

UBS AG
Form 424B2
January 23, 2019

PRICING SUPPLEMENT

Dated January 18, 2019
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Registration Statement No. 333-225551

(To Prospectus dated October 31, 2018

and Product Supplement dated October 31, 2018)

UBS AG \$2,000,000 Trigger Autocallable Contingent Yield Notes

Linked to the shares of the SPDR[®] S&P[®] Oil & Gas Exploration & Production ETF due January 21, 2022

Investment Description

UBS AG Trigger Autocallable Contingent Yield Notes (the “Notes”) are unsubordinated, unsecured debt securities issued by UBS AG (“UBS” or the “issuer”) linked to the shares of the SPDR[®] S&P[®] Oil & Gas Exploration & Production ETF, an exchange-traded fund (the “underlying asset”). We also refer to an exchange-traded fund as an “ETF” herein. UBS will pay a contingent coupon on the coupon payment date only if the closing level of the underlying asset on the applicable observation date (including the final valuation date) is equal to or greater than its coupon barrier. Otherwise, no contingent coupon will be paid for the relevant coupon payment date. UBS will automatically call the Notes early if the closing level of the underlying asset on any observation date prior to the final valuation date is equal to or greater than its initial level. If the Notes are subject to an automatic call, UBS will pay on the applicable coupon payment date following such observation date (the “call settlement date”) a cash payment per Note equal to your principal amount plus the contingent coupon otherwise due, and no further payments will be owed to you under the Notes. If the Notes are not subject to an automatic call and the closing level of the underlying asset on the final valuation date (the “final level”) is equal to or greater than its downside threshold, UBS will pay you a cash payment per Note equal to the principal amount. If, however, the Notes are not subject to an automatic call and the final level of the underlying asset is less than its downside threshold, UBS will pay you a cash payment per Note that is less than the principal amount, if anything, resulting in a percentage loss on your initial investment equal to the percentage decline in the underlying asset from the trade date to the final valuation date (the “underlying return”) and, in extreme situations, you could lose all of your initial investment. **Investing in the Notes involves significant risks. You may lose a significant portion or all of your initial investment and may not receive any contingent coupon during the term of the Notes. Generally, a higher contingent coupon rate on a Note is associated with a greater risk of loss and a greater risk that you will not receive contingent coupons over the term of the Notes. The contingent repayment of principal applies only at maturity. Any payment on the Notes, including any repayment of principal, is subject to the creditworthiness of UBS. If UBS were to default on its payment obligations you may not receive any amounts owed to you under the Notes and you could lose all of your initial investment.**

Features

Potential for Periodic Contingent Coupons — UBS will pay a contingent coupon on a coupon payment date only if the closing level of the underlying asset is equal to or greater than its coupon barrier on the applicable observation date (including the final valuation date). Otherwise, if the closing level of the underlying asset is less than its coupon barrier on the applicable observation date, no contingent coupon will be paid for the relevant coupon payment date.

Automatic Call Feature — UBS will automatically call the Notes and pay you the principal amount of your Notes plus the contingent coupon otherwise due on the related coupon payment date if the closing level of the underlying asset is equal to or greater than its initial level on any observation date prior to the final valuation date. If the Notes were previously subject to an automatic call, no further payments will be owed to you under the Notes.

Contingent Repayment of Principal at Maturity with Potential for Full Downside Market Exposure — If the Notes have not been subject to an automatic call and the final level of the underlying asset is equal to or greater than its downside threshold, UBS will repay you the principal amount per Note at maturity. If, however, the final level of the underlying asset is less than its downside threshold, UBS will pay you a cash payment per Note that is less than the principal amount, if anything, resulting in a percentage loss on your investment equal to the underlying return.

The contingent repayment of principal applies only if you hold the Notes to maturity. Any payment on the Notes including any repayment of principal, is subject to the creditworthiness of UBS.

Key Dates

Trade Date*	January 18, 2019
Settlement Date*	January 24, 2019
Observation Dates**	Quarterly (see page 4)
Final Valuation Date**	January 18, 2022
Maturity Date**	January 21, 2022

We expect to deliver the Notes against payment on or about the third business day following the trade date. Under Rule 15c6-1 of the Securities Exchange Act of 1934, as amended (the “Exchange Act”), trades in the secondary market generally are required to settle in two business days (T+2), unless the parties to a trade expressly agree otherwise. Accordingly, purchasers who wish to trade the Notes in the secondary market on any date prior to two business days before delivery of the Notes will be required, by virtue of the fact that each Note initially will settle in three business days (T+3), to specify alternative settlement arrangements to prevent a failed settlement of the secondary market trade.

* Subject to postponement in the event of a market disruption event, as described in the accompanying product supplement.

Notice to investors: the Notes are significantly riskier than conventional debt instruments. The issuer is not necessarily obligated to repay the principal amount of the Notes at maturity, and the Notes may have the same downside market risk as the underlying asset. This market risk is in addition to the credit risk inherent in purchasing a debt obligation of UBS. You should not purchase the Notes if you do not understand or are not comfortable with the significant risks involved in investing in the Notes.

You should carefully consider the risks described under “Key Risks” beginning on page 5 and under “Risk Factors” beginning on page PS-17 of the accompanying product supplement before purchasing any Notes. Events relating to any of those risks, or other risks and uncertainties, could adversely affect the market value of, and the return on, your Notes. You may lose a significant portion or all of your initial investment in the Notes. The Notes will not be listed or displayed on any securities exchange or any electronic communications network.

These terms relate to Notes we are offering linked to the shares of SPDR[®] S&P[®] Oil & Gas Exploration & Production ETF.

Underlying Asset	Bloomberg Ticker	Contingent Coupon Rate	Initial Level	Downside Threshold	Coupon Barrier	CUSIP	ISIN
Shares of SPDR [®] S&P [®] Oil & Gas Exploration & Production ETF	XOP	22.00% per annum	\$31.61	\$18.97, which is 60.00% of the Initial Level	\$26.87, which is 85.00% of the Initial Level	90270KWS4US	90270KWS40

The estimated initial value of the Notes as of the trade date is \$1,000.00 for Notes linked to the shares of SPDR[®] S&P[®] Oil & Gas Exploration & Production ETF. The estimated initial value of the Notes was determined as of the close of the relevant markets on the date hereof by reference to UBS' internal pricing models, inclusive of the internal funding rate. For more information about secondary market offers and the estimated initial value of the Notes, see "Key Risks — Fair value considerations" and "— Limited or no secondary market and secondary market price considerations" on pages 5 and 6 of this supplement.

See "Additional Information about UBS and the Notes" on page ii. The Notes will have the terms set forth in the accompanying product supplement relating to the Notes, dated October 31, 2018, the accompanying prospectus and this document. Neither the Securities and Exchange Commission nor any other regulatory body has approved or disapproved of these Notes or passed upon the adequacy or accuracy of this document, the accompanying product supplement or the accompanying prospectus. Any representation to the contrary is a criminal offense.

The Notes are not bank deposits and are not insured by the Federal Deposit Insurance Corporation or any other governmental agency.

Offering of Notes	Issue Price to Public		Underwriting Discount		Proceeds to UBS AG	
	Total	Per Note	Total	Per Note	Total	Per Note
Notes linked to the shares of the SPDR [®] S&P [®] Oil & Gas Exploration & Production ETF	\$2,000,000.00	\$1,000.00	\$0.00	\$0.00	\$2,000,000.00	\$1,000.00

UBS Securities LLC UBS Investment Bank

Additional Information about UBS and the Notes

UBS has filed a registration statement (including a prospectus, as supplemented by a product supplement for the Notes) with the Securities and Exchange Commission (the “SEC”), for the offering to which this document relates. Before you invest, you should read these documents and any other documents related to the Notes that UBS has filed with the SEC for more complete information about UBS and this offering. You may obtain these documents for free from the SEC website at www.sec.gov. Our Central Index Key, or CIK, on the SEC website is 0001114446.

You may access these documents on the SEC website at www.sec.gov as follows:

- .. Market-linked Securities product supplement dated October 31, 2018:
<https://www.sec.gov/Archives/edgar/data/1114446/000091412118002085/ub47016353-424b2.htm>
- .. Prospectus dated October 31, 2018:
<https://www.sec.gov/Archives/edgar/data/1114446/000119312518314003/d612032d424b3.htm>

References to “UBS”, “we”, “our” and “us” refer only to UBS AG and not to its consolidated subsidiaries. In this document, “Trigger Autocallable Contingent Yield Notes” or the “Notes” refer to the Notes that are offered hereby. Also, references to the “accompanying product supplement” or “Market-linked Securities product supplement” mean the UBS product supplement, dated October 31, 2018 and references to “accompanying prospectus” mean the UBS prospectus, titled “Debt Securities and Warrants”, dated October 31, 2018.

This document, together with the documents listed above, contains the terms of the Notes and supersedes all other prior or contemporaneous oral statements as well as any other written materials including all other prior pricing terms, correspondence, trade ideas, structures for implementation, sample structures, brochures or other educational materials of ours. You should carefully consider, among other things, the matters set forth in “Key Risks” beginning on page 4 and in “Risk Factors” in the accompanying product supplement, as the Notes involve risks not associated with conventional debt securities. We urge you to consult your investment, legal, tax, accounting and other advisors before deciding to invest in the Notes.

If there is any inconsistency between the terms of the Notes described in the accompanying prospectus, the accompanying product supplement and this document, the following hierarchy will govern: first, this document; second, the accompanying product supplement; and last, the accompanying prospectus.

