



The value of € 1 income in the Dutch mortgage market – from 2010 to 2023

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Content

1. INTRODUCTION	3
2. CONCLUSIONS	3
3. CALCULATION OF THE MAXIMUM MORTGAGE LOAN	4
4. THE ANALYSIS, DOUBLE INCOME	4
5. THE ANALYSIS, SINGLE INCOME	11

1. Introduction

This publication is an analysis of the calculation of maximum mortgage loans in the Netherlands over the period from 2010 to 2023. As a warning, there are lots of numbers in this analysis. Not so strange, because the calculation of a maximum mortgage loan is the result of numbers. However, in this publication we will not provide you with just the static analysis of the maximum mortgage loans, but merely put in the perspective of the housing market and the development of certain income combinations. Maximum loan amounts are prescribed by the NIBUD, the Dutch National Institute for Budget Planning. This Institute publishes each year the maximum budget for mortgage loan debt servicing. In the analysis we provide you an insight in the resulting maximum loan amounts, taking into account the average annual interest rates over the period (the notional interest rate). The analysis is indexed back to 2013. Why 2013? 2013 was the year that the housing market in the Netherlands bottomed out. In this analysis, we analyze what the development is of maximum loan amounts for certain types of income and how it relates to the housing index. Ultimately, we try to answer the following question: “What could you afford in 2013, and if you are still in the same job, what can you afford in 2023 compared to 2013?”.

For the analysis, we use the prescribed maximum affordability percentages by NIBUD. These are renewed on an annual basis. Since 2015, the maximum debt servicing percentages are leading in the Dutch market. In the period before 2015 the non-NHG maximum affordability percentages were discretionary for each label.

Also, in this analysis, we have used income development per sector. We have not just looked at a constant income over the entire period, but we have also looked at the estimated income development. In the analysis, we look at 3 partner incomes and 3 single incomes. The incomes are defined as 0.5x, 1x, 2x or 3x times modal income. For 2022, the modal income is set at € 38.000. Using CBS tables¹, we follow these incomes over the entire period, calculating back what the modal income in 2022 is worth in 2010. Actually, we have defined “economic entities” (the combination of incomes in a partner relationship or as a single situation). The purchase power of each of the combinations in the housing market is presented in paragraphs 4 and 5.

2. Conclusions

From the analysis we draw the following conclusions:

1. There has been a leveling effect in the calculation of the maximum mortgage loan per income level. This levelling effect is primarily caused by the faster decrease of the maximum loan amount for the higher incomes, compared to the decrease of the maximum loan amount for the lower incomes.
2. Compared to 2013, the purchase power (the value of each income category) has decreased by approximately 40%. This is a combination of the following moving attributes:
 - a. Increase in the housing index by approximately +95%
 - b. Increase in income by slightly more than +20%
 - c. Decrease of the maximum loan amount by -5% (compared to income increase)
 - d. Net effect of maximum loan amount -15%
3. The fastest decrease in purchase power takes place in the period 2021-2023. Not just the fast increase in house prices, but also as a result of the notional interest rate.
4. The combination of a double middle income (twice € 38.000, together € 76.000) performs best in the market, as it relates to the purchase power. This is caused by the treatment of the second income, which gradually weighs stronger in the affordability since 2016. The effect is optimized when the second income is

¹ [StatLine - Werkgelegenheid; banen, lonen, arbeidsduur, SBI2008; kerncijfers \(cbs.nl\)](#)

close to first income. If the first income is in the higher range, or the second income is in the lower range, the benefit is less favorable.

5. Single borrowers have had a benefit over double incomes for a long period. This benefit has slowly disappeared. Relatively, single borrowers have the biggest decline in the purchase power since 2013. However, in 2013 they started at a higher level compared to double incomes.

3. Calculation of the maximum mortgage loan

Abstracting from the details, the calculation of the maximum mortgage loan is dependent on the following factors:

1. The level of the income. This is in general the gross income, including allowances. Periodical payables like partner alimony or financial obligations on personal loans (including private leases or land leases) are deducted from income. Since 2016, the second income gets gradually more weight in the determining the maximum allowed percentage of gross income for mortgage debt servicing².
2. The income determines the horizontal line. In the horizontal line the maximum percentage of income is found that can be applied for mortgage debt servicing.
3. De level of the notional interest is the second entry in the table. This is either the actual offered rate (for interest fixed terms longer than and including 10 years). For terms shorter than 10 years a fictive rate is used, as set by the Authority Financial Markets on a quarterly basis.
4. The NIBUD publishes on an annual basis the maximum allowed percentages for the combination of income and notional interest rates. Each combination allows for a different percentage. The first entry is the income and the second entry is the notional interest rate. For single borrowers an additional upward correction is applied for low incomes. The NIBUD allows a higher percentage for higher incomes and a higher maximum percentage with an higher notional interest rate. With respect to the higher notional interest rate, it should be noted that in regular cases, a higher mortgage rate does not result in a higher mortgage loan.

4. The analysis, double income

Maximum loan amount with constant income

The first analysis that we present is the development over time of the maximum loan amount per combination of incomes. The maximum loan amounts are calculated on the basis of a fixed income during the entire period (same amount of income during the analysis window). We have applied 2 types of notional interest rates. An fixed average of the entire period (3.75%) and an estimation of the actual annual notional interest rate. The annual average notional interest is shown in the next table:

² The table with the percentages for the maximum allowed amount for debt servicing has 2 entries, being the amount of income and the notional interest rate. The total of the 2 incomes has always been available for debt servicing, but until 2015, but for purpose of reading the maximum percentage of debt servicing, the amount of income was determined as 100% of the first income, and 33% of the second income (before 2012, the contribution of the second income was even 0%). Suppose that a couple earned respectively € 40.000 and € 18.000 in 2015. The calculation of income for purposes of reading the maximum allowed percentage of income available for debt servicing would be € 40.000 plus 33% of € 18.000, total € 46.000. The resulting percentage was then applied to the income of € 58.000. Since 2016, an increasing percentage of the second income can be applied to find the maximum allowed percentage available for debt servicing. In 2023, this percentage is 100%. In other words, for the same couple, the percentage of maximum allowed debt servicing is not found in the line with income of € 46.000 like in 2015, but in the line for € 58.000.

