Do Immigrants improve Thailand's Competitiveness? :
Evidences from Manufacturing Data

A volunteer doctor assisting a Burmese child who was caught in the wave and swallowed a large quantity of water

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Immigration in Thailand

- Thailand has been an attractive destination of numerous migrant workers
- Migrants are an essential factor of production and laborers
- Migrant workers from GMS countries especially Myanmar, Lao PDR, and Cambodia have stood out as a major group

Economic Benefits of Immigration

Contribution of Immigrants on Thailand's GDP

- Economists try quantifying economic contribution of immigration in terms of macroeconomy (different number come from different dataset and different methodology)
  - Sussangkarn (1996) used the SAM-CGE model: by accounting migrant population around 750,000, the migration flow raises about 0.55 per cent of Thai GDP, or approximately $ 839 million (TDRI Quarterly Review, 1996)
  - Martin (2007): Foreign workers enhance around 1.25 per cent of GDP or about $ 2 billion of the US$1700 billion of Thai GDP in 2005 (ILO report).
  - Pholphirul and Rukumnuaykit (2010): Migration contribute around 0.03 percent net of the real national income (880 million Baht) in 1995 to around 0.055 percent of the real national income in 2005 (International Migration, 2010)

Economic Contribution of Immigrants on Thailand's GDP

- Sussangkarn (1996) conducted an investigation using the SAM-CGE model: by accounting migrant population around 750,000, the migration flow raises about 0.55 per cent of Thai GDP, or approximately $ 839 million at current price in 1995.
- Martin (2007): Foreign workers enhance around 1.25 per cent of GDP or about $ 2 billion of the US$1700 billion of Thai GDP in 2005.
- Pholphirul and Rukumnuaykit (2010): An increasing trend in GDP contribution from migrants from 0.03 percent of the real national income (880 million Baht) in 1995 to around 0.055 per cent of the real national income (2,039 million Baht) in 2005

Low-paid immigrants have enabled Thai firms to maintain price/cost competitiveness, especially in the global market.

- Kura et al (2009). claimed that maintaining competitiveness in the shrimp industry requires shrimp producers to pay low wages to immigrants
- Kohpaiboon (2009) examined that some Thai export-oriented small clothing firms established along the border in Tak to employ cheap immigrants from Myanmar for low wages in order to gain cost competitiveness.
- These previous studies however do not represent the whole country (just a border province) or industry (just textile or shrimp industry)
- Need national-wide firm survey

Cost of Immigration- Impact on Wages

- Byant and Rukumnuaykit (2007) 10 percentage increase of migrant share is found to cause only a reduction of 0.23 percent of domestic wage
- Kulkolkarn and Potipiti (2007): Immigration does not reduce the wages of Thai workers.
- Latthapipat (2010) Immigration reduces wage of unskilled Thai workers, but increase wage of skilled Thais (particularly in border area).

Cost of Immigrants come from the benefits that are unequally distributed

Years	*Percentage to Real GDP*			*Million Baht (at constant price in1988)*		
	Labour losses	**Capital gains**	**Net gains**	**Labour losses**	**Capital gains**	**Net gains**
1996	-0.014	0.03	0.016	-447	936	489
1997	-0.015	0.031	0.016	-459	959	500
1998	-0.016	0.04	0.024	-435	1,090	655
1999	-0.017	0.044	0.027	-493	1,255	762
2000	-0.017	0.034	0.017	-506	1,017	511
2001	-0.017	0.038	0.021	-511	1,159	648
2002	-0.016	0.039	0.023	-525	1,267	742
2003	-0.016	0.039	0.023	-558	1,362	805
2004	-0.016	0.039	0.023	-597	1,431	835
2005	-0.016	0.048	0.033	-564	1,742	1,177
2006	-0.015	0.051	0.036	-581	1,981	1,400
2007	-0.015	0.051	0.036	-605	2,056	1,451

Source: Updated from Pholphirul and Rukumnuaykit (2010)

- Benefits go to capital owner (employers) and immigrants themselves
- Native workers however bare the cost (lower wage, loss the job, etc.)

Some other Long-Term benefits/costs

- Firm's level production?
- Competitiveness?
- Productivity?
- Innovative Investment?
- Skill Development?
- Foreign/Domestic Investment?

