

Education Occupation Mismatch in Developing Countries

Bilal Khan

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Motivation

- Implications of Skill mismatch in the labor market

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- How relevant is Education-Occupation mismatch in developing countries?

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- Are the implications any different from the developed countries?

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- empirically assess the implication of Education-Occupation mismatch in 11 developing countries
- differentiates between the horizontal and vertical mismatch
- finds negative and significant implication for over-educated and horizontally mismatched workers in terms of earnings as well as life satisfaction
- did not find significant implications for under-educated workers in terms of life-satisfaction

Relevant Literature

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- Lemieux (2014) found that the horizontally mismatched workers in Canada earn 5 % to 16% less than the ones who works in relevant occupation as per their education field

Skill Towards Employment and Productivity Survey

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- This paper uses the Household survey data

Summary Statistics across Countries

Country	Total	Employed	Self-Employed	Median Wage	Average years of Education	Median ISCED completed	Over-Educated	Under-Educated	Strongly Mis-matched	Weakly Mis-matched
Armenia	2992	963	.1	2.54	14.1	6	.22	.03	.07	.15
Bolivia	2433	1414	.48	2.98	11.4	4	.58	.06	.01	.04
Colombia	2617	1566	.45	2.76	10.2	3	.41	.01	.02	.06
Georgia	2996	887	.14	2.89	15.6	6	.68	.02	.04	.08
Ghana	2987	1925	.62	1.36	8.9	2	.38	.11	.01	.05
Kenya	3894	2159	.41	1.66	9.7	3	.51	.02	.01	.05
Laos	2845	1597	.61	1.7	8.6	2	.16	.19	0	.01
Macedonia	4009	1607	.16	4.46	13.3	3	.33	.14	.16	.23
Sri Lanka	2989	1323	.34	2.42	9.5	3	.26	.01	.01	.06
Vietnam	3405	2121	.39	2.74	11.2	3	.35	.02	.01	.07
Yunnan	2017	1216	.13	2.73	12.8	3	.09	.06	.02	.18

Education Distribution across Workers

Country	Less than Primary	Primary School	Middle School	High School	College & above	Total
Armenia	0	0	.04	.26	.68	963
Bolivia	.13	.05	.12	.39	.31	1414
Colombia	.09	.22	.05	.36	.29	1566
Georgia	0	0	.02	.21	.75	887
Ghana	.22	.1	.35	.2	.13	1925
Kenya	.11	.22	.11	.43	.12	2159
Laos	.22	.22	.18	.25	.14	1597
Macedonia	0	.01	.11	.56	.32	1607
Sri Lanka	.08	.11	.29	.43	.1	1323
Vietnam	.05	.15	.2	.29	.32	2121
Yunnan	.01	.07	.28	.3	.34	1216

Distribution of Fields of Study

Distribution of workers across Education and Occupation

	Field of Study										Total
	General Programmes	Education	Humanities and Arts	Social Science, Business and Law	Science, Maths and Computing	Engineering, Manufacturing and Construction	Agriculture and Veterinary	Health and Welfare	Services	Others	
A. Percentage of Individuals in each field of study											
All	28.1	4.2	3.2	9.2	2.6	16.1	2.1	5.9	8.9	19.7	100
Men	28.8	2.5	1.9	8.9	3.0	18.4	2.6	4.1	10.3	19.5	49.2
Women	27.5	5.8	4.4	9.5	2.3	13.9	1.6	7.5	7.6	19.9	50.8
Secondary	62.9	0.7	0.7	3.8	1.0	13.0	1.3	2.2	3.2	11.2	35.1
Post-secondary	22.8	3.1	2.3	5.3	1.6	11.4	1.2	5.8	8.8	37.7	25.0
Bachelors	0.8	3.4	2.6	11.5	2.7	25.3	3.2	9.1	17.2	24.2	19.9
Masters and Above	0.9	12.4	9.1	21.0	6.7	18.4	3.5	9.2	11.0	7.8	20.0
B. Percentage of individuals assessing the usefulness of education											
Not useful	12.4	8.2	10.9	13.5	15.8	15.0	14.5	8.1	9.8	7.9	11.5
Somewhat useful	26.6	8.5	12.0	11.9	12.5	15.2	11.6	6.6	13.6	19.6	17.8
Moderately useful	23.2	12.2	10.3	18.9	14.1	20.8	19.5	11.8	17.9	23.4	20.1
Very useful	37.8	71.1	66.8	55.7	57.6	49.0	54.4	73.5	58.7	49.1	50.6

