Skills in Urban Economics

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I. Introduction

A. Skills and outcomes

"When an industry has thus chosen a locality for itself, it is likely to stay there long: so great are the advantages which people following the same skilled trade get from near neighbourhood to one another. The mysteries of the trade become no mysteries; but are as it were in the air..." (Marshall (1890, 5.3))

B. Skills and selection

"In almost all countries there is a constant migration towards the towns. The large towns and especially London absorb the very best blood from all the rest of England; the most enterprising, the most highly gifted, those with the highest physique and the strongest characters go there to find scope for their abilities." (Marshall (1890, 5.6))

B. Many similar observations about the importance of skills in urban economics.

1. Jacobs (1969): new work.

2. Vernon (1960): increasing returns activities.

3. Saxenian (2002): skilled immigrants.

4. Florida (2005): creative class.

5. Others.

C. <u>Skills vs. education</u>

1. Urban and regional econometric analysis tends to treat a worker's education as being equivalent to his/her skill.

2. By this metric, all of the students in a class are equally skilled, as long as they all graduate.

3. This does not capture what Marshall, Jacobs, and Vernon had in mind.

4. It is also does not make use of developmental psychology, a field where learning is central.

D. This talk will consider:

1. The spatial distribution of worker skills.

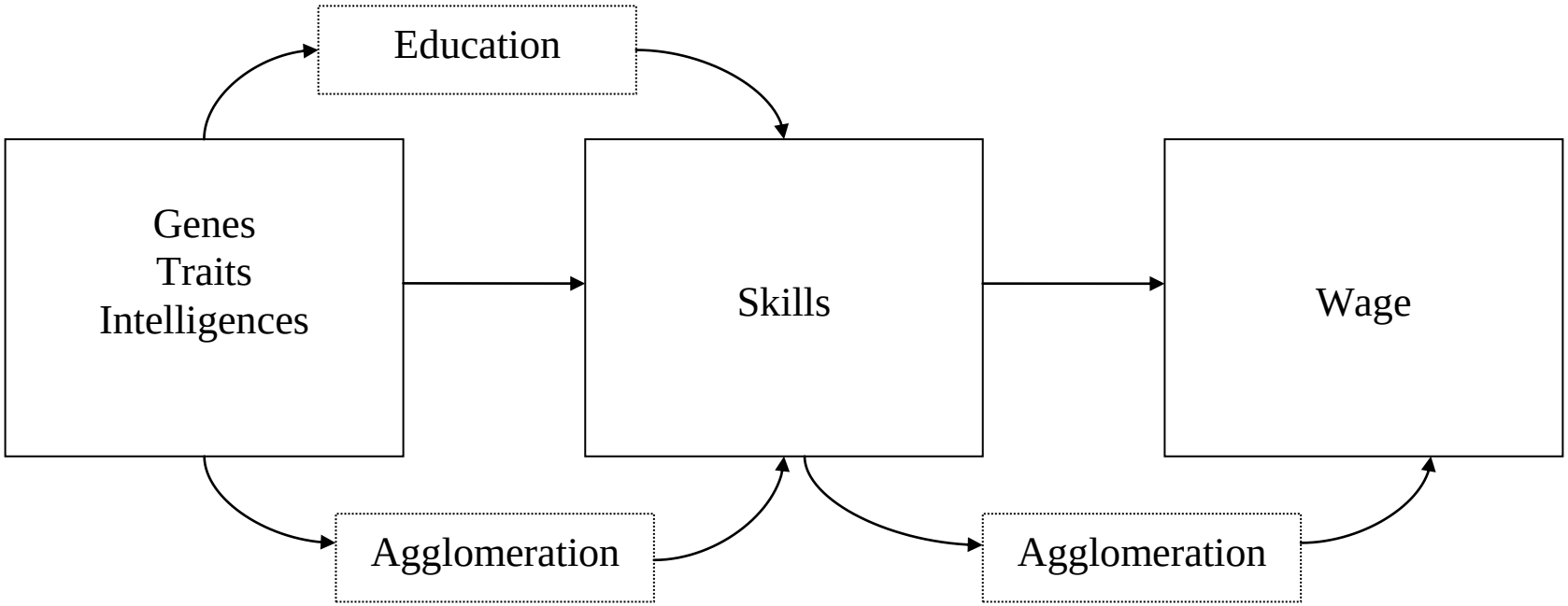
2. The impact of agglomeration on outcomes, with the primary focus being the hedonic prices of worker skills.

3. The talk will make use of psychological approaches to learning.

4. It will employ a framework where multidimensional traits and intelligences contribute to the development of skills, and both education and urbanization impact this process.

5. It will discuss a method that allows the distinguishing of skills and education in data.

Figure 2. Traits, Intelligences, Skills, and Wages



Note: from Bacolod-Blum-Strange (JRS, 2010).

