Moody's Analytics

ANALYSIS
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COVID-19: 360° View of the Dutch Mortgage Market

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INTRODUCTION

Like other countries, the Netherlands is experiencing a severe recession caused by the COVID-19 global pandemic. Moody's Analytics analyzed the impact of the economic stress on the performance of Dutch mortgages. In this paper we leveraged models of risk parameters that are linked to economic drivers at the national and regional levels. We generate vectors of probability of default (PD) and loss given default (LGD), and then project expected losses while taking into account 'Nationale Hypotheek Garantie' (NHG), a guarantee of Dutch mortgage loans. Using quantitative and qualitative stage allocation, we also calculate expected losses according to the IFRS 9 regulation and forecast impairments one year ahead. Finally, we conduct simulations of 12-month expected losses and assign ratings to loans based on a five-year expected loss. The PDs and LGDs rise and so do expected losses, because of a shift in the drivers of the economic distribution both in the baseline and in the alternative scenarios (upside and downside). The distribution of the expected losses shifts as well, with mean losses to be greater under each scenario. However, the impact on provisions and ratings is limited because of the NHG and a relatively modest increase in the Dutch unemployment rate.

COVID-19: 360° View of the Dutch Mortgage Market

BY JUAN LICARI, PETR ZEMCIK, BRENDA SOLIS GONZALEZ, AND VLADIMIR KRECMER

Like other countries, the Netherlands is experiencing a severe recession caused by the COVID-19 global pandemic. Moody's Analytics analyzed the impact of the economic stress on the performance of Dutch mortgages. In this paper we leveraged models of risk parameters that are linked to economic drivers at the national and regional levels. We generate vectors of probability of default (PD) and loss given default (LGD), and then project expected losses while taking into account 'Nationale Hypotheek Garantie' (NHG), a guarantee of Dutch mortgage loans. Using quantitative and qualitative stage allocation, we also calculate expected losses according to the IFRS 9 regulation and forecast impairments one year ahead. Finally, we conduct simulations of 12-month expected losses and assign ratings to loans based on a five-year expected loss. The PDs and LGDs rise and so do expected losses, because of a shift in the drivers of the economic distribution both in the baseline and in the alternative scenarios (upside and downside). The distribution of the expected losses shifts as well, with mean losses to be greater under each scenario. However, the impact on provisions and ratings is limited because of the NHG and a relatively modest increase in the Dutch unemployment rate.

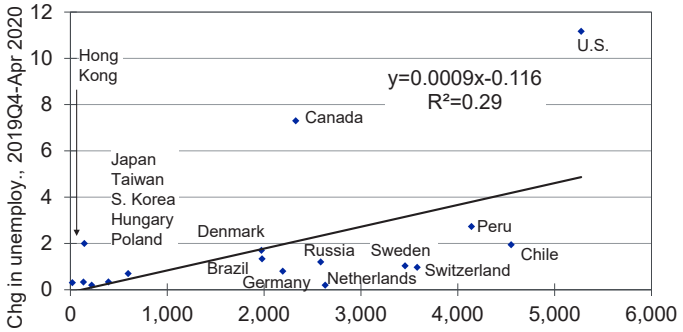
National and regional economic outlook for the Netherlands

We start with an economic forecast from the Moody's Analytics Global Macroeconomic Model that embeds the Netherlands. Global assumptions regarding the pandemic are combined with assumptions at the euro area and country levels to produce projections of key economic drivers such as GDP, the unemployment rate, and house price indexes. Some indicators such as unemployment rate and HPI are produced at the subnational level, which helps to inform the projections of risk parameters. We generate both baseline forecasts and alternative upside and downside scenarios. Assumptions regarding the pandemic evolution drive the forecast.

Chart 1 illustrates the relationship between the number of infections per 1 million inhabitants and the change in the unemployment rate between December 2019 and April 2020, for countries where such data are available. According to Worldometer, in the Netherlands the number of deaths per 1 million population due to COVID-19 is 355. This is better than the 628 in the U.K. but worse than the 46 in Norway. As the pandemic has been easing in the Netherlands, restrictive social measures have been lifted. Restaurants, cafés, bars and hotels can allow 30 guests or fewer indoors (without this restriction outdoors), with social distancing of 1.5 meters apart. Nightclubs and similar venues will remain closed until at least September 1. The Dutch unemployment rate rose only 0.2 percentage point, from 3.2% in December to 3.4% in April. It was 3.6% in May. The relatively low impact on the job market is in part thanks to the government's

Chart 1: More Infections, Worse Downturn

Confirmed infections per mil inhabitants



Sources: Government sources, WHO, Moody's Analytics

Table 1: Unemployment Rate Will Reach 7.6%

Country	Unemployment, %, 2019Q4	Max of 2020-2022 unemployment (Feb) Value	Max of 2020-2022 unemployment (Feb) Date	Max of 2020-2022 unemployment (Jun) Value	Max of 2020-2022 unemployment (Jun) Date
Germany	5.00	5.36	2022Q4	6.36	2020Q4
United Kingdom	3.80	4.64	2022Q4	8.45	2021Q1
France	8.10	8.51	2020Q1	11.04	2020Q3
Greece	16.53	16.34	2020Q1	21.15	2020Q3
Spain	13.81	14.06	2020Q2	24.02	2020Q2
Italy	9.57	10.52	2022Q4	13.16	2020Q4
Netherlands	3.40	4.48	2021Q3	7.60	2021Q2
Portugal	6.62	6.29	2020Q1	9.86	2020Q3
Russian Federation	4.58	5.78	2021Q1	6.71	2020Q3
Poland	2.85	3.91	2022Q4	6.82	2021Q3
United States	3.53	4.37	2022Q2	14.04	2020Q2

Sources: European Data Warehouse, Moody's Analytics

fiscal measures to support the economy and to policies by the European Central Bank such as the Pandemic Emergency Purchase Programme.

