Regional Science and Urban Economics 43 (2013) 272–281

Contents lists available at SciVerse ScienceDirect

Regional Science and Urban Economics

journal homepage: www.elsevier.com/locate/regec

Inter-industry employment spillovers from tourism inflows

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ARTICLE INFO

Article history:
Received 23 January 2012
Received in revised form 12 July 2012
Accepted 12 July 2012
Available online 20 July 2012

Keywords:
Labor demand
Spillovers
Tourism
Industry-linkages
Dynamic panel data models

ABSTRACT

How much economic stimulus does tourism provide by generating jobs in various local industry sectors? Using data across 43 U.S. metropolitan statistical areas during 1987–2006, we analyze the impact of tourism inflows — proxied by the number of hotel rooms sold — on the employment in 22 non-hotel industries. We estimate a dynamic labor demand model with inter-industry spillover effects, using various estimators including GMM-based dynamic panel methods. We find statistically and economically significant effects — an additional 100 rooms sold per day during a year in a given MSA generates between 2 and 5 new jobs per non-hotel industry in that area. Subsample analyses across industries indicate that construction, retail, health care, professional and technical services are among the largest beneficiaries of these spillovers.

1. Introduction

There is a general belief that tourism generates spillovers/externalities to other sectors, thus boosting local economies. Such spillovers occur as visitors staying in the area increase demand for various local goods and services, either by direct spending or indirectly via multiplier effects. This belief is often supported by government campaigns and policies to promote tourism. The U.S. Chamber of Commerce (September 5, 2011) has also endorsed tourism as one of the six key job creators for the U.S. economy to the President and Congress.[1] However, despite its potentially important economic impact, and hence policy relevance, rigorous empirical evidence on how much tourism contributes to the local economy is sparse.

To fill this gap in the literature, we analyze the impact of tourism inflows, i.e. outside visitors in a given geographic area (measured by the number of hotel rooms sold), on the local employment in non-hotel industry sectors. Our theoretical and empirical approach is a departure from traditional papers in the tourism literature and offers several advantages. First, prior studies are often descriptive and less robust in their estimation methods and theoretical frameworks (see Ivanov and Webster, 2007 for a detailed discussion). Most of these studies rely on macro-level data that are often hard to interpret. In contrast, we rely on more micro-level data and use advanced panel data empirical methods that allow us to estimate the responsiveness of local industry employment to tourism inflows.[2] Second, we use the number of hotel rooms sold in a given metropolitan statistical area (MSA hereon) as a proxy for outside visitors.[3] An advantage of this measure is that it captures only the demand effects from *outside* the area because the percentage of rooms sold to customers from within any area is likely to be very small. Other measures such as airline tickets sold, road tolls collected, restaurant or retail stores sales, museum attendance etc., all include both demand from locals and external visitors. Therefore, they are not as accurate a proxy of outside visitors. Third, consistent with the definition of "tourist" by World Tourism Organization, our occupied

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[1] The World Tourism Organization defines "tourism" as travel for recreational, leisure or business purposes. A recent government action to support tourism includes Travel Promotion Act of March 2010. According to this Act, entry fees and visas paid by foreign travelers should finance tourism-promoting campaigns and help thus "to spur faster job growth in America's private sector without adding to the deficit". There are also several tourism campaigns initiated by state-level governments (e.g., Michigan, New York).

[2] For example, Blake et al. (2001) use aggregate input-output data to analyze the impact of tourism. However, such data are usually unavailable at disaggregated geographic levels (like metropolitan areas) or are constructed from hard-to-interpret sources like Tourism Satellite Accounts. Others, e.g. Blake and Sinclair (2003), use Computable General Equilibrium (CGE) models. Some of these models rely on multipliers/elasticities from other regions when assessing the local tourism impact, instead of estimating them from within the model. Other studies use time series methods like VARs to analyze whether tourism inflows increase GDP (e.g. Brida et al., 2008). While useful, this method does not allow assessment of the magnitude of employment spillovers at a disaggregated industry-level.