YEAR	AVERAGE ANNUAL NOTIONAL RATE
2010	5,40%
2011	5,50%
2012	5,50%
2013	5,10%
2014	4,30%
2015	3,40%
2016	2,75%
2017	2,50%
2018	2,30%
2019	1,90%
2020	1,60%
2021	1,30%
2022	4,20%
2023	4,60%

For purpose of this analysis, we use the actual rates in 2022 per early December 2022 and for 2023 we choose a percentage that causes a higher available amount for debt servicing. The table for 2023 shows increments of 0.5%, whereby each increment allows for a higher maximum percentage for debt servicing.

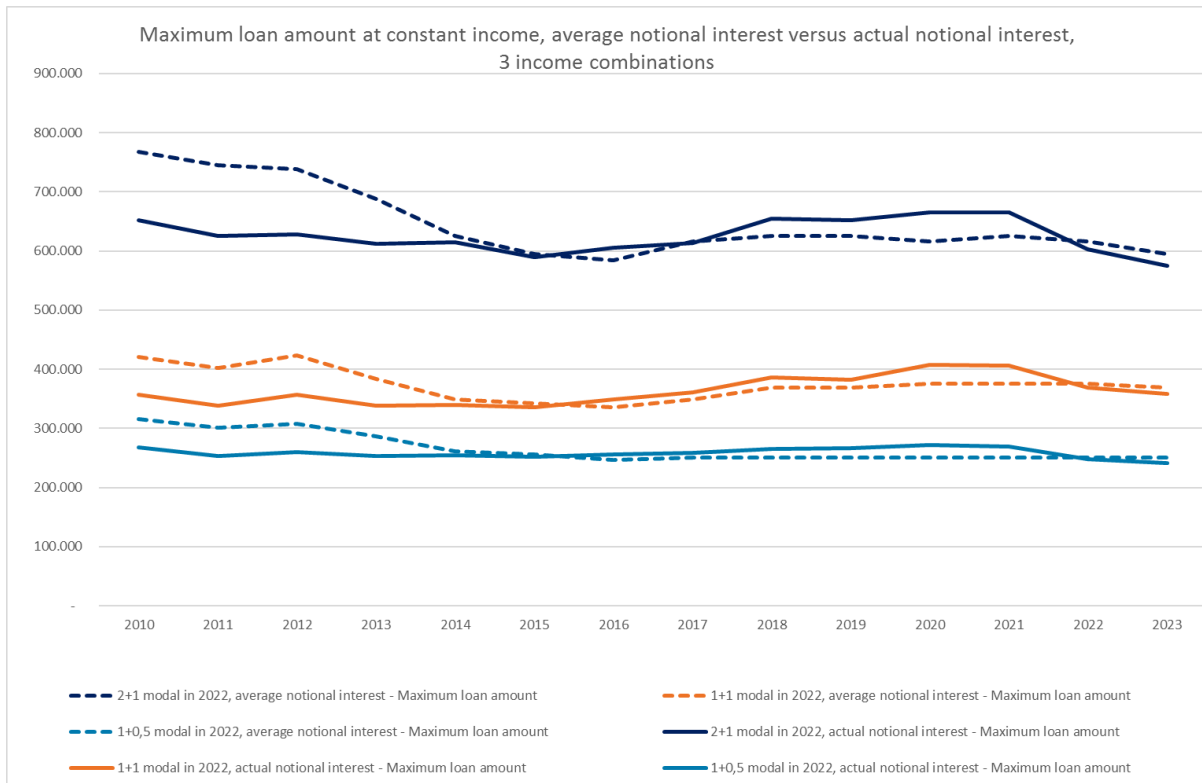
The development of the maximum mortgage loan for a fixed income can be displayed as follows. For this analysis, we use the following combinations of income.

2x modal income plus 1x modal income (modal income in 2022 = € 38.000), together € 114.000

1x modal income plus 1x modal income, together € 76.000

1x modal income plus 0.5x modal income, together € 57.000

In the graph it becomes visible what the maximum mortgage loan amount is, with a fixed income throughout the entire period. The dashed line is maximum loan amount with a constant notional interest rate, whereas the firm lines show the maximum loan amount using the actual notional interest rates.