Tested Propositions

- P1: Immigration and Production:
  International immigrants to Thailand help increasing the labor supply in producing more economic output

- P2: Immigration and Productivity:
  The relationship between immigration and productivity is still unclear depending on degree of substitution between immigrants and natives

- P3: Immigration and Labor Cost:
  Producers tend to switch to available inputs that are relatively cheaper. Lower cost of employing labor due to migrants

- P4: Immigration and Competitiveness:
  How to balance the overall competitiveness by making the balance of price/cost competiveness and value-added competitiveness from employing foreign immigrants

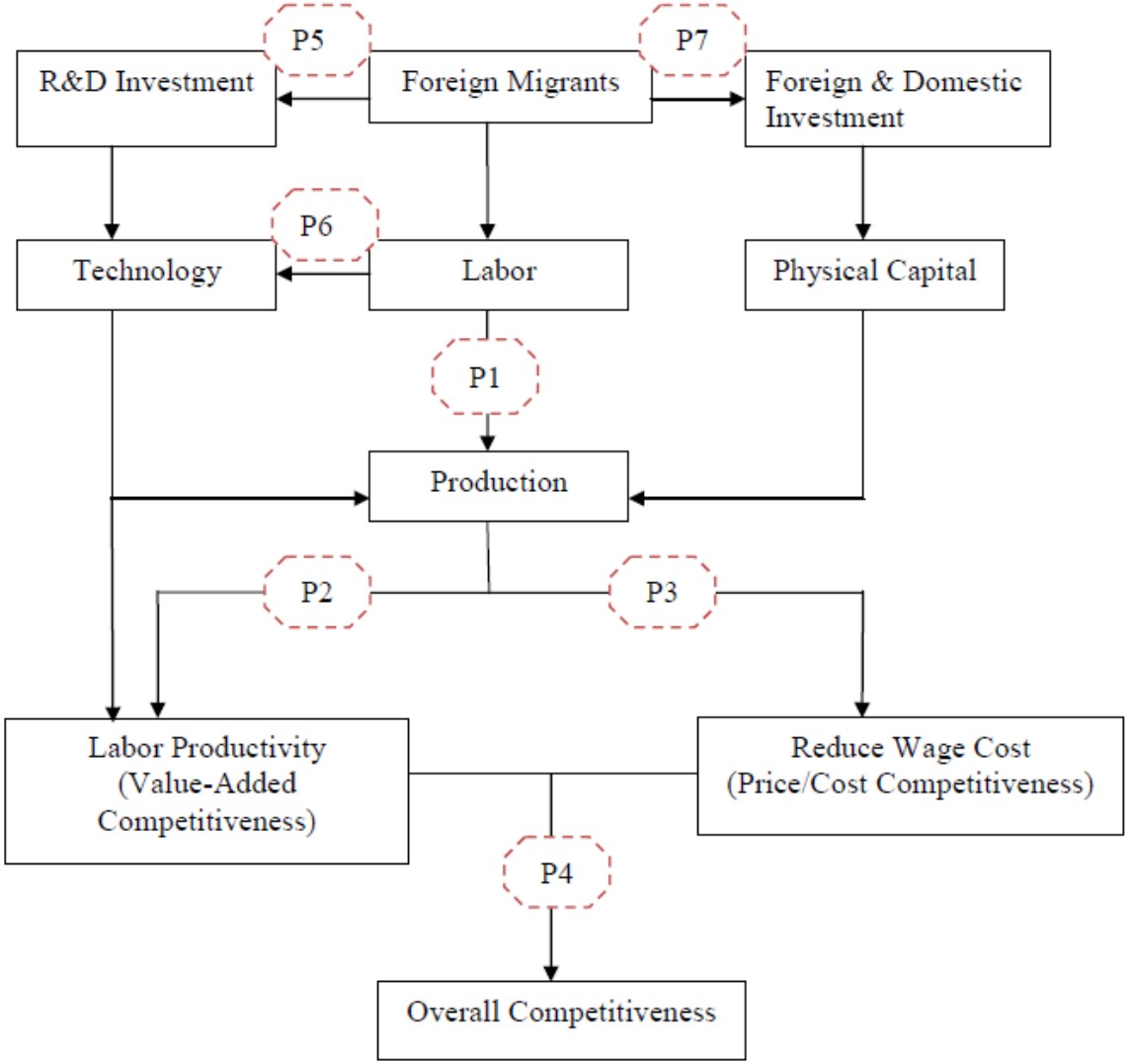
Propositions

- P5: Immigration and Innovation:
  Even though employing unskilled migrant may help a firm to save some labor costs, there is possibility to blunt the firm's incentives to invest in new technology? ("labor-saving technology")

- P6: Immigration and Skill Development
  An increase of labor migration to Thailand helps speeding the shift of Thai workers to higher-skilled position. When supply of labor is greater due to employing more immigrants to fill low-skilled jobs vacated by local workers, Thai workers are unavoidably pushed into higher-skilled position.

