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How Should Housing Be Treated in the HICP?

Policy Department for Economic, Scientific and Quality of Life Policies
Directorate-General for Internal Policies
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How should housing be treated in the HICP?

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Abstract

The ECB has approved a plan to include a measure of the cost of owner-occupied housing in the HICP. This paper reviews the various methodologies that are used to incorporate this element into consumer price indices. It recommends the use of a rental equivalence approach rather than the net acquisitions approach currently used in Eurostat's experimental price index of owner-occupied housing.

This paper was provided by the Policy Department for Economic, Scientific and Quality of Life Policies at the request of the committee on Economic and Monetary Affairs (ECON) ahead of the Monetary Dialogue with the ECB President on 15 November 2021.

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LIST OF ABBREVIATIONS

BLS	Bureau of Labor Statistics
CPI	Consumer price index
ECB	European Central Bank
EMU	Economic and Monetary Union
EU	European Union
GDP	Gross domestic product
HICP	Harmonised index of consumer prices
HFCS	Household finance and consumption survey
OOH	Owner-occupied housing

EXECUTIVE SUMMARY

- **The Harmonised Index of Consumer Prices (HICP) does not currently contain a measure of the cost of owner-occupied housing (OOH)**. The European Central Bank (ECB) has approved a plan to include a measure of this sort in the HICP.
- **This paper reviews the various methodologies that are used to incorporate this element into consumer price indices**. It recommends the use of a rental equivalence methodology as the best practice measure of the cost of consuming services of owner-occupied housing.
- **Eurostat currently use a net acquisitions methodology to construct an experimental price index for owner-occupied housing**. They do not use the rental equivalence approach because this approach requires imputations and the current scope of the HICP is household final monetary consumption expenditures, which excludes imputed rentals.
- **This paper presents a number of arguments against the use of the net acquisitions methodology in the HICP**. This approach incorporates investment expenditures into an index that is supposed to measure the cost of consumption of a basket of goods and services.
- **There is no good conceptual basis for this approach**. The convention of focusing on consumption is why consumer price index (CPI) measures do not include items like the price of gold or stock market indices even though consumers sometimes purchase these items. The proposed approach breaks with this convention.
- **The net acquisitions approach will also likely exacerbate the volatility of HICP inflation and perhaps induce an upward bias**. This is because this approach is likely to place a greater weight on house prices when they go up than when they go down.
- **Adopting either the net acquisitions approach or the rental equivalence approach would have had a limited impact on HICP inflation in recent years**. However, this paper shows that the net acquisitions approach could have a relatively large impact during more substantial housing price bubbles and busts, such as occurred in the US during the 2000s.
- **The ECB's monetary policy strategy review recommends that the net acquisitions approach be used but that it be adapted to "better isolate the consumption component"**. However, there is no way to do this because the transactions used by the net acquisitions approach are all investment transactions. There is no consumption component.
- **The ECB should publish a detailed piece of analytical research on how to isolate the consumption component of owner-occupied housing**. This will likely require a fundamentally different approach to that currently used by Eurostat.
- **If the ECB's preferred analytically sound measure of the price of the consumption component of owner-occupied housing proves inconsistent with Eurostat requirements for data quality and timeliness, then the HICP should be kept as it is**. Eurostat can publish an alternative "HICP plus OOH" index that can be used by the ECB for its policy discussions.
- **The ECB should not give any role to Eurostat's OOH price index in its monetary policy assessments**. It relies on a small and unrepresentative set of price quotes.

1. INTRODUCTION

The European Treaties require the European Central Bank (ECB) to pursue price stability as its primary objective. The Treaties, however, do not define what is meant by price stability, leaving it to the Governing Council of the ECB to come up with its own definition. This definition has evolved over time, most recently with the monetary policy strategy review published in July, which revised the ECB's target rate of inflation to 2 % over the medium term, replacing its previous definition of price stability as inflation that was "close to but below 2 %".

Another aspect of defining price stability is deciding on the "basket" of goods and services to be used to calculate inflation. The ECB uses Eurostat's Harmonised Index of Consumer Prices (HICP) to measure inflation in the euro area. One limitation of this measure is that it does not incorporate the costs associated with owner-occupied housing (OOH). This omission has been noteworthy in previous years because house prices in the euro area have risen substantially over this period. This has led to suggestions that the HICP underestimates the true level of inflation prevailing in the economy. One indication that this is the case comes from an experimental quarterly price index for owner-occupied housing published by Eurostat: This index has been growing somewhat faster than the overall HICP in recent years.

In response to these suggestions, the ECB's strategy review contained a decision "*to recommend a roadmap to include owner-occupied housing (OOH) in the HICP.*" This process, which will take several years, will see the ECB and Eurostat continue ongoing analytical work on constructing OOH price indices and preparing the necessary legal work to officially change the definition of the HICP via passing a new regulation through the European Parliament and Council. The review also committed the ECB to assigning an important supplementary role to Eurostat's OOH index during the period prior to the incorporation of an OOH price index into the HICP.

This paper reviews the methodological issues relating to the measurement of owner-occupied housing, discusses the current approach used by Eurostat to construct its OOH price index and reviews the ECB's position on these issues. The paper also provides calculations describing how the inclusion of owner-occupied housing could affect euro area price inflation depending on the methodological approach taken and illustrating how US consumer price inflation would have looked in the past if an approach similar to Eurostat's was taken.

The central argument in this paper is that the methodology used by Eurostat for its current experimental OOH series, the so-called net acquisitions approach, is deeply flawed and should not be incorporated into the HICP. The measure has a weak conceptual basis and confuses costs associated with the consumption of housing services with those associated with housing as an investment asset and savings vehicle. As such, it is inappropriate for use in an index intended to capture the costs of consumption such as the HICP. The ECB's strategic review has recognised this flaw in the net acquisitions approach but its suggestion that there may be a simple fix to this flaw while using the same underlying methodology is not correct.

In place of Eurostat's methodology, I recommend the use of a rental equivalence approach, as implemented in national accounts around the world and in the US implementation of its consumer price index (CPI). Because the current legal basis for the HICP requires it to use only explicit monetary outlays, this would require a change in the scope of the index. But legal work to change the scope of the HICP is required in any case to add any measure of the cost of owner-occupied housing so this would not represent additional work. Moreover, the purpose of the HICP is to provide the ECB with a measure of price stability. If the ECB believes the net acquisitions methodology is conceptually flawed, then it should insist that Eurostat use a different methodology.