We compare our current economic forecast from June to our pre-pandemic forecast in February. We contrast the unemployment rate in 2019Q4 with the average unemployment rate over the period of 2020Q1-2022Q4, taking the long-term view to focus on the long-term impact. In February, we forecast the unemployment rate to reach 4.48% in 2021Q3 (see Table 1). The current expectation is that the unemployment rate will hit 7.6% in 2021Q2. This is lower than that in countries such as Italy and Spain and on par with rates in Germany and Poland, for example. The Netherlands' GDP was forecast in February to grow at an annual rate of 2.1% over the next three years, in sharp contrast to growth of 0.7% from June (see Chart 2).

However, Moody's Analytics forecasts a GDP contraction of 6.4% in 2020.

The forecast for 2020 and especially for the second quarter poses a challenge because of the evolution of the pandemic and restrictions on economic activity. Although we are close to the end of the second quarter, the GDP values come with a delay. To estimate the value in the second quarter, we convert assumptions regarding the pandemic into a GDP path by looking at the industry breakdown of GDP in the Netherlands combined with capacity utilization for each industry, reflecting economic restrictions (see Chart 3). Industries well below the usual capacity include manufacturing and accommodation. The second-quarter decline is estimated to be 11.6%, followed by a recovery of 7.8% in the third quarter. The long-term level of GDP is below its normal level because of the expected management of outbreaks of the disease. We expect a vaccine and other treatment to be available within the next 12 to 18 months.[1]

The national forecast is extended to Dutch regions. The models linking the macroeconomic to subnational drivers are also part of a simulation engine that we will employ later. We first illustrate regional shocks to the unemployment rates for the Dutch NUTS 3[2] COROP[3] regions (see Chart 4). Unemployment rates rise above 7.5% in the regions East Groningen and Rest of Groningen. Real HPI is available at the NUTS 2 level, which corresponds to the Dutch provinces. Chart 5 focuses on the baseline forecast from June, in contrast to 2019Q4. House prices are expected to decline in

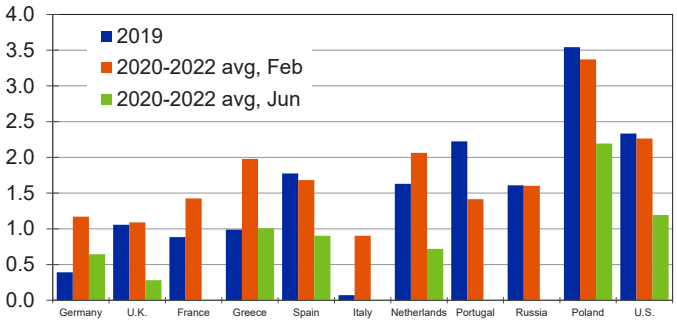
1 Dexamethasone has already been shown in a U.K. clinical trial to reduce the number of deaths among the sickest patients.

2 Nomenclature of Territorial Units for Statistics.

3 Coordination Commission Regional Research Programme.

Chart 2: GDP Growth Will Be Softer

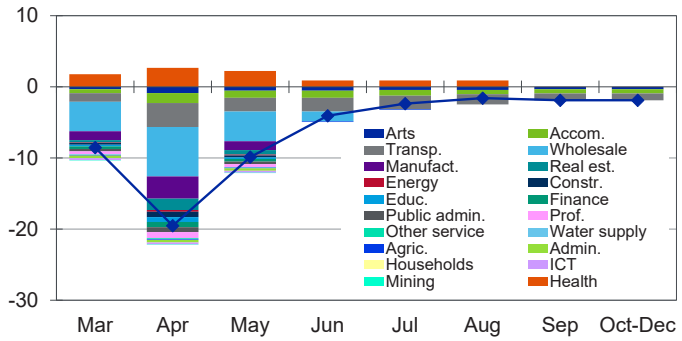
Shift of baseline scenarios, real GDP growth, % change yr ago



Sources: Eurostat, Moody's Analytics

Chart 3: Netherlands GDP Plunges in Q2

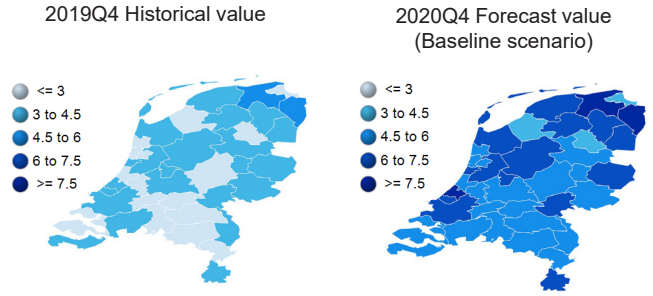
Deviation from normal level of activity, ppts, by industry, 2020



Sources: Statistics Netherlands, Moody's Analytics

Chart 4: Regional Shocks to Unemployment

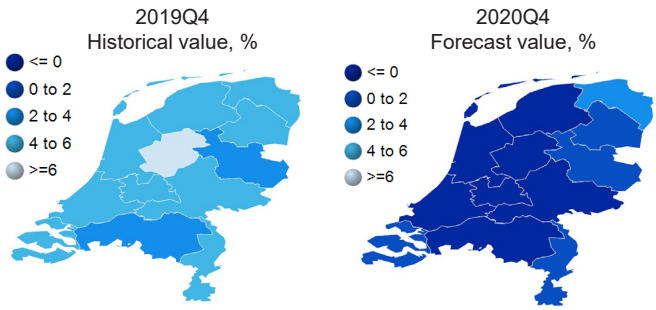
Netherlands NUTS 3 regions, % change



Sources: Statistics Netherlands, Moody's Analytics

Chart 5: Regional Shocks to Real HPI

Netherlands NUTS 2 regions, % change



Sources: Statistics Netherlands, Moody's Analytics

many provinces including North-Holland, South-Holland and Utrecht.

