675 **The income and price elasticity of demand for housing in Ghana: empirical evidence from household level data**

Responses to the review comments

1. Comment:

Why is Ghana interesting? What makes Ghana different from all the studies already conducted? In other words, what necessitates this research? And how do the answers shed light on the world housing demand issue? It is not clear in the introduction and nothing is said in the conclusions either. Without a clear rationale, it is simply a case study.

Answer:

In developed countries, almost every house is tradable; this is not the case in Ghana. Ownership of some houses is not clearly defined; the house belongs to the past, current and future kin of the family. No individual has the power to trade such houses, for any reason. These houses sometimes serve as the family’s source of unity. They exist for consumption, social and cultural purposes and not as an investment. The social relations of housing cause some households to remain in the same house, no matter what the sale of that unit would have fetched the household and how much it would have fetched if redesigned. Although the social relations of housing has dwindled in the bigger cities (UN Habitat, 2011). households in the majority of towns and villages still cling to this belief. This clearly illustrates that in developing and some emerging economies the functioning of the housing market is not the same as in developed countries. Hence the demand conditions are different.

1. Comment:

In the introduction it is mentioned that housing is supplied by individuals who take between 5 and 15 years to build a single unit. This seems odd – does nobody finish within a year? When do you count the unit as demand? When it is finished, or when building starts? This clearly has implications for interpreting the results and also the gap in housing demand-supply.

Answer:

This comment was in support of why there are a lot of housing deficits. This was buttressing the supply side rigidities. This was not part of the demand this study sought to present.

1. Comment:

A number of sources are very old and there is over-reliance on one or two sources. More sources should be referenced, especially in the theoretical framework section. For example, it is stated that demand over the past few years … and then a 1991 source is added.

Answer: The reference have been reviewed and updated to reflect current trends. Thanks

1. Comment:

It should be explained how permanent income was determined. It need not be in detail, a paragraph or two should suffice.

Answer:

**PERMANENT ESTIMATION EQUATION**

Various authors have used permanent income as the ideal income for housing demand estimation with its justification long established (see Ioannides and Zabel (2003) and Fontenla and Gonzalez (2009)). Current income Ii is made up of transitory (IiT) and permanent (IiP) income:

 Therefore, to obtain permanent income, current income of the household is regressed on the household demographic characteristics. The functional equation is therefore stated as:

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Where It isthe observed income of the household,$x\_{p}^{'}$ is the personal characteristics that determine permanent income, Dis a vector of regional dummies.

1. Comment:

Using both current and permanent income in the regressions leads to multicollinearity problems. I suggest that the regressions be done separately with either, since permanent income is derived from current income, to obtain more reliable results. You may use permanent and transitory in one equation though. I suspect that the low income elasticities are driven by the inclusion of both current and permanent income in one regression model.

Answer:

The study estimated with current income and permanent income separately, although reported on the same table, they were estimated separately, surprisingly the coefficient were the same.

1. Comment:

The regression result tables should also include some fit statistics and some diagnostics should also be added to instill confidence in the results obtained.

Answer:

Some diagnostics have been provided as recommended

1. Comment:

 The education dummy variables used imply that the middle groups (i.e. secondary education and some tertiary education) is the reference group. The results should be interpreted relative to the reference group. Also, it might be worthwhile to explain why this is chosen as the reference group.

Answer:

The dummy for education were built using a binary approach, each was measured against all others. The secondary and tertiary education variables dropped for two reasons. One they were not significant and dropping them improved the R2 and the fit statistics so it was worthwhile dropping them.

1. Comment:

  In the comparison it might be worthwhile to further explore exactly where the differences lie, i.e. is it the rural elasticities or urban elasticities that drive the differences?

Answer:

This is evident in Table 3 and Table 5. For instance there is a significant variation between the permanent income estimates for the overall country and the various localities. The estimated coefficient for the urban localities is greater than the overall estimates (0.33 for urban and 0.17 for urban). The estimated coefficient for the rural localities is not significant. This and the others might have contributed to the significant differences obtained from the Chow test. Generally the differences are due to the rural urban setting in the Ghanaian economy. There are vast differences between the rural and urban housing and housing conditions.

9 Comment:

The conclusion is too short and does not highlight any contribution of the article. For example, the introduction says that one novel thing about the article is the use of quantile regressions. However, there is no analytical discussion of the results obtained from these regressions. How does this article contribute to understanding the underlying problem?

Answer:

The conclusion has been strengthen and the quantile has further been elaborated. The articles contributions have also been outlined.