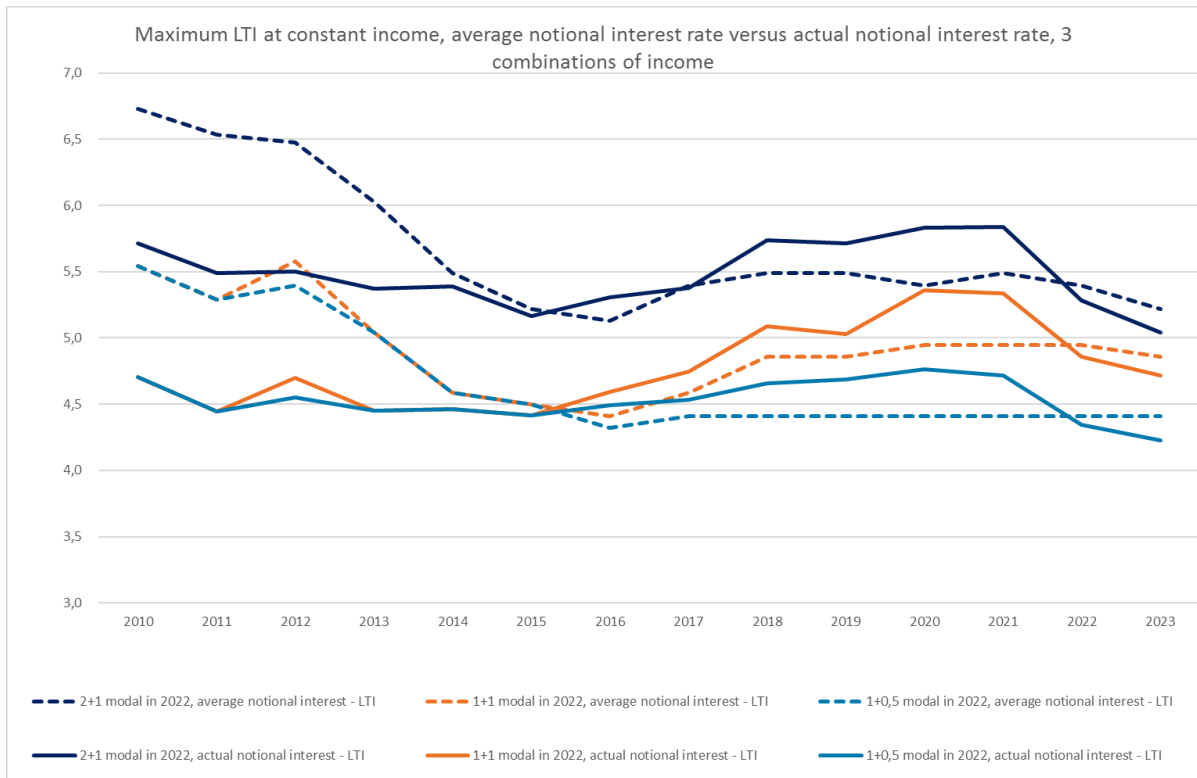


As expected, the dashed lines are initially above the firm lines, thereafter a period that the dashed lines are below the firm lines, to finish with current periods where the dashed lines are on top of the firm lines. This shows the effect of the notional interest rates. In periods that the notional interest rates are higher than the actual market rates, the maximum loan amount is lower than the maximum loan amount, when calculated with the actual notional interest amount and vice versa. Since 2022, the actual notional interest rate is higher than the long term interest, showing a lower maximum loan amount in 2022 and 2023 compared to the maximum loan amount in the same period, when calculating with the long term average.

At first sight, it seems like the maximum loan amount for the highest incomes have decreased, relative to the other combinations. The dark blue dashed line (fixed interest, fixed income) seems to have decreased, relatively more than the other dashed lines.

Maximum LTI

The graph in the previous paragraph is unfortunately not so much telling, yet. It just shows the maximum loan amounts. A more informative approach is therefore how the maximum loan amounts relates to the income. In other words, how does the Loan to Income (LTI) ratio develops over time. In below graph this ratio is shown for each of the income combinations of the graph in the previous paragraph. Again, the firm line is the calculation with the actual rates and the dashed lines are the maximum LTI's where a constant notional interest rate is assumed.



Now it becomes more interesting. Since 2010 a slow leveling has taken place in the LTI. Especially the middle group (shown in orange, being 1x modal plus 1x modal) has a relative advantage over the other couples. Until 2015 the orange LTI (firm line) was even equal to the light blue line. However, since 2016, the orange lines move into the direction of the dark blue lines and settle well in the middle during 2023. This is attributable to the mechanism that has been described before: the weight of the second income becomes gradually heavier in the equation since 2016.