Education Occupation Mismatch & Earnings

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Log (Hourly wages in USD)							
Female	-0.213(0.019)***	-0.209(0.019)***	-0.209(0.019)***	-0.209(0.019)***	-0.219(0.019)***	-0.223(0.024)***	-0.224(0.024)***
Primary Education	-0.002(0.067)	0.018(0.067)	0.018(0.067)	0.018(0.067)	0.026(0.067)	-0.005(0.091)	0.001(0.091)
Basic General	0.113(0.065)*	0.166(0.065)**	0.166(0.065)**	0.166(0.065)**	0.168(0.066)**	0.104(0.087)	0.127(0.087)
Secondary (General)	0.251(0.065)***	0.310(0.066)***	0.313(0.066)***	0.312(0.066)***	0.303(0.067)***	0.336(0.089)***	0.368(0.089)***
Post-secondary (specialized/vocational)	0.284(0.067)***	0.372(0.068)***	0.373(0.068)***	0.372(0.068)***	0.354(0.070)***	0.303(0.091)***	0.350(0.091)***
Bachelors (4 years)	0.458(0.068)***	0.558(0.071)***	0.559(0.071)***	0.559(0.071)***	0.526(0.072)***	0.474(0.094)***	0.521(0.093)***
Masters	0.748(0.073)***	0.858(0.075)***	0.858(0.075)***	0.858(0.075)***	0.806(0.077)***	0.759(0.098)***	0.814(0.097)***
Candidate of Science	0.891(0.086)***	1.039(0.091)***	1.039(0.091)***	1.040(0.091)***	0.977(0.092)***	0.953(0.111)***	1.005(0.110)***
Doctor of Science	1.197(0.179)***	1.349(0.181)***	1.349(0.181)***	1.349(0.181)***	1.286(0.181)***	1.314(0.198)***	1.362(0.197)***
Experience	0.014(0.002)***	0.014(0.002)***	0.014(0.002)***	0.014(0.002)***	0.015(0.002)***	0.014(0.003)***	0.013(0.003)***
Experience Squared	-0.000(0.000)***	-0.000(0.000)***	-0.000(0.000)***	-0.000(0.000)***	-0.000(0.000)***	-0.000(0.000)***	-0.000(0.000)***
Height (in meters)	0.235(0.090)***	0.236(0.090)***	0.236(0.090)***	0.236(0.090)***	0.213(0.090)***	0.213(0.105)**	0.212(0.105)**
Chronic Illness	-0.035(0.023)	-0.035(0.023)	-0.035(0.023)	-0.035(0.023)	-0.032(0.023)	-0.054(0.029)*	-0.053(0.029)*
