on education and youth employment in Africa. She continues to work on a project that examines the schooling choices of secondary school students in Ghana. Key questions in this project include: What kind of information influences schooling decisions? Do differences in male and female labor market opportunities affect choices about what field to study? And how does school quality affect student outcomes? She is also pursuing a project on the determinants and effects of public sector employment.

Marianne Baxter worked on projects in a wide range of fields. 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 new 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.

Laurent Bouton is an applied theorist whose interests include political economy, microeconomics, and public economics. His current work examines both theoretically and in the laboratory the properties of various electoral systems when voters are strategic. In another line of research, Laurent analyzes the welfare effect of rankings in markets in which there are consumption externalities and/or capacity constraints (e.g. education markets). He is leaving Boston University at the end of this academic year to take up a position at Georgetown University.

Randall Ellis' recent research focuses on how payment systems affect health care providers and health plans. In June 2012 he completed his two years serving as President of the American Society of Health Economists. His research on risk adjustment and predictive modeling resulted in payment models being used in the US since 2000 and Germany since 2009. Similar models are being evaluated in numerous other countries. During the past year Ellis has given talks in the US, Canada, Iceland, Korea, and Uruguay. He is currently collaborating with researchers in the US, Australia, Chile, and China, and as well as with multiple graduate students on US and developing country topics.

Carola Frydman works at the intersection of economic history, corporate finance, and labor economics. Recently, she investigated the changes in executive compensation, the market for managers, and income inequality in the U.S. over the twentieth century. Her current project studies the evolution of businesses organizations and financial markets from 1900 to 1930, focusing on the value of connections to bankers through boards of directors, and the detrimental consequences of these ties on firm outcomes during financial crises.

Stefania Garetto's current research analyzes 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 has analyzed the relationship between export/FDI status and financial indicators. Her current work focuses on banks' international activities.

Simon Gilchrist's research studies 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 investment irreversibility on business cycle dynamics in environments where capital serves as a form of collateral in loan contracts.

Robert King continues to focus 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 continues to focus his research on education and labor markets, in the context of Israel and the US. Along with Deepti Goel he is studying the role of social networks in the assimilation of immigrants to Canada. His book, *Poverty and Discrimination*, was published by Princeton University Press in 2007.

Robert Lucas's current work encompasses two main fields: international migration and inter-generational mobility. Lucas is working on a series of papers in collaboration with Sari Pekkala Kerr, a former IED visitor, on inter-generational mobility in Finland. He is also preparing a chapter on African migration to appear in the North-Holland Handbook series. In addition, Lucas has been acting as a member of the advisory committee on remittances to G8 countries.

Robert A. Margo is currently working on co-editing two NBER conference volumes, *Human Capital in History: The American Record* and *Enterprising America: Businesses, Banks, and Credit Markets in Historical Perspectives*. His current IED working paper with Lawrence Katz is a forthcoming chapter in *Human Capital in History*.

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 has been working on a combination of theoretical and empirical topics related to development economics. Currently ongoing projects include theoretical analyses of inequality, mobility and welfare, and empirical studies of effects of bankruptcy law in India and the US, land policies, deforestation, local governance, microfinance and agricultural marketing in South Asia. He returned this year from sabbatical leave at Columbia University during the previous academic year.

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. During the past academic year he was on sabbatical leave at Yale and Brown Universities.

Seminars

IED organizes a weekly seminar year-round where visiting speakers present their research.
The following is the list of seminars the past year.

Fall 2012

09/10/12
Joshua Goodman (Harvard Kennedy School)
"First Degree Earns: The Impact of College Quality on College Completion Rates"

09/17/12
Salvatore Nunnari (UC San Diego)
"Dynamic Legislative Bargaining with Veto Power"

10/01/12
Gani Aldashev (University of Namur, CRED)
"Awareness and AIDS: A Political Economy Perspective" (joint with **Jean-Marie Baland**)

10/15/12
Sheetal Sekhri (University of Virginia)
"Prestige Matters: Value of Networks Formed in Colleges"

11/05/12
Dara Lee (University of Missouri)
"The Impact of Childhood Health on Adult Educational Attainment: Evidence from Mandatory School Vaccination Laws"

11/12/12
Rajiv Sethi (Barnard)
"Perspectives, Opinions, and Information Flows"

11/19/12
Felipe Barrera-Osorio (Harvard University)
"Incentivizing schooling for learning: Evidence on the impact of alternative targeting approaches" (by **Felipe Barrera-Osorio** and **Deon Filmer**)