UBS reserves the right to change the terms of, or reject any offer to purchase, the Notes prior to their issuance. In the event of any changes to the terms of the Notes, UBS will notify you and you will be asked to accept such changes in connection with your purchase. You may also choose to reject such changes in which case UBS may reject your offer to purchase.

Investor Suitability

The Notes may be suitable for you if:

- .. You fully understand the risks inherent in an investment in the Notes, including the risk of loss of a significant portion or all of your initial investment.
You can tolerate a loss of a significant portion or all of your initial investment and are willing to make an investment that may have the same downside market risk as an investment in the underlying asset or the assets comprising such underlying asset that is an ETF (the “underlying constituents”).
You are willing to receive no contingent coupons and believe the closing level of the underlying asset will be equal to or greater than its coupon barrier on the specified observation dates and the final level of the underlying asset will be equal to or greater than its downside threshold on the final valuation date.
 - .. You understand and accept that you will not participate in any appreciation of the underlying asset and that your potential return is limited to the contingent coupons specified on the cover hereof.
 - .. You can tolerate fluctuations in the price of the Notes prior to maturity that may be similar to or exceed the downside fluctuations in the level of the underlying asset.
 - .. You are willing to invest in the Notes based on the contingent coupon rate, downside threshold and coupon barrier specified on the cover hereof.
 - .. You do not seek guaranteed current income from your investment and are willing to forgo any dividends paid on the underlying asset and the underlying constituents.
 - .. You are willing to invest in Notes that may be subject to an automatic call and you are otherwise willing to hold such Notes to maturity and you accept that there may be little or no secondary market for the Notes.
.. You understand and are willing to accept the risks associated with the underlying asset.
 - .. You are willing to assume the credit risk of UBS for all payments under the Notes, and understand that if UBS defaults on its obligations you may not receive any amounts due to you including any repayment of principal.
You understand that the estimated initial value of the Notes determined by our internal pricing models is lower than the issue price and that should UBS Securities LLC or any affiliate make secondary markets for the Notes, the price (not including their customary bid-ask spreads) will temporarily exceed the internal pricing model price.
- The Notes may not be suitable for you if:

- .. You do not fully understand the risks inherent in an investment in the Notes, including the risk of loss of a significant portion or all of your initial investment.
.. You require an investment designed to provide a full return of principal at maturity.
You cannot tolerate a loss of a significant portion or all of your initial investment or are unwilling to make an investment that may have the same downside market risk as an investment in the underlying asset or the underlying constituents.
You are unwilling to receive no contingent coupons during the term of the Notes and believe that the closing level of the underlying asset will decline during the term of the Notes and is likely to be less than its coupon barrier on at least one observation date or that the final level will be less than its downside threshold on the final valuation date.
- .. You seek an investment that participates in the full appreciation of the level of the underlying asset or that has unlimited return potential.
- .. You cannot tolerate fluctuations in the price of the Notes prior to maturity that may be similar to or exceed the downside fluctuations in the level of the underlying asset.
- .. You are unwilling to invest in the Notes based on the contingent coupon rate, downside threshold or coupon barrier specified on the cover hereof.
- .. You seek guaranteed current income from this investment or prefer to receive any dividends paid on the underlying asset or the underlying constituents.
You are unable or are unwilling to invest in Notes that may be subject to an automatic call, you are otherwise unable or unwilling to hold the Notes to maturity or you seek an investment for which there will be an active secondary market for the Notes.

.. You do not understand or are unwilling to accept the risks associated with the underlying asset.
.. You are unwilling to assume the credit risk of UBS for all payments under the Notes, including any repayment of principal.

The suitability considerations identified above are not exhaustive. Whether or not the Notes are a suitable investment for you will depend on your individual circumstances and you should reach an investment decision only after you and your investment, legal, tax, accounting and other advisors have carefully considered the suitability of an investment in the Notes in light of your particular circumstances. You should review “Information About the Underlying Asset” herein for more information on the underlying asset. You should also review carefully the “Key Risks” section herein for risks related to an investment in the Notes.

Final Terms

Issuer	UBS AG London Branch
Principal Amount	\$1,000 per Note
Term	Approximately 3 years, unless subject to an automatic call.
Underlying Asset	<p>The shares of the SPDR® S&P® Oil & Gas Exploration & Production ETF</p> <p>If the closing level of the underlying asset is equal to or greater than its coupon barrier on any observation date (including the final valuation date), UBS will pay you the contingent coupon applicable to such observation date on the related coupon payment date.</p> <p>If the closing level of the underlying asset is less than its coupon barrier on any observation date (including the final valuation date), the contingent coupon applicable to such observation date will not accrue or be payable and UBS will not make any payment to you on the relevant coupon payment date.</p>
Contingent Coupon & Contingent Coupon Rate	<p>The contingent coupon will be a fixed amount based upon equal periodic installments at the contingent coupon rate, which is a per annum rate. The table below sets forth the contingent coupon rate and contingent coupon for each Note that would be applicable to each observation date on which the closing level of the underlying asset is greater than or equal to its coupon barrier.</p> <p>Contingent Coupon Rate 22.00%</p> <p>Contingent Coupon \$55.00</p> <p>Contingent coupons on the Notes are not guaranteed. UBS will not pay you the contingent coupon for any observation date on which the closing level of the underlying asset is less than its coupon barrier.</p> <p>UBS will automatically call the Notes if the closing level of the underlying asset on any observation date prior to the final valuation date is equal to or greater than its initial level.</p>
Automatic Call Feature	<p>If the Notes are subject to an automatic call, UBS will pay you on the corresponding coupon payment date (which will be the “call settlement date”) a cash payment per Note equal to your principal amount plus the contingent coupon otherwise due on such date. Following an automatic call, no further payments will be made on the Notes.</p>
Payment at Maturity (per Note)	<p>If the Notes are not subject to an automatic call and the final level of the underlying asset is equal to or greater than its downside threshold, UBS will pay you a cash payment equal to:</p> <p>Principal Amount of \$1,000</p> <p>If the Notes are not subject to an automatic call and the final level of the underlying asset is less than its downside threshold, UBS will pay you a cash payment that is less than the principal amount, if anything, equal to:</p>

$\$1,000 \times (1 + \text{Underlying Return})$

In such a case, you will suffer a percentage loss on your initial investment equal to the underlying return.

The quotient, expressed as a percentage, of the following formula:

Underlying Return	$\frac{\text{Final Level} - \text{Initial Level}}{\text{Initial Level}}$
Downside Threshold ⁽¹⁾	A specified level of the underlying asset that is less than its initial level, equal to a percentage of its initial level, as indicated on the cover hereof and as determined by the calculation agent.
Coupon Barrier ⁽¹⁾	A specified level of the underlying asset that is less than its initial level, equal to a percentage of the initial level, as indicated on the cover hereof and as determined by the calculation agent.
Initial Level ⁽¹⁾	The closing level of the underlying asset on the trade date, as indicated on the cover hereof and as determined by the calculation agent.
Final Level ⁽¹⁾	The closing level of the underlying asset on the final valuation date, as determined by the calculation agent.

⁽¹⁾ As may be adjusted in the case of certain adjustment events as described under “General Terms of the Securities — Antidilution Adjustments for Securities Linked to an Underlying Equity or Equity Basket Asset” and “— Reorganization Events for Securities Linked to an Underlying Equity or Equity Basket Asset” in the accompanying product supplement.

Investment Timeline

Trade date	<p>The initial level of the underlying asset is observed and the final terms of the Notes are set.</p> <p>-</p> <p>If the closing level of the underlying asset is equal to or greater than its coupon barrier on any observation date (including the final valuation date), UBS will pay you a contingent coupon on the applicable coupon payment date.</p>
Observation Dates	<p>The Notes will be subject to an automatic call if the closing level of the underlying asset on any observation date prior to the final valuation date is equal to or greater than its initial level.</p> <p>If the Notes are subject to an automatic call, UBS will pay you a cash payment per Note equal to \$1,000 plus the contingent coupon otherwise due on such date.</p> <p>-</p> <p>The final level of the underlying asset is observed on the final valuation date.</p> <p>If the Notes are not subject to an automatic call and the final level of the underlying asset is equal to or greater than its downside threshold, UBS will pay you a cash payment per Note equal to:</p> <p>Principal Amount of \$1,000</p>
Maturity date	<p>If the Notes are not subject to an automatic call and the final level of the underlying asset is less than its downside threshold, UBS will pay you a cash payment per Note that is less than the principal amount, if anything, equal to:</p> <p>$\\$1,000 \times (1 + \text{Underlying Return})$</p> <p>In such a case, you will suffer a percentage loss on your initial investment equal to the underlying return.</p>

Investing in the Notes involves significant risks. You may lose a significant portion or all of your initial investment. Any payment on the Notes, including any repayment of principal, is subject to the creditworthiness of UBS. If UBS were to default on its payment obligations, you may not receive any amounts owed to you under the Notes and you could lose all of your initial investment.

If the Notes are not subject to an automatic call, you may lose a significant portion or all of your initial investment. Specifically, if the Notes are not subject to an automatic call and the final level is less than its downside threshold, you will lose a percentage of your principal amount equal to the underlying return and, in extreme situations, you could lose all of your initial investment.