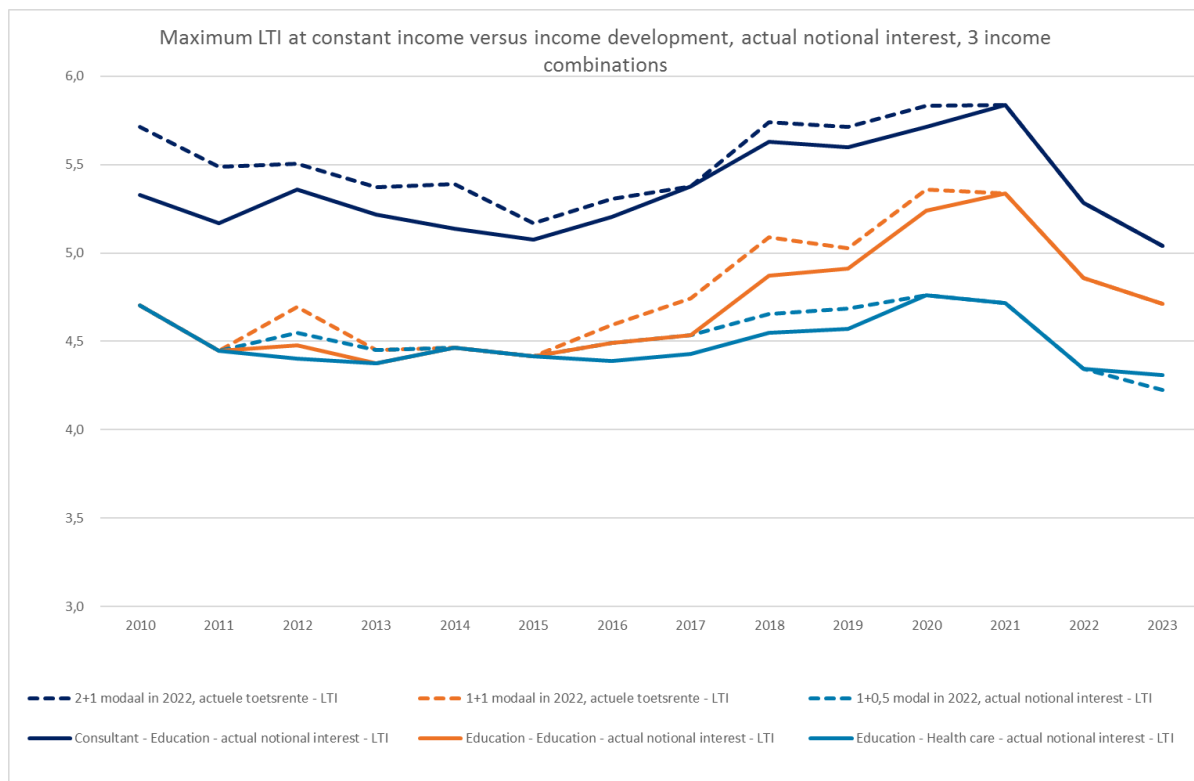
Maximum LTI for economic entities

The next step in the analysis is following an economic entity throughout the period. In this analysis, the income is not constant, but it is indexed in accordance with the CBS income tables for each job. In this analysis, we are not following a certain income, but we are analyzing the maximum loan amount for a certain job. In the below table we are describing such job. Each job has a certain multiple on the modal income in 2022. With the help of the CBS tables, we are calculating back what the incomes would have been in the past. The percentage in the column “Percentage” is the equivalent of the part time factor and/or role factor to achieve the target income in 2022 as a multiple of the modal income (€ 38.000 in 2022).

INCOME	SECTOR	ROLE	PERCENTAGE	INCOME IN 2022
3X MODAL	Banking	Management	132%	EUR 114.000
2X MODAL	Consultant	Senior	105%	EUR 76.000
1X MODAL	Health care	Senior nurse	63%	EUR 38.000
1X MODAL	Education	Teacher	66%	EUR 38.000
0.75X MODAL	Health care	Nurse	47%	EUR 28.500
0.5X MODAL	Health care	Nurse	31%	EUR 19.000

The below graph shows the LTI development of different economic entities (2 partners). Those entities are in the same job throughout the period. The dashed lines are the LTI possibilities with a constant income. The firm lines are the LTI possibilities of the economic entities through time. In 2022 the lines comes together by definition. In that year, the constant income over time and the developing income are equal. It is interesting to see that the LTI ratios

are already equal in 2021 for each of the chosen income combinations. This is caused by the fact that there is only a small income step needed from 2021 to 2022.

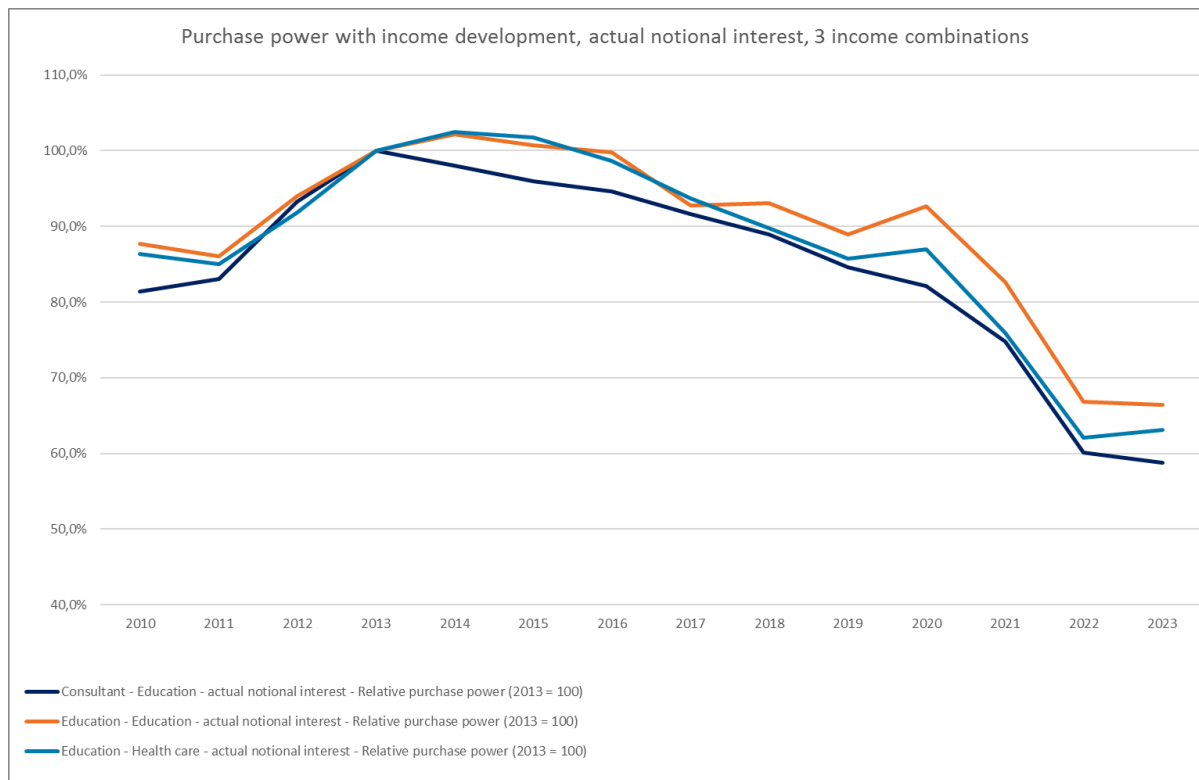


It is clear that the firm lines are below the dashed lines for a long period. This is caused by the fact that the salaries still need to grow to the target income in 2022. However, it is remarkable that the lowest two combinations are equal in 2014. This is caused by the fact that the NIBUD tables show a large gap in the middle segment. Relatively, incomes from € 28.000 to € 55.000 could borrow the same LTI.

