**Spatial Clustering and Performance of Food and Beverage Industry in a Developing Country**

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**Extended Abstract**

The performance of manufacturing sector can be improved by increasing the concentration of akin or related firms that happens due to the spatial clustering of firms, localized competition and firms’ own attributes. This research will explore the impact of both non-spatial and spatial factors (localized competition, localization economies and urbanization economies) on efficiency and productivity of the food and beverages sector for a developing economy like Pakistan. The firm level investigation will be conducted for the Food Products and Beverages sector in a developing country like Pakistan amid 1995-2005. First, this study will examine the performance of manufacturing sector by using Data Envelopment Analysis (DAE) – a non-parametric approach. Secondly, it will analyze the role of localized competition on the performance of this sector. Thirdly, it will investigate the impact of spatial clustering of firms in terms of localization and urbanization economies on the performance of this sector. The empirical analysis will be based on the survey level panel data which was gathered from Punjab Bureau of Statistics for the years 1995-96, 2000-01 and 2005-06 with five years interim.

To investigate spatial and non-spatial determinants of the performance of food and beverages sector, we will utilize following standard production function which was also utilized by Mitra (1999), Henderson (2003) and Mitra and Sato (2007):

$y=g\left(A\right).f(x)$ (1)

where *y*, *A* and *x* are performance (productivity and/or efficiency), vector of technological components and vector of input factors respectively. The production function can also be represented in the following form:

$Y\_{ijat}=A\_{ijat} K\_{ijat}^{α} L\_{ijat}^{β} M\_{ijat}^{γ}$ (2)

where *Yijat*, *Kijat ,* *Lijat* and *Mijat* are output, capital, number of workers and raw material respectively of firm *i* in industry *j* in area *a* at time *t*. α, β and γ are the elasticities of output with respect to *Kijat ,* *Lijat* and *Mijat* respectively. Following Mitra (1999), Henderson (2003), Mitra and Sato (2007), Moretti (2004) and Martin *et al.* (2008) technology (*Aijat*) of a firm is assumed to be affected by spatial clustering of firms (localization and urbanization economies), localized competition and firm specific factors. Therefore, *Aijat* can be written as:

$A\_{ijat}=(UE)\_{at}^{η} (LE)\_{jat}^{δ} (LCOM)\_{jat}^{λ} (OWN)\_{ijat}^{θ}$ (3)

where *UEat* , *LEjat* , *LCOMjat* and *OWNijat* are urbanization economies, localization economies, localized competition and ownership structure of firms respectively. η, δ, λ and θ are the elasticities of output with respect to technological factors *UEat* , *LEjat* , *LCOMjat* and *OWNijat* accordingly. Thus, substituting equation (3) into equation (2) and by taking natural logarithm, the estimable econometric model can be written as:

$lny\_{ijat}=α lnK\_{ijat}^{}+(β-1) lnL\_{ijat}^{}+γ lnM\_{ijat}^{}+ η lnUE\_{at}^{}+ δ lnLE\_{jat}^{}+λ lnLCOM\_{jat}^{}+θ OWN\_{ijat}^{}+ρ\_{a}+ν\_{t}+ε\_{ijat}$ (4.5)

where

*ln* is natural logarithm

*ρa* is cross section fixed effect for area *a*

*νt* is time fixed effect for time *t*

*εijat*  is error term which is assumed identically independently distributed

There is a large body of literature on scale externalities, spatial clustering and technical efficiency or productivity of manufacturing sector especially on the developed countries (Henderson (1986, 2003), Nakamura (1985), Duranton and Puga 2004 and Rosenthal and Strange 2004) but the literature concerning the effects of localized competition on the performance of industrial sector is scant.

The present study is important concerning the empirical and theoretical aspects. Firstly, the previous studies on the impacts of localized competition on the performance of manufacturing sector have rather been ignored in Pakistan. Secondly, the study examines the effects of spatial clustering in terms of localization and urbanization economies on the productivity and efficiency of manufacturing sector. The empirical results are expected to provide insight into the factors that determine the performance of manufacturing sector. It will also provide important policy implications for further planning and development of the food and beverage sector for the similar developing countries.

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