# EC9C0 Topics in Development Economics

## Week 3: Workers
## Lecture 6

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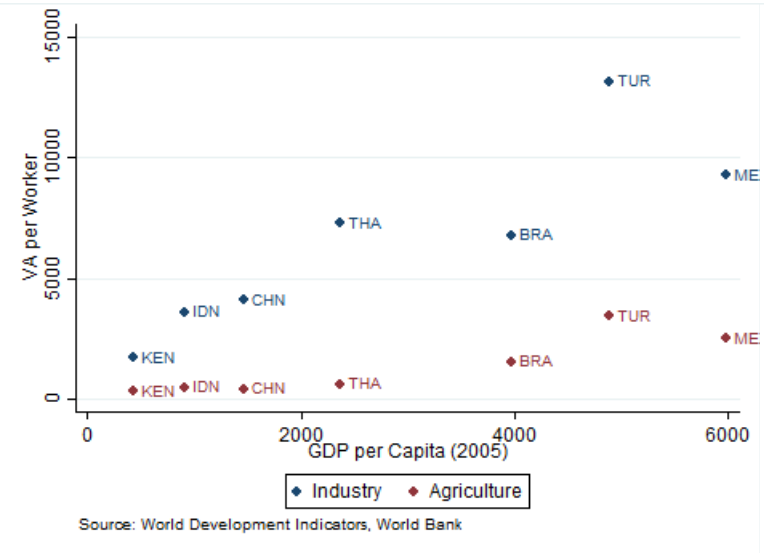
January 23, 2025

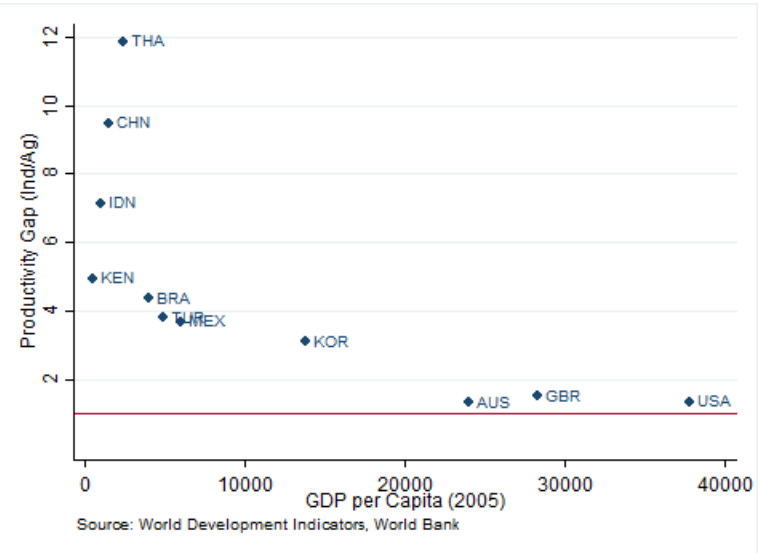
# Outline of the lecture

1. Rural-Urban Wage Gaps
2. Costs and benefits of migration
3. Migration and productivity

Lecture notes based on previous lectures developed by Anant Sudarshan and Clement Imbert.

# Labor productivity gap between sectors within developing countries (Gollin et al. 2014)



# Robustness and Mechanisms (Gollin et al. 2014)

The finding that industry is much more productive than agriculture in developing countries is robust to:

- Adjusting for hours worked (poor people work longer hours).
- Accounting for differences in human capital (schooling and experience).
- The gap decreases by half but is still substantial.

Across countries, the productivity gap is correlated with barriers to migration.

# Spatial (Mis)Allocation of labor

Evidence of labor misallocation across space:

- Gollin et al. (2014) find large productivity gap between agriculture and manufacturing.
- Munshi Rosenzweig (2016) show evidence of large real wage gaps between rural and urban India.

Evidence suggesting allocation is optimal:

- Young (2013) argues that gaps are entirely driven by selection.
- Hicks et al. (2017) use Indonesian panel data and find little to no income and consumption gains for movers.

Should workers move? If yes then why don't they?

