

The Consumer Price Index, Housing Costs, Consumer Credit, and the Cost of Living

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Taub Center for Social Policy Studies in Israel

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Introduction

The consumer price index (CPI) is based on the monetary value of a fixed basket of goods and services consumed by households. This basket is determined by Israel's Central Bureau of Statistics (CBS) on the basis of the Household Expenditure Survey and reflects the consumption of a *representative household*. Changes in the index are used to assess the cost of living, and CPI data serve as a key anchor for monetary, fiscal, and social policy.¹ Indexation to the CPI preserves the real value of wages, allowances, and long-term economic agreements. Over the years, however, a gap has emerged between the official role of the CPI and the way it is perceived by the public and in broader economic discourse—as an indicator reflecting the cost of living (Levi & Yakhin, 2018).

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1 In 2003, the Israeli government instructed the Bank of Israel to maintain an annual “inflation target” of 1%–3%.

In recent years, particularly during periods of sharp interest rate increases, public and academic criticism has intensified over the CPI's failure to reflect households' actual economic experience. This criticism focuses not only on the prices of goods and services, but primarily on the cost of financing consumption and housing, which has become a major component of household expenditure in an era of widespread credit use (Caspi et al., 2024).² Nevertheless, in its standard form in most countries, including Israel, the CPI does not include interest payments or financing costs, either in the housing component or in other consumption components.³ The main component of the CPI on which this criticism centers is housing. In Israel, as in many other countries, housing is the largest component of the CPI, and in recent years its weight has been approximately 27%.⁴ The housing component consists of three main subcomponents: (a) owner-occupied housing (OOH) services. This subcomponent measures changes in the prices of housing services consumed by households living in homes they own, and currently accounts for approximately 18% of the index; (b) rent, which measures changes in the price of housing services consumed by households living in rented homes; and (c) other housing expenses, including insurance, brokerage fees, legal fees, and other costs.

The present study focuses on owner-occupied housing services. Although households living in homes they own do not pay rent, the CBS imputes housing services to these households as well (see below). Due to the high proportion of households living in owner-occupied homes in Israel, this subcomponent alone carries substantial weight—approximately 18%, as noted above—and therefore has a considerable effect on the overall path of inflation (Levi & Yakhin, 2018).

The method used to measure the owner-occupied housing services component is not self-evident, and the issue has been at the heart of a professional and economic debate for decades (Bolhuis et al., 2024; Levi & Yakhin, 2018). In Israel, as in international indices such as the US CPI, since 1999 the CBS index

2 Public criticism led to discussions in the Knesset, followed by the submission of a bill proposing compensation for borrowers struggling to meet their mortgage payments and for all homebuyers who had a mortgage when interest rates began to rise in 2022. See Horesh, 2026.

3 See, for instance, the [Australian Bureau of Statistics website](#).

4 See the Israel Central Bureau of Statistics, Table 1.4, *The CPI, Weights of the Main and Secondary Consumption Groups in the Consumer Price Index, by Update Date* (in Hebrew).

of the prices of housing services consumed by households living in owner-occupied homes has been based on rents in new and renewed contracts, or on *imputed rent*, also known as *notional rent* (owners' equivalent rent—OER—or imputed rent). Under this approach, the housing service consumed by a homeowner is valued according to the rent the homeowner would have paid had they rented their own home, based on the rent paid by tenants for a dwelling with similar characteristics. This approach is indeed consistent with the purely consumption-based conception of the CPI, which measures consumption services rather than financial costs. However, it results in the near-complete exclusion of home prices themselves and of the direct effect of financing costs—mortgage interest—on household welfare, particularly during periods of high volatility in the housing market and in interest rates. This means that changes in home prices and mortgage interest rates are not directly reflected in the index, even when they have a substantial effect on the monthly cash flow of households repaying mortgages (see Shami et al., 2023). From an economic perspective, households living in debt-free owner-occupied homes are also indirectly affected by these changes. For example, they could sell their homes or, alternatively, lend the funds tied up in their homes and earn interest income. Such households therefore also *lose* when interest rates rise. A similar situation applies to consumer credit: the cost of credit to households changes in response to monetary conditions and interest rate policy, but it is not included in the CPI.

The gap between the official measurement method and households' perceptions of their economic situation is not unique to Israel. Recent studies, foremost among them the comprehensive study by Bolhuis et al. (2024), indicate that the US method, which is likewise based on imputed rent, missed a significant share of the effective increase in the cost of living resulting from the sharp rise in interest rates following the Covid-19 crisis. The authors distinguish between the *official price index* and households' *actual cost of living*, and show that economists have tended to disregard the cost of money, even though it constitutes a real component of household expenditure. They conclude that had the price index included financing-cost components, particularly in housing, inflation in the United States would have been higher than actually measured—approximately 18% in November 2022, 12% in August 2023, and 8% in November 2023, compared with 6%, 4.3%, and 4%, respectively, under the existing method⁵ (Bolhuis et al., 2024, p. 14).

5 See the website, Trading Economics, [United States Core Inflation Rate](#).

This discussion is complemented by the extensive historical literature on the 1983 change in the US measurement method, under which the Bureau of Labor Statistics (BLS) removed home prices and mortgage costs from the CPI and replaced them with a measure of imputed rent. This change was motivated by the desire to stabilize the index and avoid the volatile effects of the real estate market and changing credit conditions. As noted, critics of the change argue that it contributed to a degree of disconnect between the official index and the actual cost of living as experienced by households, particularly during periods of rising interest rates and home prices (Lee & Barton, 2022).