Extraversion	0.031(0.013)**	0.031(0.013)**	0.031(0.013)**	0.031(0.013)**	0.029(0.013)**	0.024(0.016)	0.024(0.016)
Conscientiousness	0.046(0.016)***	0.045(0.016)***	0.045(0.016)***	0.045(0.016)***	0.043(0.016)**	0.022(0.020)	0.025(0.020)
Openness	0.048(0.015)***	0.045(0.015)***	0.045(0.015)***	0.045(0.015)***	0.038(0.015)**	0.048(0.019)**	0.051(0.019)**
Agreeableness	0.012(0.014)	0.011(0.014)	0.011(0.014)	0.011(0.014)	0.011(0.014)	-0.026(0.018)	-0.026(0.018)
Emotional Stability	0.037(0.012)**	0.037(0.012)**	0.037(0.012)**	0.037(0.012)**	0.037(0.012)**	0.037(0.015)**	0.037(0.016)**
Risk Loving	0.024(0.006)***	0.024(0.006)***	0.024(0.006)***	0.024(0.006)***	0.023(0.006)**	0.019(0.008)**	0.018(0.008)**
Informal Sector	-0.231(0.020)***	-0.221(0.020)***	-0.221(0.020)***	-0.221(0.020)***	-0.219(0.020)***	-0.246(0.026)***	-0.247(0.026)***
Self-Employed	0.156(0.023)***	0.158(0.023)***	0.158(0.023)***	0.158(0.023)***	0.158(0.023)***	0.200(0.028)***	0.200(0.028)***
Part-time Job	0.839(0.025)***	0.844(0.025)***	0.844(0.025)***	0.844(0.025)***	0.846(0.025)***	0.780(0.030)***	0.779(0.030)***
Under-educated		0.125(0.035)**	0.125(0.035)**	0.125(0.035)**	0.125(0.035)**	0.166(0.059)***	0.168(0.060)***
Over-educated		-0.081(0.019)***	-0.084(0.019)***	-0.082(0.020)***	-0.079(0.020)***	-0.113(0.024)***	-0.114(0.024)***
Weak Horizontal Mismatch							
Strong Horizontal Mismatch			-0.040(0.038)				
Literacy score						0.000(0.000)***	
Constant	-0.367(0.177)**	-0.410(0.177)**	-0.408(0.177)**	-0.409(0.177)**	-0.328(0.178)*	-0.250(0.215)	-0.197(0.215)
Observations	14,293	14,293	14,293	14,293	14,274	8,953	8,953
R-squared	0.349	0.351	0.351	0.351	0.353	0.330	0.330
Maximum Parent Education	No	No	No	No	Yes	Yes	Yes
Academic Performance in Primary or Secondary school	No	No	No	No	Yes	Yes	Yes
Occupation-Industry-Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes



