Local poverty reduction in Chile and Mexico: The role of food manufacturing growth

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A B S T R A C T

This paper analyzes the relationship between local poverty and food manufacturing growth in Chile and Mexico using propensity score matching, differences in differences and spatial econometrics methods. We focus on food manufacturing as a sector with a number of characteristics that make it potentially pro-poor, and whose incentives for spatial distribution may either strengthen or dampen its poverty reduction potential. The overall results indicate growth in food manufacturing employment contributes to local poverty reduction.

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1. Introduction

Pro-poor growth and transfers are the two main instruments for poverty reduction (De Janvry and Sadoulet, 2010). While transfers are expensive and politically difficult to implement and sustain over time, pro-poor growth poses the challenge of identifying what kind of growth, in terms of sectoral composition and spatial distribution, leads to the best outcomes. In terms of sectoral composition, growth tends to be more pro-poor when it is based on labor-intensive sectors, especially agriculture (among others, Ravallion and Datt, 1996, 2002; Anríquez and López, 2007; Suryahadi et al., 2009; De Janvry and Sadoulet, 2010; Loayza and Raddatz, 2010; Christiaensen et al., 2011). In terms of spatial distribution, the degree of concentration of economic activity may affect poverty reduction through at least two channels. First, beyond a certain income threshold, excessive spatial concentration of economic activity slows down aggregate economic growth (Brülhart and Sbergami, 2009; Atienza and Aroca, 2013; Cerina and Mureddu, 2014), hindering poverty reduction via its effect on

growth. Second, spatially concentrated economic growth tends to be less inclusive when most of the poor live in the geographic periphery of economic activity (Dercon, 2009), while growth is especially pro-poor when it happens in medium and small cities (Christiaensen and Todo, 2014).

This paper focuses on food manufacturing as a potentially pro-poor sector, whose incentives for spatial distribution may either strengthen or dampen its ability to reduce poverty.[1] We investigate empirically what is the average long-term impact of an increase in formal food manufacturing employment on the reduction of local poverty rates in Chile and Mexico since the 1990s. Food manufacturing represents around 10% of GDP in both countries (Byerlee et al., 2005), and in the last three decades it experienced an important increase in employment and sales income. We compare poverty reduction outcomes between municipalities[2] that experienced

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[1] We define the food manufacturing sector as the manufacturing of food, beverages, and tobacco, defined by codes 311 and 312 from the North American Industry Classification (NAICS). Throughout the paper, food manufacturing and agriprocessing are used as synonyms.

[2] Municipalities are equivalent to US counties. Integrated spatial units of economic activity may be a preferable unit of analysis, but were not available for the period under study. Spatial econometric methods are used to address the shortcomings of working with municipalities, as discussed in Section 4.

growth in food manufacturing employment, and municipalities where the sector remained absent or declined. Local characteristics may affect the decision of a firm to establish or expand its operations in a site, and may also influence the subsequent local dynamics of poverty reduction. Unless accounted for, this may result in a biased estimate of the impact of food manufacturing growth on poverty reduction. Therefore, we control for the non-random location decision of firms and for initial conditions that may affect subsequent outcome trends, by using a combination of difference-in-difference and propensity score matching methods, as in Jalan and Ravallion (1998), van de Walle and Mu (2008) and Khandker et al. (2009). We also control for spatial interdependencies in location decisions of food manufacturing firms and for spillover effects of food manufacturing growth on poverty reduction of neighboring municipalities using spatial econometric methods.

Several characteristics make food manufacturing a potentially pro-poor sector. These include, first, its labor-intensive and low-tech nature, similar to agriculture (FAO, 2004; World Bank, 2008). Second, it increases formal employment, especially of women and unskilled labor (Thorbecke and Jung, 1996; Barron and Rello, 2000; Valdes and Foster, 2003; Maertens and Swinnen, 2012). Third, it provides a way for natural resource based economies to diversify into higher value activities. This, together with the backward linkages of agriprocessing with agriculture, and its potentially diverse forward linkages with other sectors (especially services), can generate an employment multiplier that lowers poverty and stimulates broader economic development and human capital accumulation (World Bank, 2008; Maertens et al., 2012; Da Silva et al., 2013).