A Bank of Israel study that compared the two measurement methods—rents in new and renewed contracts versus the opportunity cost of owning a home—likewise found that an alternative measure based on the *user cost approach* (see below) would have produced greater volatility in the index and different inflation rates over the past decade, specifically in 2010–2011 and from 2015 to mid-2017, mainly because home prices rose relative to rents (Levi & Yakhin, 2018).

Our study presents the measurement problem. Since the CPI, as currently defined, does not include the *cost of money*—that is, the interest cost paid by households—it does not reflect the full economic and cash-flow cost of maintaining a given standard of living, particularly during periods of high interest rates. The study demonstrates how including the cost of money, even partially and in a clearly defined manner, changes the picture of the cost of living derived from the data, in accordance with theoretical frameworks of the cost of capital and user cost (Jorgenson, 1963; 1967). *It is important to emphasize, however, that our study does not challenge the validity of the current index or argue that it should be replaced. Rather, it proposes calculating a parallel index that more accurately reflects the public's perception of the cost of living.*

To this end, the study develops a complementary price index in which the owner-occupied housing services component is based solely on housing costs, as well as a supplementary cost-of-money index that combines mortgage interest and consumer credit interest. By comparing the official index with these indices, the study examines the magnitude of the gap between them and identifies the measure of the cost of living that would have been obtained had the CPI explicitly included the cost of money, particularly the cost of housing and consumer credit. The results of this comparison may have implications for the assessment of inflation, the understanding of the cost of living, the setting of the economy's interest rate, the analysis of household welfare, housing

market policy, and public debate. In this way, the study contributes to the renewed international discussion of the role of price indices, the boundaries of measuring owner-occupied housing services, and the need to connect official economic measurement with households' economic reality.

Measuring owner-occupied housing services

Housing is one of the main consumption components in every modern economy. In OECD countries, the weight of owner-occupied housing services in the consumer price index generally ranges from 3% to 20%, while in Israel, as noted, it is approximately 18%.⁶ The method used to measure this component therefore has a substantial effect on inflation estimates, central banks' monetary policy decisions, and economic policy.

The measurement of owner-occupied housing services is at the center of an ongoing debate among economists, owing to the difficulty of determining whether the economic cost of housing should be measured using rent, as a consumption service, or *using home prices and the cost of holding housing capital, as an asset-based cost*.

Main measurement method

The economics literature offers three main methods of measurement:

1. Owners' equivalent rent (OER) as a measure of housing services

This is the dominant method used in modern CPIs. It is based on the assumption that the housing service consumed by an owner living in their own home is identical to the housing service consumed by a tenant. The price to be measured is therefore the rent that the owner would have paid had they rented their home. This method was introduced in the United States in 1983, following an extensive research process by the Bureau of Labor Statistics, and was adopted for several fundamental reasons:

6 See the [OECD Data Explorer](#).

- A consumer price index is intended to measure consumption, not the acquisition of assets.
- Dwellings are assets whose prices are highly volatile, and including them in the index could therefore generate excessive volatility in measured inflation.
- Financing costs, such as mortgage costs, vary across households and do not represent a uniform “consumption” price.

This method has the advantage of stabilizing the index and aligning it with the narrow definition of consumption. However, as is evident from the extensive literature on the subject, it has one notable drawback: there is a gap between the official measure and consumers’ economic experience. During periods of rising home prices and rising interest rates, rents respond slowly, and therefore the official index based on owners’ equivalent rent may not fully reflect the increase in costs experienced by new homebuyers. We discuss this issue in greater detail below.

The Australian Bureau of Statistics (ABS) notes that although the approach based on owners’ equivalent rent is not without problems, it is often chosen because of its relative stability and because it avoids introducing financial volatility into price indices.⁷ It should be borne in mind, however, that choosing this approach has a clear consequence: mortgage interest payments, although they constitute a major component of households’ cash-flow expenditure, are not reflected in the consumer price index, in addition to the cost of capital.

2. Measuring the cost of housing capital using the user cost approach

The user cost approach was developed in the economic literature to measure the economic cost of using capital assets over time. The underlying idea is that the cost of using an asset is the foregone alternative use of the capital invested in it. The original user cost formula is based on the work of Jorgenson (1963, 1967) and defines user cost as a function of the asset price, the interest rate, the depreciation rate, taxation, and expectations of future capital gains. In the context of housing, under the user cost approach, in period t , UC_t (user cost) explicitly includes interest as a central component, since interest represents the opportunity cost of the capital invested in holding the asset.

7 See the [Australian Bureau of Statistics](#) website.

Specifically:

$$UC_t = (r_t + \delta + \tau - E[\Delta p_{house,t+1}]) \cdot P_{house,t}$$

where r_t is the effective nominal mortgage interest rate; δ is the structural depreciation rate; τ is the tax rate and the rate of ownership and maintenance costs; $E[\Delta p_{house,t+1}]$ represents the expected rate of change in nominal home prices; and $P_{house,t}$ is the price of housing.

This approach is better suited to measuring the actual cost of living, particularly for households entering the housing market, because it captures two key factors: rising home prices and rising financing costs, namely interest rates. In practice, however, it is rarely used in CPIs. The literature also points to difficulties in applying this approach in official price indices. In particular, including expected capital gains is not consistent with the structure of an operational price index.⁸

3. Net acquisition of dwellings

This approach is used primarily in the European Union's harmonised index of consumer prices (HICP), as well as in Australia, New Zealand, and Finland. Its purpose is to capture changes in the prices of dwellings and of other goods and services purchased by households in their capacity as homeowners. Under this approach, directly observed transaction prices are used, as determined at the time of purchase, so that the measure is based on actual market data rather than indirect estimates.