Observation Dates and Coupon Payment Dates⁽¹⁾⁽²⁾⁽³⁾

Observation Dates	Coupon Payment Dates
April 18, 2019	April 23, 2019
July 18, 2019	July 22, 2019
October 18, 2019	October 22, 2019
January 21, 2020	January 23, 2020
April 20, 2020	April 22, 2020
July 20, 2020	July 22, 2020
October 19, 2020	October 21, 2020
January 19, 2021	January 21, 2021
April 19, 2021	April 21, 2021
July 19, 2021	July 21, 2021
October 18, 2021	October 20, 2021
Final Valuation Date	Maturity Date

(1) Subject to the market disruption event provisions set forth in the accompanying product supplement.

(2) 2 business days following each observation date, except that the coupon payment date for the final valuation date is the maturity date.

(3) If you are able to sell the Notes in the secondary market on an observation date, the purchaser of the Notes will be deemed to be the record holder on the applicable record date and therefore you will not be entitled to any payment attributable to that observation date.

Key Risks

An investment in the Notes involves significant risks. Investing in the Notes is not equivalent to investing directly in the underlying asset or its underlying constituents. Some of the risks that apply to the Notes are summarized below, but we urge you to read the more detailed explanation of risks relating to the Notes in the "Risk Factors" section of the accompanying product supplement. We also urge you to consult your investment, legal, tax, accounting and other advisors before you invest in the Notes.

Risk of loss at maturity — The Notes differ from ordinary debt securities in that UBS will not necessarily make periodic coupon payments or repay the principal amount of the Notes at maturity. If the Notes are not subject to an automatic call and the final level is less than its downside threshold, you will lose a percentage of your principal amount equal to the underlying return and, in extreme situations, you could lose all of your initial investment.

The contingent repayment of principal applies only at maturity — You should be willing to hold your Notes to maturity. If you are able to sell your Notes prior to an automatic call or maturity in the secondary market, you may have to sell them at a loss relative to your initial investment even if the level of the underlying asset is equal to or greater than its downside threshold. All payments on the Notes are subject to the creditworthiness of UBS.

You may not receive any contingent coupons with respect to your Notes — UBS will not necessarily make periodic coupon payments on the Notes. UBS will pay a contingent coupon for each observation date on which the closing level of the underlying asset is equal to or greater than its coupon barrier. If the closing level of the underlying asset is less than its coupon barrier on any observation date, UBS will not pay you the contingent coupon applicable to such observation date. If the closing level of the underlying asset is less than its coupon barrier on each of the observation dates, UBS will not pay you any contingent coupons during the term of, and you will not receive a positive return on, your Notes. Generally, this non-payment of the contingent coupon coincides with a period of greater risk of principal loss on your Notes.

Your potential return on the Notes is limited to the contingent coupons and you will not participate in any appreciation of the underlying asset or underlying constituents — The return potential of the Notes is limited to the pre-specified contingent coupon rate, regardless of any appreciation of the underlying asset. In addition, your return on the Notes will vary based on the number of observation dates, if any, on which the requirements of the contingent coupon have been met prior to maturity or an automatic call. Further, if the Notes are subject to an automatic call, you will not receive any contingent coupons or any other payment in respect of any observation dates after the applicable call settlement date. Because the Notes may be subject to an automatic call as early as the first potential call settlement date, the total return on the Notes could be less than if the Notes remained outstanding until maturity. Furthermore, if the Notes are not subject to an automatic call, you may be subject to the decline of the underlying asset even though you cannot participate in any appreciation of the underlying asset or underlying constituents. As a result, the return on an investment in the Notes could be less than the return on a hypothetical direct investment in the underlying asset or underlying constituents. In addition, as an owner of the Notes, you will not have voting rights or any other rights of a holder of the underlying asset or the underlying constituents.

A higher contingent coupon rate or lower downside threshold or coupon barrier may reflect greater expected volatility of the underlying asset, and greater expected volatility generally indicates an increased risk of loss at maturity — The economic terms for the Notes, including the contingent coupon rate, coupon barrier(s) and downside threshold(s), are based, in part, on the expected volatility of the underlying asset at the time the terms of the Notes are set. "Volatility" refers to the frequency and magnitude of changes in the level of the underlying asset. The greater the expected volatility of the underlying asset as of the trade date, the greater the expectation is as of that date that the closing level of the underlying asset could be less than its coupon barrier on any observation date and that the final level of the underlying asset could be less than its downside threshold on the final valuation date and, as a consequence, indicates an increased risk of not receiving a contingent coupon and an increased risk of loss, respectively. All things being equal, this greater expected volatility will generally be reflected in a higher contingent coupon rate than the yield payable on our conventional debt securities with a similar maturity or on otherwise comparable securities, and/or lower downside threshold(s) and/or coupon barrier(s) than those terms on otherwise comparable securities. Therefore, a relatively higher contingent coupon rate may indicate an increased risk of loss.

Further, relatively lower downside threshold(s) and/or coupon barrier(s) may not necessarily indicate that the Notes have a greater likelihood of a return of principal at maturity and/or paying contingent coupons. You should be willing to accept the downside market risk of the underlying asset and the potential to lose a significant portion or all of your initial investment.

Reinvestment risk — The Notes will be subject to an automatic call if the closing level of the underlying asset is equal to or greater than the initial level on certain observation dates prior to the final valuation date as set forth under “Observation Dates and Coupon Payment Dates” above. Because the Notes could be subject to an automatic call, the term of your investment may be limited. In the event that the Notes are subject to an automatic call, there is no guarantee that you would be able to reinvest the proceeds at a comparable return and/or with a comparable contingent coupon rate for a similar level of risk. In addition, to the extent you are able to reinvest such proceeds in an investment comparable to the Notes, you may incur transaction costs such as dealer discounts and hedging costs built into the price of the new securities. Generally, however, the longer the Notes remain outstanding, the less likely the Notes will be subject to an automatic call due to the decline in the level of the underlying asset and the shorter time remaining for the level of the underlying asset to recover. Such periods generally coincide with a period of greater risk of principal loss on your Notes.

Credit risk of UBS — The Notes are unsubordinated, unsecured debt obligations of UBS and are not, either directly or indirectly, an obligation of any third party. Any payment to be made on the Notes, including any repayment of principal, depends on the ability of UBS to satisfy its obligations as they come due. As a result, UBS’s actual and perceived creditworthiness may affect the market value of the Notes. If UBS were to default on its obligations, you may not receive any amounts owed to you under the terms of the Notes and you could lose all of your initial investment.

Market risk — The return on the Notes, which may be negative, is directly linked to the performance of the underlying asset and indirectly linked to the value of the underlying constituents. The level of the underlying asset can rise or fall sharply due to factors specific to the underlying asset and the issuer of the underlying asset (the “underlying asset issuer”) and its underlying constituents and their issuers (each, an “underlying constituent issuer”), such as stock price volatility, earnings and financial conditions, corporate, industry and regulatory developments, management changes and decisions and other events, as well as general market factors, such as general stock market or commodity market volatility and levels, interest rates and economic and political conditions. You, as an investor in the Notes, should conduct your own investigation into the underlying asset issuer and the underlying asset for your Notes. For additional information regarding the underlying asset, please see “Information about the Underlying Assets” herein and the underlying asset issuer’s SEC filings referred to in these sections. We urge you to review financial and other information filed periodically by the underlying asset issuer with the SEC.

Fair value considerations.

The issue price you pay for the Notes exceeds their estimated initial value — The issue price you pay for the Notes exceeds their estimated initial value as of the trade date due to the inclusion in the issue price of hedging costs, issuance costs and projected profits. As of the close of the relevant markets on the trade date, we have determined the estimated initial value of the Notes by reference to our internal pricing models and it is set forth herein. The pricing models used to determine the estimated initial value of the Notes incorporate certain variables, including the level and volatility of the underlying asset and underlying constituents, any expected dividends of the underlying asset and underlying constituents, if applicable, prevailing interest rates, the term of the Notes and our internal funding rate. Our internal funding rate is typically lower than the rate we would pay to issue conventional fixed or floating rate debt securities of a similar term. Hedging costs, issuance costs, projected profits and the difference in rates will reduce the economic value of the Notes to you. Due to these factors, the estimated initial value of the Notes as of the trade date is less than the issue price you pay for the Notes.

The estimated initial value is a theoretical price; the actual price that you may be able to sell your Notes in any secondary market (if any) at any time after the trade date may differ from the estimated initial value — The value of your Notes at any time will vary based on many factors, including the factors described above and in “—Market risk” above and is impossible to predict. Furthermore, the pricing models that we use are proprietary and rely in part on certain assumptions about future events, which may prove to be incorrect. As a result, after the trade date, if you attempt to sell the Notes in the secondary market, the actual value you would receive may differ, perhaps materially, from the estimated initial value of the Notes determined by reference to our internal pricing models. The estimated

initial value of the Notes does not represent a minimum or maximum price at which we or any of our affiliates would be willing to purchase your Notes in any secondary market at any time.

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Our actual profits may be greater or less than the differential between the estimated initial value and the issue price of the Notes as of the trade date — We may determine the economic terms of the Notes, as well as hedge our obligations, at least in part, prior to the trade date. In addition, there may be ongoing costs to us to maintain and/or adjust any hedges and such hedges are often imperfect. Therefore, our actual profits (or potentially, losses) in issuing the Notes cannot be determined as of the trade date and any such differential between the estimated initial value and the issue price of the Notes as of the trade date does not reflect our actual profits. Ultimately, our actual profits will be known only at the maturity of the Notes.

Limited or no secondary market and secondary market price considerations.