- P7: Immigration and Foreign/ Domestic Investment:
  An influx of migration increasing labor supply in Thailand would cause marginal product of capital and return on domestic investments to be raised and thereafter attract foreign direct investment.

Proposition Framework



Private Investment Climate Survey (PICS) data

Table 10: Percentage of Immigration Employment by Industry

Industry	2004		2007	
	Skilled Migrants	Unskilled Migrants	Skilled Migrants	Unskilled Migrants
Food Processing	0.04	0.63	1.31	11.04
Textile	0.30	0.15	1.13	3.78
Garment	0.05	0.07	2.12	7.65
Auto Parts	1.14	0.10	0.77	0.50
Electronics and Electrical Appliances	0.30	0.16	1.15	1.05
Rubber and Plastic	0.56	0.46	0.18	2.72
Furniture and Wood Products	0.03	0.84	0.28	4.73
Machinery and Equipment	0.09	0.01	0.64	0.26
Average	0.33	0.31	0.92	4.19

Source: PICS Data (2004 and 2007)

Private Investment Climate Survey (PICS) data

Table 11: Percentage of Immigration Employment by Region

Region	Skilled Migrants	Unskilled Migrants
Bangkok and Vicinity	3.63	9.02
North	0.78	2.39
Central	0.32	1.07
East	0.52	0.59
South	0.07	5.22
North-East	0.21	0.14

Source: PICS Data (2004 and 2007)

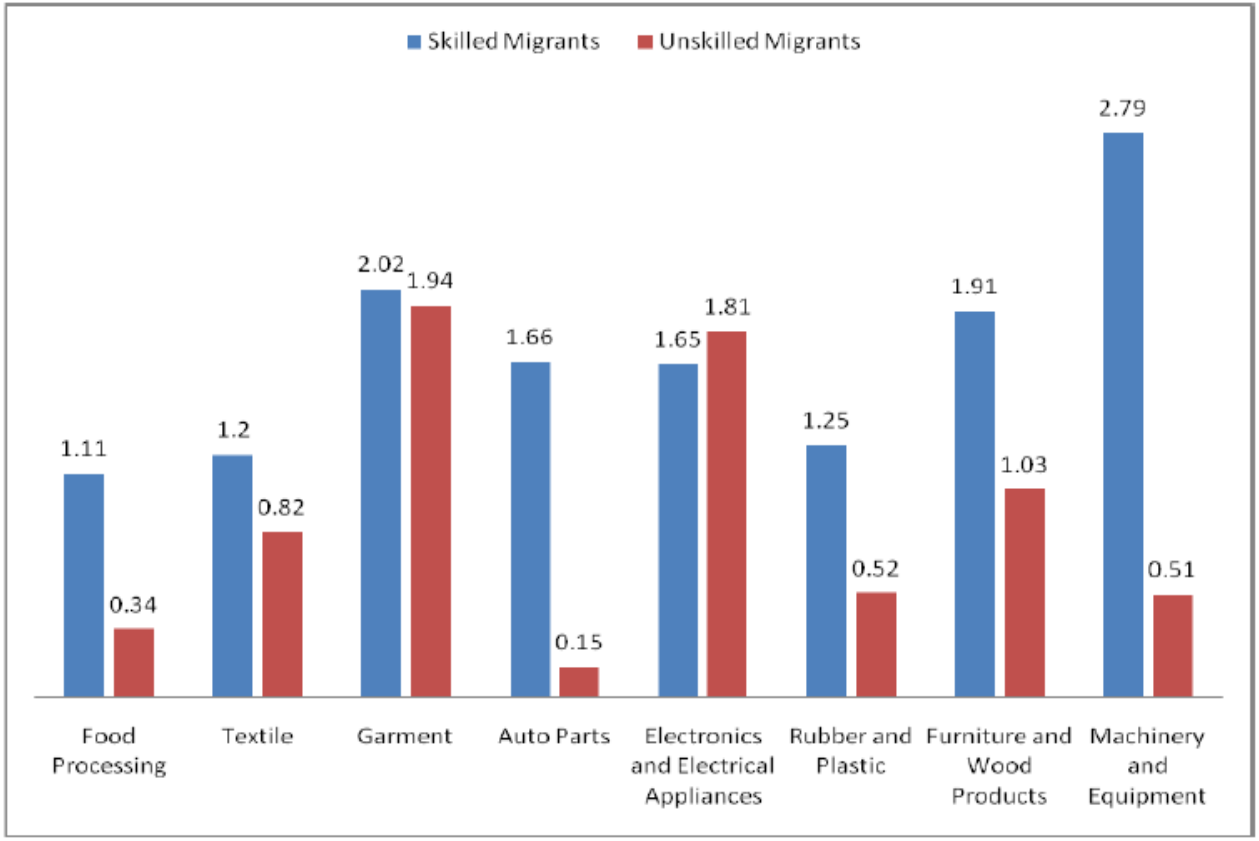
Table 12: Percentage of Migrants employed By Firm Size