Purchase power in housing market

Next question, how did the maximum loan amount behave relative to the housing market? We all know that the Dutch housing market has developed in Northern direction. Question now is, how did the maximum loan amount develop compared to the housing market. To this purpose we have made the following calculations:

In 2013 the housing market in the Netherlands bottomed out. We have given this year the index of 100. Next step was to index the income development of economic entities (see previous subparagraph) as well, also with 2013 as 100. By dividing the indices, we can calculate what the purchase power is of each economic entity, calculated back to 2013. In other words, we are calculating the purchase power of economic entities, compared to 2013. A number of 80 has the meaning that an economic entity has 20% less “house” compared to 2013. This results in the following graph:



The leveling between the highest incomes versus the middle incomes and lower incomes becomes even more clear now. The combination of 1x modal plus 1x modal is the best in class. This is attributable to the stronger weight of the second income since 2016. As a result the maximum LTI has increased strongest, even taking into account the higher interest rates. The lower second income (light blue), doesn't add the same value as the higher second income in the orange combination. Concluding, the combination of two modal incomes are best performing in the current market, whereas the highest incomes have lost most compared to 2013.

The decrease from 2021 to 2023 is a joint effect. Firstly, the increased notional interest rates have caused a lower LTI. Secondly, the fast increase in the housing market in 2021 and 2021 have caused a decrease in the purchase power. Together, the combined effects have caused the strongest decrease in purchase power during the entire analysis period. On average, between 2021 and 2023, 20% of purchase power has been lost. This can be found on the next page under the header "Total index 2021-2023" on the rows "Relative purchase power". Especially, the higher incomes are hit by the combined effects.

Conclusions partner incomes

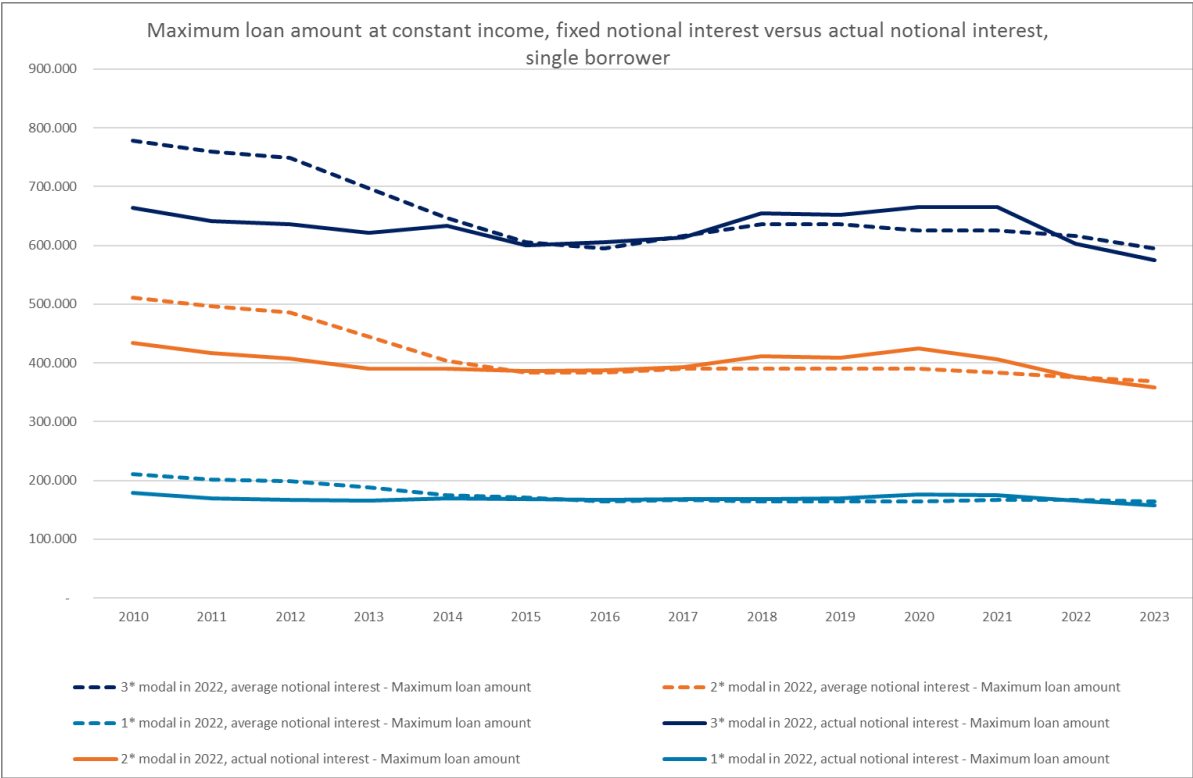
1. The middle group of partner incomes is relatively best performing. This is caused by the effect that second incomes have a gradually increasing weight in the affordability test.
2. Between 2021 and 2023, the strongest decline in the purchase power takes place. This is attributable to the higher interest rates and the strong increase in the house index. On average, 20% is lost during this period.