There may be little or no secondary market for the Notes — The Notes will not be listed or displayed on any securities exchange or any electronic communications network. UBS Securities LLC and its affiliates intend, but are not required, to make a market for the Notes and may stop making a market at any time. If you are able to sell your Notes prior to maturity, you may have to sell them at a substantial loss. Furthermore, there can be no assurance that a secondary market for the Notes will develop. The estimated initial value of the Notes does not represent a minimum or maximum price at which we or any of our affiliates would be willing to purchase your Notes in any secondary market at any time.

The price at which UBS Securities LLC and its affiliates may offer to buy the Notes in the secondary market (if any) may be greater than UBS' valuation of the Notes at that time, greater than any other secondary market prices provided by unaffiliated dealers (if any) and, depending on your broker, greater than the valuation provided on your customer account statement — For a limited period of time following the issuance of the Notes, UBS Securities LLC or its affiliates may offer to buy or sell such Notes at a price that exceeds (i) our valuation of the Notes at that time based on our internal pricing models, (ii) any secondary market prices provided by unaffiliated dealers (if any) and (iii) depending on your broker, the valuation provided on customer account statements. The price that UBS Securities LLC may initially offer to buy such Notes following issuance will exceed the valuations indicated by our internal pricing models due to the inclusion for a limited period of time of the aggregate value of hedging costs, issuance costs and theoretical projected trading profit. The portion of such amounts included in our price will decline to zero on a straight line basis over a period ending no later than the date specified under “Supplemental Plan of Distribution (Conflicts of Interest); Secondary Markets (if any)”. Thereafter, if UBS Securities LLC or an affiliate makes secondary markets in the Notes, it will do so at prices that reflect our estimated value determined by reference to our internal pricing models at that time. The temporary positive differential relative to our internal pricing models arises from requests from and arrangements made by UBS Securities LLC with the selling agents of structured debt securities such as the Notes. As described above, UBS Securities LLC and its affiliates intend, but are not required, to make a market for the Notes and may stop making a market at any time. The price at which UBS Securities LLC or an affiliate may make secondary markets at any time (if at all) will also reflect its then current bid-ask spread for similar sized trades of structured debt securities. UBS Securities LLC reflects this temporary positive differential on its customer statements. Investors should inquire as to the valuation provided on customer account statements provided by unaffiliated dealers.

Economic and market factors affecting the terms and market price of Notes prior to maturity — Because structured notes, including the Notes, can be thought of as having a debt component and a derivative component, factors that influence the values of debt instruments and options and other derivatives will also affect the terms and features of the Notes at issuance and the market price of the Notes prior to maturity. These factors include the level of the underlying asset and underlying constituents; the volatility of the underlying asset and underlying constituents; the dividend rate paid on the underlying asset and underlying constituents, if applicable; the time remaining to the maturity of the Notes; interest rates in the markets; geopolitical conditions and economic, financial, political, force majeure and regulatory or judicial events; whether the underlying asset is currently or has been less than its coupon barrier; the availability of comparable instruments; the creditworthiness of UBS; the then current bid-ask spread for the Notes and the factors discussed under “— Potential conflict of interest” below. These and other factors are unpredictable and interrelated and may offset or magnify each other.

Impact of fees and the use of internal funding rates rather than secondary market credit spreads on secondary market prices — All other things being equal, the use of the internal funding rates described above under “— Fair value considerations” as well as the inclusion in the issue price of hedging costs, issuance costs and any projected profits

are, subject to the temporary mitigating effect of UBS Securities LLC's and its affiliates' market making premium, expected to reduce the price at which you may be able to sell the Notes in any secondary market.

There can be no assurance that the investment view implicit in the Notes will be successful — It is impossible to predict whether and the extent to which the level of the underlying asset will rise or fall and there can be no assurance that the closing level of the underlying asset will be equal to or greater than its coupon barrier on any observation date, or, if the Notes are not subject to an automatic call, that the final level will be equal to or greater than its downside threshold. The level of the underlying asset will be influenced by complex and interrelated political, economic, financial and other factors that affect the underlying constituent issuers. You should be willing to accept the downside risks of owning equities in general and the underlying asset in particular, and the risk of losing a significant portion or all of your initial investment.

The calculation agent can make antidilution and reorganization adjustments that affect the payment to you at maturity — For antidilution and reorganization events affecting the underlying asset, the calculation agent may make adjustments to its initial level, coupon barrier, downside threshold and/or final level, as applicable, and any other term of the Notes. However, the calculation agent will not make an adjustment in response to every corporate event that could affect the underlying asset. If an event occurs that does not require the calculation agent to make an adjustment, the market value of the Notes and the payment at maturity may be materially and adversely affected. In addition, all determinations and calculations concerning any such adjustments will be made by the calculation agent. You should be aware that the calculation agent may make any such adjustment, determination or calculation in a manner that differs from that discussed in the accompanying product supplement or herein as necessary to achieve an equitable result. Following certain reorganization events relating to the underlying asset issuer where such issuer is not the surviving entity, the determination as to whether the contingent coupon is payable to you on any coupon payment date, whether the Notes are subject to an automatic call or the amount you receive at maturity may be based on the equity security of a successor to such underlying asset issuer in combination with any cash or any other assets distributed to holders of such underlying asset in such reorganization event. If the underlying asset issuer becomes subject to (i) a reorganization event whereby such underlying asset is exchanged solely for cash, (ii) a merger or consolidation with UBS or any of its affiliates, or (iii) such underlying asset is delisted or otherwise suspended from trading, the determination as to whether the contingent coupon is payable to you on any coupon payment date, whether the Notes are subject to an automatic call or the amount you receive at maturity may be based on a substitute security. Following a delisting or suspension from trading or discontinuance of an ETF underlying asset, the determination as to whether the contingent coupon is payable to you on any coupon payment date, whether the Notes are subject to an automatic call or the amount you receive at maturity may be based on a share of another ETF or a basket of securities, futures contracts, commodities or other assets, as described further under “General Terms of the Securities — Delisting, Discontinuance or Modification of an ETF” in the accompanying product supplement. The occurrence of any antidilution or reorganization event and the consequent adjustments may materially and adversely affect the value of the Notes and your payment at maturity, if any. For more information, see the sections “General Terms of the Securities — Antidilution Adjustments for Securities Linked to an Underlying Equity or Equity Basket Asset” and “—Reorganization Events for Securities Linked to an Underlying Equity or Equity Basket Asset” in the accompanying product supplement.

There is no affiliation between the underlying asset issuer or any underlying constituent issuer and UBS, and UBS is not responsible for any disclosure by such issuer or any underlying constituent issuer — We are not affiliated with the underlying asset issuer or any underlying constituent issuer. However, we and our affiliates may currently, or from time to time in the future engage in business with the underlying asset issuer or any underlying constituent issuer. However, we are not affiliated with the underlying asset issuer or any underlying constituent issuer and are not responsible for such issuer public disclosure of information, whether contained in SEC filings or otherwise. You, as an investor in the Notes, should conduct your own investigation into the underlying asset underlying constituents, the underlying asset issuer or any underlying constituent issuer. Neither, the underlying asset issuer nor any underlying constituent issuer is involved in the Notes offered hereby in any way and has no obligation of any sort with respect to your Notes. Neither, the underlying asset issuer nor any underlying constituent issuer has any obligation to take your interests into consideration for any reason, including when taking any corporate actions that might affect the value of your Notes.

The value of an ETF may not completely track the value of its underlying constituents — Although the trading characteristics and valuations of an ETF will usually mirror the characteristics and valuations of its underlying constituents, the level of an ETF may not completely track the value of its underlying constituents. The level of the underlying asset will reflect transaction costs and fees that the underlying constituents in which an ETF invests do not have. In

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addition, although an ETF may be currently listed for trading on an exchange, there is no assurance that an active trading market will continue for an ETF or that there will be liquidity in the trading market.

Fluctuation of NAV — The net asset value (the “NAV”) of an ETF may fluctuate with changes in the market value of its underlying constituents. The market prices of an ETF may fluctuate in accordance with changes in NAV and supply and demand on the applicable stock exchanges. In addition, the market price of an ETF may differ from its NAV per share; an ETF may trade at, above or below its NAV per share.

Failure of an ETF to track the level of its target index — While an ETF is designed and intended to track the level of a specific index as specified under “Information About the Underlying Asset” (its “target index”), various factors, including fees and other transaction costs, will prevent an ETF from correlating exactly with changes in the level of its target index. Additionally, although the performance of an ETF seeks to replicate the performance of its target index, an ETF may not invest in all the securities, futures contracts or commodities comprising its target index but rather may invest in a representative sample of the assets comprising its target index. Accordingly, the performance of an ETF will not be equal to the performance of its target index during the term of the Notes.

The SPDR® S&P® Oil & Gas Exploration & Production ETF utilizes a passive indexing investment approach —

The SPDR® S&P® Oil & Gas Exploration & Production ETF (the “XOP Fund”) is not managed according to traditional methods of “active” investment management, which involve the buying and selling of securities based on economic, financial and market analysis and investment judgment. Instead, the XOP Fund, utilizing a “passive” or indexing investment approach, attempts to approximate the investment performance of the target index by investing in a portfolio of stocks that generally replicate such target index. Therefore, unless a specific stock is removed from the target index, the XOP Fund generally would not sell a stock because the stock’s issuer was in financial trouble. In addition, the XOP Fund is subject to the risk that the investment strategy of the XOP Fund’s investment adviser may not produce the intended results.