E. Key conclusions.

1. Education is part of the skill development process.

2. Skills can be measured by hedonic attribution.

3. Surprisingly even distribution of skills.

4. For soft skills (i.e., social skills), there is sometimes a tendency towards skill spread, with large cities having more of both the most and least skilled workers.

5. Prices of cognitive and people skills rise with city size, but the price of motor skills does not.

6. Urbanization impacts manifestation of traits and intelligences as skills.

II. Framework and methods.

A. Primitives:

1. Traits: stable personal characteristics.

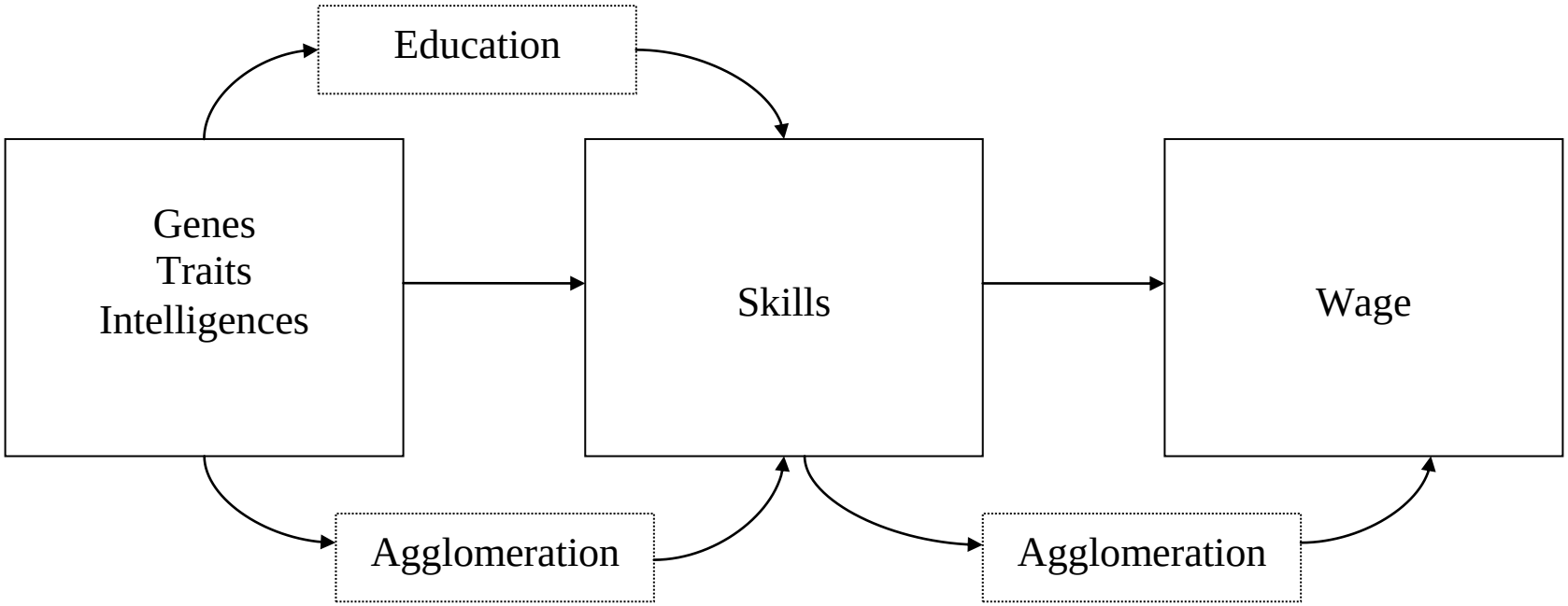
2. Intelligences: ability to process contents of the world (also fairly stable).

3. Skills: marketable characteristics, produced from traits and abilities, with impacts from education and agglomeration.

4. Outcomes (i.e., wage, innovation, growth): depend on skills and agglomeration.

5. Figure 2 describes this framework.

Figure 2. Traits, Intelligences, Skills, and Wages



Note: from Bacolod-Blum-Strange (JRS, 2010).

B. Key features of framework.

1. Agglomeration impacts wage in two ways, through the development of skill (left side of Fig. 2) and through deployment of skill (right side).

2. Many microfoundations at work: matching / sharing will impact deployment, while matching / sharing / learning will impact both development and deployment.

3. Agglomeration and education are both chosen.

C. NLSY 1979.

1. Panel.

2. Usual worker characteristics, including education.

3. <u>Traits and intelligences</u>:

   a. AFQT: cognition.
   b. Rotter: locus of control.
   c. Pearlin: self-mastery.
   d. Rosenberg: self-esteem.
   e. Sociability: outgoing vs. shy at age 6.

4. Also some Census data, but these data are not a panel and they lack the traits and intelligences variables.

D. <u>Skill measures</u> from Dictionary of Occupational Titles (DOT): 1977 Fourth Edition and 1991 Revised Fourth Edition.

