

SECURITIES NOTE

dated February 13, 2024

151 889 iX US Real Estate Exchange Traded Notes¹ due October 10, 2032

issued under

REGISTRATION DOCUMENT

dated February 13, 2024

EXCHANGE TRADED NOTES PROGRAMME

This document constitutes a Security Note for the purposes of AIFC Market Rules No.FR0003 in respect of Exchange Traded Notes, issued by iX US Real Estate SPC Limited.

This Securities Note dated February 13, 2024 for iX US Real Estate Exchange Traded Notes due October 10, 2032 (the “**Securities Note**”) shall be read in conjunction with the Registration Document for Exchange Traded Notes Programme of AIX FM Limited dated February 13, 2024, including any amendments thereto (the “**Registration Document**”), and the Prospectus Summary for iX US Real Estate Exchange Traded Notes due October 10, 2032 (the “**Prospectus Summary**”) (all three documents together, the “**Prospectus**”). These three documents collectively form the Prospectus for the purposes of AIFC Market Rules No.FR0003.

All provisions of the Registration Document and Prospectus Summary are incorporated in this Securities Note by the reference. In the event of discrepancies between the conditions of the Registration Document and/or Prospectus Summary and this Securities Note conditions of this Securities Note shall prevail.

Terms not otherwise defined herein, shall have the meaning specified in the Registration Document.

This Securities Note upon its publication and effective from February 13, 2024 supersedes the Securities Note of iX Bitcoin SPC Limited Exchange Traded Notes due December 09, 2031 dated October 10, 2022.

General

- The iX US Real Estate Exchange Traded Notes (the “**ETNs**”) are senior unsecured debt obligations of iX US Real Estate SPC Limited (the “**SPC**”), a special purpose company incorporated in the AIFC whose sole assets are shares in the Vanguard Real Estate ETF (NYSE ticker symbol: “VNQ”) (the “**Shares**”) (the “**Underlying ETF**”) and Cash (together, “**Underlying Assets**”). The base currency of the Underlying ETF is US Dollars (US\$).
- The Underlying ETF seeks to track the investment performance of the MSCI US Investable Market Real Estate 25/50 Index (the “**Index**”). The Underlying ETF seeks to provide high income and moderate long-term capital growth by investing in stocks issued by commercial REITs. Using a full-replication process, the Underlying ETF seeks to hold all stocks in the same capitalization weighting as the Index. REITs and real estate securities included in the Index must have enough shares and trading volume to be considered liquid. The Underlying ETF and the Index are described in more detail on pages 24 to 25 of this Securities Note.
- The ETNs seek to provide investors a return linked to the performance of the Underlying ETF, reduced by the Expenses. If the price of Shares at the date of your sale of ETNs is greater than the price of Shares at the date of your purchase of ETNs, you will receive less due to accrued Expenses. The amount of accrued Expenses will reduce the amount, if any, you will receive at maturity, upon Redemption or upon Early Termination (as the case may be), which could result in a loss to you on your investment, even if the price of Shares at the date of your sale is greater than the price of Shares at the date of your purchase. **Any payment on the ETNs is subject to the SPC’s ability to pay its obligations as they become due.**
- The ETNs are issued by the SPC, a special purpose company incorporated in the AIFC and governed by the AIFC Special Purpose Company Rules (AIFC Rules No. GR0001 of 2017). The SPC is a wholly-owned

¹ This amount represents the current number of ETNs outstanding. The Issuer may issue additional ETNs as further described in the Prospectus.

subsidiary of AIX FM Limited (the “**Management Company**”). The Management Company is itself a wholly-owned subsidiary of the Astana International Exchange Limited (“**AIX**”).