The system of price indices used under this approach generally includes net acquisitions of dwellings, the construction of new dwellings, alterations, extensions, and additions to existing dwellings, transaction costs such as fees and related payments, repairs and maintenance, and dwelling insurance. In other words, it comprises a basket representing household expenditure associated with acquiring and maintaining an owner-occupied dwelling.⁹ The weight of this component in the index is calculated as the share of total net expenditure on dwellings in total household consumption expenditure.

As noted, a central feature of this approach is the *net principle* used to determine expenditure weights in the index: household purchases receive a positive weight, while household sales receive a negative weight. This means

8 See the [Australian Bureau of Statistics](#) website.

9 For more on this, see the Eurostat website, [Glossary: Net acquisitions approach](#).

that transactions between households offset one another at the aggregate level, because one household's purchase is another household's sale. This point is particularly important in the market for existing dwellings, since many transactions in that market take place between households, such as the sale of a second-hand dwelling. Under the net principle, therefore, a large proportion of these transactions does not increase the total expenditure weight in the index, directing the measure primarily toward households' "net new acquisitions" from the market.

Measurement methods used in practice

The measurement of housing services is one of the central methodological issues in measuring inflation in OECD countries. The literature points to considerable variation among member countries in both the measurement approach and its components. In Euro area countries, the official harmonised index of consumer prices (HICP) does not include owner-occupied housing services at all, but measures only actual rent and ancillary housing expenses.¹⁰ Although Eurostat and the European Central Bank (ECB) have worked for years to promote the inclusion of owner-occupied housing in the index using the net acquisition approach, the official index has thus far remained without this component (OECD, 2023). By contrast, in English-speaking countries, owner-occupied housing is explicitly included in national price indices, but through entirely different methods. In the United States, the shelter component of the CPI includes owners' equivalent rent (OER), based on the estimated rent of owner-occupied homes, and currently accounts for approximately one-quarter of the index.¹¹ The United Kingdom includes owner-occupied housing in its HICP through imputed rent, while the standard CPI is similar to the HICP but does not include an owner-occupied housing component.¹² Japan adopts a similar approach and includes an imputed rent component in the CPI that reflects the cost of housing services for homeowners.¹³ Canada, by contrast, uses a fundamentally different measurement approach: the shelter component includes both mortgage interest costs and property ownership costs, thereby

10 See the Eurostat website, [HICP methodology](#).

11 See the US Bureau of Labor Statistics website.

12 See the UK Office for National Statistics website.

13 See e-Stat, [Statistics of Japan](#) website.

incorporating elements resembling user cost models or the payments approach (Lehto, 2023). Australia and New Zealand have adopted the net acquisition approach, under which owner-occupied housing is measured using the purchase prices of newly built owner-occupied dwellings, together with major renovations and structural costs, rather than estimated rent.¹⁴

This comparison therefore shows that there is no single uniform or generally accepted model for measuring owner-occupied housing services in price indices across OECD countries. Differences in approach reflect institutional considerations, housing-market structure, statistical history, and the measurement objectives of each country. This variation lies at the heart of the methodological debate over the appropriate way to measure housing costs and provides essential background for understanding the methodology used in the present study.

Discussion in the literature

A popular and well-grounded review by Full Stack Economics (Lee & Barton, 2022) describes the historical background to the decision by the US Bureau of Labor Statistics in 1983 to remove home prices and financing costs from the consumer price index and replace them with the owners' equivalent rent (OER) method. According to this review, the previous method, which was based on home prices and mortgage interest rates, generated unusually high volatility in the housing index, particularly during periods of sharp changes in interest rates. In the 1970s and 1980s, for example, steep increases in mortgage rates led to overshooting in the housing index, impairing the ability to interpret the CPI as a measure of general inflation.

At the same time, the review emphasizes a fundamental conflict that remains unresolved. Although the theoretical logic of a consumer price index supports measuring the *housing service* rather than the price of the asset itself, households do not in practice experience the cost of living through owners' equivalent rent, but through home prices, monthly mortgage payments, and financing conditions. This gap between statistical theory and everyday economic experience raises doubts about the ability of the official index to accurately reflect the cost of living as perceived by the public, an issue that is particularly relevant to the Israeli economy.

14 See the [Australian Bureau of Statistics](#) website and the New Zealand website, [Stats NZ](#).

This dimension of the *perceived cost of living* lies at the center of the innovative study by Bolhuis et al. (2024), who propose a broad theoretical and empirical framework for understanding the gap between official price indices and public perceptions. The authors argue strongly that the cost of money—that is, as noted, the interest cost paid by households—is a substantial component of the cost of living, yet is not included in standard price indices such as the CPI or the personal consumption expenditures (PCE) price index. In the US context, they show that the sharp rise in interest rates following the Covid-19 crisis led to a substantial increase in mortgage and auto-loan payments, while official price indices barely responded.

In a comprehensive empirical exercise, Bolhuis et al. (2024) construct alternative inflation indices in which the housing component is measured using the former homeownership approach, based on home prices and mortgage interest rates—in other words, an applied version of the user cost approach. Their findings indicate that inflation in the United States in 2022–2023 could have been almost twice as high had it been measured using this approach. Moreover, the alternative indices they propose explain approximately 75% of the gap between official inflation measures and consumer sentiment, a gap that could not be explained by inflation and unemployment alone. This finding strengthens the claim that standard price indices omit substantial components of the cost of living as perceived by the public.

Another recent study proposes a supplementary measure to the consumer price index called the average effective consumer price index (AECPI), based on a shift from measuring average final expenditure to measuring households' effective monetary expenditure (Martin Sanchez, 2026). Under this framework, the weighting structure of the official index is replaced by weights derived from household budget survey data, with greater weight assigned in particular to inflexible expenditures such as housing. The study emphasizes that the CPI, as currently calculated, may not fully reflect the economic burden actually borne by households, especially during periods of changing financing conditions.

