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ARTICLE

Homicide and land prices: A spatial analysis in Santiago de Cali

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Abstract Since 2000, Cali has had the highest mean annual homicide rate among the major Colombian cities. The model of Mills (1972) is extended to include the homicide per commune (from 2005 to 2012) as a measure of social distance, and to quantify the effect of this phenomenon on land prices (mean appraisals). Using an annual panel, the estimates of the model – the family violence rate being the instrumental variable – show that an increase in the homicide rate of one unit reduces the appraisals by 1.6%. One plausible interpretation is that homicides operate as a regressive tax on property wealth in Cali because it is more concentrated in the communes of the lower socio-economic stratum, systematically expanding the intra-urban social distance.

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Homicidio y precios de la tierra: un análisis espacial en Santiago de Cali

Resumen Desde el año 2000 Cali tuvo la tasa promedio anual de homicidio más alta entre las principales ciudades colombianas. Nosotros ampliamos el modelo de Mills (1972), incluyendo el homicidio por comunas (durante 2005-2012) como medida de distancia social, para cuantificar el efecto de este fenómeno sobre los precios de la tierra (avalúos medios). Empleando datos panel, las estimaciones del modelo — usando la violencia familiar como variable instrumental — evidencian que un crecimiento unitario de la tasa de homicidio reduce los avalúos hasta en

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Distancia social;
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un 1,6%. Una interpretación plausible es que el homicidio opera como un impuesto regresivo sobre la riqueza inmueble, pues en Cali se concentra más en las comunas de menor estrato socioeconómico, ampliando sistemáticamente la distancia social intraurbana.

1. Introduction

The economic literature has been interested in measuring the implications of homicide due to its possible impact on countries' aggregate performance. However, when the event occurs near a house or real property, beyond generating a possible emotional effect, it may have effects on the microeconomic scale that can be quantified. This paper aims to reveal the magnitude of these effects on variables such as the wealth of individuals and, in particular, the value of the essential property, namely land. Moreover, the paper constitutes an important element in the discussion of optimal applications of traditional policies against crime.

The mechanism for this kind of study that has prevailed in the economic literature is the estimation of hedonic price models. However, due to obvious limitations regarding the data volume for this paper, here we present the use of one extended version of the model proposed by Mills (1972). An advantage of this model is that it enables us to observe the spatial urban performance of land prices through friction (negative effect) generated by the physical distance with respect to the city center (hereinafter DCC). The other advantage of extending the model is that it allows us to add homicide as another friction element but concerning the social distance.[1]

This sociological concept is relevant because its variability may be an element that exacerbates aggression and criminal behavior (Arteaga and Lara, 2004). This argument, seen otherwise, means that in areas with higher homicide rates – which could be those that are the poorest or have a lower life quality – vicious circles and a self-sustained extension of social distance could be created that could exert a negative impact on land prices, generating an adverse effect on the wealth of individuals or households and thus impoverishing them more.

Considering that the city of Cali (Colombia) has presented relatively stable homicide rates during this century – higher rates than those of other major cities in the country, of which the location seems to result in inertial performance in some areas – we estimate the magnitude of the homicide effect on land prices, approximated by mean appraisals of the plot of land per commune (hereinafter MAPC). The data come from a panel built for 22 communes of the city between 2005 and 2012, obtained from public sources, which includes interest variables and some controls that quantify amenities and economic cycle changes. It is important to emphasize that this panel is the most complete and reliable one that is publicly available for the city, although it generates restrictions by the non-inclusion of more periods of time or variables that are considered in similar research.

Given the model structure chosen and the possibility of simultaneity between the homicide rate and the land price, the first set of estimates was made following the ordinary least square method (hereinafter OLS) with the Hausman endogeneity test (1978). However, to give more robustness to the exercises, a second set of estimates was produced using least squares in two stages (hereinafter 2SLS) with the family violence rate as the instrumental variable.

Among the most important results of the two sets of estimates, we found that: (i) there is evidence that the city does not have a monocentric urban structure, (ii) no endogeneity exists between the homicide rate and the land price and (iii), most importantly, according to the OLS estimates, there is evidence that when the homicide rate rises by one unit, the MAPC is reduced by a value that oscillates between 0.5 and 1.1% under the estimated model; in addition, the range of values can reach 1.66 percentage points based on the results of the 2SLS estimates. This shows that the homicide rate generates a significant negative wealth effect on individuals, which could be interpreted as a regressive tax because it has a proportional impact on the wealth of the poorest – the lowest stratum – and reasonably can be assumed to be a factor that expands the social distance between the city communes.

From this we infer that the homicide rate impoverishes the poorest people systematically. This derivation reiterates the importance of improving the management efficiency of the anti-homicide public policy as well as the care that the government and research agencies should take to disseminate ciphers about this kind of crime. To achieve this result, the paper is organized as follows: In Section 2, we describe some stylized facts about the phenomenon in Cali. In Section 3 we discuss some previous works available in the literature. In Sections 4–6, we lay out the theoretical and methodological specifications of our analysis. In Sections 7 and 8, we present the empirical results. Finally, in Section 9, we present our main conclusions.

2. Some stylized facts

Following the UNODC (2014), the top five of the countries in the global context with the highest average homicide rate between 2000 and 2012 are Honduras (62.5 homicides per 100,000 inhabitants), followed by El Salvador (52.1), Jamaica (48.8), Colombia (44.4) and Venezuela (43.2). However, according to the Vice President of the Republic of

[1] Bogardus (1965) defined it as the degrees of understanding and sympathy between people, between people and social groups, and among social groups.

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