Income	Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total index 2010 - 2023	Total index 2013 - 2021	Total index 2013 - 2023	Total index 2021 - 2023	Index 2022- 2023
Consultant - Education - actual notional interest	Total Income	91.801	94.236	95.424	98.170	98.562	100.535	101.417	102.287	103.434	105.760	108.337	111.220	114.000	116.850	127,3	113,3	119,0	105,1	102,5
Consultant - Education - actual notional interest	Maximum mortgage loan	489.088	486.848	511.191	512.291	506.216	510.066	527.901	550.112	582.399	592.163	619.174	648.992	602.228	588.834	120,4	126,7	114,9	90,7	97,8
Consultant - Education - actual notional interest	% change in maximum loan		-0,5%	5,0%	0,2%	-1,2%	0,8%	3,5%	4,2%	5,9%	1,7%	4,6%	4,8%	-7,2%	-2,2%	20,4%	26,7%	14,9%	-9,3%	-2,2%
Consultant - Education - actual notional interest	Loan to Income	5,3	5,2	5,4	5,2	5,1	5,1	5,2	5,4	5,6	5,6	5,7	5,8	5,3	5,0	94,6	111,8	96,6	86,4	95,4
Consultant - Education - actual notional interest	Houseprice index (2013 = 100)	117,2	114,4	107,0	100,0	100,8	103,7	108,9	117,2	127,8	136,6	147,2	169,5	195,6	195,6	166,9	169,5	195,6	115,4	100,0
Consultant - Education - actual notional interest	Maximum loan amount(2013 = 100)	95,5	95,0	99,8	100,0	98,8	99,6	103,0	107,4	113,7	115,6	120,9	126,7	117,6	114,9	120,4	126,7	114,9	90,7	97,8
Consultant - Education - actual notional interest	Relative purchase power(2013 = 100)	81,4%	83,1%	93,3%	100,0%	98,0%	96,0%	94,6%	91,6%	89,0%	84,6%	82,1%	74,7%	60,1%	58,8%	72,1	74,7	58,8	78,6	97,8
Education - Education - actual notional interest	Total Income	61.740	62.549	63.452	64.566	65.203	66.835	68.388	67.751	68.971	69.834	73.536	74.146	76.000	77.900	126,2	114,8	120,7	105,1	102,5
Education - Education - actual notional interest	Maximum mortgage loan	290.450	278.162	284.037	282.429	290.965	295.132	307.116	307.214	336.074	343.132	385.256	395.839	369.108	367.230	126,4	140,2	130,0	92,8	99,5
Education - Education - actual notional interest	% change in maximum loan		-4,2%	2,1%	-0,6%	3,0%	1,4%	4,1%	0,0%	9,4%	2,1%	12,3%	2,7%	-6,8%	-0,5%	26,4%	40,2%	30,0%	-7,2%	-0,5%
Education - Education - actual notional interest	Loan to Income	4,7	4,4	4,5	4,4	4,5	4,4	4,5	4,5	4,9	4,9	5,2	5,3	4,9	4,7	100,2	122,0	107,8	88,3	97,1
Education - Education - actual notional interest	Houseprice index (2013 = 100)	117,2	114,4	107,0	100,0	100,8	103,7	108,9	117,2	127,8	136,6	147,2	169,5	195,6	195,6	166,9	169,5	195,6	115,4	100,0
Education - Education - actual notional interest	Maximum loan amount(2013 = 100)	102,8	98,5	100,6	100,0	103,0	104,5	108,7	108,8	119,0	121,5	136,4	140,2	130,7	130,0	126,4	140,2	130,0	92,8	99,5
Education - Education - actual notional interest	Relative purchase power(2013 = 100)	87,7%	86,1%	94,0%	100,0%	102,2%	100,7%	99,8%	92,8%	93,1%	88,9%	92,7%	82,7%	66,8%	66,5%	75,8	82,7	66,5	80,4	99,5
Education - Health care - actual notional interest	Total Income	43.863	44.603	45.479	46.627	47.208	48.746	49.954	50.574	51.425	52.291	54.861	55.610	57.000	58.425	133,2	119,3	125,3	105,1	102,5
Education - Health care - actual notional interest	Maximum mortgage loan	206.351	198.351	200.246	203.959	210.664	215.256	219.236	223.992	233.869	239.006	261.287	262.358	247.691	251.679	122,0	128,6	123,4	95,9	101,6
Education - Health care - actual notional interest	% change in maximum loan		-3,9%	1,0%	1,9%	3,3%	2,2%	1,8%	2,2%	4,4%	2,2%	9,3%	0,4%	-5,6%	1,6%	22,0%	28,6%	23,4%	-4,1%	1,6%
Education - Health care - actual notional interest	Loan to Income	4,7	4,4	4,4	4,4	4,5	4,4	4,4	4,4	4,5	4,6	4,8	4,7	4,3	4,3	91,6	107,9	98,5	91,3	99,1
Education - Health care - actual notional interest	Houseprice index (2013 = 100)	117,2	114,4	107,0	100,0	100,8	103,7	108,9	117,2	127,8	136,6	147,2	169,5	195,6	195,6	166,9	169,5	195,6	115,4	100,0
Education - Health care - actual notional interest	Maximum loan amount(2013 = 100)	101,2	97,3	98,2	100,0	103,3	105,5	107,5	109,8	114,7	117,2	128,1	128,6	121,4	123,4	122,0	128,6	123,4	95,9	101,6
Education - Health care - actual notional interest	Relative purchase power(2013 = 100)	86,3%	85,0%	91,8%	100,0%	102,4%	101,7%	98,7%	93,7%	89,7%	85,8%	87,0%	75,9%	62,1%	63,1%	73,1	75,9	63,1	83,1	101,6