In the Israeli context, the measurement of the housing component was examined in depth in a Bank of Israel study that compared two main approaches for the period 2000–2017: owners' equivalent rent and user cost. The study shows that, had the user cost approach been applied in Israel, it would have produced an index that was considerably more volatile than the official index and, at times, substantially higher inflation rates, particularly during periods

of sharp increases in home prices and interest rates. By contrast, the official method, based on owners' equivalent rent, does stabilize the index, but at the cost of relatively low sensitivity to housing market trends. These findings provide a solid methodological basis for examining alternative indices in Israel, while highlighting the practical complexity and implications for inflation measurement. Another Bank of Israel study examined the effect of higher debt-servicing costs on household consumption following the tightening of monetary policy in 2022–2023. The study indicates that as monetary policy became more restrictive through increases in the interest rate, households with greater exposure to variable-rate mortgages experienced a larger decline in consumption (Caspi et al., 2024).

The literature therefore points to a fundamental dilemma regarding what price indices are intended to measure. On the one hand, a consumer price index is designed to measure the cost of current consumption, and in this sense owners' equivalent rent does provide a reasonable approximation of the cost of housing services, as international organizations emphasize. On the other hand, for households with mortgages, particularly recent homebuyers or households with variable-rate mortgages, the effective cost of living is determined to a large extent by the price of the dwelling, financing costs, and maintenance and ownership expenses. The user cost approach captures a broader dimension of economic cost, because it measures the resources a household must allocate in order to "house itself," including the cost of capital, rather than only the price of the service as estimated in the rental market.

In recent decades, a view has emerged in the literature that official price indices need not necessarily adopt a full user cost-based measure, but should provide supplementary or alternative indices that reflect the actual cost of living for homeowners. The study by Bolhuis et al. (2024) reinforces this position with robust empirical evidence and highlights the gap between narrow statistical measurement and the public's experience of the cost of living.

Research methodology

The analytical framework begins with a conceptual distinction between three terms that are sometimes used interchangeably in economic discourse: inflation, the cost of living, and cash-flow cost. Inflation, as measured by the consumer price index, is defined as the rate of change in the prices of a fixed basket of goods and services consumed by households. The cost of living, by contrast, refers to the total cost of maintaining a given standard of living—a broader concept that is not limited solely to changes in the prices of the selected basket. Cash-flow cost refers to the actual expenses households are required to pay over a given period, including interest payments and credit repayments (Bolhuis et al., 2024).

We reiterate that the consumer price index is designed to measure inflation, not the cost of living or cash-flow costs. This distinction is widely accepted in the literature and in statistical practice, and it underlies the exclusion of interest payments from official price indices (Levi & Yakhin, 2018). However, when the index is also used in practice as a benchmark for the cost of living, a gap may arise between the official measure and the economic cost experienced by households. We emphasize that the present study does not seek to challenge the conceptual distinction between inflation and the cost of living or to identify a fundamental flaw in the measurement of inflation. Rather, it addresses the conceptual gap arising from the omission of the cost-of-money component from the price index.

In this study, the cost of money is defined as the opportunity cost arising from the use of money to finance consumption and housing, which is dependent on interest rates. In the context of housing, the mortgage interest rate directly affects the economic cost of owning a home even when home prices themselves remain unchanged. In the context of current consumption, consumer credit interest rates affect the total cost of purchases financed with credit. For the analysis, we adopt a deliberately narrow approach that isolates only the cost-of-money component, while disregarding depreciation and expected capital gains. This choice is intended to avoid unnecessary methodological complexity and to focus the discussion on the research question.

Accordingly, we propose constructing a complementary price index intended to illustrate how changing the definition of owner-occupied housing services affects the overall dynamics of the index. The complementary index has three main features:

- The owner-occupied housing services component is replaced with a component based on housing financing costs.
- The weight of the component remains identical to the weight of the owner-occupied housing services component in the official index.
- All other components of the index are identical to those of the consumer price index excluding owner-occupied housing services.

Thus, the differences between the official index and the complementary index arise solely from the inclusion of the cost of money in the housing component, rather than from changes in the weights or in the measurement of other components.

In addition to the complementary price index, we calculate a supplementary cost-of-money index that combines two major channels of household financing: housing costs and consumer credit. *The supplementary index does not measure prices or inflation, but rather describes the evolution of financing conditions, namely interest rates, over time.*

Data

The empirical analysis is based on annual time series for Israel covering the period 2007–2024.¹⁵ The use of annual frequency is intended to enable the consistent integration of the consumer price index, housing price, and interest rate data, while avoiding imputations not grounded in official institutional data.

Data on the consumer price index, including the overall index and the consumer price index excluding owner-occupied housing services, were taken from CBS publications. These data are used both to present the official index and as the basis for calculating the complementary index. Data on home prices and mortgage interest rates are based on Bank of Israel data. The mortgage interest rate data distinguish between indexed and non-indexed mortgages and include information on their respective shares of the mortgage portfolio. The weight of the owner-occupied housing services component in the consumer price index was taken from CBS publications and is expressed in thousandths (out of 1,000).

15 The analysis begins in 2007 because data on the average mortgage interest rate in the non-indexed shekel segment are unavailable for earlier years.

Beginning in 2016, the analysis also includes data on the average interest rate on household credit excluding housing, based on Bank of Israel publications. Because systematic data on this interest rate are not available before 2016, the empirical analysis is divided into two subperiods: 2007–2015 and 2016–2024.