The rest of the paper is organised as follows. Section 2 discusses four different methodologies for measuring the cost of owner-occupied housing, focusing in particular on the rental equivalence method used in national accounts and the net acquisition method used by Eurostat. Section 3 discusses some specific issues relating to the HICP, to Eurostat's implementation of the net acquisition method and to the ECB's position on changing the HICP. Section 4 presents calculations estimating how recent inflation rates in the euro area would have behaved if OOH price indexes had been incorporated using either Eurostat's OOH price index or a rental equivalence approach. It also presents longer historical time series for the US, comparing the historic CPI data (based on the rental equivalence approach) to an estimate of the inflation rate that would have been reported using the net acquisitions methodology. Section 5 provides conclusions and recommendations.

2. AN OVERVIEW OF METHODOLOGIES

This section discusses a number of different methodologies that have been used to measure the cost of owner-occupied housing in consumer price indices.

2.1. The rental equivalence approach

Why is price stability a key goal of macroeconomic policy? I suspect that most people when asked this question would answer that it is good to keep the "cost of living" stable. In other words, we wish to avoid substantial increases in the cost of the typical bundle of goods and services that people purchase as part of their daily life.

Occasionally, you will see claims that central banks should target some broader measure of inflation that includes prices of investments like gold or perhaps stock market indices. After all, consumers sometimes buy these items as well. But ultimately, the inclusion of these items does not pass the "common sense" test of what we mean by the cost of living. Nobody needs to own gold or shares, so their prices do not reflect the cost of living. For this reason, central banks around the world usually define price stability in relation to consumption price measures and do not target measures including prices for investment assets.

This conceptual distinction between "consumption" and "investment" becomes complicated when considering owner-occupied housing. The decision to purchase your own home is clearly an investment decision. Indeed, it is the most important investment for most households. The ECB's Household Finance and Consumption Survey (HFCS) from 2017 showed that about 60 % of euro area households owned their own home, which is more than twice the amount of households that owned the most common category of financial asset in the survey (pension funds and life insurance). Housing also accounts for the vast majority of household wealth. The HFCS reports the average value of household assets in the euro area in 2017 was EUR 259,400, with EUR 209,400 of that due to the value of the main residence of households.

Owner-occupied housing, however, also has a consumption element. Owning a house provides its people with somewhere to live and if they didn't own this home, they would need to pay to rent accommodation. So, home ownership also provides households with a valuable service over and above its value as an asset.

The issue of how to classify owner-occupied housing has been the subject of much work by national income accountants and the UN's System of National Accounts (SNA) have come up with a standardised way to approach this issue. As described in United Nations (2008), the SNA approach has been to treat spending on new residential buildings as investment and to use a rental equivalence approach to measure the consumption services subsequently provided by the stock of owner-occupied housing.

The rental equivalence approach matches up the characteristics of the owner-occupied housing stock with equivalent rental properties and calculates what it would cost, at current rental prices, to rent the whole stock of owner-occupied housing. The total of the imputed rental payments is then used as the measure of nominal consumption of owner-occupied housing services, while a quality-adjusted rental cost index is used as the price deflator. The imputed rental payments are also counted as part of household income.

This approach means that rent increases that are not accompanied by corresponding improvements in the quality of housing are considered to be an increase in the cost of consumption of owner-occupied housing services. So, for example, if rents double but the quality of the housing stock remains

unchanged, then both nominal consumption and the price index double but the measure of real consumption of housing services remains unchanged.

There are several arguments in favour of the rental equivalence approach in the measurement of consumption in the national accounts.

First, this approach provides a clear and intuitive measure of the relevant price for the consumption element of owner-occupied housing as opposed to the investment element. Consider for example the case where there is a large increase in house prices but rental rates do not increase. This kind of jump in price-rent ratios occurred in many countries during the various housing bubbles of the 2000s. Under the rental equivalence approach, the implied cost of owner-occupied housing consumption would not rise. Because rental rates have not gone up, the cost of living in a house has not risen—the option to rent exists and has not become more expensive. What has risen in this case is the cost of a house as an investment asset.

Second, this approach provides a measure of the opportunity cost associated with home ownership. For example, consider someone living in a large house that would be expensive to rent. This person is consuming something that has a high value (i.e. a large quantity of housing services) and this value can be measured by the rent that other people are willing to pay to live there. The large "imputed rent" the SNA approach assigns to this person measures the fact that they are foregoing the additional consumption that would be associated with renting this house to someone else and then using the income from this property to rent somewhere less expensive.

Third, this approach means the total amount of real consumption of housing services (across both rental and owner-occupied properties) depends only on the size and quality of the stock of residential housing. Since the total stock of residential housing tends not to change much from year to year, this approach produces a relatively stable series for consumption of housing services. Importantly, this series does not depend on the mix of tenure status in the economy (owners versus renters), the mix of financing used to purchase the housing (debt versus equity) or the current level of activity in the housing market (the amount of sales in a given year). These factors will have little correlation with the amount of housing services actually being consumed so it is good that real GDP will not be sensitive to changes in them.

Beyond national income accounting, the rental equivalence approach has also been applied successfully to cost of consumption of owner-occupied housing in standard monthly consumer price indices CPIs. For example, the US Bureau of Labor Statistics (BLS) has used this approach to measure the price of consumption of owner-occupied housing services in their CPI since 1983. Imputed rent for owner-occupied housing is the largest category in the US CPI, with a weight of about one-quarter in recent years. The use of imputed rents in the monthly CPI combines well with their use in national income accounting measures of consumption since the large dataset of price quotes obtained as part of the CPI process can then be used by national accountants to construct real and nominal consumption measures.

Despite its successful adoption by the BLS and its widespread use in national income accounting around the world, there have been some arguments against the imputed rental approach to measure the cost of owner-occupied housing in monthly consumer price indices.

Transactions versus imputations: One criticism of the rental equivalence approach is that it uses imputations rather than actual transactions related to owner-occupied housing. This contrasts with the ideal of a price index where every quote used in the index can be traced to an actual transaction for the product under consideration. However, the reality is that there is no way to separate the consumption and investment elements of owner-occupied housing using only data on purchases or ongoing

payments on this type of housing. Any transactions data obtained from owner-occupiers—whether they be purchase prices or monthly mortgage payments—will involve a significant investment element.