In addition to our baseline forecast, we also generate upside and downside alternative scenarios. The scenarios differ based on global and country-specific assumptions with respect to the pandemic's evolution, as well as on assumptions regarding global oil prices, key interest rates, and trade agreements. For example, Brexit is likely to hurt the Netherlands economy. We define severity as the probability that the average standard deviation from the GDP baseline is greater than in a given scenario, according to 10,000 simulations of a three-year GDP path. In Chart 6, we see a large shift of the baseline from February to May. We denote S3 as a scenario with a severity of 10% (1-in-10 recession) and S4 as a scenario with a severity of 4% (1-in-25 recession). The May baseline is fairly close to the February S3. This implies that the Netherlands is currently experiencing a 1-in-10 recession. The GDP path is converted into the HPI path in Chart 7. There is a clear downward shift in all scenarios between February and May. To ensure that our alternative scenarios are consistent with the baseline forecast, we use a May vintage of Moody's Analytics forecasts. However, the update of the June forecast is fairly minor and unlikely to have a large impact on our subsequent analysis.

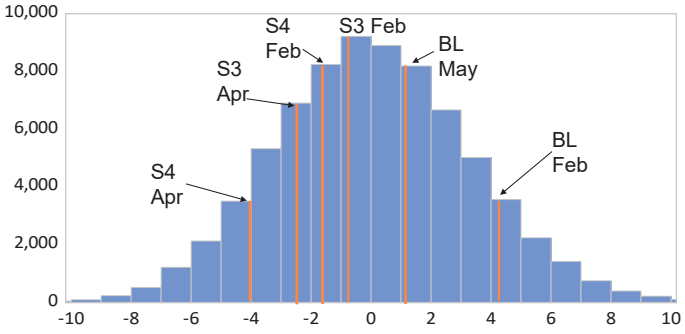
Rising PD and LGD forecasts for the Dutch mortgage market

The projections for economic drivers at the Dutch national and regional levels are used as inputs in the Moody's Dutch Portfolio Analyzer (MPA). The modular structure of the MPA tool is depicted in Chart 8. The econometric models consist of master-loan-level models for probability of default and loss given default, while the prepayment model is at the loan level. We use panel logit hazard models for probability of default and prepayment, and a simple level regression for loss given default. The exposure at default is calculated using an amortization schedule. The data used for building the models consist of monthly loan-level origination and performance data for residential-mortgage-backed-securities transactions, or RMBS, obtained from the European Data Warehouse. The historical data and scenarios of the macroeconomic indicators come from the Moody's Analytics Global Macroeconomic Model. The dataset includes more than 2 million master loans and 3.8 million loan parts.

The models for risk parameters are integrated to produce a loan-level forecast for each of the metrics and cashflow across alternative scenarios. The output is combined to generate scenario-dependent pool-level cashflows and expected credit losses of residential mortgage portfolios. We further take the trajectories of the economic scenarios to simulate a corresponding default event, prepayment event, and loss given default. These are aggregated to produce the simu-

Chart 6: Severity of Alternative Scenarios

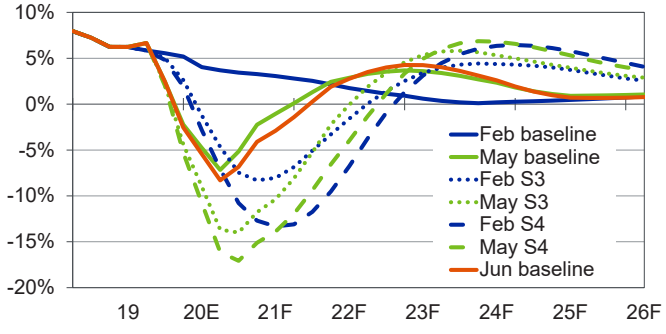
Avg deviation from baseline, %



Source: Moody's Analytics

Chart 7: Prices Decline Across Scenarios

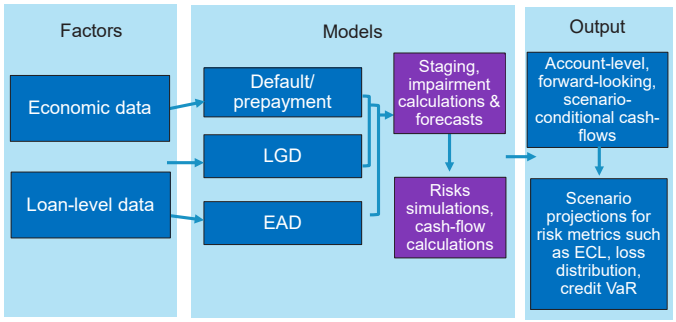
House price appreciation, % change yr ago



Sources: Statistics Netherlands, Moody's Analytics

Chart 8: Dutch Mortgage Portfolio Analyzer

Modular structure



Source: Moody's Analytics

lated losses across all loans in the portfolio for each of these trajectories. Losses are also aggregated across all trajectories to produce an estimate of the distribution of portfolio-level losses.

The models include borrower characteristics such as employment status, borrower age and income, and whether the customer has a secondary income or not. Property characteristics contain property type, occupancy, and the geographical location. The loan characteristics fields cover mortgage type, interest rate, loan term, and existence of guarantees such as the NHG. We also follow delinquency metrics such as arrears status. The key economic drivers are interest rates, GDP, house price index, and unemployment rates at the subnational level.

We concentrate on changes in the forecast of the probability of default and loss given default between the scenarios from February, pre-pandemic, and the scenario forecast from May with pandemic assumptions embedded in the predictions. We run the analysis with data of residential mortgages from EDW using a data snapshot from December 2019 with more than 83,000 loans and an exposure of more than €7 billion (see Table 2). With respect to loan performance, we observe that a majority of the loans are current and less than 1% are in arrears or in default. Because of a lag in data-processing, we had only partial information available for a snapshot in March. However, an analysis of this snapshot indicates that the portion of nonperforming loans is even smaller in this case, as performance is likely to be affected only in the second quarter, with additional delays due to payment holidays. This implies that the results are driven mainly by the shift in economic conditions and not by a change in the underlying representative portfolio.

The analysed portfolio consists of very-low-risk borrowers across different provinces in the Netherlands, and includes NHG-backed mortgages and mortgage loans excluding NHG. In the sample, 35% of loans have NHG coverage and represent 30% of the exposure, versus 65% of loans excluding NHG and representing 70% of the total exposure in the snapshot (see Chart 9). More than 70% of the outstanding balance has an LTV above 80% and around 11% has an LTV of less than 60% (see Chart 10), while 90% of the borrowers are either employed or self-employed and around 4% are either pensioners or unemployed (see Chart 11).