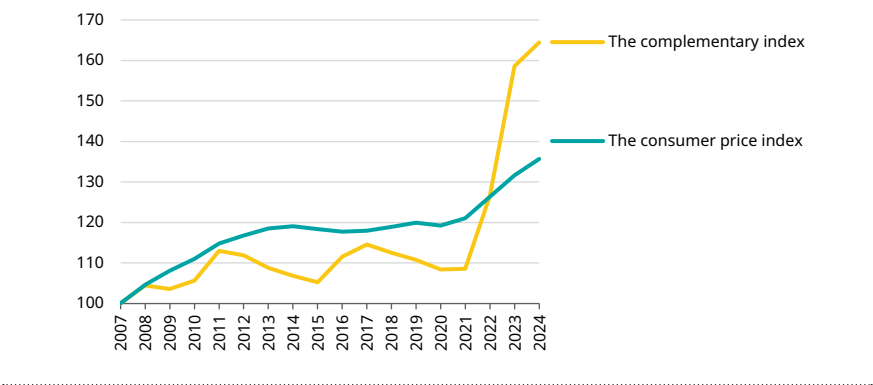
Construction of the complementary index and comparison with the official index

The complementary index is constructed in several stages. First, the mortgage interest rate is calculated as a weighted average of the interest rates on indexed and non-indexed mortgages, based on their respective shares of the mortgage portfolio in each year. This interest rate is then used to calculate housing financing costs as the product of the interest rate and the average home price in each year. This component is normalized to a base of 2007 = 100 and defined as a complementary index of owner-occupied housing services. The official consumer price index excluding owner-occupied housing services is likewise normalized to a base of 2007 = 100. The complementary index is obtained as a linear combination of these two components, using the weight of owner-occupied housing services in the consumer price index (see Appendix 1 for details).

As noted, the purpose of the index is to examine the sensitivity of the cost of living to the inclusion of the cost of money as a component of housing costs, rather than to measure the specific cash flow of an individual household. In particular, some homeowners do not have an active mortgage, for example because they have completed repayment, and are therefore not directly exposed to rising interest rates in cash-flow terms. It is therefore important to distinguish between actual cash flow, which reflects actual interest payments on an existing debt balance, and opportunity cost, under which interest represents the price of the capital tied up in holding an asset even in the absence of debt—that is, the alternative return that could have been earned by selling the asset and investing the capital in a financial asset. This distinction is consistent with the user cost approach to capital, in which interest is a central component of the economic cost of holding an asset (Jorgenson, 1963, 1967).

Figure 1 compares the consumer price index with the complementary index, with both indices normalized to a base of 2007 = 100. As shown in the figure, throughout the period, the complementary index is more volatile than the official index. In particular, during periods of falling interest rates, the complementary index rises relatively slowly and may even stagnate, whereas during periods of sharp interest rate increases it rises rapidly even when the rate of official inflation is relatively moderate.

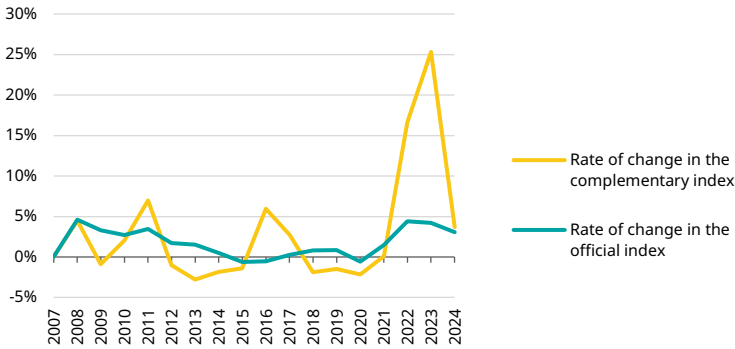
Figure 1. Consumer price index and the complementary index based on the cost of money as a component of housing cost
2007 = 100



Source: Benjamin Bental and Labib Shami, Taub Center | Data: CBS

Figure 2 shows the effect of including the cost of owner-occupied housing on the annual rate of change in the normalized indices. It is clear that that the rate of change measured by the complementary index is highly volatile and, in particular, exhibits exceptionally sharp increases in 2022–2023. As shown in Figure 3, this increase stems from a steep rise in the cost of owner-occupied housing in those years—57% and 68%, respectively—driven mainly by the increase in the weighted average mortgage interest rate (for details of the calculation, see Appendix 1).

Figure 2. Rate of change in the consumer price index and the complementary index



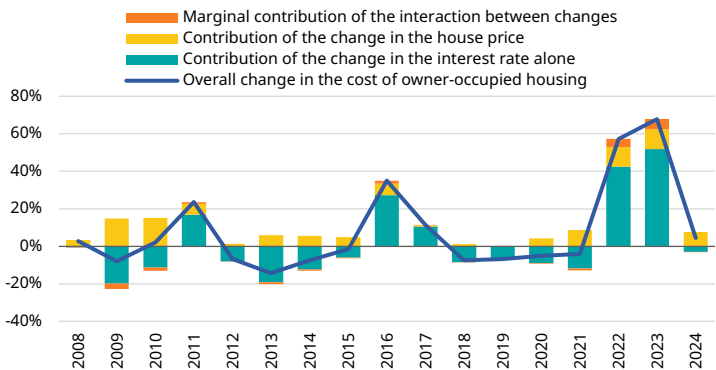
Source: Benjamin Bental and Labib Shami, Taub Center | Data: CBS

Figure 3 decomposes the annual changes in the financing cost of owner-occupied housing into their components: the contribution of the change in the nominal interest rate, the contribution of the change in home prices, and the contribution of the interaction effect arising from simultaneous changes in both components (see Appendix 1). The figure shows that the contribution of changes in home prices is positive throughout the period examined. Accordingly, the direction of the interaction effect depends solely on the direction of the change in the interest rate. In particular, declining interest rates in both the first and second halves of the previous decade reduced the owner-occupied housing index. By sharp contrast, in 2022–2023, when the Bank of Israel began a process of drastic monetary tightening, the weighted average mortgage interest rate increased by 42% and 68%, respectively. As a result, the contribution of the change in the interest rate became the dominant component driving the increase in the cost of owner-occupied housing. Moreover, home prices continued to rise during these years, substantially increasing the contribution of the interaction between rising interest rates and rising home prices.

