



# Peer effects in consumption in India: An instrumental variables approach using negative idiosyncratic shocks

Punarjit Roychowdhury

Indian Institute of Management Indore, Economics Area, Prabandh Shikhar, Rau-Pithampur Road, Indore, Madhya Pradesh 453556, India



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## ABSTRACT

This paper examines peer effects in consumption in context of a less developed country. Specifically, the question that I seek to answer is whether consumption expenditure of a household is influenced by that of its peers in a less developed country. To examine this question, I use newly available household level data from India. I define a household's peer group as other households living in its village/neighborhood. In assessing the influences of peers in this context, there are two key empirical challenges including shared group-level unobservables, and simultaneity of peer influences. I address these issues by using an instrumental variables/fixed effects approach that compares households in the same district but different villages/neighborhoods who are thus exposed to different sets of peers. In particular, I use plausibly exogenous variation in idiosyncratic expenditure shocks – which are accidental and negative in nature – faced by peers as instruments for peers' consumption expenditure. Preferred specification suggests that a one standard deviation increase in average consumption expenditure of a household's peers causes the household's own consumption expenditure to increase by 0.42 standard deviations. Falsification tests and robustness checks support the validity of my results. My findings suggest that policies that influence a household's consumption will also affect the consumption of the household's peers through social interactions. This implies traditional analyses of consumption intervention programs that do not take into account such spillover effects will understate the total social impact of the programs, and hence lead to inaccurate evaluation of cost-effectiveness of such programs.

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## 1. Introduction

Consumption of households is traditionally modeled as being a function of their own income and preferences. However, it is often thought that a household's peers' consumption expenditure plays a major role in determining its own consumption expenditure. As famously noted by [Duesenberry \(1949\)](#), the strength of any household's desire to increase its consumption expenditure is a function of the ratio of its expenditure to some weighted average of the expenditure of others with whom it comes in contact. In this paper, I empirically study peer effects in household consumption specifically in context of a less developed country. More precisely, I attempt to address the following question: Does consumption expenditure of households' peers affect their own consumption expenditure in a less developed country? I examine this question using newly available household level data from India – which is home to one-third of the world's poor.<sup>1</sup>

E-mail address: [punarjitr@iimdr.ac.in](mailto:punarjitr@iimdr.ac.in)

<sup>1</sup> <http://time.com/2999550/india-home-to-most-poor-people/>

There are at least two reasons why a careful analysis of peer effects in consumption in context of low income countries is crucial. First, understanding the magnitude and nature of peer effects is imperative for accurate evaluation of consumption intervention programs (e.g., consumption tax policies, conditional cash transfer programs, etc.) that are used frequently in low income countries as developmental policies. This is because, if there are non-negligible peer effects, such policies, in addition to having a direct effect, would have an indirect spillover effect.<sup>2</sup> If this is not taken into account, the total 'social effect' of the policies would be underestimated.

Secondly, if consumption of households' peers affect their own consumption in a positive way, ceteris paribus, this would imply that the households must be lowering their savings or taking up loans to finance their increase in consumption when peer consumption rises. This is likely to magnify the risk of poor and middle income households (who make up the majority of the population in any low income country) of getting trapped in poverty

<sup>2</sup> Also referred to as 'social multiplier effect' ([Akerlof, 1997](#); [Glaeser & Scheinkman, 2001](#)).

(or severely hamper their ability to move out of poverty traps) and increase their economic vulnerability in the long run owing to ‘under-saving’ or ‘over-borrowing’ (Moav & Neeman, 2012). Thus finding evidence of positive peer effects would highlight the importance of formulating innovative social policies that represses social pressure and using such policies in conjunction with traditional anti-poverty and redistributive policies in order to augment social welfare.<sup>3</sup>

I begin by constructing a simple model of social interactions in consumption to guide my empirics. The model allows for both endogenous peer effects (peer effects due to peer consumption) as well as exogenous peer effects (peer effects due to peer characteristics). The model is constructed by adjusting a standard model of consumer choice with a social utility component that captures the satisfaction that a household gets from ‘status-seeking behavior’. In other words, it is the utility that a household obtains from getting ahead of others in its peer group in terms of consumption spending. The model predicts a positive monotonic relationship between own and average peer consumption expenditure. I empirically test this prediction using data from the 2012 Indian Human Development Survey (Desai, Dubey, & Vanneman, 2015). I define a household’s peer group as other households living in its village (for rural areas) or neighborhood (for urban areas) since “people almost certainly compare themselves to their immediate geographical neighbors” (Deaton, 2001, p. 21). Fafchamps and Shilpi (2008), in fact, note that since social mobility is very low in low income countries as a result of which people live along people they grew up with, immediate neighbors constitute almost a ‘natural’ peer group for people in living in these countries.