No. of Employees	*2004*		*2007*	
	Unskilled Migrants	Skilled Migrants	Unskilled Migrants	Skilled Migrants
Less than 50	0.173	0.035	4.000	0.392
50-200	0.377	0.531	3.500	0.739
200-500	0.547	0.344	5.846	1.610
Greater than 500	0.075	0.342	4.636	2.146

Source: Computed from PICS Data (2004 and 2007)

What is output growth in firm-level

Figure 5: Percentage Increase of Production (Operation Revenue) from 10 percentage Increase of Labor from Employing Immigrants



Source: Adapted from World Bank (2008), Table 35

- Estimation of GMM Production function
- Skilled immigrants contribute to more production than unskilled (especially in machinery and equipment and auto parts)
- Labor-intensive production sectors (garment) receive highest contribution from unskilled immigrants

Immigration and Competitiveness

- List of Dependent Variables
  - *Labor Productivity*: Log-scale of a firm's production value (in Baht) divided by a number of employees.
  - *Average Wage*: Amounts of wage and salary for production worker divided by a number of employees measuring in Baht per person per year.
  - *Unit Labor Cost*: Log-scale of the average wage divided labor productivity.

Immigration and Competitiveness

The independent variables are classified in 2 groups as follow:

- Migration Variables
  - *Share of skilled migrants*: Percentage of skilled migrants employed by a firm to total production skilled workers
  - *Share of unskilled migrants*: Percentage of unskilled migrants employed by a firm to total production unskilled workers
  - *Border Provinces*: Constructed to be equal to 1 if a firm is locating in the province sharing cross-border three migrant sending countries namely Myanmar, Cambodia, and Lao PDR

- Control Variables
  - *Computer Control:* Percentage of production machine controlled by computer
  - *Firm Age:* Number of years since a firm commenced operations in Thailand
  - *Firm size*: Size of a firm is measured by log scale of number of persons employed.
  - *Capacity Utilization*: Percentage of amount of output a firm actually produced relative to the maximum amount that can be produced.
  - *Capital-Labor Ratio*: Amount of machinery and equipment rented or owned by a firm divided by total employees