- **An investment in the ETNs involves significant risks and is not appropriate for every investor. The ETNs should be purchased only by knowledgeable investors who understand the potential consequences of investing in the ETNs. Investors should consider their investment horizon as well as potential transaction costs when evaluating an investment in the ETNs and should regularly monitor their holdings of ETNs to ensure that they remain consistent with their investment strategies.**
- The ETNs are senior unsecured debt obligations of the SPC and mature on October 10, 2032.
- The ETNs do not guarantee any return on your investment. Prior to maturity of the ETNs, unless the ETNs are either redeemed or terminated in accordance with their terms, the ETN Holders will only be able to realise the value of their investment by selling the ETNs through a broker that is a trading member of AIX, the stock exchange within the AIFC. On maturity of the ETNs, the ETN Holders will receive Cash and/or Shares and the amount of such Cash and/or the number of Shares will be reduced by the Expenses.
- The ETNs will not pay any coupon. Any dividends paid by the Underlying ETF and received by the SPC will be used for the payment of Expenses and/or reinvestment in Shares.
- The base currency of the ETNs is US Dollars (US\$) and the nominal value of the ETNs shall be expressed in US Dollars (US\$). The nominal value of one ETN calculated as at the date of this Securities Note is equal to 1,18 US Dollars (US\$). This nominal value is not a principal amount and, accordingly, does not provide the ETN Holder with a right to claim this amount from the SPC. The value and price of the ETNs will be subject to change on a daily basis, as described in the Prospectus.
- The ETNs are expected to be listed and admitted to trading on AIX under the ticker symbol “**IXR**”. The SPC has no obligation to maintain any listing on any exchange or quotation system and no assurance can be given that the listing on AIX will be maintained.
- 35 000 ETNs have been issued by the SPC in the amount of the Initial Placement and are expected to be sold off-exchange to the Initial Purchaser where the consideration provided by the Initial Purchaser will consist of 527 Shares and cash in the amount of 1 000,00 US Dollars (US\$). Following the Initial Placement, ETNs are eligible for any public market sales. The SPC may issue additional ETNs or redeem existing ETNs, as further described in the Prospectus. As at the date of the Securities Note, the issued number of ETNs was 151 889 ETNs.
- Further issuances of the ETNs will be carried out by the SPC only upon the request of the Authorised Participants. Such additional issuances of the ETNs will be sold by the SPC to the Authorised Participants off-exchange at the price intended to be approximately close to the NAV. Upon completion of the further issuance (On-Going Placement), ETNs are eligible for any public market sales.
- Retail investors who qualify as an App Investor may subscribe for ETNs by filing an electronic request with SPC via the App. App Investors (other than Authorised Participant) have no right to require the SPC to redeem ETNs, but an App Investor may file an electronic request with SPC via the App for repurchase of its ETNs.

Investing in the ETNs involves a number of risks not associated with an investment in conventional debt securities. See the Section headed “Risk Factors” in the Registration Document, the Prospectus Summary and in this Securities Note for more information.

Astana International Exchange Ltd (AIX) and its related companies and their respective directors, officers and employees do not accept responsibility for the content of this Prospectus including the accuracy or completeness of any information or statements included in it. Liability for this Prospectus lies with the SPC. Nor has AIX, its directors, officers or employees assessed the suitability of the securities to which this Prospectus relates for any particular investor or type of investor. If you do not understand the contents of this Prospectus or are unsure whether the securities are suitable for your individual investment objectives and circumstances, you should consult an authorised financial adviser.

TABLE OF CONTENTS

DEFINITIONS AND KEY TERMS	4
NET ASSET VALUE	5
TERM AND CONDITIONS OF THE OFFER	6
GENERAL TERMS OF THE ETNS	8
RISK FACTORS	11
USE OF PROCEEDS	23
UNDERLYING ETF	24
SPC	26
FINANCIAL INFORMATION OF THE SPC	28
RESPONSIBILITY STATEMENT	31