[3] A Metropolitan Statistical Area (or MSA) is defined as the area/region that has at least one urbanized area of 50,000 or more population, and adjacent areas with a high social and economic integration with the core (as measured by commuting ties). The central cities that form the basis on MSAs are generally included in their titles. Table 1 provides some descriptive statistics for the economic size of MSAs included in our sample.

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doi:10.1016/j.regsciurbeco.2012.07.006

hotel rooms capture only those outside visitors that stay in an area for more than 24 hours (and usually less than 1 year). Fourth, we use a relatively broad industry classification at 2-digit NAICS level. In this classification our 22 non-hotel industries represent all the sectors other than a relatively broad sector — accommodation and food (our proxy for the hotel industry). This level of aggregation reduces the possibility that our results might be driven by employment spillovers within the tourism sector itself. Finally, analyzing the impact of changes in occupied hotel rooms on employment across all non-hotel industries helps us to better understand industry linkages in the economy. Our data span a significant length of time, a 20-year period of 1987–2006, across all 2-digit industry sectors in 43 major MSAs (these areas encompass more than 80% of hotel rooms). The broad coverage of our data allows us to assess whether the benefits of tourism extend more broadly to the entire economy.

Our research approach is somewhat analogous to that of foreign direct investment (FDI) "spillovers" literature (Aitken and Harrison, 1999; Javorcik, 2004; Barrios et al., 2006; Kosová, 2010). This literature analyzes whether there are positive externalities/spillovers from the presence (or activities) of foreign firms on various economic performance measures (e.g., firm productivity, growth, survival or employment) of local/domestic firms. Similarly, we study the effect of external demand generated by tourists/outside visitors to the area (captured by number of hotel rooms sold) on employment across other (non-hotel) industries.

In our approach, we first extend the standard (derived) labor demand framework by incorporating the potential spillovers from tourism. Based on this framework, we derive our empirical specification and estimate it as the dynamic labor demand equation. We use different estimators including GMM-based panel data empirical methods (Arelano and Bond, 1991; Blundell and Bond, 1998). Our methodology and data allow us to address various endogeneity issues by controlling for factors that could potentially drive both industry employment and tourism inflows, including unobserved heterogeneity across industries, geographic areas and time. Recently, the applied spatial econometrics literature has moved towards applying similar panel data models to account for various spatial interactions in the data (e.g., Baylis et al., 2012; Elhorst, 2010; Gérard et al., 2010; Kelejian et al., 2012; Lee and Yu, 2010; Mohl and Hagen, 2010; Moscone and Tosetti, 2010). Thus, our work is also related to this stream of literature.

Our results suggest statistically significant and economically relevant positive spillovers from tourism inflows on employment in non-hotel industries. These results are robust across different specifications. We find that on average, an additional 100 rooms sold per day during a year in a given MSA generates between 2 and 5 new jobs per non-hotel industry in that area. Moreover, such spillovers appear to be driven by full-service hotels that usually target wealthier customers (including both leisure and business travelers). Additional analyses also show that construction, retail, health-care, professional and technical services are the largest beneficiaries of employment spillovers from tourism.

The rest of the paper is organized as follows. In Section 2, we provide the theoretical framework to motivate our empirical analysis. In Section 3, we discuss data and relevant aggregate data patterns. In Section 4, we describe our empirical methodology and discuss results in Section 5. We conclude and discuss implications of our results in Section 6.

2. Theoretical framework

To analyze the impact of tourism and to support our empirical analysis, we derive a framework that incorporates the spillovers from tourists/visitors to the area into the standard (derived) labor demand function (Hamermesh, 1986, 1993) for non-hotel industries.