Control by time dummy, regional dummy, and industry dummy, and domestic export

Independent Variables	Labor Productivity (Log Scale)	Average Wage (Baht)	Unit Labor Cost (Log Scale)	Labor Productivity (Log Scale)	Average Wage (Baht)	Unit Labor Cost (Log Scale)
Migrant Variables						
Share of Skilled Migrants (%)	0.014	887.159	-0.003	0.028	884.797	-0.013
	[0.010]	[1,195.947]	[0.009]	[0.017]*	[2,015.711]	[0.016]
Share of Unskilled Migrants (%)	-0.005	-564.029	-0.001	-0.008	-682.353	0.002
	[0.003]*	[328.360]*	[0.003]	[0.007]	[846.049]	[0.007]
Border Provinces = 1	-0.066	7,222.49	0.034	-0.098	17,342.51	0.117
	[0.081]	[9,413.034]	[0.074]	[0.119]	[14,085.509]	[0.109]
Skilled Migrant x Border Provinces	-0.019	-1,001.66	0.009	-0.027	-404.381	0.02
	[0.012]*	[1,366.142]	[0.011]	[0.020]	[2,314.145]	[0.018]
Unskilled Migrant x Border Provinces	0.001	-57.625	0.001	-0.006	-640.464	-0.001
	[0.005]	[598.685]	[0.005]	[0.011]	[1,276.358]	[0.010]
Competitiveness/ Productivity Control Variables						
Computer Control (%)	0.003	260.587	0.001	0.001	69.384	0.001
	[0.001]***	[113.974]**	[0.001]	[0.001]	[154.060]	[0.001]
Firm Age (# Years)	0.007	725.768	-0.003	0.008	762.478	-0.003
	[0.003]***	[308.445]**	[0.002]	[0.004]**	[442.119]*	[0.003]
Firm Size (Log Scale)	0.055	-3,360.29	-0.012	0.012	-3,312.97	0.021
	[0.021]***	[2,426.801]	[0.019]	[0.030]	[3,516.169]	[0.027]
Capacity Utilization (%)	0.005	420.15	-0.002	0.004	307.829	-0.003
	[0.001]***	[151.837]***	[0.001]**	[0.002]**	[222.152]	[0.002]
Capital-Labor Ratio (Baht)	0.001	0.17	0.001	0.001	0.159	0.001
	[0.000]***	[0.015]***	[0.000]***	[0.000]***	[0.017]***	[0.000]***
Region (Reference: Bangkok and Vicinity)						
North	-0.069	1,379.03	-0.112	0.107	1,808.27	-0.177
	[0.120]	[13,977.299]	[0.109]	[0.157]	[18,575.962]	[0.144]
Central	0.198	-4,217.54	-0.22	0.222	-12,581.59	-0.273
	[0.074]***	[8,613.198]	[0.067]***	[0.117]*	[13,896.412]	[0.108]**
East	0.455	15,054.35	-0.278	0.37	-4,934.72	-0.254
	[0.094]***	[10,960.020]	[0.086]***	[0.136]***	[16,182.054]	[0.125]**
South	0.979	-3,723.38	-1.083	0.768	-26,457.26	-0.926
	[0.098]***	[11,415.063]	[0.090]***	[0.133]***	[15,706.442]*	[0.122]***
North-East	-0.365	-14,664.75	0.083	-0.177	-28,835.17	-0.024
	[0.113]***	[13,193.971]	[0.103]	[0.167]	[19,795.874]	[0.153]
Industry (Reference: Processing Food)						
Textile	-0.047	-22,071.32	-0.074	0.068	-50,274.11	-0.279
	[0.096]	[11,211.428]**	[0.088]	[0.133]	[15,774.808]***	[0.122]**
Garment	-0.629	-26,195.52	0.397	-0.609	-32,584.89	0.42
	[0.100]***	[11,578.310]**	[0.091]***	[0.127]***	[15,082.947]**	[0.117]***
Auto Parts	-0.04	-3,650.23	-0.092	0.083	-39,097.07	-0.323
	[0.104]	[12,114.167]	[0.095]	[0.141]	[16,702.754]**	[0.129]**
Electronics and Electrical Appliances	0.264	3,858.82	-0.206	0.421	-16,360.56	-0.382
	[0.098]***	[11,336.284]	[0.089]**	[0.126]***	[14,949.382]	[0.116]***
Rubber and Plastic	0.07	-33,551.51	-0.32	0.148	-46,497.76	-0.427
	[0.089]	[10,346.572]***	[0.081]***	[0.121]	[14,319.419]***	[0.111]***
Furniture and Wood Products	-0.611	-28,794.19	0.405	-0.561	-40,800.00	0.313
	[0.105]***	[12,222.443]**	[0.096]***	[0.145]***	[17,239.938]**	[0.134]**
Machinery and Equipment	-0.123	-22,498.06	0.033	-0.215	-44,723.62	0.016
	[0.116]	[13,472.777]*	[0.106]	[0.168]	[19,869.903]**	[0.154]
Year (Reference: Year 2004) and Domestic Export Dummy						
year2007	0.392	15,069.19	-0.264	0.206	17,437.92	-0.085
	[0.055]***	[6,428.858]**	[0.050]***	[0.087]**	[10,274.879]*	[0.080]
Domestic Export	-	-	-	-0.14	-19,282.70	0.045
	-	-	-	[0.075]*	[8,848.494]**	[0.069]
skilled Migrant x Domestic Export	-	-	-	0.005	-457.574	-0.008
	-	-	-	[0.027]	[3,204.790]	[0.025]
Unskilled Migrant x Domestic Export	-	-	-	0.001	334.641	-0.002
	-	-	-	[0.009]	[1,099.472]	[0.009]
Constant	12.297	66,283.28	-1.624	12.837	108,476.52	-1.866
	[0.151]***	[17,534.375]***	[0.138]***	[0.228]***	[27,007.511]***	[0.209]***
Observations	2,378	2,384	2,372	1,220	1,224	1,219
R-squared	0.23	0.09	0.17	0.21	0.11	0.17