Table 2: Representative Portfolio Snapshot Exposure (€7,395,141,163)

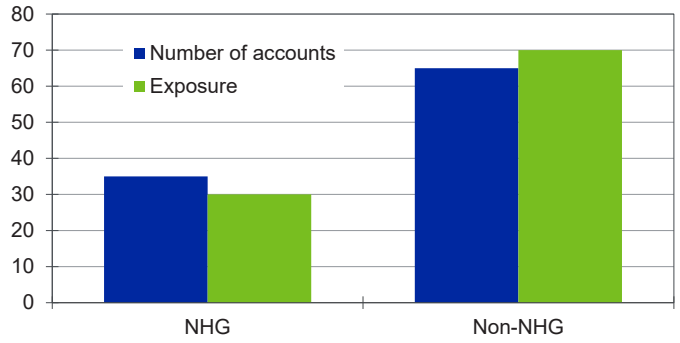
Loan status, Dec 2019

Reported status	#	%
Current	82,343	99.13
30 DPD	492	0.59
60 DPD	115	0.14
Defaulted	118	0.37
Total	83,068	100.00

Sources: European Data Warehouse, Moody's Analytics

Chart 9: NHG Guarantees

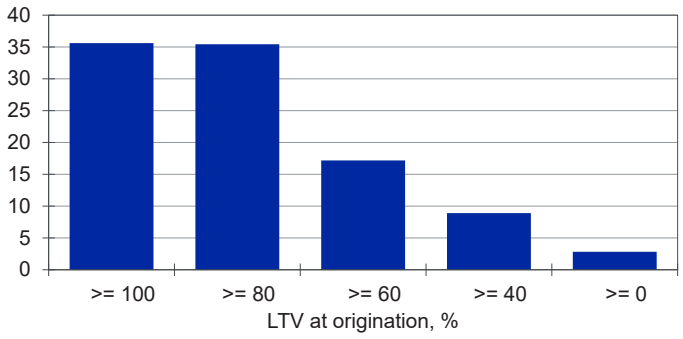
% of total



Sources: European Data Warehouse, Moody's Analytics

Chart 10: LTV at Origination

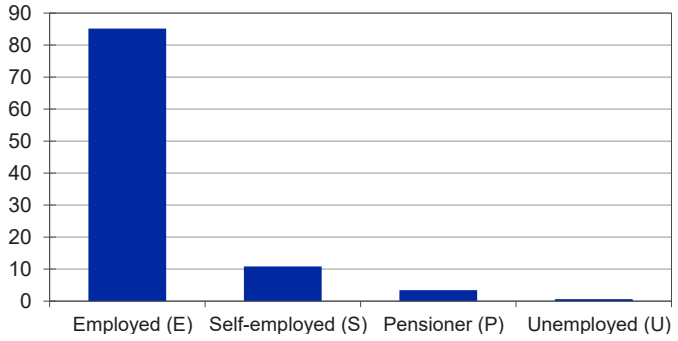
Origination exposure, % of total



Sources: European Data Warehouse, Moody's Analytics

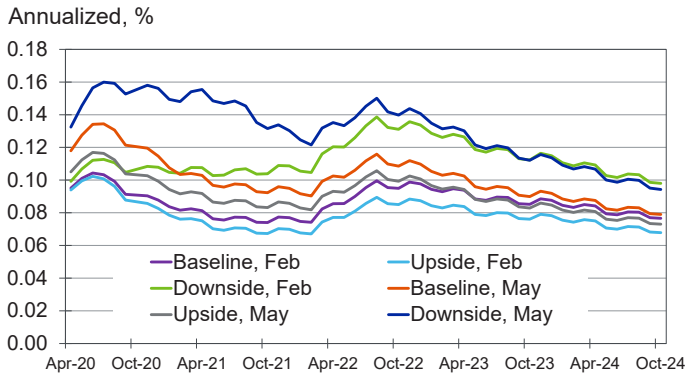
Chart 11: Employment Status at Origination

New applications, % of total



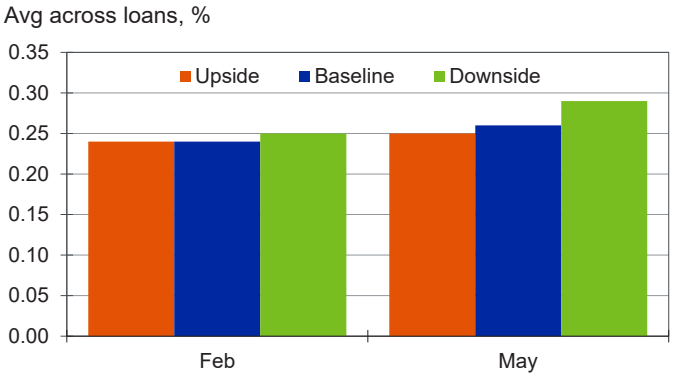
Sources: European Data Warehouse, Moody's Analytics

Chart 12: Conditional PD Forecast



Sources: European Data Warehouse, Moody's Analytics

Chart 13: 12-Month PD



Sources: European Data Warehouse, Moody's Analytics

Chart 12 displays the annualized conditional PD forecast for the baseline, downside (S3) and upside (S1) scenarios from February and May. The PD is seasonally adjusted by using a six-month moving average. At a portfolio level, the forecast dynamics are mainly driven by changes in house prices and unemployment at a regional level. Because of worsening economic conditions, there is an upward shift between the baseline forecast from February and the baseline and alternative upside and downside scenarios from May, which already incorporate the impact of the pandemic.