Moreover, imputations of various sorts are widely used in consumer price indices. For example, even if one was to instead use an index based only on prices paid to purchase houses, for these prices to be combined in a meaningful index requires adjustments to be made for the quality of the houses being purchased. In practice, this requires the use of "hedonic" regressions, involving imputations being made to place valuations on various features of a residential unit.

Data quality and timeliness: Another concern is whether it is possible in practice to collect a sufficient quantity of rental quotes that are an accurate proxy for the cost of renting the owner-occupied housing stock. Most euro area countries have large and active rental markets and so the collection of enough relevant quotes should not be a problem. However, some Member States have limited rental markets and it may be challenging in those circumstances to find enough accurate quotes.

One way the BLS obtains a large sample of quotes is by using a six-month rolling sample to construct its owner's equivalent rent series. This suggests a potential trade-off between accuracy and the timeliness that we would ideally like for high-frequency monthly indicators. However, while these trade-offs may exist, there are few reasons to doubt the quality of the US CPI series and I am confident that euro area statistical agencies can be given the resources to produce accurate and timely monthly imputed rent series.

Comparing renting and owning: One question about using rental quotations to proxy the consumption value of owner-occupied housing is whether this approach compares apples with oranges. People may place additional value on the security of tenure that comes with owning their own homes and being able to adapt them to suit their own needs. This could mean rental quotes underestimate the consumption value obtained from owning one's own home. However, while this may be true, it is not clear there is much change over time in the consumption premium enjoyed from ownership over renting, so changes in rental rates over time can still be a good way to measure changes in the value of owner-occupied housing consumption.

Inconsistency: Housing is not the only good that provides a flow of consumption services for years after the initial purchase. One could argue that the purchase of a television that will last 5 years represents an investment in the future services it will provide. Since rental equivalence approaches are not used for consumer durables such as TVs, it could be argued that applying the rental equivalence approach to housing represents an inconsistent way to treat products with both a consumption and investment feature.

Again, one can make counterarguments. Theoretically, the ideal approach would be to apply a rental equivalence approach to all consumer durables. However, markets for renting household consumer durables are thin and inefficient. For these reasons, the SNA approach has been to count consumer durable expenditures as consumption rather than investment.

Measuring the cost of consumer durables in a price index by only measuring their purchase costs is also less likely to lead to distortions than applying this approach to housing. The amount of money spent this year on televisions is likely to be a good proxy for the total consumption value being generated by these products in the economy—people are not purchasing TVs as an investment vehicle or as part of a lifetime savings strategy[1]. In contrast, because houses are much longer-lived assets, their prices

[1] To give a simple example, suppose a TV costs EUR 500 and lasts for five years. With a zero-profit rental market for TVs and no depreciation charges, the rental price for a TV would be EUR 100 per year. If total spending each year on TVs was constant and the price was unchanged,

regularly rise and fall in ways that have little correlation with the underlying value of the services they provide.

To summarise, while the rental equivalence method is not perfect, I believe it has the advantages of being theoretically sound and there is plenty of evidence that it can be successfully implemented.

2.2. The net acquisitions approach

An alternative approach—the one used by Eurostat, as discussed in greater detail below—is to treat expenditure on housing in a similar fashion to how other consumer durables are treated in consumer price indices. The so-called net acquisitions approach measures the costs associated with the household sector acquiring new residential housing. Properties being sold by one household to another are not counted, only the addition of housing capacity for the household sector. Implementations of this approach typically include all money spent on the net acquisitions of dwellings by the household sector including self-builds, spending on major renovations and repairs and the various service costs associated with acquiring new homes.

This approach has one major advantage. It is based on observable price quotes for each of the categories covered, most notably house sales. From a practical perspective, this means there is less reliance on imputations and most likely fewer statistical resources required than is associated with the rental equivalence approach, which requires obtaining a large number of rental quotes carefully matched with appropriate representative sample of owner-occupied units.

There are also serious disadvantages to the net acquisitions approach, which in my opinion outweigh the advantages. First and foremost, this approach does not produce a consumption price index and so should not be used in an index such as the HICP which is intended to capture movements in the cost of consumption. Most of the expenditures being captured by this approach are considered to be gross fixed capital formation (i.e. investment) by the national accounts. Also, by focusing only on the current acquisition of homes, the approach ignores the service flow of housing services obtained by all pre-existing owner-occupiers.

Another problem with this approach is that would likely induce spurious volatility into a consumption price index. The weight assigned to owner-occupied housing would depend upon the quantity of net housing acquisitions. The residential construction sector is highly cyclical, so the role played in the overall price index by net acquisition of housing would vary widely over time. Historical time series for the euro area are limited, so to give an example with historical context, Figure 1 shows the share of US GDP accounted for by residential investment. This value tends to move around a lot over the business cycle. To give a recent example, this share was 6.6 % in 2005 and only 2.7 % in 2009.