Education Occupation Mismatch & Earnings (Secondary and above)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	1	2	3	4	5	6	7
USD log of Hourly earnings							
Female	-0.191(0.022)***	-0.186(0.022)***	-0.186(0.022)***	-0.187(0.022)***	-0.185(0.022)***	-0.209(0.028)***	-0.210(0.028)***
Post-secondary (specialized/vocational)	-0.005(0.027)	0.031(0.027)	0.029(0.027)	0.029(0.027)	0.006(0.032)	-0.126(0.054)**	-0.120(0.055)**
Bachelors (4 years)	0.171(0.030)***	0.223(0.031)***	0.220(0.031)***	0.220(0.031)***	0.173(0.037)***	0.022(0.063)	0.031(0.063)
Masters	0.439(0.039)***	0.505(0.040)***	0.503(0.040)***	0.502(0.040)***	0.438(0.046)***	0.278(0.066)***	0.293(0.066)***
Candidate of Science	0.590(0.059)***	0.712(0.062)***	0.710(0.062)***	0.710(0.062)***	0.647(0.067)***	0.496(0.082)***	0.510(0.082)***
Doctor of Science	0.900(0.172)***	1.026(0.172)***	1.025(0.172)***	1.026(0.172)***	0.974(0.168)***	0.858(0.178)***	0.867(0.178)***
Experience	0.010(0.003)***	0.010(0.003)***	0.010(0.003)***	0.010(0.003)***	0.010(0.003)***	0.013(0.003)***	0.013(0.003)***
Experience Squared	-0.000(0.000)***	-0.000(0.000)***	-0.000(0.000)***	-0.000(0.000)***	-0.000(0.000)***	-0.000(0.000)***	-0.000(0.000)***
Height (in meters)	0.341(0.110)***	0.342(0.110)***	0.342(0.110)***	0.341(0.110)***	0.335(0.110)***	0.310(0.128)**	0.311(0.128)**
Chronic Illness	-0.013(0.028)	-0.012(0.027)	-0.011(0.028)	-0.011(0.027)	-0.011(0.027)	-0.019(0.033)	-0.019(0.033)
Extraversion	0.041(0.015)***	0.042(0.014)***	0.042(0.014)***	0.042(0.014)***	0.043(0.015)***	0.034(0.018)*	0.034(0.018)*
Conscientiousness	0.019(0.018)	0.016(0.018)	0.016(0.018)	0.016(0.018)	0.016(0.018)	0.013(0.022)	0.016(0.022)
Openness	0.060(0.017)***	0.057(0.017)***	0.057(0.017)***	0.057(0.017)***	0.056(0.017)***	0.049(0.022)**	0.051(0.022)**
Agreeableness	0.001(0.017)	0.000(0.017)	0.000(0.017)	0.000(0.017)	0.000(0.017)	-0.019(0.021)	-0.018(0.021)
Emotional Stability	0.029(0.014)**	0.030(0.014)**	0.029(0.014)**	0.029(0.014)**	0.030(0.014)**	0.030(0.017)*	0.030(0.017)*
Risk Loving	0.035(0.007)***	0.035(0.007)***	0.035(0.007)***	0.035(0.007)***	0.035(0.009)***	0.036(0.009)***	0.036(0.009)***
Informal Sector	-0.276(0.024)***	-0.263(0.024)***	-0.264(0.024)***	-0.263(0.024)***	-0.261(0.024)***	-0.260(0.030)***	-0.260(0.030)***
Self-Employed	0.219(0.029)***	0.224(0.029)***	0.224(0.029)***	0.224(0.029)***	0.224(0.029)***	0.248(0.034)***	0.248(0.034)***
Part-time Job	0.775(0.029)***	0.780(0.029)***	0.781(0.029)***	0.781(0.029)***	0.782(0.029)***	0.764(0.034)***	0.763(0.034)***
Under-educated		0.111(0.039)***	0.103(0.040)***	0.103(0.040)***	0.110(0.040)***	0.200(0.074)***	0.202(0.074)***
Over-educated		-0.118(0.022)***	-0.122(0.022)***	-0.125(0.023)***	-0.124(0.023)***	-0.150(0.027)***	-0.152(0.027)***
Weak Horizontal Mismatch				-0.026(0.026)	-0.025(0.026)	-0.021(0.040)	-0.021(0.040)
Strong Horizontal Mismatch			-0.055(0.039)				
Literacy score						0.000(0.000)**	
Constant	-0.141(0.204)	-0.123(0.204)	-0.116(0.204)	-0.110(0.205)	0.007(0.214)	0.203(0.267)	0.291(0.265)
Observations	10,025	10,025	10,025	10,025	10,025	6,868	6,868
R-squared	0.336	0.339	0.339	0.339	0.340	0.324	0.323
Educational Field	No	No	No	No	Yes	Yes	Yes
Maximum Parent Education	No	No	No	No	Yes	Yes	Yes
Academic Performance in Primary or Secondary school	No	No	No	No	Yes	Yes	Yes
Occupation-Industry-Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Education Occupation Mismatch & Life-Satisfaction