DEFINITIONS AND KEY TERMS

Acting Law of the AIFC	Has the same meaning as defined in clause 1 of Article 4 of the Constitutional Statute of the Republic of Kazakhstan “On the Astana International Financial Centre” No. 438-V ZRK, dated 7 December 2015.
App	means a mobile application developed by AIX under brand name “Tabys” and leased out to SPC (acting through the Management Company) based on corresponding sub-license arrangements to facilitating communication and document transactions (subscription or buyback) in respect of ETNs between the SPC and the App Investor. The App can be downloaded to investor’s mobile device subject to the terms of service of the App.
App Investor	An investor who has accepted the terms and conditions of the App Investor Agreement and the terms of service of the App for the purpose of ETN subscription and buyback with SPC.
Creation Amount	100 ETNs, subject to the right of the Management Company to modify the Creation Amount at any time at its sole and absolute discretion.
Custodian	Jusan Bank JSC, a legal entity incorporated under the laws of the Republic of Kazakhstan and acting as a custodian for the Shares and Cash owned by the SPC, pursuant to and in accordance with the terms and conditions of the Custody Agreement.
ISIN	KZX000001169.
Listing	Application has been made to list the ETNs on the official list of AIX and for admission to trade the ETNs on AIX.
Maturity Date	October 10, 2032.
Permitted Assets	The assets which the SPC is permitted to hold and own are: <ul style="list-style-type: none"> • Shares; and • Cash.
Placement Fee	Zero.
Primary Exchange or NYSE	The New York Stock Exchange LLC.
Redemption Fee	0.125 percent of a sum equal to the product of the NAV (as at the Business Day preceding the date of the Redemption Notice) multiplied by the number of ETNs redeemed, subject to the right of the Management Company to modify the Redemption Fee at any time at its sole and absolute discretion.
Redemption Amount	100 ETNs, subject to the right of the Management Company to modify the Redemption Amount at any time at its sole and absolute discretion.
SPC	iX US Real Estate SPC Limited (“ SPC ”, “ we ”, “ our ” or “ us ”), a special purpose company, registration number 220540900307, incorporated under the Acting Law of the AIFC on 18 May 2022 with a registered address at Mangilik El 55, building 19, Nur-Sultan, Kazakhstan, telephone +7(717) 223 53 66. The SPC is registered by Astana Financial Services Authority in the public register https://publicreg.myafsa.com/details/220540900307/ and governed by the AIFC Special Purpose Company Rules (AIFC Rules No. GR0001 of 2017).
Underlying ETF	Vanguard Real Estate ETF (NYSE ticker symbol: “VNQ”).

NET ASSET VALUE

As at the date of this Securities Note, the Net Asset Value (“NAV”) was equal to 1.32 USD and consist of the following:

Date

February 13, 2024

Type of asset	Value, USD
Cash	11,251.73
Shares (2,287 shares in the Vanguard Real Estate ETF)	189,043.42
Gross asset value	200,295.15
Total accrued Expenses for account of ETN Holders	63.67
NAV	200,231.48
NAV per ETN (with 151 889 ETNs outstanding as at the date of this Securities Note)	1.32

Historical Net Asset Value (since inception, end of month values):

Month	NAV per ETN, USD	Month	NAV per ETN, USD
10 October 2022	1,18	June 2023	1,30
November 2022	1,35	July 2023	1,34
December 2022	1,28	August 2023	1,30
January 2023	1,41	September 2023	1,19
February 2023	1,33	October 2023	1,16
March 2023	1,30	November 2023	1,29
April 2023	1,30	December 2023	1,41
May 2023	1,25	January 2024	1.34

TERM AND CONDITIONS OF THE OFFER

The following is the general terms and conditions of the offer of ETNs under this Securities Note.