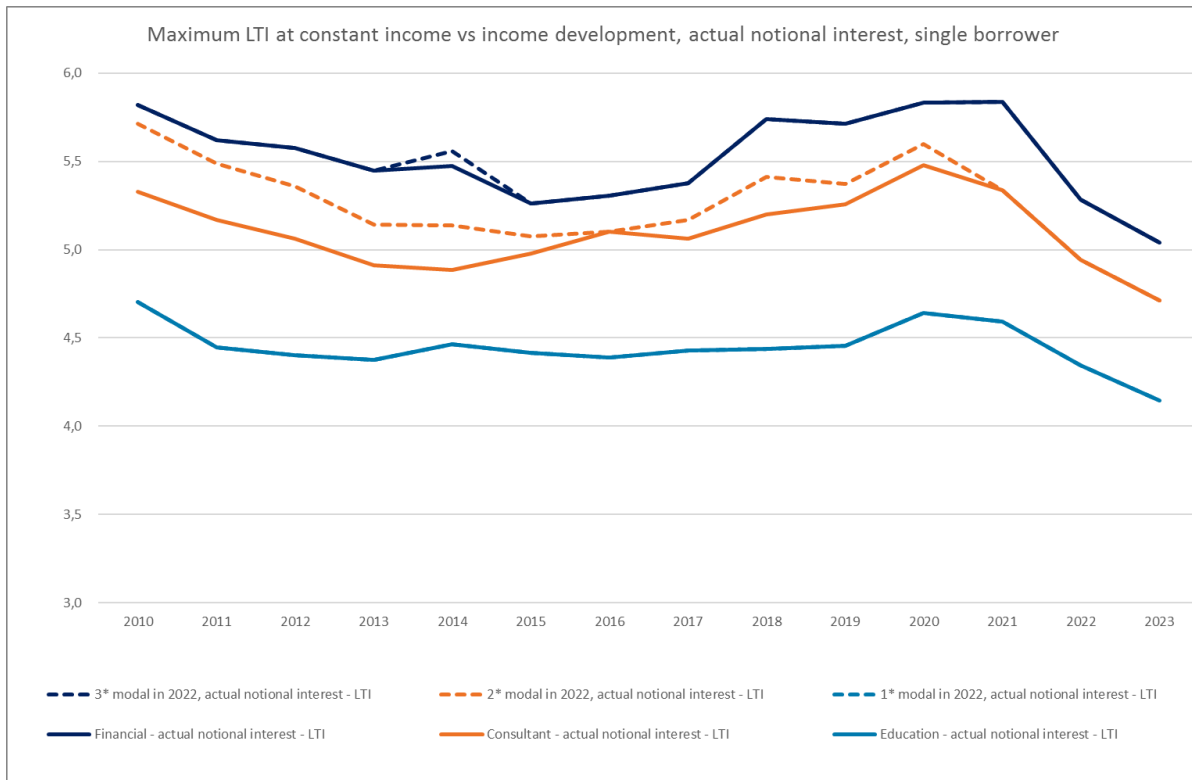
5. The analysis, single borrower

In this paragraph, we take the same steps as described in the paragraph for double incomes. However, in this paragraph we refrain from methodological comments and intermediate comments. This paragraph just shows the graphs as in paragraph 4 in the same order and concludes accordingly.

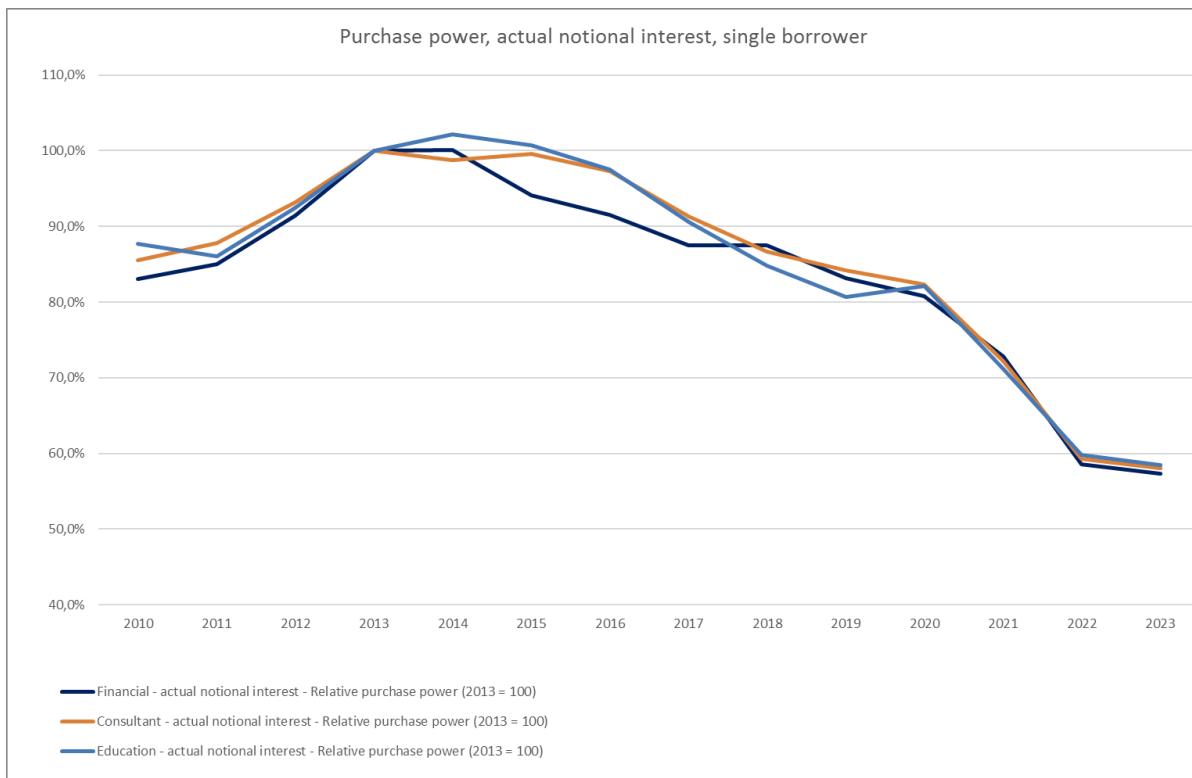
Maximum loan amount with constant income



Maximum LTI for economic entities



Purchase power in housing market



Conclusions single incomes

1. The benefit that singles had compared to couple incomes has disappeared in 2023.
2. In the middle of the analysis period, the single borrower could allow more than the couple income. This has levelled.
3. The purchase power for a single borrower has decreased more than the purchase power of a couple. However, the purchase power of a single borrower in 2013 was higher than the purchase power of a couple.