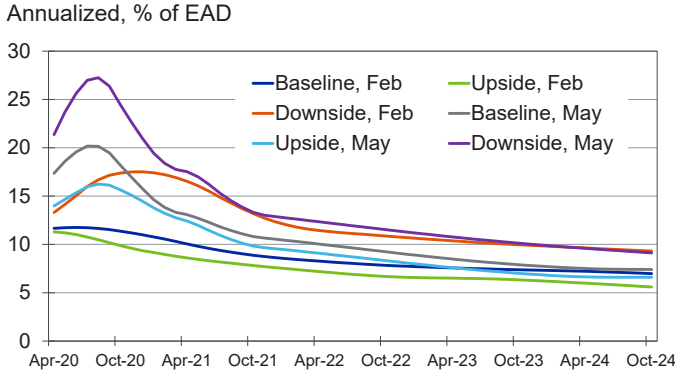
In February's projection, the baseline PD forecast peaks at 0.11% in the second half of 2020. In contrast, the May baseline projection peaks at 0.134% in the same period, which is similar to the peak of the probability of default in the February downside projection depicted in the same chart. The peak of the PD forecast for the May projection in the downside scenario reaches 0.16% in the second half of 2020. The same result is also visible in the pattern in the 12-month PD, illustrated in Chart 13. The baseline 12-month PD in May is higher than the downside scenario from February, and with a similar level as the upside scenario in May.

With regards to the loss given default forecast, the analysis resulted in a similar qualitative outcome. However, the impact in levels almost doubles. Chart 14 shows the six-month moving average loss given default forecast while Chart 15 depicts the losses across scenarios by loan-to-value ratio. In February, the baseline LGD forecast peaks at 12% in the first half of 2020, while the May baseline projection peaks at 21% at the beginning of the second half of the same year. The peak of loss given default in the February downside scenario is lower than the May baseline forecast: 18% at the end of the second quarter versus 21% in the same period, respectively. Moreover, the peak of the downside scenario rises above 27% in the second half of this year. Regarding the expected losses by loan-to-value ratio, the results suggest that for loans with an LTV ratio of less than 40%, the losses more than doubled across the scenarios. For loans with an LTV above 40%, the increase in losses is around 50% across scenarios. These results are mainly explained by the projected decline of the house price index and unemployment rate for all the scenarios, including the upside one.

Impact of COVID-19 on IFRS 9 impairments in 2020 and 2021

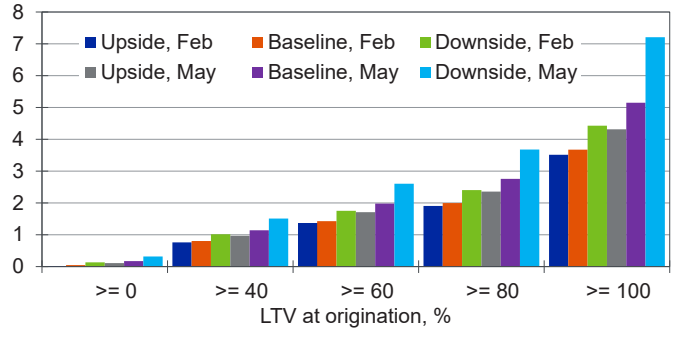
We also illustrate how the shift in the current macroeconomic environment has affected expected credit losses calculated according to the IFRS 9 regulation. The first step in this calculation is allocation of accounts to stages based on a change in credit risk. If there is a significant increase in credit risk (SICR), an account is allocated to Stage 2

Chart 14: LGD Forecast



Sources: European Data Warehouse, Moody's Analytics

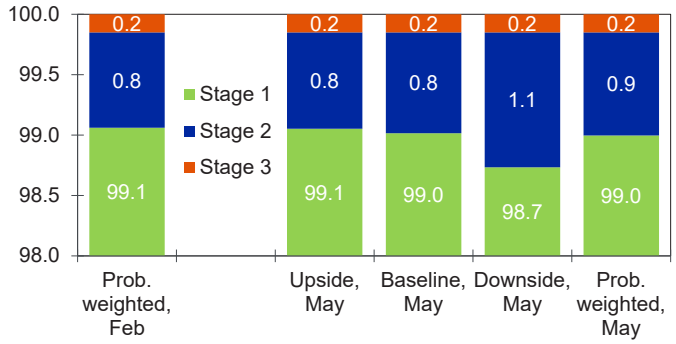
Chart 15: Losses by LTV



Sources: European Data Warehouse, Moody's Analytics

Chart 16: Stage Allocation Adjustment

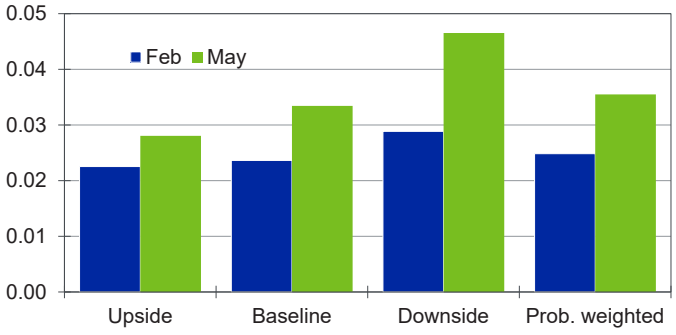
Distribution of exposures across stages per scenario, %



Sources: European Data Warehouse, Moody's Analytics

Chart 17: Impact of COVID-19 on ECL

Expected credit loss over exposures, %



Sources: European Data Warehouse, Moody's Analytics

even if it is not in default. We measure SICR using a quantitative approach, followed by applying a set of qualitative rules used by the European Banking Authority. The second step in the ECL calculation adjusts the future cashflows by an effective rate of interest to calculate their present value. We calculate the ECL for each of the three scenarios and weight them by 30% for the upside and downside scenarios and by 40% for the baseline scenario.

Our quantitative stage rules compare a lifetime PD at observation with a lifetime PD at origination adjusted for time on books. If the PD at observation is greater than the PD at origination by a certain threshold, there is a SICR. The threshold ('buffer') is derived by maximizing the discriminatory power of the staging rule over a 12-month window. In other words, Stage 1 accounts are likely to be performing and Stage 2 accounts are more likely to default. The EBA qualitative overlay keeps accounts with a very low level of absolute risk, defined as less than 30 basis points for 12-month PD, in Stage 1. Accounts with a high level of absolute risk, greater than 20% for 12-month PD, are in Stage 2. In terms of relative risk, if the lifetime PD at observation is greater than the lifetime PD at origination by more than 200%, an account is transferred to Stage 2.