VARIABLES	(1)	(2)	(3)	(4)	(5)
	1	2	3	4	5
Life satisfaction					
USD log of Hourly earnings	0.254(0.020)***	0.252(0.020)***	0.252(0.020)***	0.252(0.020)***	0.210(0.021)***
Female	0.293(0.041)***	0.296(0.041)***	0.296(0.041)***	0.296(0.041)***	0.237(0.042)***
Married	0.375(0.044)***	0.376(0.044)***	0.376(0.044)***	0.376(0.044)***	0.367(0.044)***
Has Children	-0.120(0.044)***	-0.120(0.044)***	-0.120(0.044)***	-0.121(0.044)***	-0.163(0.044)***
Primary Education	0.151(0.110)	0.162(0.110)	0.162(0.110)	0.160(0.110)	0.047(0.121)
Basic General	0.114(0.103)	0.171(0.104)	0.171(0.104)	0.172(0.104)*	-0.030(0.112)
Secondary (General)	0.211(0.104)**	0.278(0.107)***	0.282(0.107)***	0.301(0.108)***	0.008(0.115)
Postsecondary (specialized/vocational)	0.314(0.107)***	0.415(0.113)***	0.418(0.113)***	0.431(0.113)***	0.091(0.120)
Bachelors (4 years)	0.396(0.111)***	0.511(0.117)***	0.513(0.117)***	0.525(0.117)***	0.132(0.124)
Masters	0.776(0.120)***	0.911(0.129)***	0.912(0.129)***	0.925(0.129)***	0.441(0.136)***
Candidate of Science	0.559(0.173)***	0.749(0.185)***	0.750(0.185)***	0.765(0.185)***	0.279(0.190)
Doctor of Science	0.178(0.693)	0.373(0.694)	0.374(0.694)	0.391(0.694)	-0.130(0.679)
Age	-0.084(0.012)***	-0.085(0.012)***	-0.085(0.012)***	-0.084(0.012)***	-0.082(0.012)***
Age squared	0.001(0.000)***	0.001(0.000)***	0.001(0.000)***	0.001(0.000)***	0.001(0.000)***
Height (in meters)	0.457(0.205)**	0.455(0.205)**	0.456(0.205)**	0.454(0.205)**	0.195(0.209)
Chronic Illness	-0.334(0.051)***	-0.335(0.051)***	-0.334(0.051)***	-0.333(0.051)***	-0.338(0.051)***
Extraversion	0.082(0.029)***	0.081(0.029)***	0.082(0.029)***	0.081(0.029)***	0.055(0.030)*
Conscientiousness	-0.025(0.035)	-0.026(0.035)	-0.026(0.035)	-0.027(0.035)	-0.048(0.036)
Openness	0.071(0.033)**	0.068(0.033)**	0.068(0.033)**	0.068(0.033)**	0.031(0.033)
Agreeableness	0.197(0.031)***	0.196(0.031)***	0.196(0.031)***	0.196(0.031)***	0.192(0.032)***
Emotional Stability	0.264(0.029)***	0.264(0.029)***	0.264(0.029)***	0.264(0.029)***	0.243(0.030)***
Risk Loving	0.032(0.014)**	0.031(0.014)**	0.031(0.014)**	0.031(0.014)**	0.021(0.014)
Informal Sector	-0.239(0.046)***	-0.228(0.047)***	-0.228(0.047)***	-0.228(0.047)***	-0.169(0.048)***
Self-Employed	0.301(0.048)***	0.305(0.048)***	0.305(0.048)***	0.305(0.048)***	0.214(0.049)***
Part-time Job	-0.331(0.048)***	-0.323(0.048)***	-0.323(0.048)***	-0.322(0.048)***	-0.291(0.050)***
Under-educated		0.056(0.082)	0.051(0.083)	0.039(0.083)	0.016(0.084)
Over-educated		-0.121(0.042)***	-0.124(0.042)***	-0.138(0.043)***	-0.104(0.044)**
Weak Horizontal Mismatch				-0.095(0.067)	-0.102(0.068)
Asset Wealth Index					0.339(0.020)***
Strong Horizontal Mismatch			-0.057(0.114)		
Constant	4.927(0.443)***	4.902(0.443)***	4.904(0.443)***	4.913(0.443)***	6.054(0.458)***
Observations	15,600	15,600	15,600	15,600	14,429
R-squared	0.267	0.268	0.268	0.268	0.291
Occupation-Industry-Country Fixed Effects	Yes	Yes	Yes	Yes	Yes