The Notes are subject to energy sector risk — The assets of the XOP Fund are also concentrated in the energy sector, and therefore the XOP Fund may be more volatile than a fund with more diversified components. Energy companies develop and produce oil, gas and consumable fuels and provide drilling and other energy resources production and distribution related services. Stock prices for these types of companies are affected by supply and demand, exploration and production spending, world events and economic conditions, swift price and supply fluctuations, energy conservation, the success of exploration projects, liabilities for environmental damage and general civil liabilities and tax and other governmental regulatory policies. Weak demand for energy companies’ products or services or for energy products and services in general, as well as negative developments in these other areas, including natural disasters or terrorist attacks, would adversely impact the XOP Fund’s performance.

The Notes are subject to oil and gas sector risk — The assets of the XOP Fund are concentrated in the oil and gas exploration and production industry, and therefore the XOP Fund may be more volatile than a fund with more diversified components. Companies in the oil and gas sector develop and produce crude oil and natural gas and provide drilling and other energy resources production and distribution related services. Stock prices for these types of companies are affected by supply and demand both for their specific product or service and for energy products in general. The price of oil and gas, exploration and production spending, government regulation, world events and economic conditions will likewise affect the performance of these companies. Correspondingly, securities of companies in the energy field are subject to swift price and supply fluctuations caused by events relating to international politics, energy conservation, the success of exploration projects, and tax and other governmental regulatory policies. Weak demand for the companies’ products or services or for energy products and services in general, as well as negative developments in these and other areas, would adversely impact the performance of the XOP Fund. Oil and gas exploration and production can be significantly affected by natural disasters as well as changes in exchange rates, interest rates, government regulation, world events and economic conditions. These companies also may be at risk for environmental damage claims.

Potential UBS impact on the underlying asset — Trading or transactions by UBS or its affiliates in the underlying asset or any underlying constituent, listed and/or over-the-counter options, futures, exchange-traded funds or other instruments with returns linked to the performance of the underlying asset or any underlying constituent or target index, may adversely affect the level of the underlying asset and, therefore, the market value of the Notes.

Potential conflict of interest — UBS and its affiliates may engage in business with the underlying asset issuer or any underlying constituent issuer, which may present a conflict between the obligations of UBS and you, as a holder of the Notes. There are also potential conflicts of interest between you and the calculation agent, which will be an affiliate of UBS and which will make potentially subjective judgments. The calculation agent will determine whether the contingent coupon is payable to you on any coupon payment date, whether the Notes are subject to an automatic call and the payment at maturity of the Notes, if any, based on observed levels of the underlying asset. The calculation agent can postpone the determination of the initial level, closing level or final level of the underlying asset (and therefore the settlement date, the related coupon payment date or the maturity date, as applicable), on the trade date, any observation date or the final valuation date, respectively, if a market disruption event occurs and is continuing on such date. As UBS determines the economic terms of the Notes, including the contingent coupon rate, downside threshold and coupon barrier, and such terms include hedging costs, issuance costs and projected profits, the Notes represent a package of economic terms. There are other potential conflicts of interest insofar as an investor could potentially get better economic terms if that investor entered into exchange-traded and/or OTC derivatives or other instruments with third parties, assuming that such instruments were available and the investor had the ability to assemble and enter into such instruments. Additionally, given that UBS Securities LLC and its affiliates temporarily maintain a market making premium, it may have the effect of discouraging UBS Securities LLC and its affiliates from recommending sale of your Notes in the secondary market.

Potentially inconsistent research, opinions or recommendations by UBS — UBS and its affiliates publish research from time to time on financial markets and other matters that may influence the value of the Notes, or express opinions or provide recommendations that are inconsistent with purchasing or holding the Notes. Any research, opinions or recommendations expressed by UBS or its affiliates may not be consistent with each other and may be modified from time to time without notice. Investors should make their own independent investigation of the merits of investing in the Notes and the underlying asset to which the Notes are linked.

The Notes are not bank deposits— An investment in the Notes carries risks which are very different from the risk profile of a bank deposit placed with UBS or its affiliates. The Notes have different yield and/or return, liquidity and risk profiles and would not benefit from any protection provided to deposits.

If UBS experiences financial difficulties, FINMA has the power to open restructuring or liquidation proceedings in respect of, and/or impose protective measures in relation to, UBS, which proceedings or measures may have a material adverse effect on the terms and market value of the Notes and/or the ability of UBS to make payments thereunder— The Swiss Financial Market Supervisory Authority (“FINMA”) has broad statutory powers to take measures and actions in relation to UBS if (i) it concludes that there is justified concern that UBS is over-indebted or has serious liquidity problems or (ii) UBS fails to fulfil the applicable capital adequacy requirements (whether on a standalone or consolidated basis) after expiry of a deadline set by FINMA. If one of these pre-requisites is met, FINMA is authorized to open restructuring proceedings or liquidation (bankruptcy) proceedings in respect of, and/or impose protective measures in relation to, UBS. The Swiss Banking Act grants significant discretion to FINMA in connection with the aforementioned proceedings and measures. In particular, a broad variety of protective measures may be imposed by FINMA, including a bank moratorium or a maturity postponement, which measures may be ordered by FINMA either on a stand-alone basis or in connection with restructuring or liquidation proceedings. The resolution regime of the Swiss Banking Act is further detailed in the FINMA Banking Insolvency Ordinance (“BIO-FINMA”). In a restructuring proceeding, FINMA, as resolution authority, is competent to approve the resolution plan. The resolution plan may, among other things, provide for (a) the transfer of all or a portion of UBS' assets, debts, other liabilities and contracts (which may or may not include the contractual relationship between UBS and the holders of Notes) to another entity, (b) a stay (for a maximum of two business days) on the termination of contracts to which UBS is a party, and/or the exercise of (w) rights to terminate, (x) netting rights, (y) rights to enforce or dispose of collateral or (z) rights to transfer claims, liabilities or collateral under contracts to which UBS is a party, (c) the conversion of UBS' debt and/or other obligations, including its obligations under the Notes, into equity (a "debt-to-equity" swap), and/or (d) the partial or full write-off of obligations owed by UBS (a "write-off"), including its obligations under the Notes. The BIO-FINMA provides that a debt-to-equity swap and/or a write-off of debt and other obligations (including the Notes) may only take place after (i) all debt instruments issued by UBS qualifying as additional tier 1 capital or tier 2 capital have been converted into equity or written-off, as applicable, and (ii) the existing equity of UBS has been fully cancelled. While the BIO-FINMA does not expressly address the

order in which a write-off of debt instruments other than debt instruments qualifying as additional tier 1 capital or tier 2 capital should occur, it states that debt-to-equity swaps should occur in the following order: first, all subordinated claims not qualifying as regulatory capital; second, all other claims not excluded by law from a debt-to-equity swap (other than deposits); and third, deposits (in excess of the amount privileged by law). However, given the broad discretion granted to FINMA as the resolution authority, any restructuring plan in respect of UBS could provide that the claims under or in connection with the Notes will be partially or fully converted into equity or written-off, while preserving other obligations of UBS that rank pari passu with, or even junior to, UBS' obligations under the Notes. Consequently, holders of Notes may lose all or some of their investment in the Notes. In the case of restructuring proceedings with respect to a systemically important Swiss bank (such as UBS), the creditors whose claims are affected by the restructuring plan will not have a right to vote on, reject, or seek the suspension of the

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restructuring plan. In addition, if a restructuring plan has been approved by FINMA, the rights of a creditor to seek judicial review of the restructuring plan (e.g., on the grounds that the plan would unduly prejudice the rights of holders of Notes or otherwise be in violation of the Swiss Banking Act) are very limited. In particular, a court may not suspend the implementation of the restructuring plan. Furthermore, even if a creditor successfully challenges the restructuring plan, the court can only require the relevant creditor to be compensated ex post and there is currently no guidance as to on what basis such compensation would be calculated or how it would be funded.

..Uncertain tax treatment— Significant aspects of the tax treatment of the Notes are uncertain. You should consult your tax advisor about your tax situation.

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Hypothetical Examples of How the Notes Might Perform

The below examples are based on hypothetical terms. The actual terms are indicated on the cover hereof.

The examples below illustrate the payment upon a call or at maturity for a \$1,000 Note on a hypothetical offering of the Notes, with the following assumptions (amounts may have been rounded for ease of reference):

Principal Amount:	\$1,000
Term:	Approximately 3 years
Initial Level:	22.00% per annum (or 5.50% per quarter)
Contingent Coupon Rate:	\$55.00 per quarter
Contingent Coupon:	Quarterly
Observation Dates:	\$30.83
Downside Threshold:	\$18.50 (which is 60.00% of the Initial Level)
Coupon Barrier:	\$26.21 (which is 85.00% of the Initial Level)

Example 1 — The Closing Level of the Underlying Asset is equal to or greater than its Initial Level on the Second Observation Date

Date	Closing Level	Payment (per Note)
First Observation Date	\$26.73 (equal to or greater than Coupon Barrier; less than Initial Level)	\$55.00 (Contingent Coupon)
Second Observation Date	\$32.37 (equal to or greater than Initial Level)	\$1,055.00 (Settlement Amount)
	Total Payment:	\$1,110.00 (an 11.00% total return)

Because the Notes are subject to an automatic call following the Second Observation Date, UBS will pay you on the call settlement date a total of \$1,055.00 per Note, reflecting your principal amount plus the applicable contingent coupon. When added to the contingent coupon(s) of \$55.00 received in respect of the prior observation date(s), UBS will have paid you a total of \$1,110.00 per Note for an 11.00% total return on the Notes. No further amount will be owed to you under the Notes.