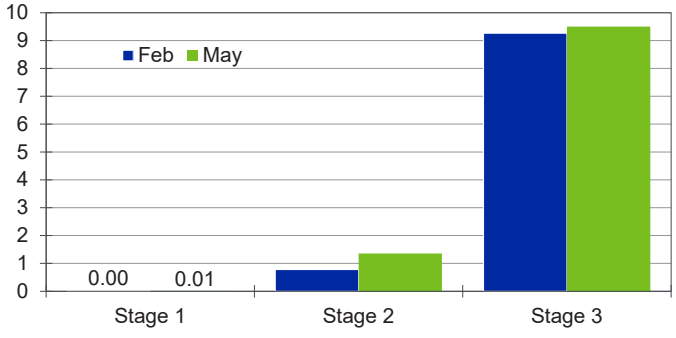
Chart 16 shows the distribution of exposure across the stages for each of the scenarios under analysis and the distribution of the exposures using probability-weighted lifetime PD for staging. We see a stable amount of exposures in Stage 3 since we are using the same sample of loans with the same loan-level information and only changing the economic paths. In line with our previous results, the distribution of exposure across stages for the probability-weighted results in February is similar to the upside results given the current economic conditions. As for the May scenarios, a higher amount of exposures is transferred into Stage 2 while the amount of exposures in Stage 1 is reduced.

Chart 17 displays changes on the expected credit losses over exposure across the scenarios. The greatest increase in the ECL is observed for the downside scenario, as the ECL increases from 0.03% in February to 0.05% in May. This is mainly because of a large exposure of 1.117% in Stage 2). As a result of increasing ECL across all scenarios, the probability-weighted ECL doubles from 0.02% in February to 0.04% in May. Chart 18 looks at ECL as a percentage of exposure by stages. The ECL increases in all stages between February and May.

The Nationale Hypotheek Garantie (NHG) is a loan insurance scheme in the Netherlands. It covers the outstanding principal, accrued unpaid interest, and disposal costs. We investigate what is the relationship between impairments for accounts covered by NHG and those not covered. NHG mainly restricts LGD, although

Chart 18: ECL Increases Across Stages

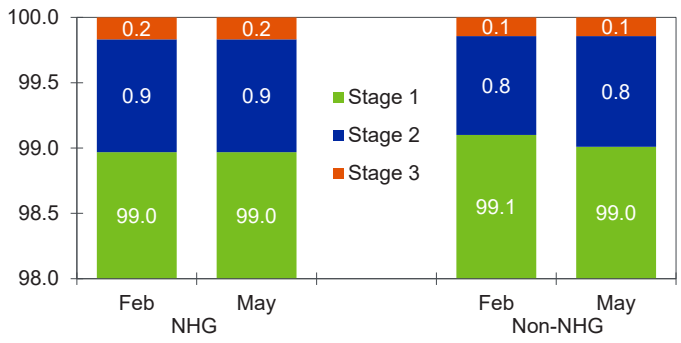
Expected credit loss by stage, % of exposure



Sources: European Data Warehouse, Moody's Analytics

Chart 19: NHG Impact on Stage Allocation

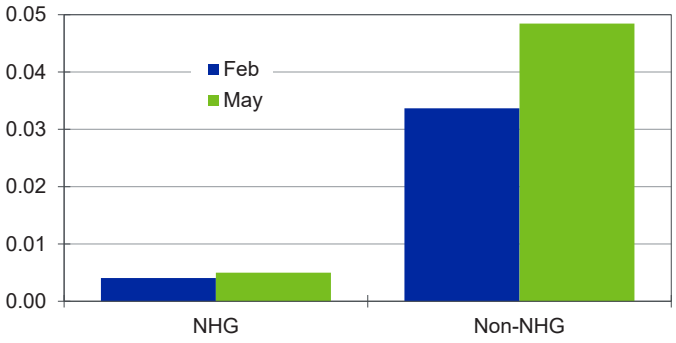
Distribution of exposures, probability-weighted results, % of total



Sources: European Data Warehouse, Moody's Analytics

Chart 20: NHG Impact on ECL

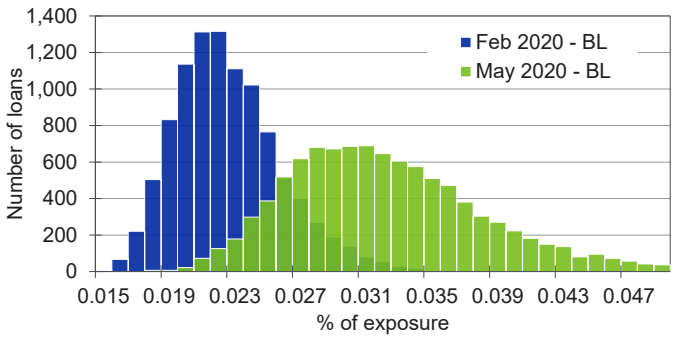
Expected credit losses over exposures, %



Sources: European Data Warehouse, Moody's Analytics

Chart 21: EL Across Vintages–Baseline

12-mo expected loss, VaR approach, baseline scenario



Sources: European Data Warehouse, Moody's Analytics

there is a correlation with PD as well that reflects conditions for NHG coverage. These favour less risky loans. As the losses are limited, there is no impact of NHG on staging (see Chart 19). On the other hand, the relative exposure of Stage 2 accounts has increased from 76 basis points in February to 85 basis points in May. As Chart 20 shows, the overall ECL for NHG-covered accounts increased by 22%, from 0.0041% in February to 0.005% in May. This is mainly via the greater PDs. The ECL of non-NHG covered accounts increased by 43.6%, from 0.0337% in February to 0.0484% in May.

We also forecast impairments according to the rules of the stress test conducted by the European Banking Authority. The EBA assumptions include no cure and a static balance sheet. The stress test was cancelled in mid-March because of the COVID-19 pandemic. The key reason is that the stress scenario was not sufficiently severe and did not correspond to the projections, taking into account the economic impact of the epidemic. However, our forecasts do include this impact and we can therefore forecast impairments one year ahead. We focus on ECL at the end of the first quarter and therefore compare ECL in March 2020 with ECL in March 2021, using macroeconomic projections from May.

