Discussion of “Rising Skill Premium: The Roles of Capital-Skill Complementarity and Sectoral Shifts in a Two-Sector Economy” by Naoko Hara, Munechika Katayama, Ryo Kato

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Workshop on Macroeconomics - Koç University, September 18, 2015
Background

- The paper documents three observations on the Japanese labor market
Stylized facts - 1

- A decline in the skill premium

![Figure 1: Skill Premium](image-url)
Stylized facts - II

- Rising sectoral wage gap (manufacturing wages $\uparrow$ and non-manufacturing wages $\downarrow$)
Stylized facts - III

- An increase in the unskilled labor share in the non-manufacturing sector

Figure 4: Fraction of Total Hours Worked by Part-time Workers (%)
This paper

- The paper finds an explanation for all three observations: a decline in the capital-skill complementarity in non-manufacturing sector.
- Framework: Two-sector DSGE model with skilled and unskilled labor.
- Considers a Bayesian approach to estimate the model, investigates the impact of possible mechanisms at play.
- Focusing on the non-manufacturing sector, finds further support based on industry-level data.
This paper

• The pattern is different for many countries: the skill premium has increased

• This pattern in the US can be explained by the increase in capital-skill complementarity – Krusell, Ohanian, Rios-Rull and Violante (2000)
Capital-skill complementarity
Sectoral production function (2-level CES)

\[ Y_t = A_t [\mu (\psi_{u,t} U_t)^\sigma + (1 - \mu) \{ \lambda (K_t)^\rho + (1 - \lambda) (\psi_{s,t} S_t)^\rho \}]^{\sigma/\rho} ]^{1/\sigma} \]

- Krusell et al. (2000)
- \( A_t \): sectoral productivity, \( \psi_{s,t}, \psi_{u,t} \): skilled and unskilled labor efficiency, respectively, \( \mu, \lambda \): parameters capturing factor shares of unskilled labor and capital, respectively
- \( \frac{1}{1 - \sigma} \): elasticity of substitution between unskilled labor and capital
- \( \frac{1}{1 - \rho} \): elasticity of substitution between skilled labor and capital
- \( \frac{1}{1 - \sigma} > \frac{1}{1 - \rho} \) (hence, \( \sigma > \rho \)) "capital-skill complementarity"  
  \( \implies \) capital is more substitutable with unskilled labor than skilled labor
Capital-skill complementarity and skill premium

• If the degree of capital-skill complementarity, $\sigma - \rho$ declines,
  • capital becomes less complementary with skilled labor
  • firms demand skilled labor by less, creating excess supply of skilled labor
  • wages of skilled labor go down until market clears
  • skill premium, $w_s/w_u$, declines

• HKK’s quantitative analysis shows that the changes in $\sigma_n$ is consistent with the changes in skill premium (Stylized fact 1), the wages in the non-manufacturing sector (Stylized fact 2) and changes in the unskilled labor share in the non-manufacturing sector (Stylized fact 3)
HKK use data on temporary/part-time employment for unskilled employment, limitations with schooling data

Further striking features about the Japanese labor market:

- More college graduates picking temporary/part-time jobs
- High-skilled women are employed in part-time/temporary jobs in Japan at a high rate
  - 58% of women in workforce was part-time in 2014Q1 vs. 22% of male workers (Bloomberg)
- Are these college graduates mostly women?
Why is Japan different compared to other countries?

Any policy implications on

- the dual market structure, gender wage gap, and more college graduates going into temporary/part-time jobs?
  - Might be an inefficient allocation of resources
  - High gender wage gap prevails in Korea as well as Japan (Bloomberg, 2014)—potentially cultural explanations
Comments
Estimation of the model

- HKK estimate the model for the pre-1995 period, to capture the initial steady state before the labor market patterns start changing
- Conduct counterfactuals to explain changes in the post-1995 period
- Alternatives: estimate the model with all available data and see how time-varying parameter estimates evolve
The paper provides a framework to estimate capital-skill complementarity

Might have an interesting application in the cross-country capital-skill complementarity hypothesis literature

Papageorgiou and Chmelarova (2004) has a survey of possible specifications

- Estimation of a CES production function (Sato, 1967)
- A two-step procedure on estimating factor demand and production function (Fallon and Layard, 1975)
- Relative demand for skilled workers based on cost minimization under CRTS production function (Brown and Christensen, 1981)
Conclusion

- The paper provides a clean analysis of the stylized facts of the Japanese labor market and suggests a mechanism to shed light on them.
- A thought-provoking paper suggesting future questions to work on:
  - Cross-country comparisons
  - Worker characteristics: gender, age and education level
Thank you!