Example 2 — Notes are NOT subject to an Automatic Call and the Final Level of the Underlying Asset is equal to or greater than its Downside Threshold and Coupon Barrier

Date	Closing Level	Payment (per Note)
First Observation Date	\$27.00 (equal to or greater than Coupon Barrier; less than Initial Level)	\$55.00 (Contingent Coupon)
Second Observation Date through Eleventh Observation Date	Various (all less than Coupon Barrier)	\$0.00
Final Valuation Date	\$30.21 (equal to or greater than Downside Threshold and Coupon Barrier; less than Initial Level)	\$1,055.00 (Payment at Maturity)
	Total Payment:	\$1,110.00 (an 11.00% total return)

Because the Notes are not subject to an automatic call and the final level of the underlying asset is equal to or greater than its downside threshold and coupon barrier, at maturity, UBS will pay you a total of \$1,055.00 per Note, reflecting your principal amount plus the applicable contingent coupon. When added to the contingent coupon(s) of \$55.00 received in respect of prior observation date(s), UBS will have paid you a total of \$1,110.00 per Note for an 11.00% total return on the Notes.

Example 3 — Notes are NOT subject to an Automatic Call and the Final Level of the Underlying Asset is less than its Coupon Barrier and equal to or greater than its Downside Threshold

Date	Closing Level	Payment (per Note)
First Observation Date	\$28.52 (equal to or greater than Coupon Barrier; less than Initial Level)	\$55.00 (Contingent Coupon)
Second Observation Date through Eleventh Observation Date	Various (all less than Coupon Barrier)	\$0.00
Final Valuation Date	\$22.36 (equal to or greater than Downside Threshold; less than Initial Level and Coupon Barrier)	\$1,000.00 (Payment at Maturity)
	Total Payment:	\$1,055.00 (a 5.50% total return)

Because the Notes are not subject to an automatic call and the final level of the underlying asset is equal to or greater than its downside threshold and the final level of the underlying asset is less than its coupon barrier, at maturity UBS will pay you a total of \$1,000.00 per Note, reflecting your principal amount. When added to the contingent coupon(s) of \$55.00 received in respect of prior observation date(s), UBS will have paid you a total of \$1,055.00 per Note for a 5.50% total return on the Notes.

Example 4 — Notes are NOT subject to an Automatic Call and the Final Level of the Underlying Asset is less than its Downside Threshold Date

Date	Closing Level	Payment (per Note)
First Observation Date	\$27.26 (equal to or greater than Coupon Barrier; less than Initial Level)	\$55.00 (Contingent Coupon)
Second Observation Date through Eleventh Observation Date	Various (all less than Coupon Barrier)	\$0.00
Final Valuation Date	\$12.33 (less than Downside Threshold and Coupon Barrier)	\$1,000.00 [1 + Underlying Return] = \$1,000.00 × [1+(-60.00)%] = \$1,000.00 × 0.40 = \$400.00 (Payment at Maturity)
	Total Payment:	\$455.00 (a 54.50% loss)

Because the Notes are not subject to an automatic call and the final level of the underlying asset is less than its Downside Threshold, at maturity UBS will pay you \$400.00 per Note. When added to the contingent coupon(s) of \$55.00 received in respect of prior observation date(s), UBS will have paid you \$455.00 per Note for a loss on the Notes of 54.50%.

Investing in the Notes involves significant risks. The Notes differ from ordinary debt securities in that UBS is not necessarily obligated to repay the full amount of your initial investment. If the Notes are not subject to an automatic call, you may lose a significant portion or all of your initial investment. Specifically, if the Notes are not subject to an automatic call and the final level of the underlying asset is less than its Downside Threshold, you will lose a percentage of your principal amount equal to the underlying return and, in extreme situations, you could lose all of your initial investment.

Any payment on the Notes, including any payments in respect of an automatic call, contingent coupon or any repayment of principal, is subject to the creditworthiness of UBS. If UBS were to default on its payment obligations, you may not receive any amounts owed to you under the Notes and you could lose all of your initial investment.

Information About the Underlying Asset

All disclosures contained in this document regarding the underlying asset are derived from publicly available information. UBS has not conducted any independent review or due diligence of any publicly available information with respect to the underlying asset. You should make your own investigation into the underlying asset.

Included on the following pages is a brief description of the underlying asset issuer. This information has been obtained from publicly available sources. Set forth below is a table that provides the quarterly high and low closing levels for the underlying asset. We obtained the closing level information set forth below from the Bloomberg Professional[®] service ("Bloomberg") without independent verification. You should not take the historical prices of the underlying asset as an indication of future performance.

The underlying asset is registered under Securities Act of 1933, the Securities Exchange Act of 1934 and/or the Investment Company Act of 1940, each as amended. Companies with securities registered with the SEC are required to file financial and other information specified by the SEC periodically. Information filed by the underlying asset issuer with the SEC can be reviewed electronically through a website maintained by the SEC. The address of the SEC's website is <http://www.sec.gov>. Information filed with the SEC by the underlying asset issuer can be located by reference to its SEC file number provided below. In addition, information filed with the SEC can be inspected and copied at the Public Reference Section of the SEC, 100 F Street, N.E., Room 1580, Washington, D.C. 20549. Copies of this material can also be obtained from the Public Reference Section, at prescribed rates.

SPDR[®] S&P[®] Oil & Gas Exploration & Production ETF

We have derived all information contained herein regarding the SPDR[®] S&P[®] Oil & Gas Exploration & Production ETF (the "XOP Fund") from publicly available information. Such information reflects the policies of, and is subject to change by, SSgA Funds Management, Inc., the investment adviser (the "Adviser") of the XOP Fund. UBS has not undertaken an independent review or due diligence of any publicly available information regarding the XOP Fund.

The XOP Fund seeks to provide investment results that, before fees and expenses, correspond generally to the total return performance of the S&P Oil & Gas Exploration & Production Select Industry Index (the "target index"). The XOP Fund employs a sampling strategy, which means that the XOP Fund is not required to purchase all of the securities represented in the target index. Instead, the XOP Fund may purchase a subset of the securities in the target index in an effort to hold a portfolio of securities with generally the same risk and return characteristics of the target index. Under normal market conditions, the XOP Fund generally invests substantially all, but at least 80%, of its total assets in the securities comprising the target index. In addition, the XOP Fund may invest in equity securities that are not included in the target index, cash and cash equivalents or money market instruments, such as repurchase agreements and money market funds (including money market funds advised by the Adviser).

The target index represents the oil and gas exploration and production industry group of the S&P Total Market Index that satisfy the following criteria: (i) have a float-adjusted market capitalization above \$500 million with a float-adjusted liquidity ratio (defined by dollar value traded over the previous 12 months divided by the float-adjusted market capitalization as of the index rebalancing reference date) above 90% or have a float-adjusted market capitalization above \$400 million with a float-adjusted liquidity ratio (as defined above) above 150%; and (ii) are U.S. based companies. The market capitalization threshold and the liquidity threshold are each reviewed from time to time based on market conditions. Rebalancing occurs on the third Friday of the quarter ending month.

As of December 31, 2018, ordinary operating expenses of the XOP Fund are expected to accrue at an annual rate of 0.35% of the XOP Fund's daily net asset value. Expenses of the XOP Fund reduce the net value of the assets held by the XOP Fund.

As of December 31, 2018, the XOP Fund's five largest company holdings include: Valero Energy Corporation (2.05%), PBF Energy Inc. Class A (2.04%), Diamondback Energy Inc. (2.00%), Newfield Exploration Company (2.00%) and Phillips 66 (1.99%).

In making your investment decision you should review the prospectus supplement and the prospectus related to the XOP Fund, dated October 31, 2018, filed by the SPDR® Series Trust.

In addition, the XOP Fund Prospectus is available on the XOP Fund's website. In making your investment decision you should pay particular attention to the sections of the XOP Fund Prospectus entitled "Principal Risks of Investing in the Fund" and "Additional Risk Information." UBS has not undertaken an independent review or due diligence of any publicly available information regarding the XOP Fund Prospectus, and such information is not incorporated by reference in, and should not be considered part of, this document or any accompanying prospectus.

Information filed by the XOP Fund with the SEC can be found by reference to its SEC file numbers: 333-57793 and 811-08839.

Information from outside sources is not incorporated by reference in, and should not be considered part of, this document or any accompanying prospectus. UBS has not conducted any independent review or due diligence of any publicly available information with respect to the underlying asset.

Historical Information

The following table sets forth the quarterly high and low closing levels for the XOP Fund, based on the daily closing levels on the primary exchange for XOP Fund as reported by Bloomberg, without independent verification. The closing levels may be adjusted by Bloomberg for corporate actions such as stock splits, public offerings, mergers and acquisitions, spin-offs, extraordinary dividends, delistings and bankruptcy. UBS has not undertaken an independent review or due diligence of any publicly available information obtained from Bloomberg. The closing level of the XOP Fund's shares on January 18, 2019 was \$31.61. **The historical performance of the underlying asset should not be taken as indication of the future performance of the underlying asset during the term of the Notes.**

Quarter Begin	Quarter End	Quarterly Closing High	Quarterly Closing Low	Quarterly Close
January 1, 2015	March 31, 2015	\$53.94	\$42.55	\$51.66
April 1, 2015	June 30, 2015	\$55.63	\$46.43	\$46.66
July 1, 2015	September 30, 2015	\$45.22	\$31.71	\$32.84
October 1, 2015	December 31, 2015	\$40.53	\$28.64	\$30.22
January 1, 2016	March 31, 2016	\$30.96	\$23.60	\$30.35
April 1, 2016	June 30, 2016	\$37.50	\$29.23	\$34.81
July 1, 2016	September 30, 2016	\$39.12	\$32.75	\$38.46
October 1, 2016	December 31, 2016	\$43.42	\$34.73	\$41.42
January 1, 2017	March 31, 2017	\$42.21	\$35.17	\$37.44
April 1, 2017	June 30, 2017	\$37.89	\$30.17	\$31.92
July 1, 2017	September 30, 2017	\$34.37	\$29.09	\$34.09
October 1, 2017	December 31, 2017	\$37.64	\$32.25	\$37.18
January 1, 2018	March 31, 2018	\$39.85	\$32.38	\$35.22
April 1, 2018	June 30, 2018	\$44.22	\$34.03	\$43.06
July 1, 2018	September 30, 2018	\$44.52	\$39.10	\$43.29
October 1, 2018	December 31, 2018	\$44.57	\$24.12	\$26.53
January 1, 2019	January 18, 2019*	\$31.61	\$27.10	\$31.61

*The above table only includes data through this date. Accordingly, the "Quarterly Closing High," "Quarterly Closing Low" and "Quarterly Close" data indicated are for this shortened period only and do not reflect complete data for this

calendar quarter.