To forecast impairments, we leverage on the conditional 12-month point-in-time (PiT) PD obtained from the Moody's Dutch MPA, the IFRS 9 staging criteria, and the 3x3 Trough the Cycle (TTC) transition matrix of days past due (fewer than 30, 31-90, and more than 90). We calibrate this TTC transition matrix to the 12-month conditional PiT PDs one year ahead based on a "Z-factor shifting approach" that captures the deviation between yearly migration matrixes and the long-run average. The stressed TTC transition matrix is therefore conditional on the May macroeconomic projections. Table 3 presents the results of this exercise. The overall ECL jumps by 56.1%, or €2,471,845 to €3,858,662. This large increase in ECL is driven by more accounts with greater losses in default (Stage 3).[4]

Living through a real-life stress test: Expected and unexpected losses

So far, we have looked at expected losses (EL) conditional on macroeconomic projections. These can be computed either by using the IFRS 9 regulation as described above or simply by looking at the product of PD and LGD across time. To characterize unexpected losses, we generate a distribution of EL using a simulation of the underlying economic drivers anchored by a given scenario.

We focus on the 12-month outcome window, which is a natural point of comparison for internal ratings-based, stress-testing, and IFRS 9 perspectives. The 12-month PD under economic stress can be contrasted as a benchmark to a portfolio or account-level 12-month PD from IRB models. As the ECL for Stage 1 accounts in IFRS 9 calculation is only computed for one year, the 12-month period puts all accounts in the same category. Also, we concentrate on EL in our analysis, as losses are limited by the NHG guarantees and are a better measure of risk as compared with the 12-month PD.

4 Table 3 results do not require staging at account level, but this is often needed to forecast exposures by stages for additional years, depending on methodology. When determining the transition at account level, we select the accounts by rank-ordering based on their 12-month PD, ensuring the aggregate exposure by stages is preserved.

Table 3: Stressing Impairments
ECL & staging for 31/03/2021 vs. 31/03/2020

IFRS 9 stage 31/03/2020	#	%	Exposure	ECL %	ECL €
1	82,332	99.02	€ 7,322,327,200	0.01	€ 648,822
2	618	0.83	€ 61,713,978	1.25	€ 768,584
3	118	0.15	€ 11,099,985	9.5	€ 1,054,439
		Total	€ 7,395,141,163	0.03	€ 2,471,845

IFRS 9 stage 31/03/2021	#	%	Exposure	ECL %	ECL €
1	82,747	99.39	€ 7,298,659,826	0.01	€ 372,567
2	154	0.35	€ 25,491,575	2.75	€ 700,215
3	167	0.26	€ 19,356,892	14.39	€ 2,785,880
		Total	€ 7,343,508,293	0.05	€ 3,858,662

Sources: European Data Warehouse, Moody's Analytics

Table 4: Simulations—Distribution of Conditional Expected Losses

12-mo expected losses, Value at Risk approach

Dutch MPA - Feb 2020 Vintage		Dutch MPA - May 2020 Vintage	
Loss Summary Baseline Feb 2020		**Loss Summary Baseline May 2020**	
Expected loss	0.0231	Expected loss	0.033
Loss Summary S3 Feb 2020		**Loss Summary S3 May 2020**	
Expected loss	0.0275	Expected loss	0.0527
Loss Summary S4 Feb 2020		**Loss Summary S4 May 2020**	
Expected loss	0.0306	Expected loss	0.1011
Aggregate Statistics Feb 2020 – BL		**Aggregate Statistics May 2020 – BL**	
Simulations	10,000	Simulations	10,000
Mean	0.0231	Mean	0.033
SD	0.0032	SD	0.0068
IQR	0.0042	IQR	0.008
Skewness	0.7191	Skewness	1.6842
Kurtosis	0.7368	Kurtosis	8.2953
95th/50th Pct	1.2845	95th/50th Pct	1.404
Value at Risk		**Value at Risk**	
50%	0.0227	50%	0.032
75%	0.025	75%	0.0364
90%	0.0274	90%	0.0412
95%	0.0292	95%	0.045

Sources: European Data Warehouse, Moody's Analytics

Table 4 reports the results. The mean of conditional EL increases by 42.9%, from 0.0231% in February to 0.033% in May. Both means are close to the corresponding medians, also shown in Table 4. Chart 21 illustrates how the distribution shifted and its variance increased between February and May. The increase of the mean of conditional EL is even more dramatic in the downside scenarios. It increases by 91.6% for the 1-in-10 recession S3 and by a whopping 230.4% for the 1-in-25 recession S4. Chart 22 again shows the shift of the distribution, this time for the downside scenario S3. The probability that 12-month EL is greater than 0.0292% is 5% based on simulations linked to February projections. So, the value at risk (VaR) for the February macroeconomic projections is 0.0292% at 5% probability. Similarly, it is 0.045% using May projections. The VaR measure has therefore increased by 54.1%.

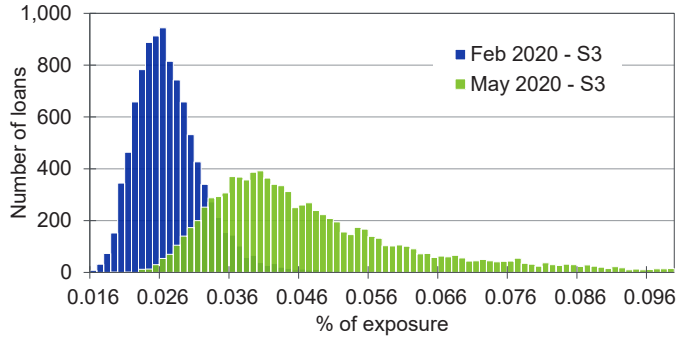
We also look at the distribution of accounts by ratings, using the Moody's Idealized Cumulative Expected Loss years over five years to gain a longer-term perspective.[5] The rating based on Els is again preferable to properly account for NHG guarantees. For example, the five-year EL for Aaa rating is 0.0016% and for Ca rating is 55%.