Immigration and Competitiveness

- 10 percentage employment more of unskilled migrants will face a drop of its labor productivity by around 5 percent.
- A firm employing 10 percent more of skilled migrants, on the other hand, will be 28 percent more productive
- A firm locating in border province with 10 percentages more of employing skilled workers will be however 19 percentage point less productive than a firm employing those skilled migrants in non-border provinces.

Immigration and Competitiveness

- Regressions report that approximated 5,748 baht per worker per year on average can be saved among Thai firms who employ additional 10 percentages more of unskilled migrants
- Firms with labor intensive production, for example those in textile industry, can be able to save substantial amounts of wage cost by 24,144 baht per year
- Since both labor productivity and wage fall from employing immigrants, there is no significant impacts of immigration on "Unit Labor Cost"
- By enjoying cheaper wage cost, they have to face a potential trade-off from deteriorating their productivity and possibly their global competitiveness in the long-run.
- The result is ever stronger in textiles firms locating in border provinces where their labor productivity is about 45.2 percent lower than firms locating in non-border provinces.

Immigration and Innovation

- A number studies found that there is no "technology-saving" strategies from employing immigrants (Kohpaiboon, 2009 and Bryant, 2006)
- Lists of dependent variables measuring innovative/R&D investment are as follow:
  - *Prob(Machine Upgrade)*: Constructed to be equal to 1 if a firm reports their upgrading the machinery and equipment in the last 2 years before the survey period.
  - *Prob (R&D)*: Constructed to be equal to 1 if a firm has positive expenditure on R&D expenditure.
  - *R&D Expenditure*: Amounts (in Baht) of R&D expenditure a firm reports in the year of survey.

Immigration and Innovation

- There is also evidence of "labor-saving technology to labor-intensive firms such as those in textiles and garment industry.
- Additional 10 percentage increase of employing unskilled migrants is found to reduce probability a firm to invest in R&D by 2.1 percent in textile industry.
- On another flip side, additional 10 percentage increase of employing skilled migrants raises probability of R&D investment by 54 percent in Garment industry.
- The labor-saving technology phenomenon is also verifiable to firms in rubber and plastic industry in which 10 percent increase of unskilled migrants will reduce their probability to invest in R&D by 12 percent especially rubber and plastic firms locating in non-border area.
- Probability of machine upgrade if found to reduce by 40 percent while the R&D expenditure reduce by around 20 million baht per year in spare part firms from employing 10 percent more of skilled immigrants

Immigration and Skill Development

- we estimate the probability impacts of immigration on probability that the factories provide such formal training program for its employees or send its workers for training in a Skills Development Institute.

- Using probit estimation, firms locating in border provinces seem to be about 3 percent "less probability in providing training programs to its workers from employing 10 percentage more of unskilled workers.

- This result is similar to what we found as an evidence of "labor-saving technology" strategy.

Immigration and Domestic Investment

- Evidences found from macroeconomic simulation model clearly support the argument that firms should gain from employing migrant workers and expect higher profit
- There is significant result found in rubber and plastic firms to have about 8 percent higher probability to increase its investment as 10 percentages of unskilled immigrants are employed.
- Employing skilled migrants, on the other hand, reduce probability to make an investment in the machinery and equipment firms.