Name of security	iX US Real Estate Exchange Traded Notes
Class of security	Senior unsecured debt notes
Form of security	Book-entered non-bearer securities in uncertificated form
Currency of security	US Dollars
Nominal value	The nominal value of one ETN calculated as at the date of the initial Prospectus (being October 10, 2022) was equal to 1,18 US Dollars (US\$). This nominal value is not a principal amount and, accordingly, does not provide the ETN Holder with a right to claim this amount from the SPC.
Price of security	The value and price of the ETNs will be subject to change on a daily basis, as described in the Prospectus.
Governing law	Acting Law of the AIFC
Issuer	iX US Real Estate SPC Limited
Registrar	Astana International Exchange Registrar Ltd
Issue date	October 10, 2022
Maturity date	October 10, 2032
Offer period	Continuing offering
New issuances	The ETNs are issued on continuous basis in transactions with Authorised Participants. New ETNs are created by virtue of decision of the SPC on approval of the Prospectus.
Coupon	None
Repayment	Bullet at maturity, subject to the right of an Authorised Participant to require the SPC to redeem the ETNs, the right of the SPC to exercise Early Termination or (as the case may be) the right of the SPC to extend the term of the ETNs, each as described in the Prospectus.
ISIN	KZX000001169
Transferability	Freely transferable, no restrictions
Listing and trading	Astana International Exchange Limited
Date of admission to trading	The ETNs are expected to be admitted to trading on AIX on October 21, 2022.
Ticker	IXR
Initial issued quantity	35 000
Current issued quantity	151 889
Custodian	Jusan Bank JSC, Republic of Kazakhstan
Auditor	IAC Russell Bedford A+ Partners LLP, Republic of Kazakhstan
Underlying ETF	Vanguard Real Estate ETF (NYSE ticker symbol: "VNQ").
Ranking of ETNs	The ETNs constitute direct, unconditional and unsecured obligations of the SPC and rank and will rank: (i) pari passu, without any preference among themselves; and (ii) as senior debt with preference over all other outstanding unsecured and unsubordinated obligations of the Issuer, present and future, but, in each case, in the event of insolvency, only to the extent permitted by applicable laws relating to creditors' rights.
Potential investors	The ETNs are offered to the various categories of potential investors, that are eligible to invest in ETNs. Each potential investor shall consult with his/her financial and/or legal adviser on eligibility on ETNs in light of his/her particular circumstances.
Material interest and conflict of interest	Disclosures on affiliated companies within AIX group. AIX FM Limited is a wholly-owned subsidiary of AIX and acts as a Management company of the SPC and enters into all necessary agreements in the Prospectus on behalf of the SPC. Whereas, AIX CSD, AIX Registrar and AIX MLS are wholly-owned subsidiaries of AIX and may from time to time act as an administrator, registrar, transfer-agent, representative or otherwise as may be required from time to time in relation to the Prospectus, or be otherwise involved in or with other funds and clients which have similar investment objectives to those of the SPC. It is, therefore, possible that any of them may, in the course of business, have potential conflicts of interest with the SPC. Each of these companies will, at all times, have regard in such event to its obligations to the SPC and will endeavor to ensure that such conflicts are resolved fairly and taking into account interests of the investors. Each of these companies has measures in place to minimize potential conflicts of interest.

	<p>The services of companies provided to the SPC are not deemed to be exclusive and each of these companies shall be free to render similar services to others so long as its services hereunder are not impaired thereby and to retain for its own use and benefit all fees and other money payable thereby and companies shall not be under any duty to disclose to the SPC any fact or thing which comes to the notice of companies in the course of its rendering similar services to others or in the course of its business in any other capacity or in any manner whatsoever otherwise than in the course of carrying out its duties under contracts with the SPC.</p> <p>Conflicts of interest may also arise due to the widespread business operations of companies and their connected persons (CEO, CFO, Directors). The foregoing parties may effect transactions where those conflicts arise and shall not, subject to the terms of contracts be liable to account for any profit, commission or other remuneration arising. However, all transactions carried out by or on behalf of the SPC will be on arm's length terms.</p> <p>In the event that any conflicts of interest arise, each company will, at all times, have regard in such event to its obligations under contracts and, in particular, to its obligations to act in the best interests of the SPC and the ETN Holder (s) so far as practicable. Companies will endeavor to ensure that such conflicts are resolved fairly and taking into account interests of the investors.</p>
The manner of placement, allocation and method of payment for ETNs	<p>The ETNs are issued and redeemed by the SPC on a continued basis upon the request of the Authorised Participants. Any issuances of the ETNs are to be sold by the SPC to the Authorised Participants off-exchange in exchange for the Shares and Cash in proportion to the NAV. Upon completion of the placement, ETNs are eligible for any public market sales.</p> <p>Retail investors who qualify as an App Investor may subscribe for any number of ETNs or may request SPC to repurchase all or part of its ETNs by filing an electronic request with SPC via the App. Prospective investors may purchase or sell ETNs on AIX through a brokerage firm that is a trading member of AIX. The Authorised Participants have a right to redeem ETNs purchased from the SPC, on AIX or off-exchange. The redemptions of the ETNs are to be made off-exchange. ETN Holders (other than Authorised Participant) have no right to require the SPC to redeem ETNs.</p>
The effect the issuance of the ETNs on the capital structure of the SPC	Continuing issuance and redemptions of ETNs (being debentures of the SPC) will not affect the capital structure of the SPC
Particulars of any commissions or other fees to be paid by the SPC in relation to the offer	The SPC is not planning to pay any fees or commissions in relation to the offer (except customarily fees of the Stock Exchange).
All relevant details of the appointment of an underwriter and/or a placing agent	Not applicable, the offer has no underwriter or a placing agent.
Details of the entities which have a firm commitment to act as intermediaries in secondary trading	As stated in this Prospectus, the Stock Exchange at its sole discretion may appoint a market maker to provide two-way bid and ask quotes for secondary trading. Such appointment and provision of trading quotes are not guaranteed and could be terminated at any point of time.