1. Occupation classification (12,742 in 1991).

2. Cognitive index from: the data requirements of a worker's job (*data*), the reasoning required (*gedr*), the mathematics required (*gedm*), the language abilities required (*gedl*), and the intelligence, verbal, and numerical aptitudes required(*aptg*, *aptv*, and *aptg*).

3. Motor skills index from: complexity of the job in relation to things; aptitudes for manual dexterity, finger dexterity, motor coordination, eye-hand-foot coordination, spatial and form perception, and color discrimination; and adaptability to situations requiring attainment of standards.

D. Skill measures from DOT: 1977 Fourth Edition and 1991 Revised Fourth Edition (continued).

4. People skill index from: *depl* assesses the "adaptability to dealing with people beyond giving and receiving instructions," *dcp* which measures direction-control-planning, *influ* which measures the ability to influence people, *people* which measures gradations of the interpersonal demands of a job.

5. Hedonic attribution: workers are judged by local labor markets to possess the various skills.

6. This approach is equivalent to evaluating the skills of a student based on the job they hold after graduation.

III. Skill distribution

A. <u>The shares of population with education/skills do not vary much with city size</u>.

1. Education increases modestly.

2. Various cognitive skills (i.e., reasoning) increase even more slowly.

3. Various soft skills (i.e., social interaction capacities) also increase modestly.

4. Physical skills (i.e., working with things) do not tend to increase with city size.

(In table, small cities have populations 100,000-500,000; medium are under 1 million; largr are 1-4 million; very large are 4 million plus)

Table 3. Skill Distribution- Share of Population

Skill Distribution- Share of Population	City Size			
	Small	Medium	Large	Very Large
Education				
College Degree	0.221	0.242	0.285	0.270
Skills				
GED-R				
Carry out simple instructions	0.056	0.052	0.047	0.053
Commonsense understanding	0.191	0.179	0.153	0.171
Carry out detailed instructions	0.317	0.313	0.306	0.314
Solve practical problems	0.298	0.315	0.342	0.320
Logical or scientific thinking	0.115	0.117	0.125	0.116
Deal w/very abstract concepts	0.023	0.025	0.027	0.027
depl: Adaptability to dealing with people beyond giving and receiving instructions	0.533	0.552	0.576	0.561
THINGS				
Handling	0.413	0.423	0.445	0.436
Feeding	0.129	0.128	0.124	0.132
Tending	0.072	0.067	0.061	0.061
Manipulating	0.082	0.081	0.08	0.075
Driving-Operating	0.102	0.102	0.094	0.098
Operating-Controlling	0.166	0.168	0.167	0.168
Precision Working	0.035	0.031	0.029	0.031
Setting Up	7.10E-04	6.90E-04	6.70E-04	5.40E-04

Note: from Bacolod-Blum-Strange (JUE, 2009).

B. Mean models.

1. Estimating equation (errors clustered by industry/MSA):

$$DOT_{ikm} = \delta_k + \alpha\ Cluster_{km} + \beta \log(Pop_m) + \nu_{ikm}$$

2. Modest increase in average skill levels across city sizes.

3. Generally, an insignificant effect of own-industry employment.

4. A different pattern than for "hard" cognitive and physical skills.

   a. Cognitive skills increase with both.

   b. Physical skills decrease with city size and increase with own industry employment.

Table 6: Mean Regressions: Selected Services Sectors - 2000

Panel A: Education Measures

	Less Than HS	HS Grad.	Some Col.	Col. Grad.	Years Educ.
Log(Pop)	0.002	-0.015	-0.016	0.028	0.101
	[0.001]***	[0.001]***	[0.003]***	[0.003]***	[0.012]***
Cluster	0.006	-0.026	-0.331	0.351	1.378
	[0.029]	[0.062]	[0.169]*	[0.171]**	[0.663]**
Constant	0.010	0.357	0.602	0.031	12.626
	[0.017]	[0.020]***	[0.044]***	[0.047]	[0.21]***
Observations	535342	535342	535342	535342	535342
R-squared	0.02	0.03	0.02	0.07	0.11

Panel B: Soft Skills

	depl	influ	dcp	peoidx	people
Log(Pop)	0.006	0.003	0.009	0.198	0.032
	[0.001]***	[0.001]***	[0.001]***	[0.028]***	[0.005]***
Cluster	-0.133	-0.086	-0.096	-3.585	-0.634
	[0.035]***	[0.042]**	[0.051]*	[1.014]***	[0.19]***
Constant	0.570	0.087	0.320	106.735	3.300
	[0.019]***	[0.018]***	[0.021]***	[0.515]***	[0.086]***
Observations	535342	535342	535342	535342	535342
R-squared	0.11	0.11	0.07	0.05	0.08

Note: from Bacolod-Blum-Strange (JEG, 2009).

