Plurilingualism and Brain Drain: Unexpected Consequences of Access to Foreign TV *

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This file is still work in progress and should contain more once the paper gets closer to publication.

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1 Online Appendix

1.1 Average TV ownership by district in 1990

District	Mean Tel.	Mean Tel. weighted	Obs	signal
Berat	0.34	0.25	145	0.17
Bulqize	0.13	0.17	119	0
Delvine	0.29	0.28	17	0.07
Devoll	0.32	0.23	28	0
Diber	0.64	0.62	289	0
Durres	0.14	0.14	131	0.29
Elbasan	0.45	0.41	157	0.09
Fier	0.58	0.57	215	.57
Gjirokaster	0.88	0.89	40	0.025
Gramsh	0.89	0.81	124	0.04
Has	0.80	0.81	71	0
Kavaje	0.68	0.67	87	0.37
Kolonje	0.80	0.80	25	0
Korce	0.85	0.85	144	0
Kruje	0.23	0.15	47	0.18
Kucove	0.96	0.95	23	0.02
Kukes	0.80		241	0
Kurbin	0.73	0.71	62	0.14
Lezhe	0.63	0.61	63	0.11
Librazhd	0.82	0.80	208	0
Lushnje	0.40	0.39	155	0.30
Malesi e madhe	0.21	0.15	29	0
Mallakaster	0.43	0.40	51	0.21
Mat	0.40	0.22	65	0.04
Mirdite	0.79	0.79	29	0.02
Peqin	0.05	0.03	20	0.14
Permet	0.73	0.81	26	0.03
Pogradec	0.66	0.60	41	0
Puke	0.81	0.82	54	0
Sarande	0.88	0.86	33	0.08
Shkoder	0.06	0.03	143	0.02
Skrapar	0.71	0.70	48	0.07
Tepelene	0.73	0.75	41	0.12
Tirane	0.77	0.78	541	0.14
Tropoje	0.77	0.83	117	0
Vlore	0.95	0.96	155	0.37
Average	0.62	0.56	3840	

1.2 Borjas model: Self-Selection and the earnings of migrants

In the following Appendix we refer to the Borjas model of migrant self-selection as developed in **?**. The model in **?** is developed to discuss differences between native and migrant populations, and the relationship between inequalities and migrant self-selection. However, the richness of the model's predictions goes beyond what is discussed in the original paper. In this Appendix, we discuss the model's prediction regarding the relationship between the correlation of labour productivity between two countries and the skill composition of the migrant population. We argue that it is reasonable to interpret the language skills of country x in country y as part of the correlation in labour productivity between countries y and x. In what follows, we show how the Borjas model, given a wide range of parameters, predicts that an increase in the correlation of productivity between countries x and y will lead to an increase in the migration of positively selected workers from y to x.

Notation and Definition:

- 0 is country of origin
- 1 is destination country
- $\varepsilon_0 \sim N(0,\sigma_0^2)$, $\varepsilon_1 \sim N(0,\sigma_1^2)$, corr($\varepsilon_0,\varepsilon_1$)=$\rho$, $\sigma_{01} = cov(\varepsilon_0,\varepsilon_1)$, and $v = \varepsilon_1 - \varepsilon_0$
- π is the time equivalent cost of migration
- Earnings of origin country residents: $lnw_0 = \mu_0 + \varepsilon_0$
- Earnings of the individuals of origin country if they were to migrate to country of destination: $lnw_1 = \mu_1 + \varepsilon_1$
- Index function: $I = lnw_1 - lnw_0 - \pi = (\mu_1 - \mu_0 - \pi) + (\varepsilon_1 - \varepsilon_0)$. If $I > 0$ individual migrate.
- Call z=$-(\mu_1 - \mu_0 - \pi)$
- Define $\Phi(z)$ (where $\Phi()$ is the standard normal distribution function), as $Pr(v > -(\mu_1 - \mu_0 - \pi)) = 1 - \Phi(z)$
- Define Q_0 as the difference between the average earnings of migrants if they were to remain in the country and the average earnings of the population $Q_0 = E(lnw_0|I > 0) - E(lnw_0) = \frac{\sigma_0\sigma_1}{\sigma_v}(\rho - \frac{\sigma_0}{\sigma_1})\frac{\phi(z)}{1-\Phi(z)}$
- Call $\frac{\phi(z)}{1-\Phi(z)} = \lambda$

Note that $\frac{\partial Q_0}{\partial \rho}$ measure how changes the selection of migrant with respect to the native population as we increase the productivity correlation between countries.

$$\frac{\partial Q_0}{\partial \rho} = -(\lambda)(\frac{\sigma_0^3\sigma_1}{\sigma_v^3})(\frac{\sigma_1}{\sigma_0}(\rho - \frac{\sigma_1}{\sigma_0})) + \frac{\sigma_0^2\sigma_1^2}{\sigma_v^3}(\rho - \frac{\sigma_0}{\sigma_1})\frac{\partial \lambda}{\partial z}z \tag{1}$$

Divide in 2 components:

1. $-(\lambda)(\frac{\sigma_0^3\sigma_1}{\sigma_v^3})(\frac{\sigma_1}{\sigma_0}(\rho - \frac{\sigma_1}{\sigma_0}))$
2. $\frac{\sigma_0^2\sigma_1^2}{\sigma_v^3}(\rho - \frac{\sigma_0}{\sigma_1})\frac{\partial \lambda}{\partial z}z$

1. Is positive iff $\rho < \frac{\sigma_1}{\sigma_0}$
2. Is positive iff $\rho < \frac{\sigma_0}{\sigma_1}$ as $z < 0$ and $\frac{\partial \lambda}{\partial z} > 0$

If 1) and 2) are positive then $\frac{\partial Q_0}{\partial \rho}$ is positive.

If $\sigma_0 > \sigma_1$, then 2. is always positive, and 1. is positive conditional on ρ be small enough. In case $\rho > \frac{\sigma_1}{\sigma_0}$ under a set of parameters value of z and λ, 2.>1. and $\frac{\partial Q_0}{\partial \rho}$ is positive. The same apply to the case $\sigma_0 < \sigma_1$: 1. is always positive, while 2. for a set of ρ value.