Price level, market size and remoteness: an empirical analysis

Anna Mishura
Novosibirsk

We investigate how price level depends on prices of primary resources, wages and market size (as on demand size and on supply size).

Demand size of any market for the multiregional case associated with the real market potential of a location:

$$RMP_r = \sum_{s=1}^{R} \tau_{rs}^{-(\sigma-1)} \mu_s Y_s P_s^{\sigma-1}$$

Supply size of a market and supplier potential:

$$SP_s = P_s^{-(\sigma-1)} = \sum_{r=1}^{R} n_r p_r^{1-\sigma} \tau_{rs}^{-(\sigma-1)}$$

Price for monopolistically competitive goods:

$$p_r = m_r * markup$$

$$m_r = x_r^\alpha w_r^\beta P_r^\gamma$$

x_r, w_r - price of primary resources and wages.

Markup can change depending on market size.

We try to estimate the following equation:

$$p_r^{average} = f\left(x_r, w_r, SP_r, RMP_r\right)$$

We use electricity prices, wages in food industry, average income.

RMP and SP we estimate following (Redding, Venables, 2004) and using fixed effects from the gravity model:

$$\ln X_{rs} = FX_r - (\sigma - 1)\ln \tau_{rs} + FM_s$$

$$FX_r = \ln\left(n_r\, p_r^{1-\sigma}\right) \qquad FM_s = \ln\left(\mu_s Y_s P_s^{\sigma-1}\right)$$

$$RMP_r = \sum_s \tau_{rs}^{-(\sigma-1)} \exp(FM_s) \quad SP_r = \sum_s \tau_{rs}^{-(\sigma-1)} \exp(FX_s)$$

We use data on trade flows in food industry in Russian regions, they do not include trade costs.

$$\ln(X_{rs}/\tau_{rs}) = FX_r - \sigma\delta \ln d_{rs} + FM_s$$

$$\ln \tau_{rs} = \delta \ln d_{rs}$$

We use Poisson PML following (Silva, Tenreyro, 2006).

We need $(\sigma - 1)\delta$, but we obtain $\sigma\delta$ =1.43.

So we use for $(\sigma - 1)\delta$ interval [0.7;1.43] for calculating RMP and SP.

Baseline estimation for $(\sigma - 1)\delta$ = 1.

Regressors (in logs)	Dependent variables: average prices (in logs), 2009г.										
	fixed consumer set	salt	sugar	cookies	fruit juice	sunflower oil	margarine	chicken	milk 2.5-3.2%	beef	butter
RMP	-0.017 (0.027)	-0.000 (0.059)	-0.005 (0.026)	-0.022 (0.047)	-0.030 (0.046)	-0.058 (0.36)	-0.022 (0.051)	-0.033 (0.028)	-0.059 (0.062)	-0.031 (0.033)	-0.002 (0.051)
SP	-0.115*** (0.022)	-0.292*** (0.043)	-0.138*** (0.022)	-0.066* (0.038)	-0.088** (0.038)	-0.060** (0.029)	-0.194*** (0.042)	-0.139*** (0.023)	-0.260*** (0.051)	-0.048* (0.025)	-0.090** (0.042)
average income/wages in food industry	0.325*** (0.029)	0.322*** (0.058)	0.112*** (0.029)	0.431*** (0.051)	0.228*** (0.051)	0.284*** (0.040)	0.298*** (0.057)	0.081** (0.031)	0.276*** (0.069)	0.185*** (0.029)	0.309*** (0.056)
electricity prices	0.162*** (0.033)	0.227*** (0.065)	0.087** (0.033)	0.121** (0.058)	0.112* (0.058)	0.049 (0.045)	0.062 (0.064)	0.117*** (0.035)	0.274*** (0.079)	0.094** (0.041)	0.106* (0.064)
R^2	0.83	0.76	0.70	0.64	0.48	0.62	0.65	0.69	0.61	0.53	0.50
N	79	79	79	79	79	79	79	79	79	80	79

Regressors (in logs)	Dependent variables: average prices (in logs), 2009г.									
	eggs	cakes	curd	boneless pork	bread	beer	pasta	buckwheat	flour	black tea
RMP	0.005 (0.052)	-0.077 (0.049)	-0.054 (0.053)	0.082*** (0.030)	-0.106* (0.059)	-0.113** (0.048)	-0.170** (0.08)	-0.131** (0.054)	-0.083* (0.044)	-0.074 (0.064)
SP	-0.319*** (0.040)	-0.133*** (0.040)	-0.170*** (0.044)	-0.069*** (0.024)	-0.062 (0.045)	-0.050 (0.037)	-0.064 (0.066)	-0.017 (0.044)	-0.028 (0.036)	0.061 (0.052)
average income/wages in food industry	0.293*** (0.045)	0.404*** (0.054)	0.354*** (0.059)	0.061* (0.034)	0.425*** (0.051)	0.147*** (0.041)	0.474*** (0.088)	0.402*** (0.059)	0.338*** (0.049)	0.178** (0.070)
electricity prices	0.265*** (0.064)	0.152** (0.061)	0.131* (0.067)	0.075** (0.037)	-0.134* (0.073)	0.057 (0.059)	0.179* (0.100)	0.064 (0.067)	0.150*** (0.055)	0.214*** (0.080)
R^2	0.77	0.70	0.66	0.24	0.57	0.38	0.50	0.55	0.58	0.21
N	80	79	79	79	80	80	79	79	79	79

Preliminary results

Supplier potential in food industry negatively affects most food prices, and if it is not so then in most cases in real market potential play the same role.

Higher wages, income and electricity prices lead to higher food prices in most specifications.