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# Bryan Chowdhury and Mobarak (2014) Context

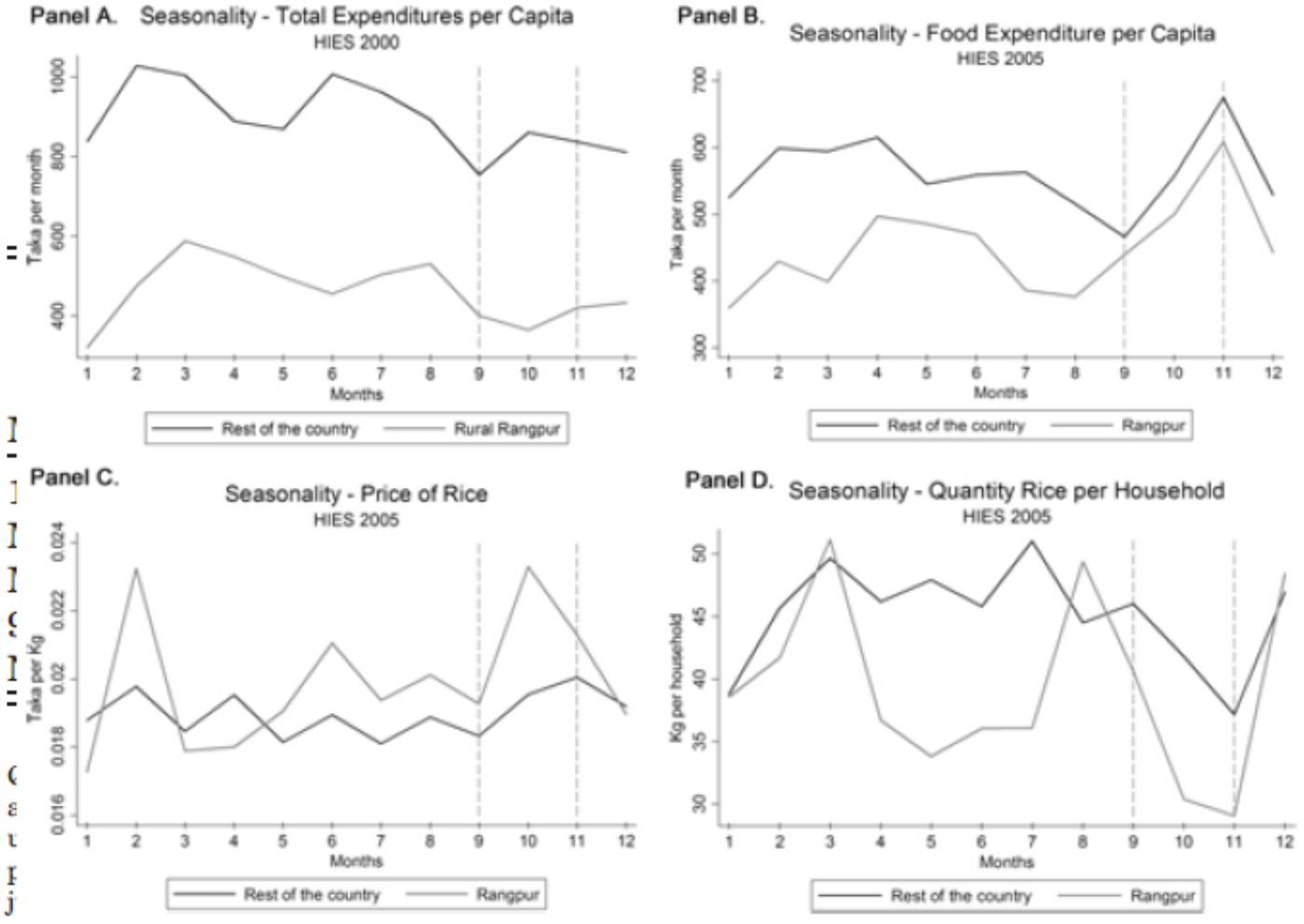


FIGURE 1.—Seasonality in consumption and price in Rangpur and in other regions of Bangladesh. *Source*: Bangladesh Bureau of Statistics 2005 Household Income and Expenditure Survey.

Source: Bryan et al. (2014).

# Bryan Chowdhury and Mobarak (2014) Experiment

TABLE II

PROGRAM TAKE-UP RATES[a]

| | *Incentivized* | Cash | Credit | *Not Incentivized* | Info | Control | *Diff. (I − NI)* |
|---|---|---|---|---|---|---|---|
| Migration rate in 2008 | 58.0% | 59.0% | 56.8% | 36.0% | 35.9% | 36.0% | 22.0*** |
| | (1.4) | (1.9) | (2.1) | (2.0) | (2.8) | (2.8) | (2.4) |
| Migration rate in 2009 | 46.7% | 44.6% | 49.1% | 37.5% | 34.4% | 40.5% | 9.2*** |
| | (1.4) | (1.9) | (2.1) | (2.0) | (2.8) | (2.9) | (2.5) |
| Migration rate in 2011[b] | 39% | | | 32% | | | 7.0** |
| | (2.1) | | | (2.5) | | | (3.3) |

[a]Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Diff. Incentivized − Not Incentivized tests the difference between migration rates of incentivized and non-incentivized households, regardless of whether they accepted our cash or credit. No incentives were offered in 2009.