Table 7: "Hard" Skills Mean Regressions: Manufacturing Sectors - 2000

Panel A: Cognitive Skills

	Cog Index	GED-M	GED-R	GED-L
Log(Pop)	0.003	0.028	0.037	0.047
	[0.0004]***	[0.005]***	[0.004]***	[0.005]***
Cluster	0.112	1.282	1.006	1.279
	[0.032]***	[0.353]***	[0.315]***	[0.408]***
Constant	1.002	2.283	2.963	2.322
	[0.008]***	[0.084]***	[0.080]***	[0.097]***
Observations	521344	521344	521344	521344
R-squared	0.13	0.13	0.12	0.13

Panel B: Physical Skills

	Mot Index	Things	Strength	STS
Log(Pop)	-0.003	-0.057	-0.031	-0.012
	[0.0002]***	[0.005]***	[0.002]***	[0.001]***
Cluster	0.062	0.771	-0.531	0.158
	[0.011]***	[0.244]***	[0.178]***	[0.071]**
Constant	1.017	4.288	2.637	0.614
	[0.004]***	[0.088]***	[0.052]***	[0.014]***
Observations	521344	521344	521344	521344
R-squared	0.04	0.03	0.1	0.03

Note: from Bacolod-Blum-Strange (JEG, 2009).

C. Distribution models: two stage procedure.

1. First, net out the industry-specific component of the distribution of the soft skill and calculate percentile values of the skills by industry and MSA:

$$DOT_{ikm} = \delta_k + \sum_q \alpha_{km}^q d_{km}^q + \eta_{ikm} .$$

2. Second, use first-stage estimates of α to estimate the relationship between the percentile values of the distribution of skills and industry concentration and agglomeration at the MSA-industry level.

3. Estimated by feasible GLS, bootstrapped errors.

B. Distribution models (continued):

4. Spread models:

$$\left(\hat{\alpha}_{km}^{90} - \hat{\alpha}_{km}^{10}\right) = \kappa^{90,10} + \gamma^{90,10} * \text{Cluster}_{km} + \lambda^{90,10} * \log\left(\text{Popn}_{m}\right) + \varepsilon_{km}^{90,10}$$

$$\left(\hat{\alpha}_{km}^{75} - \hat{\alpha}_{km}^{25}\right) = \kappa^{75,25} + \gamma^{90,10} * \text{Cluster}_{km} + \lambda^{75,25} * \log\left(\text{Popn}_{m}\right) + \varepsilon_{km}^{75,25}$$

5. Key results:

   a. Skill spread for big cities.

   b. Skill compression for industry clusters.

Table 8: Skill Distribution Regressions for Manufacturing – 2000

	Years of Education						
	p10	p25	p50	p75	P90	P90-P10	P75-P25
Log(Pop)	-0.493	-0.133	0.066	0.192	0.219	0.713	0.325
	[0.111]***	[0.06]**	[0.023]***	[0.028]***	[0.022]***	[0.118]***	[0.048]***
Cluster	-2.904	-2.952	2.393	2.270	1.016	3.919	5.222
	[4.647]	[2.475]	[1.26]*	[1.245]*	[1.078]	[4.746]	[2.153]**
Constant	4.402	0.883	-0.979	-1.384	-0.263	-4.664	-2.267
	[1.483]***	[0.803]	[0.311]***	[0.372]***	[0.301]	[1.579]***	[0.642]***
Observations	4852	4852	4852	4852	4852	4852	4852
	DEPL						
	p10	p25	p50	p75	P90	P90-P10	P75-P25
Log(Pop)	-0.006	0.000	0.054	0.081	0.021	0.027	0.081
	[0.001]***	[0.001]	[0.007]***	[0.007]***	[0.002]***	[0.002]***	[0.005]***
Cluster	0.216	0.178	-0.781	-1.410	-0.187	-0.403	-1.588
	[0.068]***	[0.073]**	[0.250]***	[0.237]***	[0.086]**	[0.062]***	[0.238]***
Constant	-0.285	-0.340	-0.889	-0.746	0.282	0.566	-0.407
	[0.015]***	[0.021]***	[0.095]***	[0.092]***	[0.025]***	[0.027]***	[0.069]***
Observations	4852	4852	4852	4852	4852	4852	4852

Note: from Bacolod-Blum-Strange (JEG, 2009).

Table 8: Skill Distribution Regressions for Manufacturing – 2000 (continued).