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The graph below illustrates the performance of the XOP Fund's shares for the period indicated, based on information from Bloomberg. The dotted lines represent the threshold of \$18.97 and the coupon barrier of \$26.87, which are equal to 60.00% and 85.00%, respectively, of the initial level. Past performance of the underlying asset is not indicative of the future performance of the underlying asset.

What Are the Tax Consequences of the Notes?

This discussion is based on the Internal Revenue Code of 1986, as amended (the “Code”), its legislative history, existing and proposed regulations under the Code, published rulings, interpretations and court decisions, all as currently in effect and all of which are subject to change, possibly on a retroactive basis.

The U.S. federal income tax consequences of your investment in the Notes are uncertain and we do not plan to request a ruling from the Internal Revenue Service (the “IRS”). Some of these tax consequences are summarized below, but we urge you to read the more detailed discussion in “Material U.S. Federal Income Tax Consequences” of the accompanying product supplement, including the discussion under “ — Securities Treated as Prepaid Derivatives or Prepaid Forwards with Associated Contingent Coupons”, and particularly the discussion in respect of the “constructive ownership” rules under Section 1260 of the Code, and to discuss the tax consequences of your particular situation with your tax advisor.

US Tax Treatment. Pursuant to the terms of the Notes, UBS and you agree, in the absence of a statutory or regulatory change or an administrative determination or judicial ruling to the contrary, to characterize the Notes as prepaid derivative contracts with respect to the underlying asset. If your Notes are so treated, any contingent coupon that is paid by UBS (including on the maturity date or upon an automatic call) should be included in your income as ordinary income in accordance with your regular method of accounting for U.S. federal income tax purposes. In determining our information reporting obligations, if any, we intend to treat the contingent coupons as ordinary income.

In addition, excluding amounts or proceeds attributable to any contingent coupons, you should generally recognize gain or loss upon the taxable disposition or maturity of your Notes in an amount equal to the difference between the amount you receive at such time (other than amounts or proceeds attributable to a contingent coupon or any amount attributable to any accrued but unpaid contingent coupons) and the amount you paid for your Notes. Subject to the constructive ownership rules, discussed below, such gain or loss should generally be long-term capital gain or loss if you have held your Notes for more than one year (otherwise such gain or loss would be short-term capital gain or loss). The deductibility of capital losses is subject to limitations. Although uncertain, it is possible that proceeds received from the taxable disposition of your Notes prior to an observation date that are attributable to an expected contingent coupon, could be treated as ordinary income. You should consult your tax advisor regarding this risk.

Based on certain factual representations received from us, our counsel, Cadwalader, Wickersham & Taft LLP, is of the opinion that it would be reasonable to treat your Notes in the manner described above. However, because there is no authority that specifically addresses the tax treatment of the Notes, it is possible that your Notes could alternatively be treated for tax purposes as a single contingent payment debt instrument, or pursuant to some other characterization, (including possible treatment as a “constructive ownership transaction” under Section 1260 of the Code), such that the timing and character of your income from the Notes could differ materially and adversely from the treatment described above, as described further under “Material U.S. Federal Income Tax Consequences — Alternative Treatments for Securities Treated as Any Type of Prepaid Derivative or Prepaid Forward” in the accompanying product supplement.

Section 1260. Because an underlying asset would be treated as a “pass-thru entity” for purposes of Section 1260 of the Code, it is possible that the Notes could be treated as a constructive ownership transaction under Section 1260. If the Notes were treated as a constructive ownership transaction certain adverse U.S. federal income tax consequences could apply (i.e., all or a portion of any long-term capital gain that you recognize upon the taxable disposition or maturity of your Notes could be recharacterized as ordinary income and you could be subject to an interest charge on any deferred tax liability with respect to such recharacterized gain). We urge you to read the discussion concerning the possible treatment of the Notes as a constructive ownership transaction under “Material U.S. Federal Income Tax Consequences — Securities Treated as Prepaid Derivatives or Prepaid Forwards — Section 1260” in the accompanying product supplement.

Notice 2008-2. In 2007, the IRS has released a notice that may affect the taxation of holders of the Notes. According to Notice 2008-2, the IRS and the U.S. Treasury Department are actively considering whether the holder of an instrument such as the Notes should be required to accrue ordinary income on a current basis. It is not possible to determine what guidance they will ultimately issue, if any. It is possible, however, that under such guidance, holders of the Notes will ultimately be required to accrue income currently in excess of any receipt of contingent coupons and this could be applied on a retroactive basis. The IRS and the U.S. Treasury Department are also considering other relevant issues, including whether additional gain or loss from such instruments should be treated as ordinary or capital, whether non-U.S. holders of such instruments should be subject to withholding tax on any deemed income accruals, and whether the special “constructive ownership rules” of Section 1260 of the Code should be applied to such instruments. Holders are urged to consult their tax advisors concerning the significance, and potential impact, of the above considerations. Except to the extent otherwise required by law, UBS intends to treat your Notes for U.S. federal income tax purposes in accordance with the treatment described above and under “Material U.S. Federal Income Tax Consequences — Securities Treated as Prepaid Derivatives or Prepaid Forwards with Associated Contingent Coupons” in the accompanying product supplement unless and until such time as the IRS and the Treasury Department determine that some other treatment is more appropriate.

Medicare Tax on Net Investment Income. U.S. holders that are individuals, estates, and certain trusts are subject to an additional 3.8% tax on all or a portion of their “net investment income,” which may include any income or gain realized with respect to the Notes, to the extent of their net investment income that when added to their other modified adjusted gross income, exceeds \$200,000 for an unmarried individual, \$250,000 for a married taxpayer filing a joint return (or a surviving spouse), \$125,000 for a married individual filing a separate return or the dollar amount at which the highest tax bracket begins for an estate or trust. The 3.8% Medicare tax is determined in a different manner than the income tax. U.S. holders should consult their tax advisors with respect to their consequences with respect to the 3.8% Medicare tax.

Specified Foreign Financial Assets. Certain U.S. holders that own “specified foreign financial assets” in excess of an applicable threshold may be subject to reporting obligations with respect to such assets with their tax returns, especially if such assets are held outside the custody of a U.S. financial institution. You are urged to consult your tax advisor as to the application of this legislation to your ownership of the Notes.

Non-U.S. Holders. The U.S. federal income tax treatment of the contingent coupons is unclear. Subject to the discussions below with respect to Section 871(m) of the Code and FATCA (as defined below), our counsel is of the opinion that contingent coupons paid to a non-U.S. holder that provides us (and/or the applicable withholding agent) with a fully completed and validly executed applicable IRS Form W-8 should not be subject to U.S. withholding tax and we do not intend to withhold any tax on contingent coupons. However, it is possible that the IRS could assert that such payments are subject to U.S. withholding tax, or that another withholding agent may otherwise determine that withholding is required, in which case the other withholding agent may withhold up to 30% on such payments (subject to reduction or elimination of such withholding tax pursuant to an applicable income tax treaty). We will not pay any additional amounts in respect of such withholding. Subject to Section 897 of the Code and Section 871(m) of the Code, discussed below, gain from the taxable disposition or maturity of a Note generally should not be subject to U.S. tax unless (i) such gain is effectively connected with a trade or business conducted by the non-U.S. holder in the U.S., (ii) the non-U.S. holder is a non-resident alien individual and is present in the U.S. for 183 days or more during the taxable year of such taxable disposition and certain other conditions are satisfied or (iii) the non-U.S. holder has certain other present or former connections with the U.S.

Section 897. We will not attempt to ascertain whether the underlying asset issuer or any underlying constituent issuer would be treated as a “United States real property holding corporation” (“USRPHC”) within the meaning of Section 897 of the Code. We also have not attempted to determine whether the Notes should be treated as “United States real property interests” (“USRPI”) as defined in Section 897 of the Code. Nevertheless, we do not intend to treat the Notes as USRPI. If the underlying asset issuer or any underlying constituent issuer and the Notes were so treated, certain adverse U.S. federal income tax consequences could possibly apply, including subjecting any gain to a non-U.S.

holder in respect of a Note upon a taxable disposition or maturity of a Note to U.S. federal income tax on a net basis, and the proceeds from such a taxable disposition could be subject to a 15% withholding tax. Non-U.S. holders should consult their tax advisor regarding the potential treatment of the the underlying asset issuer or any underlying constituent issuer for their Notes as a USRPHC and the Notes as USRPI.