As noted by Manski (1993), identification of endogenous peer effects is ‘notoriously difficult’. More specifically, there are two econometric problems that hamper inferences about peer influences on household behavior. The first problem that arises is due to a simultaneity bias. This bias is generated by a ‘reflection problem’ – the simultaneous determination of own and peer outcome (which is consumption in the present case). The second factor complicating identification and estimation of peer influences is an omitted variables bias. In the absence of a perfect set of controls, one cannot validate a peer influence on consumption by observing that a group of neighbors spend similar amounts of resources on consumption. Inferences will be biased whenever there are group level unobservables that are correlated with consumption expenditure of all those belonging to the group (i.e., correlated unobservables).<sup>4</sup>

<sup>3</sup> As suggested by Putnam et al. (2007), a policy that would repress social pressure might be promotion of a broad sense of ‘we’ among members of the same community or reference groups through popular culture, education and common experiences. Such ‘community cohesion programs’ could be targeted towards children so that a sense of ‘we’ develops from early childhood. One example of such community cohesion program is the school twinning program that was implemented in the UK in 2003 which brought together children of different backgrounds from monocultural schools. The Government took the significant step of trying embed cohesion practice into all 23,000 state maintained schools in England through the introduction of the ‘duty to promote community cohesion’, supported by formal guidance. This meant that every school age child, from entry into primary school at around four years of age to around seventeen years when they left, would be introduced to ‘others’ virtually or actually, and provided with more positive experiences of difference (for details about the 2003 UK Community Cohesion Program see <http://webarchive.nationalarchives.gov.uk/20120920045237/http://www.communities.gov.uk/documents/communities/pdf/pathfinderlondon.pdf>). Similar such programs could be developed in other countries as well, so that individuals from their childhood develop a strong sense of community. In addition to this, other ‘belonging programs’ that local governments could potentially implement include: using ‘the power of sport’ to bring communities together, developing new communications strategies to promote inclusion and a sense of belonging, etc.

<sup>4</sup> Another source of correlated unobservables is non-random sorting of households into peer groups since this would imply that unobservable characteristics of households are correlated with the characteristics of the group. However, as I argue in Section 4, this is unlikely to be a cause of concern in the present case since social mobility at the household level is very low in India.

In the present paper, I tackle these problems based on a strategy of instrumental variables (IV)/fixed effects. I create my instruments based on assumptions invoked in my theoretical model. Specifically, my model assumes that a household faces various idiosyncratic shocks that affects its own consumption, and some of these shocks are *observable* (to the econometrician). I further assume that these shocks are ‘household specific’. In other words, it is only the own idiosyncratic shocks that affect own consumption and peer idiosyncratic shocks do not have any influence on own consumption. As argued by Helmers and Patnam (2014, p. 95), “this is a credible assumption given the idiosyncratic nature of the shocks”.

The above assumptions allow me to instrument average peer consumption (which is the source of the simultaneity bias) by average peer observable idiosyncratic shocks, and thankfully, the IHDS 2012 has data on some such shocks which are accidental and negative in nature (e.g., death of a household member, accident/injury, job loss, incident of crime, etc). The intuition is that since own idiosyncratic shocks affect own consumption and do not contain any information about consumption of other households, to this extent, average peer idiosyncratic shocks should affect average peer consumption and that there should not be any effect of average peer idiosyncratic shocks on the target household’s consumption after conditioning on own idiosyncratic shocks (to show that my instruments are plausibly exogenous, I carry out balancing tests (Bifulco, Fletcher, & Ross, 2011; Lavy & Schlosser, 2011) and other standard IV diagnostic tests). I also include a full set of district fixed effects to control for group level unobservables that might be correlated with peer characteristics and/or peer idiosyncratic shocks.

My IV/fixed effects strategy is similar to the ‘spatial IV’ method used widely in empirical spatial literature (for an overview see Gibbons & Overman, 2012; Gibbons, Overman, & Patacchini, 2015). The strategy requires some/all exogenous characteristics of neighboring spatial units (the spatial units being households in my case) to be used as instruments for spatial interaction term which is endogenous. The major requirements for this strategy, thus, is to carefully justify why such characteristics might potentially affect a spatial unit’s own outcome but not the outcome of its neighbors. This approach has recently been used in some papers in the peer effects literature including Gaviria and Raphael (2001), Goux and Maurin (2007), Fletcher (2010, 2012, 2015), Helmers and Patnam (2014) and McVicar and Polanski (2014).

The IV/fixed effects-based identification strategy used in this paper not only allows one to clearly identify endogenous peer effects, but also has the advantage of being fairly flexible in terms of data requirement. Alternative methods, although novel and unique, are either unable to isolate endogenous peer effects from exogenous ones (e.g., Sacerdote, 2001; Graham, 2008; Ammermueller & Pischke, 2009), or do so at the cost of being extremely restrictive in terms of data requirement. For instance, the method proposed by Lee (2007) and developed later by Bramoullé, Djebbari, and Fortin (2009) allows one to identify endogenous peer effects but requires peer groups to be ‘small’ on average and that there should be sufficient variation in peer group size. Again, using the empirical strategies proposed by Bramoullé et al. (2009), Calvo-Armengol, Patacchini, and Zenou (2009) and Lee, Liu, and Lin (2010) to isolate endogenous peer effects from exogenous ones requires a researcher to be able to observe *all* social interaction links in the data (that is, the researcher must have very detailed network data). Such requirements are not met by most micro datasets, including the dataset used in the present paper.

My results are striking. In consonance with the prediction of the theory of status-seeking behavior, I find robust evidence that average peer consumption has a significant positive impact on households’ own consumption. More specifically, I find that an increase

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