The impact of food manufacturing on poverty reduction, however, also depends on its spatial distribution vis-à-vis that of the poor. Spatial economic theory suggests strong agglomeration incentives for service and manufacturing firms, because geographical proximity to other firms can increase productivity via knowledge spillovers and access to specialized services and deeper labor pools (Henderson et al., 1995; Glaeser and Gottlieb, 2009; Saito and Gopinath 2011; Almeida and Fernandes, 2013). The pattern of economic development in both Chile and Mexico is concentrated around a few metropolitan cities,[3] while most of the poor are located outside the high-growth areas (Modrego and Berdegué, 2015; Escobal and Ponce, 2011; World Bank, 2009). If agriprocessing shares the same agglomeration incentives of the rest of manufacture, concentration around metropolitan cities might dampen the sector's potential for poverty reduction. On the other hand, the dependence of food manufacturing on raw materials, and the incentives to locate closer to rural areas, may result in a spatially dispersed location pattern, reaching poorer areas.

This paper contributes to the literature on the poverty elasticity to sectoral growth by, first, offering a comparison of two middle-income countries over a period of profound change in their structure of production, focusing on an important industry for resource rich countries, and using a lower level of spatial aggregation than most existing studies, which tend to rely on cross-country analyses. Second, the literature on poverty elasticity to sectoral growth usually treats the spatial distribution of sectors as exogenous and ignores possible spatial spillovers of sectoral growth. Our empirical strategy allows modeling and accounting for non-random firm location of food manufactures, thus controlling for local characteristics which may simultaneously determine poverty outcomes, and for spatial spillovers of the impacts of food manufacturing growth on poverty reduction.

The rest of the paper is organized as follows. Section 2 provides some background information on the evolution of the food manu-

facturing sector and of poverty reduction in Chile and Mexico. Section 3 presents the conceptual framework and Section 4 details the empirical strategy. Section 5 presents the data and descriptive statistics, Section 6 discusses results, and Section 7 concludes.

2. Background: Food manufacturing growth and poverty reduction in Chile and Mexico

This section provides some background information about how food manufacturing and poverty incidence have evolved in each country during the period of analysis.

In Chile, the incidence of income poverty fell markedly since the 1990s, from about 38% to 28% over the period 1992–2002. In Mexico, food poverty decreased significantly between 2000 and 2010. In contrast, asset poverty only dropped from 54% to 51% over the same period, because of the global crisis of 2008. Both countries, however, show important differences across regions: poverty rates fell rapidly in metropolitan areas, but remained substantially higher in rural areas and smaller cities (Modrego and Berdegué, 2015).

For information on employment, number of firms and sales of the food manufacturing sector we rely on the 1995 and 2002 National Industrial Annual Survey (ENIA for its name in Spanish) for Chile, and on the 1998 and 2008 Economic Census for Mexico. The ENIA collects data only on formal manufacturing firms with 10 employees or more. For comparability, we apply the same criterion to Mexico. Table 1 shows the main characteristics of food manufacturing in Chile and Mexico during the period of analysis and compares them to the rest of the manufacturing sector. In Chile, the sector grew by 93% in the number of firms and by 79% in employment, while sales increased by 110%. In comparison, the rest of manufacture increased the value of its sales by 182%, while the number of firms increased by 83%, and employment only by 44%. Consistent with these trends, labor intensity decreased in both sectors over time, by 15% in agriprocessing and 49% in the rest of manufacture. However, while in 1995 the degree of labor intensity was similar in the two sectors, by 2002 agriprocessing was significantly more labor intensive than the rest of manufacture.

In Mexico, the increase in number of firms, employment and sales has been much less marked than in Chile. However, during the studied period agriprocessing grew in number of firms and employment more than the rest of manufacture, albeit slightly less in terms of sales. Labor intensity decreased over time in both sectors, but more slowly for agriprocessing than for the rest of manufacture.

Fig. 1 shows variation in labor intensity across subsectors in agriprocessing in Chile and Mexico respectively. In both countries, the meat, fruits and vegetables, fish and confectionery subsectors are the most labor intensive. These subsectors together represent 17% of the total number of agriprocessing firms in Mexico, and 53% in Chile.

Food manufacturing is much less spatially concentrated than the rest of manufacturing in both Chile and Mexico. Spatial dispersion is particularly marked in Chile, where only 26% of total agriprocessing employment is concentrated in the capital, versus 59% of the rest of manufacturing. In Mexico, 40% of agriprocessing employment is concentrated between the North and the capital, versus about 60% of the rest of manufacturing.

With respect to the relationship between the spatial distribution of food manufacturing employment and of poverty rates, Fig. 2 shows that employment in agriprocessing is higher in richer municipalities. However, in both countries, food manufacturing employment declines much less steeply than for the rest of manufacture as local poverty rates increase, suggesting that food manufacturing remains an important source of income in relatively poor municipalities.

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[3] Defined as a conurbation with a population of at least 250 thousand inhabitants.