This result yields an important economic insight: when demand for housing is high, whether because of basic housing needs or expectations of further price increases, a sharp rise in interest rates does not necessarily translate

into weaker demand. Instead, it creates a situation in which households must bear both high home prices and the high monthly payments associated with financing their purchase at elevated interest rates. This finding affects the assessment of the cost of living in the economy in two ways. First, it emphasizes that the official consumer price index, which does not include the cost-of-money component, may underestimate the cost of living during periods of sharp changes in interest rates. Second, it shows that monetary policy has immediate implications for household welfare—implications that are not reflected in conventional inflation indices, particularly when those indices indicate a relative moderation in the rate of price increases.

Figure 3. Contribution of the components of the change in owner-occupied housing costs



Source: Benjamin Bental and Labib Shami, Taub Center | Data: CBS; Bank of Israel

The supplementary cost-of-money index

This index is intended to measure the cost of money and therefore combines two main channels of household financing: mortgages and consumer credit. As noted, the supplementary index does not measure prices or inflation, but rather describes changes over time in financing conditions in these two channels.

Consumer credit

Data on consumer credit are available beginning in 2016. The index, which focuses solely on the cost of money, is constructed using the weighted mortgage interest rate and the average interest rate on household credit excluding housing, with these rates weighted according to the actual distribution of debt between the two types of credit in each year. Unlike the complementary index, which examines the effect on the price index of incorporating housing financing costs into the owner-occupied housing services component, the cost-of-money index describes only the evolution of the price of money for total household debt and makes it possible to track the dynamics of financing conditions over time.

The weights of the cost-of-money index are derived from households' annual outstanding housing and non-housing debt, as published by the Bank of Israel.¹⁶ Thus, for each year t , the following is calculated:

$$w_t^M = \frac{D_t^M}{D_t^M + D_t^C} \quad ; \quad w_t^C = \frac{D_t^C}{D_t^M + D_t^C}$$

where D_t^M is the outstanding housing debt and D_t^C is the outstanding non-housing debt. Thus, w_t^M represents the share of outstanding housing debt in total household debt, while w_t^C represents the share of outstanding non-housing debt in total household debt. Accordingly, the cost-of-money interest rate is defined as:

$$r_t^{COM} = w_t^M \cdot r_t^M + w_t^C \cdot r_t^C$$

The cost-of-money index is normalized to a base of 2016 = 100. Figure 4 presents the cost-of-money index over the period 2016–2024. The figure shows that the index remained relatively stable until the beginning of the third decade of this century, but beginning in 2022, the cost of money rose sharply and continuously, driven mainly by an increase in the housing cost index and reflecting the tightening of monetary policy.

16 See the Bank of Israel website, [Debt and Credit](#).

Figure 4. Cost-of-money index: Combining mortgage and non-housing credit interest rates

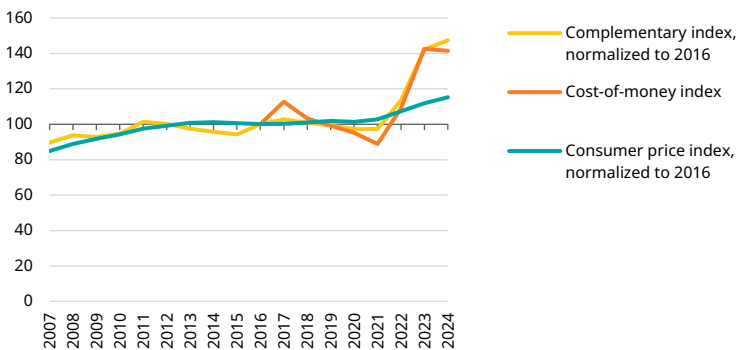
2016 = 100



Source: Benjamin Bental and Labib Shami, Taub Center | Data: CBS; Bank of Israel

Figure 5 compares the official consumer price index, the complementary index, and the cost-of-money index, with all three indices normalized to a base of 2016 = 100. The figure shows a clear gap between the official index and the indices that are sensitive to financing costs. While the official consumer price index rises moderately, the complementary index and the cost-of-money index indicate a sharp and sustained increase in financing costs in the economy in recent years.

Figure 5. The CPI, the complementary index and the cost-of-money index
2016 = 100



Source: Benjamin Bental and Labib Shami, Taub Center | Data: CBS; Bank of Israel

The difference between the values of the two indices—the complementary index and the cost-of-money index—stems from the fact that the cost-of-money index reflects interest rate dynamics alone, whereas the complementary index incorporates housing financing costs as a component of the price basket and is therefore affected by changes both in interest rates and in home prices themselves. Accordingly, the values of the two indices should not be expected to overlap fully, but rather to exhibit similar overall trends and relative magnitudes of change.

In summary, the findings indicate that during periods of low interest rates, the complementary index rises more slowly than the official index, whereas during periods of high interest rates—particularly after 2022—the complementary index rises substantially more sharply than the official index. These findings reinforce the argument that excluding the cost of money from the consumer price index creates a systematic measurement gap that widens during periods of sharp changes in financing conditions.