11/26/12
Raffaella Sadun (Harvard Business School)
"Managerial Capital at the Top: Evidence from Indian CEOs"

12/03/12
Tavneet Suri (MIT)
"Rural Roads and Intermediated Trade: Regression Discontinuity Evidence from Sierra Leone"

12/10/12
Rema Hanna (Harvard Kennedy School)
"The Effect Of Pollution On Labor Supply: Evidence From A Natural Experiment In Mexico City"

12/12/12
David Weil (Brown University)
"Malaria and Early African Development: Evidence from the Sickle Cell Trait," joint with **Emilio Depetris Chauvin** (Brown University)

Spring 2013

03/04/13
Stephen Coate (Cornell)
"Evaluating Durable Public Good Provision using Housing Prices"

03/18/13
Eliana La Ferrara (Università Bocconi)
"Does interaction affect racial prejudice and cooperation? Evidence from randomly assigned peers in South Africa"

03/25/13
Monika Schnitzer (Ludwig-Maximilians-Universitat Munchen, visiting Harvard)
"Spillovers of Venture Capital"

Leigh Linden (University of Texas at Austin)
"The Effects of "Girl-Friendly" Schools: Evidence from the BRIGHT School Construction Program in Burkina Faso"

04/08/13
Claudio Ferraz (Pontifica Universidade Catolica do Rio de Janeiro)
"Rewarding Violence Control: The Electoral Effects of Pacifying Rio's Favelas"

04/18/13
Duncan Thomas (Duke)
"The Impact of a Natural Disaster on Child Health"

04/22/13
Nishith Prakash (Uconn Storrs)
"Cycling to School: Increasing High School Enrollment for Girls in India"

04/29/13
Sandip Sukhtankar (Dartmouth, visiting Harvard)
"Fiscal Federalism and Local Politics"

05/06/13
Miguel Uriquola (Columbia)
"College reputation and educational market performance"

Distinguished Visitors 2012/2013

Manuel Arellano from CEMFI, Spain, visited from September 24th through the 28th. He gave one seminar and two lectures on econometrics.

Iwan Barankay from Wharton School, University of Pennsylvania, visited from October 23rd through the 26th. He gave one seminar and two lectures on labor economics.

Yeon-Koo Che from Columbia University visited from November 5th through the 9th. He gave one seminar and two lectures on microeconomic theory.

Rajiv Sethi from Barnard College visited from November 12th through the 16th. He gave one seminar and two lectures on development economics.

Noah Williams from University of Wisconsin, Madison visited from December 4th through the 7th. He gave one seminar and two lectures on macroeconomics

Thomas Buchmueller from University of Michigan visited from March 4th through the 8th. He gave one seminar and two lectures on health and public policy economics.

Patrick Bolton from Columbia University visited from April 1st through the 4th. He gave one seminar and two lectures on corporate finance.

Thomas Lemieux from University of British Columbia visited from April 22nd through the 26th. He gave one seminar and two lectures on econometrics.

Students Activity

PhD Students Completed Dissertations and Placement

The Economics Department had another strong and diverse group of PhD students on the job market. We congratulate the following students on their new academic positions: **Andrew Ellis**, London School of Economics; **Wendong Shi**, Renmin University, Beijing, China; **Jiawen Xu**, Shanghai University of Finance and Economics, China; **Myongjin Kim**, University of Oklahoma; **Sarah Kroeger**, University of Wisconsin, Milwaukee; **Giulia La Mattina**, University of Southern Florida; **Laura Salisbury**, York University, Toronto, Canada and **Yanfei Wang**, Capital University of Economics and Business, Beijing China.

The following PhD students secured post doc positions: **Olesya Baker**, Harvard Medical School, Department of Health Policy Translation; **Osea Giuntella**, Oxford University and **Ju Shi**, Harvard University, Department of Health Care Policy.

2013 Rosenstein-Rodan Prize

The Rosenstein-Rodan prize is awarded annually for the best paper in a development-related area written by a PhD economics student.

This year the prize was won by **Deborah Goldschmit**, for her paper titled: "Family Structure and Abortion Law". The paper studies the impact of recent regulations in various US states that effectively increased the cost of abortion, disproportionately affecting low-income women. Using data on 20 years of changing abortion laws, the paper finds little effect on the population overall, but a significant impact on low-income children. More specifically, poor children born under restrictive abortion regimes were less likely to live with married parents, and more likely to live with single mothers or in multi-generational households.

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