Section 871(m). A 30% withholding tax (which may be reduced by an applicable income tax treaty) is imposed under Section 871(m) of the Code on certain “dividend equivalents” paid or deemed paid to a non-U.S. holder with respect to a “specified equity-linked instrument” that references one or more dividend-paying U.S. equity securities. The withholding tax can apply even if the instrument does not provide for payments that reference dividends. Treasury regulations provide that the withholding tax applies to all dividend equivalents paid or deemed paid on specified equity-linked instruments that have a delta of one (“delta-one specified equity-linked instruments”) issued after 2016 and to all dividend equivalents paid or deemed paid on all other specified equity-linked instruments issued after 2018. However, the IRS has issued guidance that states that the Treasury and the IRS intend to amend the effective dates of the Treasury regulations to provide that withholding on dividend equivalents paid or deemed paid will not apply to specified equity-linked instruments that are not delta-one specified equity-linked instruments and are issued before January 1, 2021.

Based on our determination that the Notes are not “delta-one” with respect to the underlying asset or any U.S. underlying constituents, our counsel is of the opinion that the Notes should not be delta-one specified equity-linked instruments and thus should not be subject to withholding on dividend equivalents. Our determination is not binding on the IRS, and the IRS may disagree with this determination. Furthermore, the application of Section 871(m) of the Code will depend on our determinations made upon issuance of the Notes. If withholding is required, we will not make payments of any additional amounts.

Nevertheless, after issuance, it is possible that your Notes could be deemed to be reissued for tax purposes upon the occurrence of certain events affecting the underlying asset, the underlying constituents or your Notes, and following such occurrence your Notes could be treated as delta-one specified equity-linked instruments that are subject to withholding on dividend equivalents. It is also possible that withholding tax or other tax under Section 871(m) of the Code could apply to the Notes under these rules if a non-U.S. holder enters, or has entered, into certain other transactions in respect of the underlying asset, the underlying constituents or the Notes. A non-U.S. holder that enters, or has entered, into other transactions in respect of the underlying asset, the underlying constituents or the Notes should consult its tax advisor regarding the application of Section 871(m) of the Code to its Notes in the context of its other transactions.

Because of the uncertainty regarding the application of the 30% withholding tax on dividend equivalents to the Notes, you are urged to consult your tax advisor regarding the potential application of Section 871(m) of the Code and the 30% withholding tax to an investment in the Notes.

Foreign Account Tax Compliance Act. The Foreign Account Tax Compliance Act (“FATCA”) was enacted on March 18, 2010, and imposes a 30% U.S. withholding tax on “withholdable payments” (i.e., certain U.S.-source payments, including interest (and original issue discount), dividends, other fixed or determinable annual or periodical gain, profits, and income, and on the gross proceeds from a disposition of property of a type which can produce U.S.-source interest or dividends) and “passthru payments” (i.e., certain payments attributable to withholdable payments) made to certain foreign financial institutions (and certain of their affiliates) unless the payee foreign financial institution agrees (or is required), among other things, to disclose the identity of any U.S. individual with an account of the institution (or the relevant affiliate) and to annually report certain information about such account. FATCA also requires withholding agents making withholdable payments to certain foreign entities that do not disclose the name, address, and taxpayer identification number of any substantial U.S. owners (or do not certify that they do not have any substantial U.S. owners) to withhold tax at a rate of 30%. Under certain circumstances, a holder may be eligible for refunds or credits of such taxes.

Pursuant to final and temporary Treasury regulations and other IRS guidance, the withholding and reporting requirements under FATCA will generally apply to certain “withholdable payments”, will not apply to gross proceeds on a sale or disposition, and will apply to certain foreign passthru payments only to the extent that such payments are made after the date that is two years after final regulations defining the term “foreign passthru payment” are published.

If withholding is required, we (or the applicable paying agent) will not be required to pay additional amounts with respect to the amounts so withheld. Foreign financial institutions and non-financial foreign entities located in jurisdictions that have an intergovernmental agreement with the U.S. governing FATCA may be subject to different rules.

Investors should consult their tax advisor about the application of FATCA, in particular if they may be classified as financial institutions (or if they hold their Notes through a foreign entity) under the FATCA rules.

Proposed Legislation. In 2007, legislation was introduced in Congress that, if it had been enacted, would have required holders of Notes purchased after the bill was enacted to accrue interest income over the term of the Notes despite the fact that there may not be interest payments over the entire term of the Notes. It is not possible to predict whether a similar or identical bill will be enacted in the future, or whether any such bill would affect the tax treatment of your Notes.

Furthermore, in 2013, the House Ways and Means Committee released in draft form certain proposed legislation relating to financial instruments. If it had been enacted, the effect of this legislation generally would have been to require instruments such as the Notes to be marked to market on an annual basis with all gains and losses to be treated as ordinary, subject to certain exceptions.

It is not possible to predict whether any similar or identical bills will be enacted in the future, or whether any such bill would affect the tax treatment of your Notes. You are urged to consult your tax advisor regarding the possible changes in law and their possible impact on the tax treatment of your Notes.

Prospective purchasers of the Notes are urged to consult their tax advisor concerning the application of U.S. federal income tax laws to their particular situations, as well as any tax consequences of the purchase, beneficial ownership and disposition of the Notes arising under the laws of any state, local, non-U.S. or other taxing jurisdiction.

Supplemental Plan of Distribution (Conflicts of Interest); Secondary Markets (if any)

We have agreed to sell to UBS Securities LLC, and UBS Securities LLC has agreed to purchase, all of the Notes at the issue price to public. UBS Securities LLC intends to resell the Notes to the public at the issue price to public.

Conflicts of Interest — UBS Securities LLC is an affiliate of UBS and, as such, has a “conflict of interest” in this offering within the meaning of Financial Industry Regulatory Authority, Inc. (“FINRA”) Rule 5121. In addition, UBS will receive the net proceeds (excluding the underwriting discount) from the initial public offering of the Notes, thus creating an additional conflict of interest within the meaning of FINRA Rule 5121. Consequently, the offering is being conducted in compliance with the provisions of FINRA Rule 5121. UBS Securities LLC is not permitted to sell Notes in this offering to an account over which it exercises discretionary authority without the prior specific written approval of the account holder.

UBS Securities LLC and its affiliates may offer to buy or sell the Notes in the secondary market (if any) at prices greater than UBS’ internal valuation — The value of the Notes at any time will vary based on many factors that cannot be predicted. However, the price (not including UBS Securities LLC’s or any affiliate’s customary bid-ask spreads) at which UBS Securities LLC or any affiliate would offer to buy or sell the Notes immediately after the trade date in the secondary market is expected to exceed the estimated initial value of the Notes as determined by reference to our internal pricing models. The amount of the excess will decline to zero on a straight line basis over a period ending no later than 6 months after the trade date, provided that UBS Securities LLC may shorten the period based on various factors, including the magnitude of purchases and other negotiated provisions with selling agents. Notwithstanding the foregoing, UBS Securities LLC and its affiliates are not required to make a market for the Notes and may stop making a market at any time. For more information about secondary market offers and the estimated initial value of the Notes, see “Key Risks — Fair value considerations” and “Key Risks — Limited or no secondary market and secondary market price considerations” of this document.

Prohibition of Sales to EEA Retail Investors — The Notes are not intended to be offered, sold or otherwise made available to and should not be offered, sold or otherwise made available to any retail investor in the European Economic Area (“EEA”). For these purposes, a retail investor means a person who is one (or more) of: (i) a retail client as defined in point (11) of Article 4(1) of Directive 2014/65/EU, as amended (“MiFID II”); (ii) a customer within the meaning of Directive 2002/92/EC, as amended, where that customer would not qualify as a professional client as defined in point (10) of Article 4(1) of MiFID II; or (iii) not a qualified investor as defined in Directive 2003/71/EC, as amended. Consequently no key information document required by Regulation (EU) No 1286/2014, as amended (the “PRIIPs Regulation”), for offering or selling the Notes or otherwise making them available to retail investors in the EEA has been prepared and therefore offering or selling the Notes or otherwise making them available to any retail investor in the EEA may be unlawful under the PRIIPs Regulation.

Validity of the Notes

In the opinion of Cadwalader, Wickersham & Taft LLP, as special counsel to the issuer, when the Notes offered by this pricing supplement have been executed and issued by the issuer and authenticated by the trustee pursuant to the indenture and delivered, paid for and sold as contemplated herein, the Notes will be valid and binding obligations of the issuer, enforceable against the issuer in accordance with their terms, subject to applicable bankruptcy, insolvency, fraudulent conveyance, reorganization, moratorium, receivership or other laws relating to or affecting creditors' rights generally, and to general principles of equity (regardless of whether enforcement is sought in a proceeding at law or in equity). This opinion is given as of the date hereof and is limited to the laws of the State of New York. Insofar as this opinion involves matters governed by Swiss law, Cadwalader, Wickersham & Taft LLP has assumed, without independent inquiry or investigation, the validity of the matters opined on by Homburger AG, Swiss legal counsel for the issuer, in its opinion dated October 29, 2018 filed on that date with the Securities and Exchange Commission as Exhibit 5.3 to the issuer's registration statement on Form F-3 (the "Registration Statement"). In addition, this opinion is subject to customary assumptions about the trustee's authorization, execution and delivery of the indenture and, with respect to the Notes, authentication of the Notes and the genuineness of signatures and certain factual matters, all as stated in the opinion of Cadwalader, Wickersham & Taft LLP dated October 29, 2018 filed on that date with the Securities and Exchange Commission as Exhibit 5.4 to the Registration Statement.