Education Occupation Mismatch & Life-Satisfaction (Secondary and above)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	1	2	3	4	5	6
Life satisfaction						
USD log of Hourly earnings	0.285(0.025)***	0.282(0.025)***	0.282(0.025)***	0.225(0.026)***	0.225(0.026)***	0.224(0.026)***
Female	0.338(0.049)***	0.339(0.049)***	0.340(0.049)***	0.269(0.049)***	0.269(0.049)***	0.266(0.049)***
Married	0.410(0.051)***	0.410(0.051)***	0.410(0.051)***	0.408(0.051)***	0.408(0.051)***	0.408(0.051)***
Has Children	-0.132(0.051)***	-0.131(0.051)***	-0.130(0.051)***	-0.150(0.051)***	-0.150(0.051)***	-0.154(0.051)***
Postsecondary (specialized/vocational)	0.068(0.062)	0.093(0.063)	0.090(0.063)	0.023(0.065)	0.023(0.065)	-0.004(0.079)
Bachelors (4 years)	0.156(0.065)**	0.192(0.067)***	0.187(0.067)***	0.078(0.068)	0.078(0.068)	0.065(0.085)
Masters	0.499(0.082)***	0.554(0.087)***	0.550(0.087)***	0.352(0.089)***	0.352(0.089)***	0.340(0.107)***
Candidate of Science	0.294(0.148)**	0.401(0.155)***	0.397(0.155)**	0.199(0.156)	0.199(0.156)	0.200(0.167)
Doctor of Science	-0.045(0.683)	0.066(0.684)	0.064(0.684)	-0.171(0.671)	-0.171(0.671)	-0.203(0.676)
Age	-0.080(0.014)***	-0.081(0.014)***	-0.081(0.014)***	-0.083(0.014)***	-0.083(0.014)***	-0.083(0.014)***
Age squared	0.001(0.000)***	0.001(0.000)***	0.001(0.000)***	0.001(0.000)***	0.001(0.000)***	0.001(0.000)***
Height (in meters)	0.669(0.236)***	0.666(0.236)***	0.666(0.236)***	0.411(0.237)*	0.411(0.237)*	0.419(0.237)*
Chronic Illness	-0.387(0.060)***	-0.386(0.060)***	-0.384(0.060)***	-0.384(0.060)***	-0.384(0.060)***	-0.385(0.060)***
Extraversion	0.076(0.034)**	0.076(0.034)**	0.077(0.034)**	0.062(0.034)*	0.062(0.034)*	0.062(0.034)*
Conscientiousness	-0.044(0.042)	-0.045(0.042)	-0.045(0.042)	-0.055(0.042)	-0.055(0.042)	-0.055(0.042)
Openness	0.108(0.039)***	0.107(0.039)***	0.107(0.039)***	0.081(0.039)**	0.081(0.039)**	0.082(0.039)**
Agreeableness	0.222(0.036)***	0.222(0.036)***	0.222(0.036)***	0.210(0.037)***	0.210(0.037)***	0.210(0.037)***
Emotional Stability	0.261(0.033)***	0.261(0.033)***	0.260(0.033)***	0.253(0.034)***	0.253(0.034)***	0.253(0.034)***
Risk Loving	0.021(0.016)	0.020(0.016)	0.021(0.016)	0.017(0.016)	0.017(0.016)	0.017(0.016)
Informal Sector	-0.207(0.054)***	-0.199(0.054)***	-0.199(0.054)***	-0.162(0.054)***	-0.162(0.054)***	-0.163(0.054)***
Self-Employed	0.219(0.058)***	0.225(0.059)***	0.223(0.058)***	0.175(0.059)***	0.175(0.059)***	0.174(0.059)***
Part-time Job	-0.321(0.057)***	-0.314(0.057)***	-0.313(0.057)***	-0.253(0.059)***	-0.253(0.059)***	-0.246(0.059)***
Under-educated		-0.037(0.099)	-0.055(0.099)	-0.064(0.101)	-0.064(0.101)	-0.062(0.102)
Over-educated		-0.117(0.047)**	-0.128(0.048)***	-0.115(0.050)**	-0.115(0.050)**	-0.120(0.050)**
Weak Horizontal Mismatch				-0.131(0.069)*	-0.131(0.069)*	-0.131(0.069)*
Asset Wealth Index				0.316(0.023)***	0.316(0.023)***	0.316(0.023)***
Strong Horizontal Mismatch			-0.143(0.115)			
Constant	4.621(0.504)***	4.671(0.505)***	4.689(0.505)***	5.523(0.511)***	5.523(0.511)***	5.710(0.532)***
Observations	10,981	10,981	10,981	10,591	10,591	10,591
R-squared	0.262	0.262	0.262	0.278	0.278	0.279
Educational Field	No	No	No	No	No	Yes
Occupation-Industry-Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

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