Discussion and conclusions

This study examined how the cost of living in Israel would be measured if the consumer price index explicitly included housing financing costs and the cost of consumer credit. We focused in particular on the gap between the consumer price index and a complementary index that we developed, which takes into account the cost of capital associated with owning a home—whether actually incurred through interest payments or hypothetically incurred through the foregone return on the capital invested in the property. The findings show a systematic gap between the two forms of measurement, particularly during periods of high interest rates. These findings do not, of course, call into question the validity of the consumer price index as a tool for measuring inflation, but they do underscore the need for a clear distinction between measuring prices and measuring the cost of living.

The gap is evident both in the values of the indices and in their annual rates of change, and it widens especially during periods of sharp interest rate increases. Over the period examined, the consumer price index exhibits relatively moderate volatility, reflecting the dynamics of the prices of the goods and services included in the measured basket. By contrast, the complementary index, in which the owner-occupied housing services component is based solely on housing financing costs, responds sharply to changes in mortgage interest rates and home prices.

An examination of the annual rate of change in the official consumer price index relative to the rate of change in the complementary index (Figure 2), together with the rate of change in the weighted average mortgage interest rate, shows that if inflation had been measured using the complementary index, it would have been more volatile than inflation as measured by the official index. In particular, periods of sharp increases in interest rates are accompanied by surges in inflation as measured by the complementary index. For example, in 2022 and 2023, when mortgage interest rates rose by approximately 42% and 52%, respectively, the increase in the complementary index was four and six times as large as the increase in the official consumer price index. This finding highlights the effect of including the cost of money in the index, both on the index level and on the rate of change in the cost of living over time, particularly during periods of monetary tightening.

The addition of the supplementary cost-of-money index from 2016 onward sharpens the picture. This index, which examines only changes in the weighted interest rate on mortgages and consumer loans, without accounting for depreciation or expected capital gains, indicates a sharp and sustained rise in financing costs in the economy beginning in 2022, far exceeding the official inflation rate (Figure 5). This gap between the indices illustrates that changes in financing conditions may have a substantial effect on households' economic and cash-flow costs, even when changes in prices themselves are limited.

It is important to emphasize that the gap identified does not indicate an error or flaw in the consumer price index. The index operates in accordance with its definition and the purposes for which it was constructed, as emphasized in the literature and in institutional publications. Nevertheless, the findings underscore the need to distinguish clearly between measuring inflation and measuring the cost of living. The measurement gap identified in this study arises from the exclusion of the cost of money from price measurement—a cost that constitutes a crucial component of the economic cost of living, particularly in an era in which housing and consumption are financed to a large extent through credit. Accordingly, when the consumer price index is also used in practice as a benchmark for the cost of living, the omission of the cost of money may result in an incomplete interpretation of economic reality.

The findings for Israel fit well within the international discussion of the limitations of price indices. Bolhuis et al. (2024) show that in the United States there is a gap between official inflation measures and the public's perception of the cost of living, and that this gap widens during periods of high interest rates. Although the present study does not examine perceptions, it provides a measurement framework that explains how such a gap may arise even in the absence of a psychological component. Institutional reviews likewise show that the exclusion of interest payments from price indices is common practice in many countries and is not unique to Israel.¹⁷ In this respect, the study offers a concrete case study of a general limitation of standard price indices.

17 See, for instance, the [Australian Bureau of Statistics](#) website.

Although the findings of our study do not lead to immediate operational recommendations, they may have important implications for economic discourse and policy making. First, monetary policy based on changes in inflation, even when it is set on the basis of an accurate assessment of price stability, may lead to a sharp increase in households' cash-flow costs as a result of rising interest rates. Second, in the context of wage indexation, allowances, and long-term agreements, exclusive reliance on the consumer price index may fail to reflect the actual erosion of households' purchasing capacity during periods of high interest rates. This is not to argue that indexation mechanisms should be changed, but rather to emphasize the need to understand the limitations of the index.

Alongside its contribution to the literature, this study has several limitations that should be stated explicitly. First, one might consider incorporating a fixed scaling parameter into the housing financing cost component, such as the average share of a home purchase financed by a mortgage. However, because this component is constructed as an index normalized to a fixed base of 2007 = 100, any constant multiplication of the series is eliminated in the normalization process and does not alter either the index values or the rates of change derived from them. Accordingly, adding a fixed parameter of this kind would have no effect on the results of the analysis, particularly because the purpose of the study is not to reconstruct actual interest payments, but to examine the sensitivity of the price index to the inclusion of the cost-of-money component. A substantive change would arise only if the parameter varied over time; in that case, however, this would constitute a different empirical extension requiring separate data on the dynamics of leverage.

Another limitation concerns the fact that not all mortgage borrowers are immediately exposed to changes in interest rates, since some loans are issued at fixed rates that do not change over the life of the loan (Shami et al., 2023). Here too, however, the complementary index does not purport to reconstruct the actual interest-payment cash flow of all existing borrowers, but rather to reflect the cost of money as the price of capital in the economy at a given point in time.

The interest rate used in the calculation is the average mortgage interest rate reported for year t , and therefore represents the financing conditions relevant to that period. Fixed-rate mortgages likewise reflect the interest rate conditions prevailing when they were taken out, while the current interest rate continues to represent the opportunity cost of the capital tied up in holding an asset, in accordance with the user cost of capital framework (Jorgenson, 1963, 1967). This also gives rise to an important interpretive limitation: the complementary index may overstate the effect of interest rates on households without mortgage debt and understate it for households carrying particularly large mortgage burdens. It should therefore be viewed as an analytical tool for measuring measurement gaps, rather than as a tool for fully estimating actual interest payments for every household.