The distribution for investment-grade ratings under the baseline scenario in Chart 23 does not change dramatically using February or May projections. However, Chart 24 shows that there is a small increase by tens of accounts in the lower ratings under IG-rated accounts. Chart 25 illustrates that the distribution of ratings for IG accounts remains stable for the two projections, but the number of accounts below IG ratings increases by the hundreds in Chart 26.

5 Please note that these ratings are not the ratings produced by Moody's Investors Service, as Moody's Analytics operates independently.

Chart 22: EL Across Vintages Under Stress

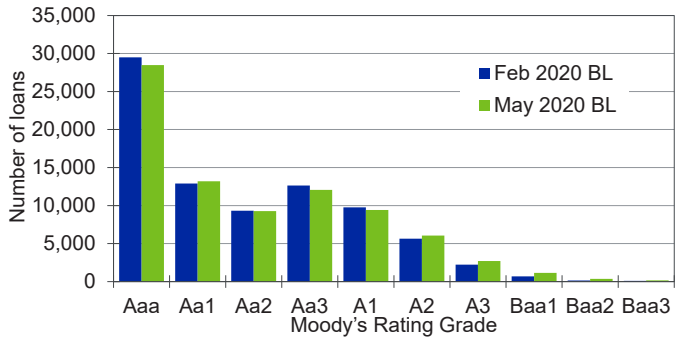
12-mo expected loss, VaR approach, S3 stress scenario



Sources: European Data Warehouse, Moody's Analytics

Chart 23: Ratings Distribution–IG Baseline

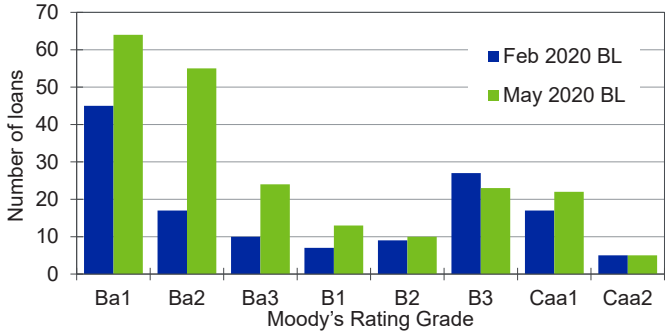
Scenario and vintage comparison based on 5-yr ELs



Sources: European Data Warehouse, Moody's Analytics

Chart 24: Ratings Distribution–Below IG

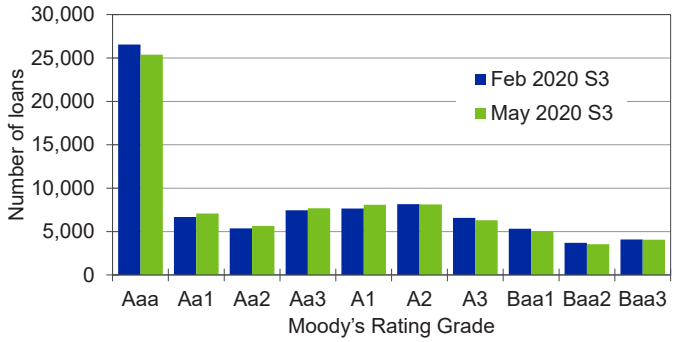
Scenario and vintage comparison based on 5-yr ELs



Sources: European Data Warehouse, Moody's Analytics

Chart 25: Ratings Distribution–IG Stress

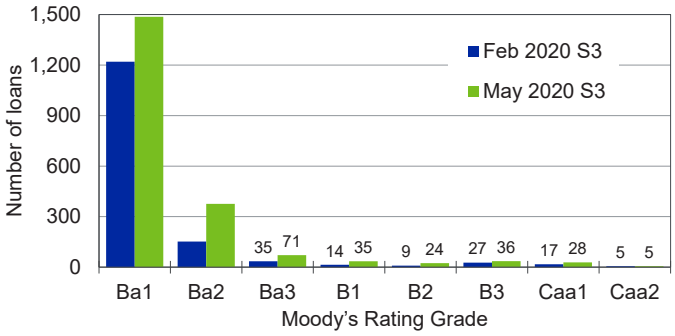
Scenario and vintage comparison based on 5-yr ELs



Sources: European Data Warehouse, Moody's Analytics

Chart 26: Ratings Distribution–Below IG Stress

Scenario and vintage comparison based on 5-yr ELs



Sources: European Data Warehouse, Moody's Analytics

Summary

We have investigated the impact of the pandemic-induced recession on the Dutch mortgage market. The dramatic recession in 2020 is likely to be followed by faster growth in 2021, which will somewhat mitigate the impact of the initial shock. Projections of risk parameters linked to underlying economic drivers such as PD and LGD increase because of a shift in economic conditions. Subsequently, the IFRS 9 provisions increase between February and May as the economic outlook has worsened. One-year-ahead impairments will rise as well, although the impact of the recession is reduced by the presence of NHG, which reduces LGD. Finally, 12-month PD rises dramatically in 2020 but ratings based on five-year EL shift moderately, again because of NHG.

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Dr. Juan M. Licari is a managing director at Moody's Analytics in the London office. He is the global head of the Business Analytics team consisting of risk modellers, economists, and statisticians in the U.K., the U.S., China, UAE, the Czech Republic and Singapore. Dr. Licari's team provides consulting support to major industry players, builds econometric tools to model credit phenomena, and implements several stress-testing platforms to quantify portfolio risk exposure. His team is an industry leader in developing and implementing credit solutions that explicitly connect credit data to the underlying economic cycle, allowing portfolio managers to plan for alternative macroeconomic scenarios. Dr. Licari has extensive hands-on experience as a project lead with respect to development, validation, calibration and monitoring of internal ratings-based models, IFRS 9 and stress-testing credit risk models especially for U.K. banks and financial institutions, for both retail and corporate portfolios. Dr. Licari is actively involved in communicating the team's research and methodologies to the market, including senior management and board members. He often speaks at credit events and economic conferences worldwide. Dr. Licari holds a PhD and an MA in economics from the University of Pennsylvania and graduated summa cum laude from the National University of Cordoba in Argentina.

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