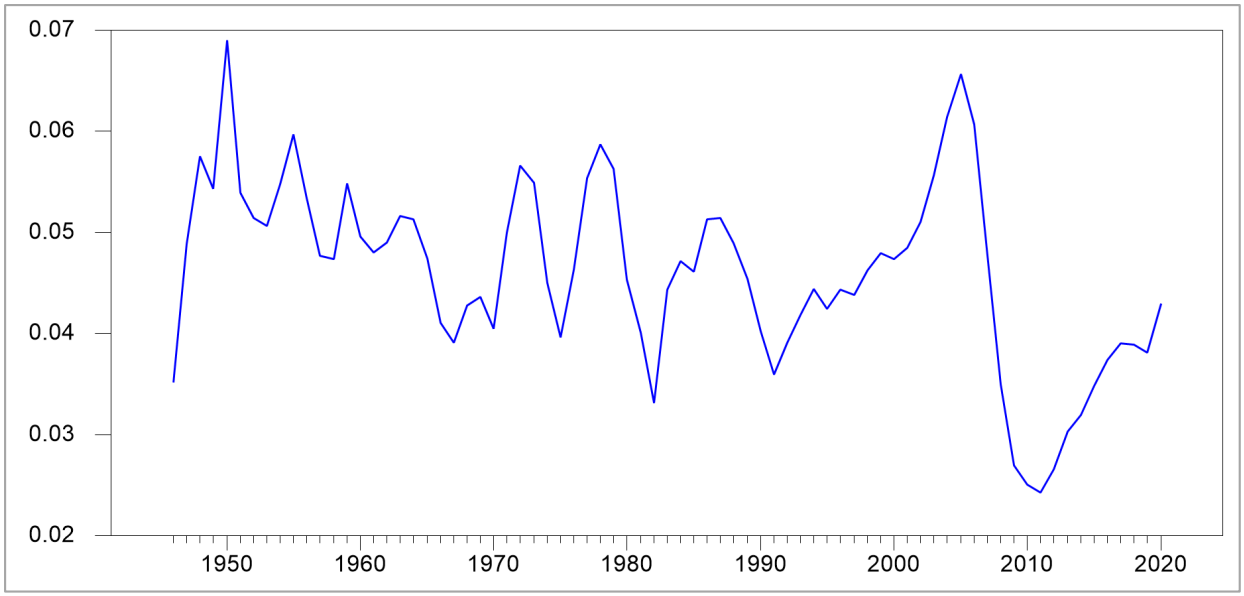
The HICP updates its weights annually based on the level of expenditure on each item for the previous year. The cyclicality of residential housing construction could mean big year-to-year changes in the weight for owner-occupied housing using the net acquisition approach. These fluctuations would not correspond to most people's understanding of changes in the importance of the cost of owner-occupied housing for the cost of living.

In addition, this cyclicality could impart an upward bias to average inflation. Housing markets go through cycles where house prices rise and this encourages additional construction until the cycle turns and prices and construction both fall. The net acquisition approach applied in a HICP context with

then the total amount of EUR 500 purchases would also equate to how much it would cost to rent all the TVs in the economy. In other words, the weight in the CPI from counting just this period's purchases would be the same as the weight from a theoretical calculation of the rental equivalent expenditure for all TVs.

annually updated weights would put a high weight on owner-occupied housing during boom periods when house prices are rising and would then put a low weight on them during periods when prices are falling. The result could be a positive contribution to measured inflation even during a period when the owner-occupied housing price index starts and finishes at the same value.

Figure 1: US residential investment as share of GDP



Source: Author's calculations based on data from the US Department of Commerce, Bureau of Economic Analysis.

2.3. The payments approach

Another approach is to focus on the average cash flows that are related to expenses associated with owner-occupied housing, including mortgage interest payments, insurance, property taxes and maintenance and repair costs among others. While this approach may seem intuitive, it has the same problem as the net acquisition approach in measuring both the consumption and investment element of housing. Mortgage repayments have both an interest and principal element to them. The principal repayments are considered by the SNA approach to be savings rather than consumption and as such these payments should not be included in a consumption price index.

The behaviour of a price index constructed according to the payments approach would vary over time according to factors such as the fraction of people who have a mortgage and the mix of debt and equity for those who do have mortgages. It is questionable as to whether such fluctuations should be considered actual changes in the cost of living. For example, consider the case where people decide to sell their stock market investments to provide more equity and lower the mortgages they need to purchase a house. This doesn't make the households wealthier and it doesn't make housing cheaper but it would result in a reduction in the cost of home ownership (and thus the consumer price index) according to the payments approach.

The payments approach is also unlikely to provide a timely measure of current conditions in the housing market. For example, suppose the housing market is booming, with rents and prices rising but mortgage rates fixed. For new buyers, obtaining owner-occupied housing will have become more expensive but the majority of people surveyed via the payments approach will have bought their houses in previous years and will report no change in their monthly costs.

2.4. The user cost approach

A final approach that has been used by some statistical agencies is the user cost approach[2]. This approach has its roots in the modelling of business investment due to Dale Jorgenson (1967). This approach derives a formula for the optimal rental rate a firm would charge to rent out a unit of its capital subject to the investment in the unit of capital obtaining a required net rate of return. Because this rental rate would be the cost to the user renting out the capital, this is often called the "user cost of capital" approach.

There are various versions of the use cost formula depending on the level of complexity being considered about issues such as tax treatment of capital. However, each of the formulas require that the rental rate on capital should equal a required rate of return for the investment (perhaps given by the interest rate on an alternative investment) as well as covering depreciation on the capital. Applied in the context of residential investment, the formula would generally equate the user cost to the typical mortgage rate plus an additional factor related to depreciation and perhaps a term related to the potential for capital gains on the investment in a property.

The user cost approach is similar to the rental equivalence approach in attempting to distinguish between consumption and investment element of housing. However, provided a sufficiently accurate dataset on rental rates can be assembled, the rental equivalence approach would seem to be superior to the user cost approach. The user cost approach uses economic theory to assess what a reasonable rental rate would be for a residential property. The rental equivalence rate gathers actual data on what those rental rates would be and does not rely on the equilibrating or optimising conditions of Jorgenson's model having to hold in real-life property markets.

[2] See for example Hill, Steurer and Waltl (2017) for an application of the user cost approach and some arguments in its favour.

3. EUROSTAT AND THE ECB

Here, we will briefly describe the origins and current scope of the HICP, discuss Eurostat's experimental price index for owner-occupied housing and the ECB's position on the inclusion of owner-occupied housing in the HICP.

3.1. Some background on the HICP

The need for a harmonised approach to the measurement of consumer prices in Europe emerged in the 1990s during the preparations for Economic and Monetary Union (EMU). Countries were required to meet various criteria for entry into EMU, including a price stability requirement. Effective implementation of this criteria required a credible harmonised approach to the measures of consumer price inflation[3]. In October 1995, the EU adopted a regulation providing the legal basis for the establishment of a harmonised methodology for compiling consumer price indices.

Owner-occupied housing was a difficult issue to deal with as part of this harmonisation process. Some EU countries used rental equivalence measures; others used a payments approach, meaning mortgage rates (and thus monetary policy) influenced headline inflation; other countries ignored owner-occupied housing. The decision was taken to exclude this category from the new HICP. It was decided that the scope of the HICP would be to measure the cost of household final monetary consumption expenditures, thus explicitly excluding imputed costs such as those used in the rental equivalence approach.

With the euro in place, the HICP still plays a role in deciding the suitability of new applicants who wish to join the euro but its main role since 1999 has been to provide a measure for the ECB to assess its performance relative to its primary objective of price stability.