Immigration and FDI

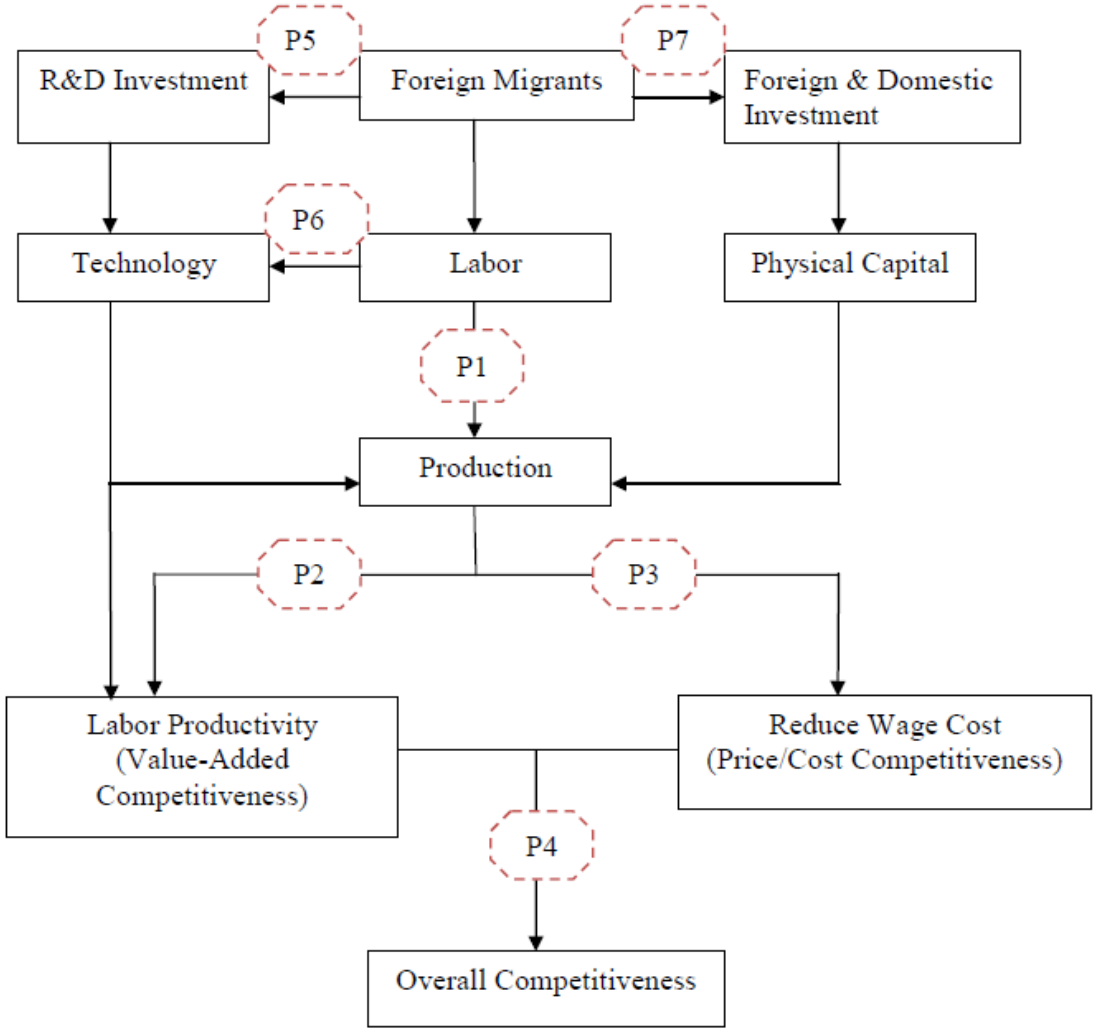
- Relationship between immigration and FDI is still doubtful (depending on unskilled/skilled human capital).
- Use "Percentage of Foreign Ownership" as proxy of FDI
- A firm will have about 17.2 percentages more of foreign ownership with 10 percentages more of skilled migrants.
- Employing more 10 percent of unskilled migrants, on the other hand, reduce foreign ownership by 2.9 percent.
- We find strong evidence supporting the argument that foreign direct investors are likely to concern with quality of labor instead of their cheaper cost.

Endogeneity of Migrant Labor

- One can expect that the proportion of migrants is not an exogenous variable due to selectivity based on past performance or characteristics of the firms.
- We take only firms that are surveyed both in 2004 and 2007 and computer correlation between outcome variables in 2004 and the percentage change of migrants employed during 2004-2007
- We find no evidence of such selection for both shares of unskilled migrants and skilled migrants.
- IV estimation is estimated by using migrant share in 2004 as instrument

Conclusion and Policy Recommendation

Proposition Framework



Migrants have positive contribution to economic output

- P1: Immigration and Production:
  - Immigrants to Thailand help increasing the country's aggregate output (GDP). Both simulation model and growth accounting approach confirms that existing migrants have contributed around to 0.75-1 percentage point of the real GDP growth
  - Firm-level data also confirm the importance of migrant workers to a particular industry depends on their skill level.
  - Skilled migrants are found being major input for relatively capital intensives sector such as Machinery and Equipment, Auto Parts, and Electronic and Electrical Appliances.
  - Unskilled migrants, on the other hand, are important for relatively labor intensive industry such as Garment and Textile.