Source: Bryan et al. (2014).

# Bryan Chowdhury and Mobarak (2014)

- Context: poor remote area of rural Bangladesh with seasonal famine.
- Experiment: travel subsidy to the city for seasonal migrants.
- Large and sustained positive effects on migration.
- Some evidence of positive effect on welfare (health).
- Main question is: why didn't they migrate before?
  - Liquidity constraints: unlikely, subsidy is very small.
  - Income risk: risk aversion would have to be very high.
  - Lack of information: but 30-40% of control migrates!
- Based on these results: scale-up "No-lean season" projects in Indonesia, India, Sub-Saharian Africa...

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# Welfare analysis: Lagakos, Mobarak and Waugh (2023)

- Offer a welfare analysis of the BCM experiment.
- Develop a model of rural to urban migration (seasonal and permanent)
- Use the experimental data to estimate the model.
- Leverage the model for:
  - welfare analysis of treatment impacts.
  - counterfactual effects of unconditional transfer.
  - counterfactual effects of permanent subsidy.

# Lagakos, Mobarak and Waugh (2023) Model

- Blocks:
  - Preferences: disutility of migrating mediated by experience (generates persistence).
  - Endowments: Productivity + rural/urban shocks
  - Production + wages
  - Location Choice
  - Asset Accumulation (outside option)
- Estimation: Simulated Method of Moments.

# Lagakos, Mobarak and Waugh (2023) Model

- State Variables:
  - Urban Productivity Draw
  - Productivity Shock (affects wage rate)
  - Moving Cost Shock
  - Endogenous: Assets, Location, Experience (Migrated Before), Migrant Status
  - Exogenous Aggregate: Season, Population Size
- Dynamics:
  - Transitory versus permanent state variables.
  - Exogenous versus endogenous state variables.
  - Value function for rural and urban households.
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# Lagakos, Mobarak and Waugh (2023) Model

- Season: Set productivity draw low during lean season
- Productivity Draw: Increases migration incentives
- Disutility: Decreases migration incentives
- Migration Experience: Increases migration incentives (generates repeat migration)
- Wage Shock:
  - If urban areas are volatile, migrate when positive rural shock+high assets
  - If urban areas are predictable, migrate when negative rural shock

# Lagakos, Mobarak and Waugh (2023) Pre-assigned parameters

Some parameters are pre-assigned:

**Table 1: Pre-Assigned Parameters**

| | $\alpha$ | $\beta$ | $R$ | $A_{rl}/A_{rg}$ | $m_T$ | $m_p$ | $\phi$ |
|---|---|---|---|---|---|---|---|
| Value | 2.0 | 0.95 | 0.95 | 0.50 | 0.1 $\times$ rural cons. | 2 $\times$ $m_T$ | 0.91 |

Source: Lagakos et al. (2023).

- Risk-aversion, discount rate and returns on assets.
- Seasonal and permanent migration costs.
- Labor demand elasticity.

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# Lagakos, Mobarak and Waugh (2023) Matched Moments

**Table 2: Moments Targeted in the Estimation**

| Moments | Data | Model |
|---|---|---|
| Control: Variance of rural log consumption growth | 0.19 (0.03) | 0.19 |
| Control: Percent of rural households with no liquid assets | 47 (1.13) | 48 |
| Control: Seasonal migration rate | 36 (2.64) | 36 |
| Control: Consumption increase of migrants (OLS) | 10 (4.47) | 10 |
| Control: Repeat migration rate | 68 (0.46) | 70 |
| Treatment: Seasonal migration relative to control | 22 (2.39) | 21 |
| Treatment: Seasonal migration relative to control in year 2 | 9 (2.44) | 4 |
| Treatment: Consumption increase of induced migrants (LATE) | 30 (9.67) | 29 |
| Urban-Rural wage gap | 1.89 (0.18) | 1.89 |
| Percent in rural area | 62 (1.36) | 60 |
| Variance of log urban wages | 0.56 (0.06) | 0.56 |

Source: Lagakos et al. (2021).