3.2. Eurostat's different house price series

The most recent regulation on the HICP, from 2016, acknowledges the absence of owner-occupied housing from the index and explicitly states that "*The HICP is designed to assess price stability. It is not intended to be a cost of living index*" [4]. However, the absence of any treatment of the cost of owner-occupied housing from Eurostat's publications has been widely acknowledged as a weakness. A 2013 regulation thus required Eurostat to establish "*owner-occupied housing price indices with a view to improving the relevance and comparability of harmonised indices of consumer prices*" [5].

Because the scope of the HICP excludes imputed rentals, the 2013 regulation required Eurostat to prepare an index of the cost of owner-occupied housing based on the net acquisitions approach. This series, which is still classified as "experimental", is now available on a quarterly basis with a time series beginning in 2010. Eurostat have also been producing a broader house price index based on a wider dataset of price quotes rather than just focused on prices for net acquisitions by the housing sector.

Eurostat's OOH index follows the methodology described in the previous section. The index combines sub-indices for purchases of new dwellings, self-build dwellings and major renovations and services related to the acquisition and ownership of dwellings. Figure 2 shows annual data for three different measures of housing prices for the euro area, all published by Eurostat. The black line is Eurostat's overall house price index and the blue line is the experimental OOH index. The green line shows the

[3] Annex 1 of ILO et al (2004) provides a useful summary of the origins of the HICP.

[4] Regulation 2016/792 of the European Parliament and of the Council. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R0792&rid=1.

[5] Commission regulation 93/2013. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R0093&from=EN.

price index associated with the national income accounts consumption item "imputed rentals for housing" which is based on the rental equivalence method.

The figure shows that the OOH measure does not simply follow Eurostat's overall house price measure. This is not too surprising since the mix of housing involved is different and the OOH index includes service-related costs that are not in the overall house price index. Still, the cumulative increase in these series over 2010-19 was the same, before 2020 saw a somewhat faster pace of increase in the overall house price index. The rental equivalence price index has shown a much steadier growth rate, growing somewhat faster than the other measures in the first few years after 2010 and somewhat slower in the last few years up to 2019 (the last year for which these data are available). These results likely reflect increasing price-rent ratios in housing markets driven by lower financing costs and possibly speculative behaviour.

3.3. The ECB's position

Given the principal usage of the HICP is for monetary policy purposes, the ECB should be the key "stakeholder" in relation to decisions about how the index is constructed. While officially, the HICP is not a cost of living index, the ECB's decision to recommend the inclusion of OOH in the index clearly reflects its assessment that this would make the HICP a better approximation to a cost of living index and that this is a good thing. Surprisingly, however, given the time and energy devoted to the recent monetary policy strategy review, the position taken on OOH prices adopted by the ECB in the review strikes me as confused.

The ECB is clearly in favour of the inclusion of an OOH price index in the HICP and they have "*decided to recommend a roadmap*" for this to occur. The review then states:

> *"The ECB considers the net acquisition approach to be the preferred method for including OOH, based on the transaction prices that households pay for the acquisition of homes."*

However, this statement is immediately followed by a clear articulation of one of the key flaws with the net acquisition approach, as outlined earlier in this paper:

> *"Since the OOH price index measured with the net acquisition approach currently includes an element of investment, the ECB supports further research projects on optimal measurement methods. These should also aim at better isolating the consumption component from the investment component, with the former being the relevant one for monetary policy."*

In other words, the ECB's position is that the net acquisition approach is its preferred method but actually it isn't really. It would actually like Eurostat to do something different. In the meantime, during the transition period to the addition of an OOH index to the HICP:

> "*the quarterly standalone OOH index will play an important supplementary role in assessing the impact of housing costs on inflation and will thus inform the Governing Council's monetary policy assessments."*

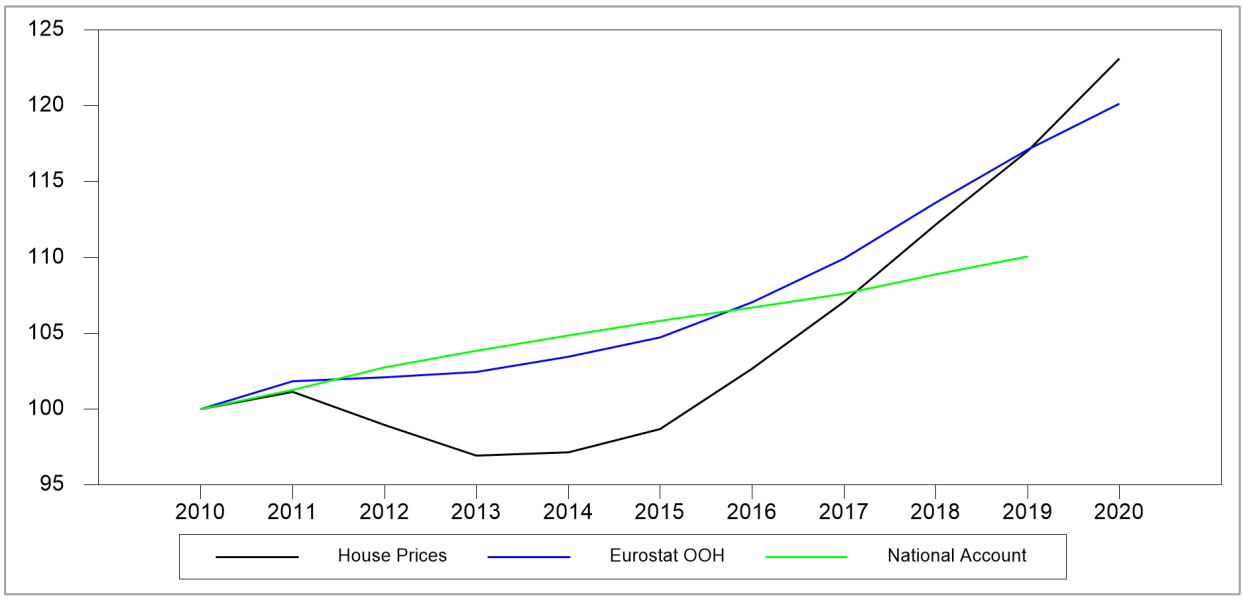
This position strikes me as perhaps a compromise designed to appease different groups of thought within the ECB. Perhaps some members wish to proceed with using Eurostat's methodology—an examination of the Eurostat (2017) technical manual shows that a lot of work has gone into operationalising this index and perhaps it would be unpopular with some for that work to be wasted. Perhaps others are aware that it is inappropriate to include the net acquisition index in what is supposed to be a consumption price measure. However, the suggestion that there is a "split the difference" approach—in which you still essentially use the net acquisition method but somehow

"isolate the consumption component from the investment component"—has no sound basis.

