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*Comments on “Estimation of owner occupied dwelling service”, Nan Liu, NBS*

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### **Background**

1. Nan Liu’s paper on the estimation of owner-occupied dwelling services (imputed rent) in China presents both a historical (pre 2004) and current description of the methodology used for estimation.
2. China, like many other economies in transition or development, has a relatively low share of properties that are actually rented in the market-place, rendering the use of the measurement approach used in most OECD economies, the rental equivalence approach, inappropriate, partly because most market-rentals occur in urban areas and partly because even in the urban areas the observable rents may not adequately represent the mix of dwellings in urban areas.
3. Prior to 2004 therefore the NBS calculated the current price value-added related to imputed rent by calculating the depreciation related to owner-occupied dwellings: taking the product of the value of urban dwellings and a depreciation rate of 2% plus the product of the value of rural dwellings and a depreciation rate of 4%.
4. The paper explicitly recognises the deficiencies in this approach: (a) the omittance of a notional operating surplus (the real return to capital that one would expect if the dwelling was instead let on the market) and property taxes, resulting in an under-estimate of gross value-added and (b) the omittance of any intermediate costs, such as maintenance and insurance that would also be used up in the process of producing these imputed services, resulting in an underestimate of GDP if these costs were not already included within household final consumption estimates.
5. The upshot of this is that, since 2004, NBS has been experimenting with the implementation of a user-cost approach to estimating imputed-rent; the purpose of which is to estimate the missing components mentioned above.

### **Quasi User-Cost Approach**

6. Thus far the approach has been to include, in the main, two new components to the estimation of imputed rent. The first is an estimate of maintenance costs based on household survey information and the second, arguably contentious, addition is the inclusion of management costs for urban areas. An additional

modification has arisen for rural areas where the depreciation rate has been reduced to 3%; although the reasons for this change are not spelt out in the paper.

7. The impact of these adjustments has as the paper shows led to a significant increase in the contribution of dwelling services to GDP rising from 2.2% using the pre 2004 method to 4.9% with the new method for 2000 data.

### **Constant Price Estimates**

8. Constant price estimates of imputed rent are achieved by deflating estimates with a rental price index of houses.

### **Comments, Observations and Recommendations**

9. The paper raises a number of questions and observations addressed in turn below.

- It's not clear why the new methodology witnessed the introduction of a new (lower) depreciation rate for rural dwellings. Further information on the reasons for this change would be helpful.
- In the pre 2004 calculations the method takes the product of the value of dwellings and a depreciation rate (2% for urban and 4% for rural properties). In the new methodology however the approach refers to calculations that apply depreciation to the product of housing area per capita and the construction costs per unit area and the population (broken down by rural and urban areas). This raises a couple of fundamental questions that are not unfortunately answered in the text.
  - The first is: given the focus on the calculation of the value of buildings (area \* construction costs) in the revised methodology, should one infer that the earlier estimates calculated depreciation on land and buildings, as the description of the methodology refers to the 'value of the dwellings'. This is an important point as in calculating user-cost based estimates depreciation should only be applied to the value of the building and not the value of the land as well.
  - The second question concerns the implicit calculation of the capital stock estimates used in the calculation of depreciation. The revised methodology implies that each year the stock of capital is calculated as gross (at 'as new' prices). This is inferred from the reference of 'construction costs per unit area' in the calculation. If this is the case, and the construction costs are updated every year when applied to the stock of capital, this will seriously overestimate the depreciation component of user-cost based imputed rent estimates.
- The fact that the revised methodology produces a figure of 9.7% of GDP in 1990, even without an imputation for a real return to capital, raises some serious concerns about the methodology. Including an imputation for a return to capital would produce unfeasibly large estimates of dwelling services in the early 1990s, or at the very least would suggest some other systematic problem in GDP calculations, for example the exclusion of significant parts of a large non-observed economy, whose contribution had fallen significantly over time. As an example one need only look at the experiences of the former Candidate Countries of the European Union, prior to their inclusion in the EU, who adopted a common real rate of return of 2.5% for calculating imputed rent (and about 2% depreciation rates). Recalling also that the rate of return applies to the total value of land and buildings, whereas depreciation rates are applied to the value of buildings only, and one can see that the contribution of the net operating surplus is of a similar order of

magnitude to the depreciation component (significantly larger in the case of the Candidate Countries).