# Lagakos, Mobarak and Waugh (2023) Estimates

**Table 3: Estimated Parameters and Standard Errors**

| $\frac{1}{\theta}$ | $\bar{u}$ | $\lambda$ | $\pi$ | $\gamma$ | $A_u$ | $\sigma_s$ | $\rho$ | $\sigma_\nu$ | $\sigma^2_{rc}$ | $\sigma^2_{ui}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.54 | 1.51 | 0.67 | 0.63 | 0.57 | 1.55 | 1.28 | 0.74 | 0.11 | 0.15 | 0.15 |
| (0.002) | (0.004) | (0.054) | (0.028) | (0.002) | (0.022) | (0.866) | (0.217) | (0.010) | (0.005) | (0.004) |

Source: Lagakos et al. (2023).

- $\gamma < 1$ implies urban less volatile
- Disutility equivalent to 33% less consumption

# Lagakos, Mobarak and Waugh (2023) Counterfactuals

**Table 8: Welfare Effects of One-Time Migration Subsidies**

| | | Migration Subsidy Migration Endogenous | | Migration Subsidy Migration Policy Fixed | | Unconditional Transfer Migration Endogenous | |
|---|---|---|---|---|---|---|---|
| | | Welfare | Migr. Rate | Welfare | Migr. Rate | Welfare | Migr. Rate |
| Income Quintile | 1 | 1.17 | 85 | 0.77 | 48 | 1.05 | 45 |
| | 2 | 0.45 | 63 | 0.31 | 38 | 0.56 | 37 |
| | 3 | 0.29 | 52 | 0.20 | 34 | 0.40 | 33 |
| | 4 | 0.20 | 46 | 0.15 | 31 | 0.32 | 31 |
| | 5 | 0.12 | 40 | 0.10 | 31 | 0.20 | 31 |
| Average | | | | | | | |
| Rural & Low Assets | | 0.44 | 57 | 0.30 | 36 | 0.51 | 35 |
| All Rural | | 0.22 | 41 | 0.15 | 31 | 0.25 | 30 |

Note: The first two columns report the lifetime consumption-equivalent welfare gains and migration rates for rural assets with low assets from one-time conditional migration subsidies. The next two columns report the same when the migration policies are held fixed for every agent. The final two columns report the welfare gains and migration rates from a one-time unconditional transfer costing the same total amount as the migration subsides. The rows are for different income quintiles of the rural households eligible for the subsidy, with 1 being the poorest and 5 being the richest. All three experiments are in partial equilibrium, meaning that the rural wage is held fixed, and without financing the subsidies in equilibrium.

Source: Lagakos et al. (2021).

# Lagakos, Mobarak and Waugh (2023) Conclusions

- Welfare gains from migration subsidies are small.
- Partly due to selection: new migrants less productive.
- Mostly due to high non-monetary cost of migration: seasonal migration as “distress migration”.
- But migration subsidies are better targeted than most unconditional transfers: households in distress.
- If implemented permanently, it is equivalent to an insurance policy.

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# Bryan and Morten 2019: Spatial Allocation of Labor

- Quantify the contribution of selection and moving cost to productivity differences across space.
- Use data on wages, migration flows and distance
- Estimate spatial equilibrium model with migration costs, intrinsic productivity of workers, and amenities.
- Application to Indonesia and the US (lower mig costs) + counterfactual.

# Bryan and Morten (2019): Five facts

TABLE 2
FIVE FACTS ABOUT MIGRATION IN INDONESIA

| | Movement Costs | | Selection | | Compensating Differential |
|---|---|---|---|---|---|
| Dependent Variable | log $\pi_{odt}$ (1) | log $w_{odt}$ (2) | log $w_{odt}$ (3) | log $w_{odt}$ (4) | log $w_{odt}$ (5) |
| Log distance | −.717 | .029 | | .007 | |
| | (.009)*** | (.001)*** | | (.002)*** | |
| Log share migrating | | | −.039 | −.031 | |
| | | | (.001)*** | (.003)*** | |
| Amenities | | | | | −.023 |
| | | | | | (.010)** |
| Destination × year fixed effects | Yes | Yes | Yes | Yes | No |
| Origin × year fixed effects | Yes | Yes | Yes | Yes | Yes |
| Destination fixed effects | | | | | Yes |
| Number of individuals | 187,065 | 186,763 | 186,763 | 186,763 | 185,357 |
| Number of region pairs | 25,540 | 25,244 | 25,244 | 25,244 | 25,050 |

Source: Bryan and Morten (2019).