As the Eurostat manual makes clear, the transactions that make up the vast majority of its OOH index (and that would decide its weight in a future HICP) are investment transactions. The weight of this index would be largely determined by gross fixed capital investment in dwellings by the household sector. None of this is counted as consumption in the national accounts, so there is no "consumption component" to isolate. If someone spends EUR 300,000 on a buying a property to live in, this is all investment and the subsequent return on that investment is the flow of housing services they get in future years from owning it. We cannot simply extract a sub-component of the EUR 300,000 and call it "the consumption bit".

So either Eurostat use an approach such as rental equivalence to approximate the consumption element or else they use the net acquisitions approach and incorporate capital investment into the HICP. There is not going to be a coherent middle ground.

Figure 2: Three house price indices for the euro area, 2010-2020



Source: Eurostat.

Note: The black line is Eurostat's house price index. The blue line is Eurostat's experimental series for owner-occupied housing. The green line is the price index for consumption of owner-occupied housing from Eurostat's euro area national accounts. The latest value for this series is from 2019.

4. IMPACT ON HICP INFLATION

How much does this issue matter for the measurement of inflation? Perhaps surprisingly, given the attention that has been paid to the issue in recent years, it appears that including an OOH index in the HICP would have had very little effect on headline inflation in recent years. ECB (2021) reported that:

> *"According to experimental calculations, adjusted inflation figures that give a larger weight to housing costs would currently be slightly higher than the annual HICP inflation rate. Preliminary estimates indicate that the wedge between adjusted and actual HICP ranged between 0.1 and 0.3 percentage points in the third quarter of 2020. At the same time, in the past such adjustments would have resulted in a lower inflation rate (a negative wedge) depending on the state of the house price cycle."*

To give a graphical illustration of the potential impact, Figure 3 reports some calculations that I have done that attempt to approximate what the inclusion of Eurostat's net acquisitions OOH price series would have done to overall annual HICP inflation in recent years.

This calculation requires an assumption about the weight the new series would have in the HICP index. To assess how much spending is involved, I used the national accounts series on gross fixed capital formation for dwellings multiplied by about 0.8 to reflect that about 20 % of euro area households live in rental accommodation (so some residential investment goes into the buy-to-rent sector)[6]. This approach is imperfect in excluding the costs of services associated with acquiring housing but it captures the vast majority of what is measured by the OOH index. The OOH index would have a weight of about 10 % in the HICP if these calculations are correct.

Figure 3 shows the largest difference between the newly constructed HICP series and the published one occurs in 2020, with a difference of 0.25 %: The published annual inflation rate for 2020 was 0.25 % and the series including the OOH index grew by 0.5 %. However, the differences in most years were very small and the average values over this period are very close: 1.21 % for published HICP inflation and 1.28 % for the adjusted series.

One can also ask how the adoption of a rental equivalence price index for OOH would have affected HICP inflation. A longer time perspective is available to answer this question because the national accounts price index for imputed rents for OOH is available going back further in time. To construct this second counterfactual HICP inflation series, I used national accounts data on nominal consumption of actual rents and imputed rents to calculate a weight for imputed rents by scaling them relative to the existing weights in the HICP for actual rents. The weight implied for imputed rentals is about 15 % in recent years, which is higher than my estimate for net acquisitions approach but a lot lower than the 25 % weight for owners equivalent rent in the US CPI. This produces an alternative HICP inflation series going back to 2000.

Figure 4 shows the rental-equivalence-based approach produces an annual HICP inflation series that is even closer to the published one. The largest difference is for 2004 and this is only 0.2 percentage points. Over 2000-2019, the average inflation level for the new series is 0.05 percentage points higher than the published HICP. In other words, it is more or less identical.

A similar study that also comes up with a relatively modest figure is Coffey, McQuinn and O'Toole (2021) who use a large administrative data set of rental quotes in Ireland to estimate a rental equivalence price index for OOH. They find that replacing Ireland's current payments approach to measuring these costs

[6] Data on housing tenure patterns for various countries are available from the OECD. Available at: https://www.oecd.org/els/family/HM1-3-Housing-tenures.pdf.

in its CPI with a rental equivalence would have added 0.1 % per year to inflation over the period of their study, 2012 to 2016.

These calculations suggest that in the circumstances the euro area has been in over the past few years, the inclusion of an OOH price index would not have made much difference. However, house price inflation in the euro area has actually been relatively modest in recent years—Eurostat's house price index has been growing at between 4 % to 5 % per year while its OOH index has been growing a bit slower over the past few years. So, it is not surprising that the inclusion of this index would have had a modest impact on overall inflation.

This raises the question of how Eurostat's proposed approach to measuring OOH prices would impact consumer price inflation during more extreme housing booms and busts. To give an illustration, Figure 5 provides a counterfactual for the US consumer price index in which its current rental equivalence approach to measuring these prices is replaced with the Case-Shiller house price index with the weight determined in a similar fashion to the net acquisitions methodology.