We assume that each non-hotel industry j has n_j firms. In each industry, output of firm i at time t is given by the production function $Q_{it}=A_{it}F(L_{it}, \boldsymbol{Z_{it}})$, where $F(.)$ is a concave function, L is labor input and $\boldsymbol{Z}=(z_1,z_2\ldots z_K)$ is the vector of other inputs. A_{it} is the firm-level technology (or efficiency level of production) given by $A_{it}=T_j.\exp(v_{it})$, where T_j is the technology standard for industry j and v_{it} is the firm-level technology (or productivity) shock, uncorrelated over time and across firms, such that $E(v_{it})=0$. Each firm behaves as a price taker on input markets. In every period, each firm chooses labor L_{it} and other inputs $\boldsymbol{Z}_{it}$ to minimize total costs subject to the expected level of output $\bar{Q}_{it}$. Also, since v_{it} is the i.i.d shock, $v\equiv E[exp(v_{it})]$ is the same for all firms. Therefore, the level of output a firm expects when choosing inputs can be written as $\bar{Q}=\bar{T}\ F(L;\ \boldsymbol{Z})$, where $\bar{T}=T.v$ is the average technological/production efficiency characterizing industry j.

Following standard cost minimization approach, we can derive the conditional input demand functions for firm i in industry j, $L_{ij}=L(W, \boldsymbol{w},\bar{Q},\bar{T})$ and $\boldsymbol{Z_{ij}}=\boldsymbol{Z}(W, \boldsymbol{w}, \bar{Q},\bar{T})$. W is the wage rate, $\boldsymbol{w}$ represents the vector of non-labor input prices, and $\overline{T}_j$ is the industry-specific level of technological/production efficiency. (As a result, firms in different industries, choosing inputs subject to the same level of $\bar{Q}$ and facing exactly the same input prices, will choose different levels of inputs depending how efficient they are).

After aggregating conditional labor demand $L_{ij}(.)$ across all the firms in industry j and imposing the equilibrium condition that at any time t total industry supply, $\sum_{i=1}^{n_j}\bar{Q}_i$, must equal to the demand for output produced by firms in the industry, Q_j^D, we obtain the unconditional labor demand of industry j. For simplicity, we assume that the industry output demand has a general form: $Q_j^D=d_jP_j^{-\gamma_j}$, where P_j, γ_j are price and price elasticity of product demand respectively, and d_j is a function of output demand shifters. Hence, the labor demand for industry j at time t can be written as:

$$L_{jt}=L\left(W_{jt}, \boldsymbol{w_{jt}}, P_{jt}, \bar{T}_j, d_{jt}\right) \tag{1}$$

Since each visitor to the area (MSA) can increase demand for local product(s)/service(s) offered by industry j, we assume that d_{jt} in any MSA m can be approximated by a linear function:

$$d_{mjt}=\exp\left\{\text{No. of Visitors}_{mt}+\Omega_{jmt}\right\} \tag{2}$$

where Ω_{jmt} represents other aggregate, industry and regional demand shocks. This equation implies that if there are no tourists in the area in a given year and there are no other demand shocks, demand for output in industry j will be simply: $Q_{jm}^D=P_{jm}^{-\gamma_j}$. We also assume that firms in all industries obey minimum wage regulation. Then, in equilibrium, at any time t the labor demand in industry j and MSA m will not exceed the labor demand implied by minimum wage in that area, so $L_{jmt}\geq L\ (W_{mt}^{\min}, \boldsymbol{w}_{jt}, P_{jt},\overline{T}_j, d_{jmt})$. The hotel industry usually employs a relatively large portion of low-skilled and part-time workers paid at the minimum wage. Therefore, a higher share of workers employed in the hotel industry in a given MSA (*Hotel Empl. Sh*) may increase the pressure on minimum wage. This might reduce labor demand in other industries and potentially outweigh possible gains from tourism.[4] It is also possible that such minimum wage increase may generate a positive impact on employment in non-hotel industries when spent on local goods. However, such wage affects might be mitigated by inflows of unskilled hotel workers from other areas, leaving hotel employment share in a given MSA unchanged (as total MSA employment increases too). The labor demand equation for non-hotel industry j in MSA m and time t, that accounts for possible positive spillovers from

[4] Using employment share to capture the pressures on minimum wage is consistent with the studies that analyze the impact of union workers on non-union wages. These studies also use the proportion of unionized workers and test its impact non-union wage rate. See e.g., Neumark and Wachter (1995) and references therein.