- Of course, it's difficult to say from the figures presented in this paper what the impact of the inclusion of a net operating surplus is likely to be. It would be helpful, indeed essential, therefore for the author to provide considerably more information on the nature of the calculations for net capital stock (and gross capital stock) and indeed the respective contributions made by each of the components – maintenance costs, management costs, and depreciation – broken down by urban rural areas and for each year. Going further it would also be useful to have some further explanation on the sources of information used to measure the stock and quality (size, type, age etc) of housing and how, if at all, land and building values are separated. And indeed how the values of these assets are calculated.
- Another cautionary note concerns the use of household based data to estimate maintenance costs. Experience in many other countries suggests that these figures are notoriously erratic, and are extremely sensitive to the quality and size of the household based survey (which also typically under-represent certain groups, for example high-income households, which is another story). The advice given by the OECD to Western Balkan countries in recent work undertaken with them has been to try and smooth fluctuations in this data by taking averages over time.
- The revised methodology also raises a conceptual question. It's not altogether clear why management costs are included in the calculation of imputed-rents. These costs, as the name suggest, reflect a different service to that provided by the dwelling itself – namely the services provided by letting agencies and should not be included in the calculation of intermediate consumption of imputed rent. That said, this may be a problem of translation and so it would be helpful if some clarification was given in this regard.
- The paper proposes an alternative approach to the calculation of constant price estimates of dwelling services, and the method proposed should be welcomed. My understanding is that the estimates of growth in urban/rural dwellings are in fact consistent with a PIM approach to valuation (taking estimates of increases in gross fixed capital formation added to the pre-existing stock minus retirements/withdrawal as the key drivers for these growth rates). But, again, this is only my inference and further explanations on the sources of information would be helpful. Certainly the current approach, using a price index of market rentals does not appear appropriate given its lack of representativeness (although this point shouldn't be oversold as the key point concerns price changes as opposed to price levels, and so the issue of representativeness may not be so severe).
- If the issues raised above can be adequately addressed, particularly those relating to the valuations of net capital stock and the split of the values of land and buildings, it should be in theory relatively easy to begin to include estimates of the missing net operating surplus component. As mentioned above EU Candidate Countries were encouraged to use a real rate of return of 2.5% in their calculations. A similar approach, which perhaps looks at the trend rate difference between mortgage rates and inflation, should be achievable for China. Indeed in the absence of any other information a rate of 2.5% seems better than none at all. One cannot overstress, however, the importance of using a trend rate. Doing otherwise runs the risk of introducing considerable volatility in the estimates of imputed rent which bear no relation to economic reality (movements in average rental prices for example). This would also imply the need for considerable care in the pricing of net capital stock estimates, such that they were consistent with the trend approach used in calculating the 'real rate of interest'. In this context one needs to recognise that the user-cost approach is not immune to property price bubbles, which

reflect the duality of property (land) as both a non-financial asset and in an economic, if not a national accounts sense, financial asset. Calculations of the value of land in the user-cost approach need to strip away this 'financial asset' component if a trend real rate of return is to be used. This of course is not easy to achieve, a perhaps simple way of achieving this is to calculate the value of land in calculations of net capital stock using trend estimates too. The building component can be calculated using construction estimates to arrive at estimates of gross capital stock (ensuring, of course, that in any given year cumulative depreciation is applied reflecting the age of the building). This does not mean however that estimates of dwellings on the nation's balance sheets should also reflect this 'trend' approach. Estimates here should reflect the actual market value, property bubble or not.