In addition, the analysis is based on annual data and therefore does not capture short-term fluctuations, while the cost-of-money component is measured using a theoretical calculation rather than households' actual payments. Finally, data on consumer credit interest rates are available only from 2016 onward. This limitation is addressed by dividing the analysis into subperiods, but it still restricts the historical depth of the analysis.

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Appendix 1. A complementary price index (2007–2024)

Notation and variable definitions

All variables are annual and refer to years $t \in \{2007, \dots, 2024\}$, unless otherwise stated.

Price indices

- CPI_t — The overall consumer price index, as published by the CBS.
- CPI_t^{-OOH} — The consumer price index excluding the owner-occupied housing services component.
- w_t — The weight of the owner-occupied housing services component in the consumer price index.

All indices are normalized to a base year of 2007, unless otherwise stated.

Housing variables and mortgage and consumer credit interest rates

- P_t — Average home price (nominal), based on official housing price data.
- r_t^I — Average interest rate on CPI-indexed mortgages.
- r_t^N — Average interest rate on non-indexed mortgages.
- s_t^I and s_t^N — The respective shares of indexed and non-indexed mortgages in the mortgage portfolio, such that:

$$s_t^I + s_t^N = 1$$

- r_t^C — Average interest rate on household credit excluding housing, based on Bank of Israel publications.

Weighted average mortgage interest rate

The effective mortgage interest rate is defined as the weighted average of the interest rates on indexed and non-indexed mortgages:

$$r_t^M = s_t^I \cdot r_t^I + s_t^N \cdot r_t^N$$

This interest rate represents households' average cost of financing owner-occupied housing.

The cost-of-money component for owner-occupied housing services in the complementary index

Conceptual definition

The alternative owner-occupied housing services component is intended to isolate only the cost of money—that is, the *cost of financing* housing. Accordingly, the component does not include maintenance expenses, depreciation, taxation, or expected capital gains. This choice deliberately departs from the full user cost approach in order to focus specifically on the cost-of-money component, which lies at the heart of the research question. In addition, maintenance expenses, depreciation, and taxation are already included in Israel's consumer price index.

Nominal housing financing cost

The annual nominal financing cost of owner-occupied housing is defined as follows:

$$OOH_t^{money} = r_t^M \cdot P_t$$

This quantity represents the annual capital cost of an average dwelling.

Converting the component into an index

The housing financing cost component in each year is normalized to a base of 2007:

$$I_t^{OOH,money} = \frac{OOH_t^{money}}{OOH_{2007}^{money}} \cdot 100$$

Construction of the complementary price index

Normalization of the index excluding owner-occupied housing services

$$I_t^{CPI-OOH} = \frac{CPI_t^{-OOH}}{CPI_{2007}^{-OOH}} \cdot 100$$

Aggregation formula

The complementary index is obtained by replacing the owner-occupied housing services component with an index based on the cost of money, while retaining the weights of the official index:

$$I_t^{AltCPI} = \frac{w_t \cdot I_t^{OOH,money} + (1000 - w_t) \cdot I_t^{CPI-OOH}}{1000}$$

This ensures that the differences between the complementary index and the official index arise solely from the method used to measure owner-occupied housing services.

Calculation of annual inflation

Annual inflation rates are calculated as follows:

$$\pi_t^{CPI} = 100 \cdot \left(\frac{CPI_t}{CPI_{t-1}} - 1 \right)$$

$$\pi_t^{Alt} = 100 \cdot \left(\frac{I_t^{AltCPI}}{I_{t-1}^{AltCPI}} - 1 \right)$$

Calculation of the components of the change in owner-occupied housing costs

As noted, the annual nominal financing cost of owner-occupied housing is defined as follows:

$$OOH_t^{money} = r_t^M \cdot P_t$$

This yields the following decomposition:

$$\begin{aligned} \frac{OOH_t^{money}}{OOH_{t-1}^{money}} - 1 &= \frac{(r_{t-1}^M + \Delta r_t) \cdot (P_{t-1} + \Delta P_t)}{r_{t-1}^M P_{t-1}} - 1 \\ &= \frac{r_{t-1}^M P_{t-1} + r_{t-1}^M \Delta P_t + \Delta r_t^M P_{t-1} + \Delta r_t^M \Delta P_t}{r_{t-1}^M P_{t-1}} - 1 = \frac{\Delta P_t}{P_{t-1}} + \frac{\Delta r_t^M}{r_{t-1}^M} + \frac{\Delta r_t^M}{r_{t-1}^M} \cdot \frac{\Delta P_t}{P_{t-1}} \end{aligned}$$

Appendix 2. Cost-of-money index (2016–2024)

The cost-of-money index combines two main channels of household financing: (1) housing finance (mortgages); and (2) consumer credit (non-housing).

The combined interest rate is defined as follows:

$$r_t^{COM} = w_t^M \cdot r_t^M + w_t^C \cdot r_t^C$$

The weights in the index are derived from the actual distribution of debt between housing and non-housing debt in each year, based on household debt balances as reported by the Bank of Israel. Thus, the weights w_t^M and w_t^C are defined as the shares of outstanding housing and non-housing debt, respectively, in total debt, and the combined interest rate r_t^{COM} is calculated accordingly as a weighted average of the mortgage interest rate and the non-housing credit interest rate.

Index normalization

The cost-of-money index is normalized to a base of 2016:

$$I_t^{COM} = \frac{r_t^{COM}}{r_{2016}^{COM}} \cdot 100$$