	INFLU						
	p10	p25	p50	p75	P90	P90-P10	P75-P25
Log(Pop)	-0.002	-0.002	-0.002	0.017	0.076	0.078	0.019
	[0.0004]***	[0.0004]***	[0.0003]***	[0.002]***	[0.008]***	[0.008]***	[0.002]***
Cluster	0.102	0.102	0.070	-0.401	-2.039	-2.141	-0.503
	[0.021]***	[0.021]***	[0.023]***	[0.059]***	[0.225]***	[0.24]***	[0.083]***
Constant	-0.047	-0.047	-0.056	-0.256	-0.810	-0.763	-0.208
	[0.005]***	[0.005]***	[0.005]***	[0.028]***	[0.11]***	[0.104]***	[0.029]***
Observations	4852	4852	4852	4852	4852	4852	4852
	DCP						
	p10	p25	p50	p75	P90	P90-P10	P75-P25
Log(Pop)	-0.003	-0.003	0.009	0.060	0.026	0.029	0.064
	[0.001]***	[0.001]***	[0.003]***	[0.008]***	[0.003]***	[0.003]***	[0.008]***
Cluster	0.135	0.157	0.242	-0.984	-0.192	-0.327	-1.141
	[0.078]*	[0.073]**	[0.142]*	[0.339]***	[0.119]	[0.111]***	[0.403]***
Constant	-0.239	-0.235	-0.338	-0.577	0.258	0.497	-0.343
	[0.013]***	[0.011]***	[0.046]***	[0.115]***	[0.044]***	[0.048]***	[0.115]***
Observations	4852	4852	4852	4852	4852	4852	4852

Note: from Bacolod-Blum-Strange (JEG, 2009).

Table 8: Skill Distribution Regressions for Manufacturing - 2000 (continued)

PEOPLE VARIABLE							
	p10	p25	p50	p75	p90	P90-P10	P75-P25
Log(Pop)	-0.007	0.022	0.141	0.268	0.108	0.116	0.246
	[0.004]*	[0.007]***	[0.018]***	[0.025]***	[0.015]***	[0.016]***	[0.022]***
Cluster	0.674	0.584	-1.919	-5.986	-2.118	-2.792	-6.569
	[0.221]***	[0.329]*	[0.650]***	[0.761]***	[0.676]***	[0.699]***	[0.735]***
Constant	-1.449	-1.611	-2.540	-2.636	1.097	2.546	-1.025
	[0.054]***	[0.093]***	[0.242]***	[0.34]***	[0.200]***	[0.213]***	[0.296]***
Observations	4852	4852	4852	4852	4852	4852	4852
PEOPLE INDEX							
	p10	p25	P50	p75	p90	P90-P10	P75-P25
Log(Pop)	-0.086	0.076	0.992	1.705	0.704	0.791	1.630
	[0.023]***	[0.046]*	[0.134]***	[0.167]***	[0.071]***	[0.076]***	[0.126]***
Cluster	4.566	5.412	-12.877	-33.973	-5.315	-9.881	-39.384
	[1.713]***	[1.968]***	[4.326]***	[4.843]***	[2.877]*	[2.799]***	[5.398]***
Constant	-7.824	-9.059	-17.460	-16.247	5.695	13.519	-7.189
	[0.317]***	[0.607]***	[1.796]***	[2.265]***	[0.993]***	[1.047]***	[1.679]***
Observations	4852	4852	4852	4852	4852	4852	4852

Table 9: "Hard" Skills Distribution Regressions: Manufacturing Sector - 2000 (abridged)

Panel A: Cognitive Skills

	Cognitive Index						
	p10	p25	p50	p75	p90	P90-P10	P75-P25
Log(Popn)	0.003	0.005	0.009	0.009	0.006	0.003	0.004
	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.0006]***	[0.001]***
Cluster	0.014	-0.061	-0.065	0.026	0.133	0.119	0.087
	[0.026]	[0.028]**	[0.056]	[0.052]	[0.037]***	[0.035]***	[0.039]**
Constant	-0.148	-0.136	-0.135	-0.062	0.041	0.189	0.074
	[0.008]***	[0.012]***	[0.018]***	[0.016]***	[0.010]***	[0.008]***	[0.011]***
Observations	4852	4852	4852	4852	4852	4852	4852