# Bryan and Morten (2019): Intuition

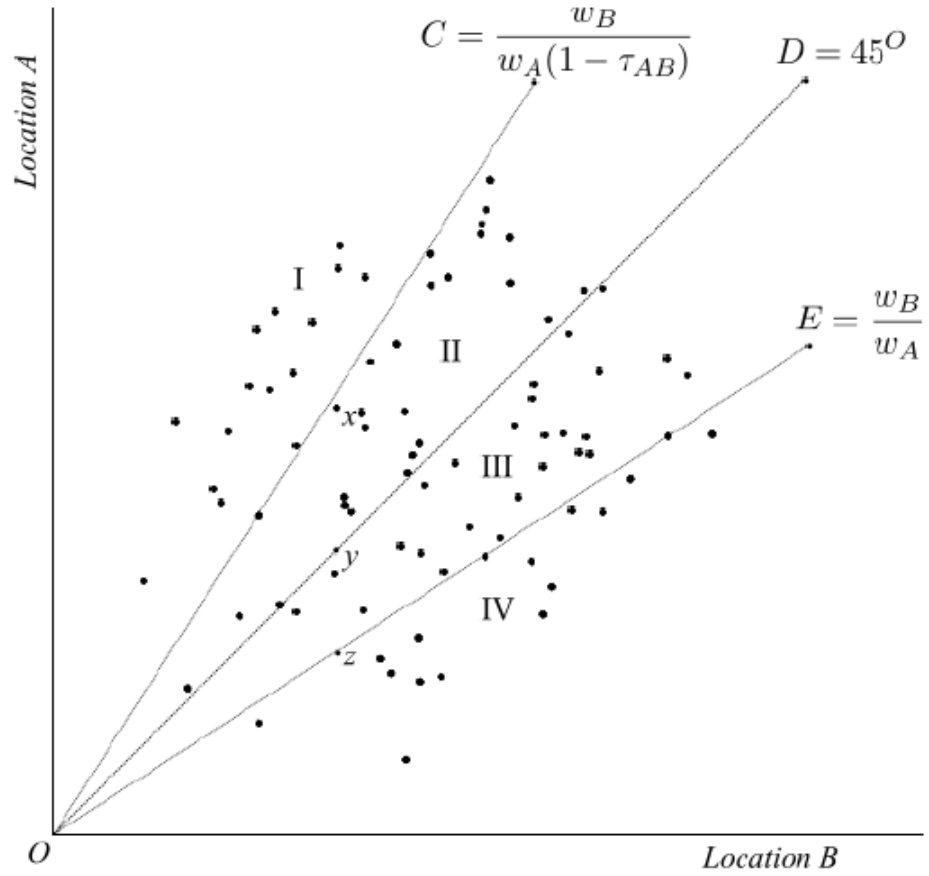


Figure 2: Productivity and Location Choices of People Born in B

Source: Bryan and Morten (2019).

# Bryan and Morten (2019): Model

- Utility and sorting
  - Frechet parameters: governs the distribution of the idiosynchratic productivity shock in each destination.
  - Workers choose where to live based on amenities, migration costs and wage.
- Production and General Equilibrium
  - Wages depend on how productive the worker is, and how productive the location is (fundamental + endogenous agglomeration externalities).
  - Amenities depend on fundamental + (negative) agglomeration externalities.
  - No wage gap if there are no frictions! i.e. when productivity rises average wages do not change (negative selection of migrants cancels the effect).

# Bryan and Morten (2019): Identification

- Frechet parameters: Elasticity of average wage w.r.t. share of migrants.
- Productivity from origin: Wages from different origins to same destination.
- Productivity at destination: Wages from different origins.
- Migration costs: Share of stayers - share of movers.
- Unexplained residual of gravity model: amenities.
- Differences in wages earned in a given destination by migrants from different origins yield productivity.

# Bryan and Morten (2019): Results

Table 5: Output gain from reducing migration barriers

| | (1) Mig costs | (2) Amenities | (3) Mig costs, amenities |
|---|---|---|---|
| Baseline | 1.075 | 1.127 | 1.217 |
| No selection | 0.914 | 1.127 | 1.133 |

Source: Bryan and Morten (2019).

# Roadmap

## Reading

- (*) Bryan et al. (2024). Underinvestment in a profitable technology: The case of seasonal migration in Bangladesh. Econometrica 82, no. 5 (2014): 1671-1748.

- (*) Lagakos et al (2023). The welfare effects of encouraging rural?urban migration. Econometrica 91, no. 3 (2023): 803-837.

- (*) Bryan and Morten (2019) The aggregate productivity effects of internal migration: Evidence from Indonesia. Journal of Political Economy 127, no. 5 (2019): 2229-2268.

- Gollin et al (2014). ”The agricultural productivity gap.” The Quarterly Journal of Economics 129, no. 2 (2014): 939-993.