Income	Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Total index 2010 - 2023	Total index 2013 - 2021	Total index 2013 - 2023	Total index 2021 - 2023	Index 2022- 2023
Financial - actual notional interest	Total Income	87.920	90.897	92.061	96.427	96.890	97.433	98.729	100.211	102.368	104.472	107.091	111.220	114.000	116.850	132,9	115,3	121,2	105,1	102,5
Financial - actual notional interest	Maximum mortgage loan	511.467	510.951	513.442	525.397	530.262	512.633	523.989	538.947	587.479	596.890	624.809	648.992	602.228	588.834	115,1	123,5	112,1	90,7	97,8
Financial - actual notional interest	% change in maximum loan		-0,1%	0,5%	2,3%	0,9%	-3,3%	2,2%	2,9%	9,0%	1,6%	4,7%	3,9%	-7,2%	-2,2%	15,1%	23,5%	12,1%	-9,3%	-2,2%
Financial - actual notional interest	Loan to Income	5,8	5,6	5,6	5,4	5,5	5,3	5,3	5,4	5,7	5,7	5,8	5,8	5,3	5,0	86,6	107,1	92,5	86,4	95,4
Financial - actual notional interest	Houseprice index (2013 = 100)	117,2	114,4	107,0	100,0	100,8	103,7	108,9	117,2	127,8	136,6	147,2	169,5	195,6	195,6	166,9	169,5	195,6	115,4	100,0
Financial - actual notional interest	Maximum loan amount(2013 = 100)	97,3	97,3	97,7	100,0	100,9	97,6	99,7	102,6	111,8	113,6	118,9	123,5	114,6	112,1	115,1	123,5	112,1	90,7	97,8
Financial - actual notional interest	Relative purchase power(2013 = 100)	83,0%	85,0%	91,4%	100,0%	100,1%	94,1%	91,6%	87,5%	87,5%	83,2%	80,8%	72,9%	58,6%	57,3%	69,0	72,9	57,3	78,6	97,8
Consultant - actual notional interest	Total Income	60.931	62.962	63.698	65.887	65.960	67.118	67.223	68.412	68.949	70.843	71.569	74.146	76.000	77.900	127,8	112,5	118,2	105,1	102,5
Consultant - actual notional interest	Maximum mortgage loan	324.623	325.276	322.536	323.599	322.113	334.216	343.052	346.284	358.360	372.373	391.991	395.839	375.583	367.230	113,1	122,3	113,5	92,8	97,8
Consultant - actual notional interest	% change in maximum loan		0,2%	-0,8%	0,3%	-0,5%	3,8%	2,6%	0,9%	3,5%	3,9%	5,3%	1,0%	-5,1%	-2,2%	13,1%	22,3%	13,5%	-7,2%	-2,2%
Consultant - actual notional interest	Loan to Income	5,3	5,2	5,1	4,9	4,9	5,0	5,1	5,1	5,2	5,3	5,5	5,3	4,9	4,7	88,5	108,7	96,0	88,3	95,4
Consultant - actual notional interest	Houseprice index (2013 = 100)	117,2	114,4	107,0	100,0	100,8	103,7	108,9	117,2	127,8	136,6	147,2	169,5	195,6	195,6	166,9	169,5	195,6	115,4	100,0
Consultant - actual notional interest	Maximum loan amount(2013 = 100)	100,3	100,5	99,7	100,0	99,5	103,3	106,0	107,0	110,7	115,1	121,1	122,3	116,1	113,5	113,1	122,3	113,5	92,8	97,8
Consultant - actual notional interest	Relative purchase power(2013 = 100)	85,6%	87,9%	93,2%	100,0%	98,7%	99,6%	97,3%	91,3%	86,7%	84,2%	82,3%	72,2%	59,3%	58,0%	67,8	72,2	58,0	80,4	97,8
Education - actual notional interest	Total Income	30.870	31.275	31.726	32.283	32.602	33.418	34.194	33.875	34.486	34.917	36.768	37.073	38.000	38.950	126,2	114,8	120,7	105,1	102,5
Education - actual notional interest	Maximum mortgage loan	145.225	139.081	139.690	141.215	145.482	147.566	150.068	150.035	153.100	155.606	170.738	170.303	165.127	161.455	111,2	120,6	114,3	94,8	97,8
Education - actual notional interest	% change in maximum loan		-4,2%	0,4%	1,1%	3,0%	1,4%	1,7%	0,0%	2,0%	1,6%	9,7%	-0,3%	-3,0%	-2,2%	11,2%	20,6%	14,3%	-5,2%	-2,2%
Education - actual notional interest	Loan to Income	4,7	4,4	4,4	4,4	4,5	4,4	4,4	4,4	4,4	4,5	4,6	4,6	4,3	4,1	88,1	105,0	94,8	90,2	95,4
Education - actual notional interest	Houseprice index (2013 = 100)	117,2	114,4	107,0	100,0	100,8	103,7	108,9	117,2	127,8	136,6	147,2	169,5	195,6	195,6	166,9	169,5	195,6	115,4	100,0
Education - actual notional interest	Maximum loan amount(2013 = 100)	102,8	98,5	98,9	100,0	103,0	104,5	106,3	106,2	108,4	110,2	120,9	120,6	116,9	114,3	111,2	120,6	114,3	94,8	97,8
Education - actual notional interest	Relative purchase power(2013 = 100)	87,7%	86,1%	92,5%	100,0%	102,2%	100,7%	97,6%	90,6%	84,8%	80,7%	82,1%	71,1%	59,8%	58,4%	66,6	71,1	58,4	82,1	97,8