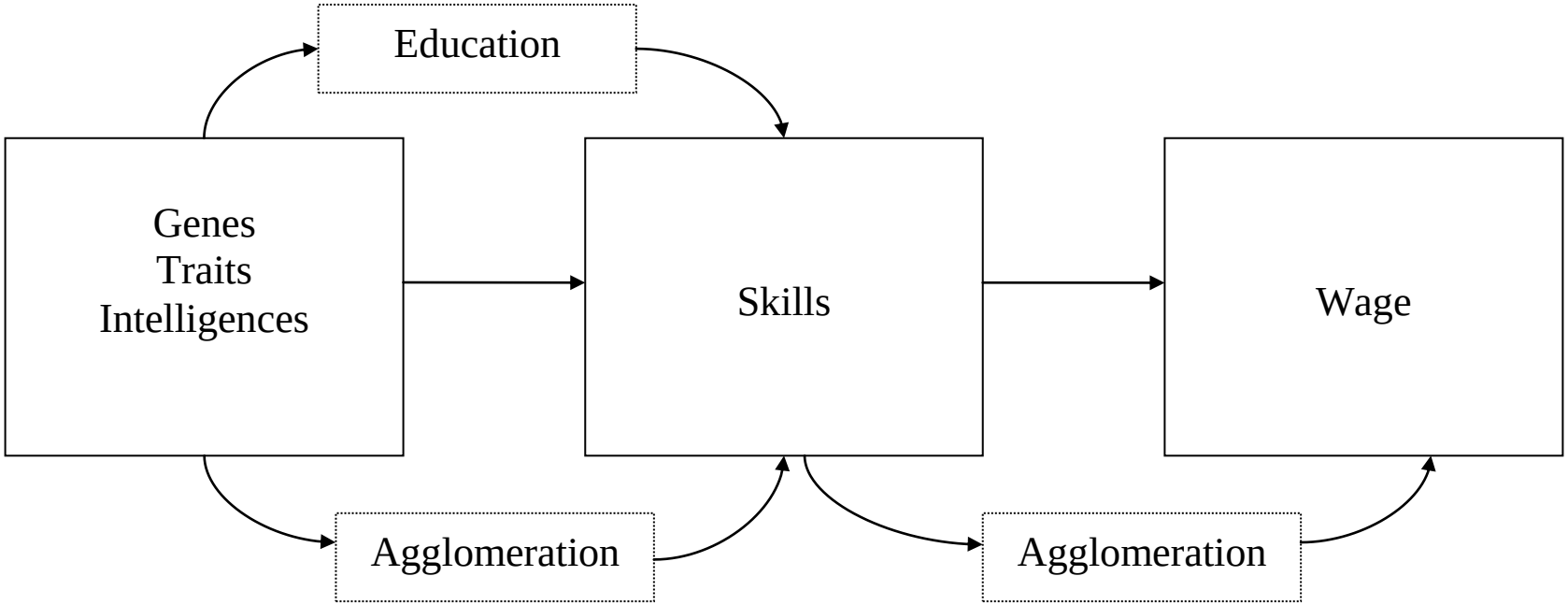
Panel B: Physical Skills

	Motor Index						
	p10	p25	p50	p75	p90	P90-P10	P75-P25
Log(Popn)	-0.002	-0.006	-0.004	-0.001	0.000	0.002	0.005
	[0.0004]***	[0.001]***	[0.0006]***	[0.0005]**	[0.0006]	[0.0007]***	[0.001]***
Cluster	0.082	0.102	0.044	0.033	0.037	-0.045	-0.069
	[0.023]***	[0.023]***	[0.030]	[0.025]	[0.028]	[0.035]	[0.039]*
Constant	-0.077	0.006	0.054	0.078	0.109	0.186	0.072
	[0.006]***	[0.010]	[0.007]***	[0.007]***	[0.008]***	[0.01]***	[0.011]***
Observations	4852	4852	4852	4852	4852	4852	4852

Note: from Bacolod-Blum-Strange (JEG, 2009).

IV. Skill and outcomes.

Figure 2. Traits, Intelligences, Skills, and Wages



Note: from Bacolod-Blum-Strange (JRS, 2010).

A. Implications of the framework for urban wage premium.

1. Simple urban wage model (agglomeration $\rightarrow$ wage): must control for skill or for traits/intelligences (reduced form model).

2. Controlling for education is not equivalent if traits – intelligences - skills are multi-dimensional.

3. Education is, thus, part of the skill development process.

4. Urbanization impacts skill prices.

5. Other outcomes: growth, innovation.

B. Skill and urban wage premium:

1. Urbanization has a somewhat greater effect on more educated workers.

2. Urban cognition premium, consistent with various microfoundations.

3. Urban people skills premium, consistent with models of urban interaction.

4. No motor skills premium.

Table 8. Urban skill premia: Basic models (abbreviated)

Dependent variable: Log of weekly wages		
	Baseline	Pop*Educ
ln(MSA Pop'n)	0.06695	
	[0.00286]***	
ln(MSA Pop'n)*less than HS		0.03897
		[0.00472]***
ln(MSA Pop'n)*HS degree		0.07021
		[0.00300]***
ln(MSA Pop'n)*College degree		0.07277
		[0.00470]***
Observations	726277	726277
R-squared	0.22	0.22

Note: from Bacolod-Blum-Strange (JUE, 2009).

Table 8. Urban skill premia: Basic models (abbr.),

	Pop*Cog	+Pop*Peo	+Pop*Motor
ln(MSA Pop'n)*LTHS	-0.08478	0.02966	0.14173
	[0.02756]***	[0.00510]***	[0.02473]***
ln(MSA Pop'n)*HS	-0.06573	0.05359	0.17298
	[0.02782]**	[0.00329]***	[0.02369]***
ln(MSA Pop'n)*College	-0.07107	0.05055	0.17239
	[0.02902]**	[0.00531]***	[0.02621]***
Cognitive skills	-0.04153		
	[0.43038]		
ln(MSA Pop'n) * Cog	**0.12249**		
	[0.02643]***		
People Skills		-0.30568	
		[0.08801]***	
ln(MSA Pop'n) *People		**0.0294**	
		[0.00555]***	
Motor Skills			1.69678
			[0.39573]***
ln(MSA Pop'n) *Motor			**-0.10364**
			[0.02467]***
Constant	0.57633	0.46053	-1.37656
	[0.45463]	[0.09600]***	[0.41813]***
Observations	726277	726277	726277
R-squared	0.25	0.22	0.22

Note: Demographic and worker education controls reported in the paper. Standard errors in brackets, clustered at the individual level.
* significant at 10%; ** significant at 5%; *** significant at 1%.