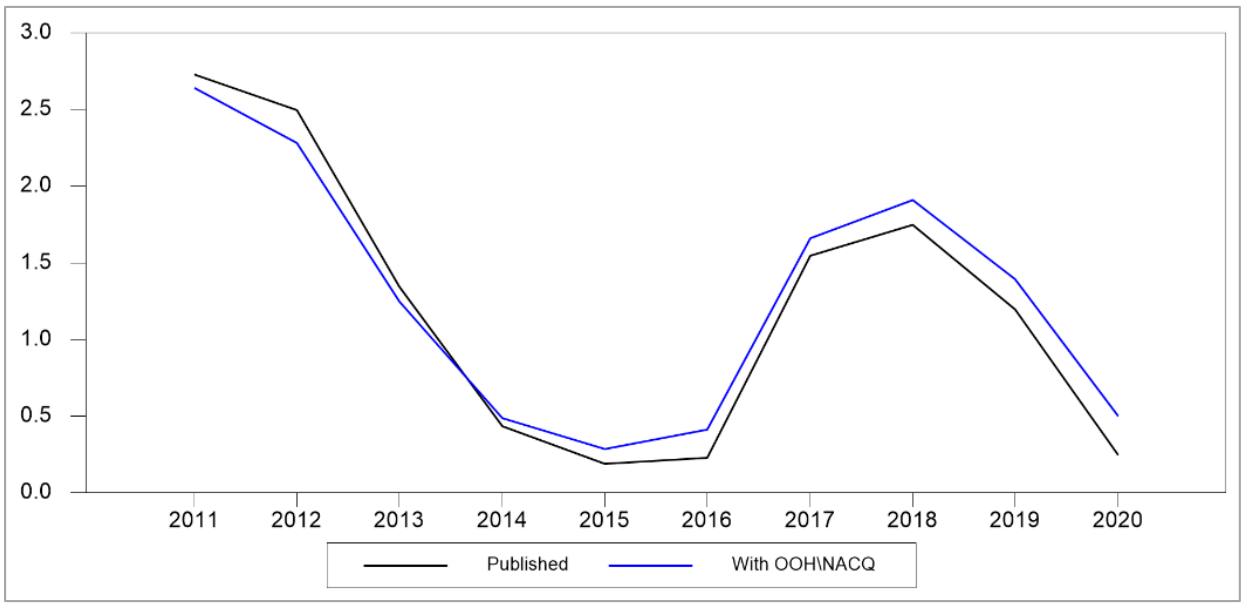
I have used the Case-Shiller house price index, which is a nationally representative index of repeat-sales residential transactions, because the US statistical agencies do not publish a net acquisitions price index such as Eurostat's. So the assumption here is that Eurostat's methodology would generally produce a price index that grows at the same rate as a price index of all residential housing sales, something the evidence from Figure 2 suggests has been approximately true over the past decade. The counterfactual CPI inflation series removes the existing owners equivalent rent series from the CPI and replaces it with the Case-Shiller series with a weight calculated from total residential investment minus three quarters of the amount spent on home improvements, adjusted downwards by one third to reflect OECD estimates that one third of US households rent[7].

The resulting counterfactual inflation series behaves similarly to the published CPI with a few exceptions. Most notably, during the housing bubble of the mid-2000s, the alternative CPI grows much faster: Inflation in 2005 is estimated at 4.9 % compared with the published 3.9 %. For 2009, the estimated rate of deflation is much larger than the published figure.

Some could argue that these calculations provide evidence in favour of including house prices in the CPI. Perhaps the Federal Reserve would have taken stronger action to cool the housing market if it had impacted the headline CPI rate in this way? On balance, I would disagree. There are good reasons related to financial stability and macroprudential policy for central banks to pay attention to house price developments. One should not have to distort the key inflation index to include non-consumption items just because occasionally central banks have failed to act responsibly in the face of threats to financial stability.

[7] Eurostat's methodology includes major renovations and replacements in its measure of net acquisitions. The three quarters figure used here is based on an estimate that one quarter of the value of total US housing improvements are major renovations. This is based on a now-discontinued US Census Bureau survey which suggested, at least as of its final publication in 2004, major renovations represented one quarter of total residential housing improvements spending.

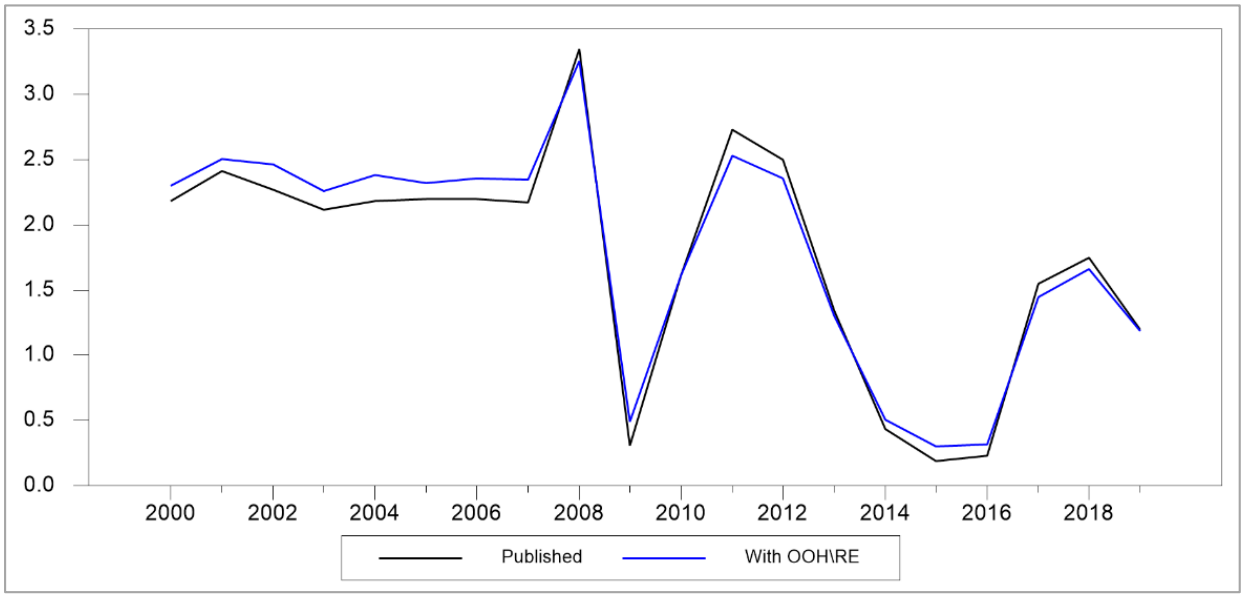
Figure 3: HICP inflation and counterfactual using Eurostat's OOH series, 2011-2020



Source: Eurostat and author's calculations using annual data.

Note: The black line is the published annual HICP inflation series. The blue line is my calculation of what HICP inflation would have been if owner-occupied housing had been added as a category and Eurostat's experimental OOH price index had been used.