Productivity drop from unskilled migrant but higher from the skill

- P2: Immigration and Productivity:
  - Firm-level data reconfirming that a 10 percentage increase of employing unskilled migrant workers should cause a drop of the labor productivity by around 5 percent.
  - Employing 10 percentages more of skilled migrant workers, on the other hand, helps enhancing the labor productivity by around 28 percent.

Firm save wages from employing immigrants

- P3: Immigration and Labor Cost:
  - Our simulation should that employing migrants in agricultural sector tends to reduce wage rate by around 4.34 percent from the base case.
  - firm-level data reports that approximated 5,746 baht per person per year can be saved from additional 10 percent more of unskilled migrants.
  - This result is straight-forward to a firm with labor-intensive production, for example in textile industry, that can save up to 24,144 baht per person per year.

Long-Term competitiveness from migrants is still questionable

- P4: Immigration and Competitiveness:
  - Even though higher unskilled migrant workers help saving wage cost (by approximately 5,746 baht per person per year), it however cause a reduction of the labor productivity by 5 percent.
  - Even though the Thai businesses enjoy their benefits from maintaining their price competitiveness by seeking the employment from cheap foreign workers for a certain period of time, there are no guarantees the achievement of approaching competitive advantage in the long-run.

Unskilled migrants deteriorate probability of R&D investment.

- P5: Immigration and Innovation:
  - a 10 percentage increase of employing unskilled migrants tends to reduce a firm's probability of R&D investment by around 4 percent (especially to firms locating in border provinces)
  - Evidence show in textile and plastic
  - There is nevertheless the opposite result to Thai firms in the garment industry which able to raise probability of R&D investment by around 54 percent from employing skilled migrant workers.
  - This result implies complementary effect that firms hiring more skilled workers (migrants) should be enforced to invest in high-technology.
  - Employing cheap labor from aboard adopt a kind of the "labor-saving technology", which would slow down productivity improvement and deteriorating global competitiveness in the long-run.

Unskilled migrants reduce skill development/ training

- Using probit estimation, firms locating in border provinces seem to be about 3 percent "less probability in providing training programs to its workers from employing 10 percentage more of unskilled workers.

- This result is similar to what we found as an evidence of "labor-saving technology" strategy.

Skilled migrants attract FDI, but those unskilled reduce FDI. Migrants create profit for re-investment.

- P6: Immigration and Foreign Investment/ Domestic Investment
  - Firm level data confirm that a firm employing 10 percent more of skilled migrants will have 17.2 percent more of foreign ownership.
  - A firm employing 10 percent more of unskilled migrants, on the other hand, will have 2.9 percent less of foreign ownership.
  - the foreign investors in Thailand are concerned to the quality of migrant workers rather than the cheap wage.

Policy Recommendations

1. Migration policy should be placed based on long-term objective rather than short-term response. Relying short-term benefits on cheap labor can be jeopardized

2. Employing skilled immigrants help improving productivity, promoting R&D investment, attracting foreign investment, and increasing knowledge transfer, the importation of skilled migrants (rather unskilled one) should therefore be prioritized.
   - Temporary Foreign Working Program" in Canada
   - the Migration Occupations in Demand List (MODL) Program in Australia.

Policy Recommendations

3. There is a need to provide them basic social protection to unskilled workers residing in Thailand
   - the governments have to be ensured in providing sufficient numbers of healthcare personals, e.g. doctors and nurses, and education personal, e.g. teachers, especially in the provinces where migrants are concentrated
   - Getting benefits of employing migrants (especially Burmese) skilled workers (health personal, teachers) in migrant concentrated areas.

4. The government needs to put a great emphasis on obtaining an accurate estimation of labor demand by sectors and occupations (LFS, Census, SES)

5. Long term vision with regards to the contributions of migrant workers to Thai economy should be incorporated with the international agreement of both multilateral and bilateral cooperation on migration. What happen in 2015? How migrants will be treated vis-à-vis to Thais

The imbalance of cost-benefit recipients (between loss groups and gain groups) may open some rooms for the Thai government to tax the benefits from employers or immigrants themselves.

Thank you

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