Note: from Bacolod-Blum-Strange (JUE, 2009).

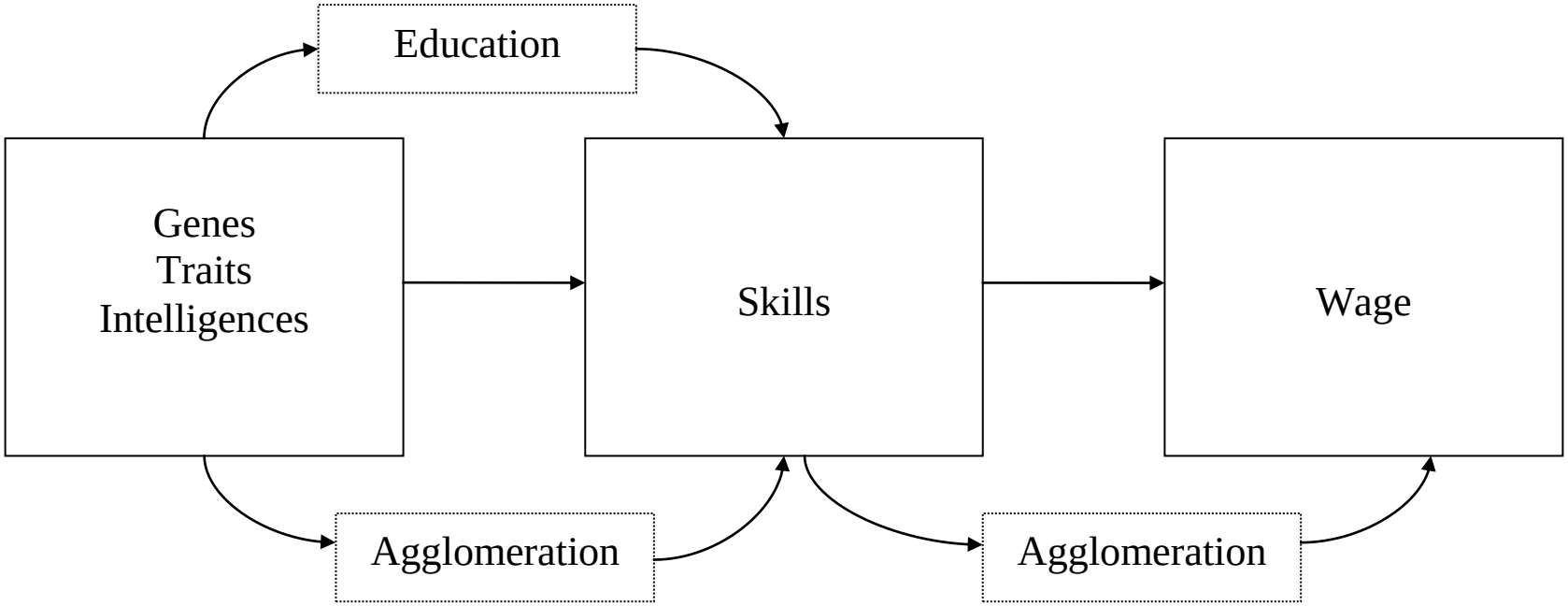
C. <u>A very robust result</u>.

1. The results for the skill indices generally hold for individual cognitive, social, and motor skills.

2. The same pattern appears in panel estimates that allow control for selection.

V. Skill development

Figure 2. Traits, Intelligences, Skills, and Wages



Note: from Bacolod-Blum-Strange (JRS, 2010).

A. Reduced form relationship between traits and skills.

1. Early exposure to agglomeration may be associated with skill development.

2. Current exposure also related to skill development, with the clearest pattern being that there is less motor skill development in larger cities.

Table 2a. Skill Manifestation in Cities (abr.)

	OVERALL SKILLS		
	Cognitive	Motor	People
AFQT %ILE/100	0.134	-0.008	0.085
	[0.002]***	[0.002]***	[0.002]***
Rotter Locus of Control	0.008	0.012	0.011
	[0.004]*	[0.004]***	[0.004]**
Pearlin Control Mastery	0.07	-0.022	0.057
	[0.005]***	[0.005]***	[0.005]***
Rosenberg Self-Esteem	0.027	-0.034	0.055
	[0.006]***	[0.006]***	[0.006]***
Sociability Trait 'not shy'	0.005	-0.003	0.01
	[0.001]***	[0.001]***	[0.001]***
Age	0.009	-0.005	0.008
	[0.002]***	[0.002]**	[0.002]***
Age-squared	0	0	0
	[0.000]***	[0.000]*	[0.000]***
Female	0.029	-0.013	0.041
	[0.001]***	[0.001]***	[0.001]***
Black	0.004	-0.009	0.004
	[0.002]**	[0.002]***	[0.002]**
Married	0.009	0	0.006
	[0.001]***	[0.001]	[0.001]***
No. of Children	-0.01	0.002	-0.007
	[0.001]***	[0.001]***	[0.001]***
MSA,1979=Large(.5+M)	0.003	0.001	0.001
	[0.001]**	[0.001]	[0.001]

Note: from Bacolod-Blum-Strange (JRS, 2010).