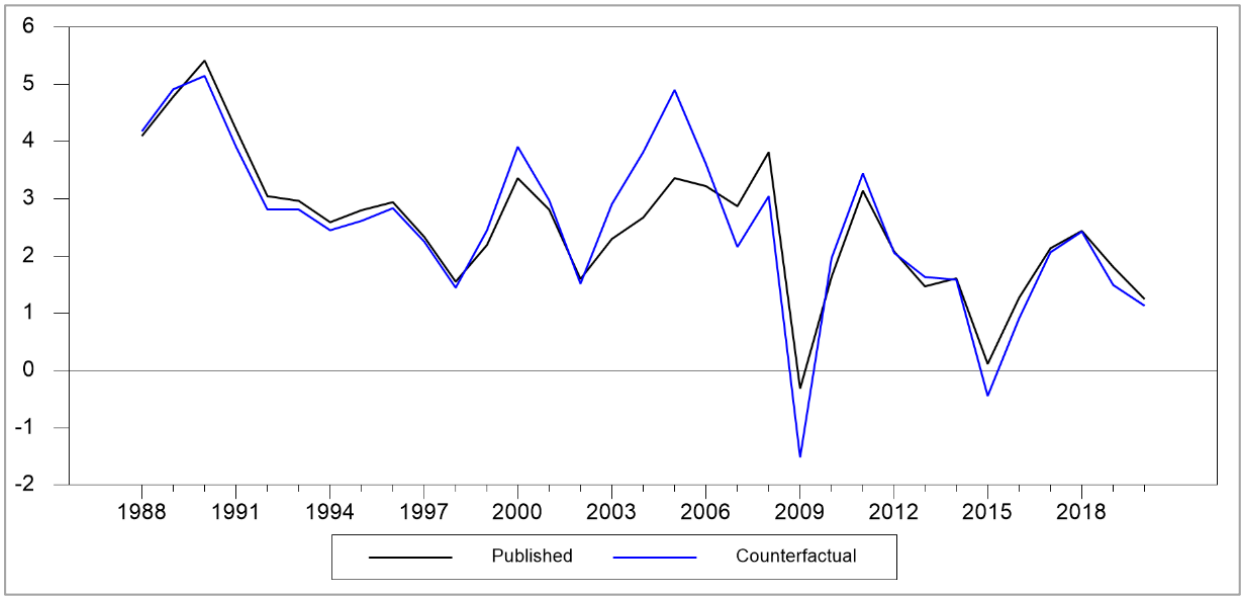
Figure 4: HICP inflation and counterfactual using a rental equivalence series, 2000-2019



Source: Eurostat and author's calculations using annual data.

Note: The black line is the published annual HICP inflation series. The blue line is my calculation of what HICP inflation would have been if owner-occupied housing had been added as a category and rental equivalence price index from Eurostat's national accounts had been used.

Figure 5: US CPI inflation and counterfactual using net acquisition approach weighting for owner-occupied housing and the Case-Shiller price index



Source: Eurostat and author's calculations using annual data.

Notes: The black line is the published annual US CPI inflation series. The blue line is my calculation of what CPI inflation would have been replacing the existing treatment of owner-occupied housing (based on an equivalent rent imputation) with the Case-Shiller house price index with a weight calculated using a net acquisitions methodology.

5. CONCLUSIONS AND RECOMMENDATIONS

The ECB's decision to approve the inclusion of a price index for owner-occupied housing in the HICP likely reflect several factors. With house prices rising, the ECB's leadership likely feels pressure from elements of public opinion that believe the HICP is systematically under-estimating the true rate of consumer price inflation. And within the Governing Council, there are likely some members that would prefer to switch to a new measure of inflation that produces higher rates of inflation which would perhaps accelerate the ECB's exit from unconventional monetary policies that do not sit well with them.

While these pressures are understandable, it is important that the ECB and Eurostat refrain from any actions that undermine the integrity of the defining measure of price stability in the euro area. The HICP provides meaningful content because it is a measure of the cost of consuming a specific basket of goods and services. The inclusion of Eurostat's proposed owner-occupied housing index based on a net acquisition approach would change the HICP to include prices for categories that represent investment and not consumption. This would undermine the coherence of the index and make it conceptually different from the measures used by other major central banks.

The ECB is aware of this problem and its recent monetary policy strategy publication contains a suggestion that Eurostat could alter its methodology to "isolate the consumption component". This is not possible via tinkering with the net acquisition approach because the transactions considered under this approach are all investment transactions.

While the inclusion of Eurostat's proposed approach is unlikely to have large effects on HICP inflation in most circumstances, we have described cases where a methodology of this sort could have large temporary effects. It is also likely that this methodology would induce spurious additional volatility to the HICP and perhaps impart a medium-term upward bias to inflation with house prices getting more weight when they are rising than when they are falling.

My recommendations to the ECB on this issue are as follows.

1. The ECB should publish a detailed piece of analytical research on how to isolate the consumption component of owner-occupied housing. I am confident that such research would find the net acquisitions approach can not be tweaked to achieve this outcome. My recommendation is that the best way to do this is to copy the US BLS and use a rental equivalence approach.

2. If the ECB's preferred analytical price index for the consumption component of owner-occupied housing is best implemented using imputations from rental quotes or other sources, then the ECB should recommend that a new regulation be passed to widen the scope of the HICP, which is currently limited to household final monetary consumption expenditures.

3. If the ECB's preferred analytically sound measure of the price of the consumption component of owner-occupied housing, be it a rental equivalence approach or some other approach, ultimately proves to be inconsistent with Eurostat and the ECB's requirements in relation to data quality and timeliness, then I recommend that the HICP be kept as it is but that Eurostat publish an alternative "HICP plus OOH" index that can be incorporated by the ECB into its policy discussions.

4. The ECB should not give any role to Eurostat's experimental OOH price index in its monetary policy assessments. There are good reasons relating to financial stability and macroprudential policies for the ECB to monitor of house price developments and Eurostat publishes a comprehensive price index based on a representative range of residential house sales. With this series available, there is no good to reason to prioritise any additional focus on the experimental OOH index, which relies on a small subset of total residential housing transactions.

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The ECB has approved a plan to include a measure of the cost of owner-occupied housing in the HICP. This paper reviews the various methodologies that are used to incorporate this element into consumer price indices. It recommends the use of a rental equivalence approach rather than the net acquisitions approach currently used in Eurostat's experimental price index of owner-occupied housing.

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