Table 2a. Skill Manifestation in Cities (cont.; abbr.)

	SMALL (<.5M) SKILLS			LARGE (.5M+) SKILLS		
	Cognitive	Motor	People	Cognitive	Motor	People
AFQT %ILE/100	0.136	0	0.09	0.133	-0.01	0.083
	[0.005]***	[0.005]	[0.005]***	[0.003]***	[0.003]***	[0.003]***
Rotter Locus of Control	0.017	0.065	0.005	0.006	-0.003	0.013
	[0.010]*	[0.010]***	[0.010]	[0.005]	[0.005]	[0.005]***
Pearlin Control Mastery	0.07	-0.013	0.072	0.068	-0.022	0.052
	[0.012]***	[0.012]	[0.012]***	[0.006]***	[0.006]***	[0.006]***
Rosenberg Self-Esteem	-0.001	-0.027	0.022	0.03	-0.036	0.061
	[0.014]	[0.014]*	[0.014]	[0.007]***	[0.007]***	[0.007]***
Sociability Trait 'not shy'	0.021	-0.001	0.022	0.001	-0.003	0.007
	[0.003]***	[0.003]	[0.003]***	[0.001]	[0.001]***	[0.001]***
MSA,1979=Large(.5+M)	-0.003	-0.005	-0.01	0	0.002	-0.001
	[0.005]	[0.005]	[0.005]*	[0.001]	[0.001]	[0.001]

Note: from Bacolod-Blum-Strange (JRS, 2010).

B. Additional models.

1. Selection of traits and abilities into large cities (Table 3): high skill workers pick large cities (so sorting matters, as in Combes et al (2008)).

2. Movers/stayers model (Table 6): movers have higher skill levels.

Table 3. Abilities, Traits, Education, and Cities (abbr.)

	MSA at *t* is Large(.5+M)=1		Highest Grade Completed
	Logit, Marginal Effects	OLS/LPM	
AFQT %ILE/100	0.016	0.017	5.345
	[0.007]**	[0.007]**	[0.032]***
Rotter Locus of Control	0.004	0	0.333
	[0.013]	[0.013]	[0.061]***
Pearlin Control Mastery	0.092	0.094	1.245
	[0.014]***	[0.015]***	[0.069]***
Rosenberg Self-Esteem	0.147	0.16	1.455
	[0.017]***	[0.018]***	[0.085]***
Sociability Trait 'not shy'	0.013	0.014	0.145
	[0.003]***	[0.003]***	[0.016]***

Note: from Bacolod-Blum-Strange (JRS, 2010).

Table 6. Selection: Abilities, Traits, and Cities Using Mover/Stayer Sample (abbr.)

	Multinomial Logit Marginal Effects	
	Move Small to Large MSA	Move Large to Small MSA
AFQT %ILE/100	0.233	0.096
	[0.018]***	[0.012]***
Rotter Locus of Control	0.054	-0.083
	[0.035]	[0.022]***
Pearlin Control Mastery	0.022	0.123
	[0.040]	[0.024]***
Rosenberg Self-Esteem	0.191	0.094
	[0.047]***	[0.029]***
Sociability Trait 'not shy'	0.077	0.051
	[0.009]***	[0.005]***

Note: from Bacolod-Blum-Strange (JRS, 2010).

VI. Conclusions

A. What we know:

1. Skill ≠ education.

2. With contributions from education and also from agglomeration, traits and abilities determine skills.

3. It is possible to characterize worker skills using occupation level data on the skill requirements of jobs such as the DOT and O-NET.

A. What we know (continued):

4. Modest increases in cognitive and social skills with city size, but not with own industry employment.

5. For soft skills, an increase in spread with city size.

6. Skill development in cities.

B. Some policy thoughts:

1. Agglomeration raises the prices of cognitive and social skills, but not motor/physical skills. Industrial policy must recognize this.

2. Agglomeration is complementary to low-skill activities too. Poverty policy must recognize this.

3. Cities may have an impact on skill development. Urban policy must recognize this.

C. What we do not know:

1. Impact of local skills -- another measure of agglomeration, as in human capital externalities literature -- on key outcomes.

2. Impact of own skills on other outcomes such as innovation.

3. Impact of skills in different circumstances

   a. Historical: how were skill prices impacted by agglomeration during the industrial revolution? What was the skill distribution?

   b. Growing economy.

   c. Other developed economies.