GENERAL TERMS OF THE ETNS

The following are general terms of the ETNs and other considerations you should take into account when deciding whether to invest in the ETNs.

What are the ETNs and how do they work?

The ETNs are unsecured senior debt obligations of iX US Real Estate SPC Limited, a special purpose company governed by the AIFC Special Purpose Company Rules (AIFC Rules No. GR0001 of 2017) and incorporated in the AIFC. The assets of the SPC are a combination of shares in the Underlying ETF (the “**Shares**”) and cash in US Dollars and Kazakhstan tenge in the hands of the SPC (the “**Cash**”).

Over the term of the ETNs, the NAV will generally fluctuate in line with the change in value of the Underlying ETF, reduced by the Expenses (as explained in more detail immediately below).

Net Asset Value

The NAV equals:

the closing price of a Share as quoted on the Primary Exchange on the preceding Business Day
multiplied by
the number of Shares held by the SPC
plus
Cash
plus
accrued but not received dividends
plus
any other assets
less
accrued but unpaid Expenses
less
any other liabilities (excluding ETNs issued).

The NAV per ETN calculated by dividing the NAV by number of outstanding ETNs.

In calculation of the market price for securities and value of any other assets or liabilities the SPC usually uses the most appropriate valuation procedure including the closing price for such securities on any major stock exchange as well as other methods. Any assets or liabilities that are denominated in currency other than USD will be translated into USD at the prevailing market rates.

Besides, the SPC has a right, acting reasonably and prudently, to adjust the calculation of the NAV by excluding or (as the case may be) including certain items in order to determine the correct value of the assets of the SPC.

The NAV is calculated on each Business Day and usually published on the website of the Stock Exchange at www.aix.kz at 11:00 a.m. Astana time on that Business Day.

The NAV is rounded down to the nearest cent.

Expenses

The SPC shall pay the following expenses:

- operational fees;
- the management fee; and
- other expenses.

The above expenses of the SPC are deducted from, and reflected in the value of the SPC and, accordingly, the NAV. The effect of the SPC paying Expenses is therefore to reduce the NAV.

Any cash dividends received by the SPC in relation to the Shares owned by the SPC may be used for the payment of Expenses and/or reinvestment in Shares.

Total Expense Ratio

The Total Expense Ratio is the ratio of the Expenses, including operational fees and the management fee and the fees charged by the manager of the Underlying ETF, accrued on a daily basis, to the NAV. It is expected (but not guaranteed) that the Total Expense Ratio will not exceed 1.0 percent per annum.

For avoidance of doubt, any extraordinary expenses as well as any withholding (or other taxes) associated with the net cash dividends related to the Shares will not be included in expenses for the purpose of calculation of the Total Expense Ratio.

Right of the Management Company to pay Expenses

If at any time the Total Expense Ratio exceeds 1.0 percent per annum, the Management Company has a right, but is not obliged, to reimburse the SPC for such shortfall.

The Management Company may, but is not obliged to, pay any operational fees at its own expense, with or without reimbursement from the SPC.

The management fee and operational fees are described in more detail on this page of this Prospectus.

Operational fees

Operational fees include all costs, charges, fees and expenses incurred in the operation of the SPC, including transactional costs, banking costs, brokerage costs, borrowing costs, the costs and expenses of obtaining and maintaining authorisations or registrations with regulatory authorities, professional fees, expenses for auditing, interest payments and other fees.

Management fee

In accordance with the Management Agreement, the SPC shall pay a fee to the Management Company for the Management Company's services. Pursuant to and in accordance with the terms and conditions of the Management Agreement, the Management Company may modify the management fee, provided that the Total Expense Ratio may not exceed 1.0 percent per annum.

Calculation and payment of the management fee

The management fee will be accrued on a daily basis and paid monthly by the SPC.

In the event the SPC has insufficient cash to pay the management fee or other Expenses, the SPC may sell Shares in order to cover such Expenses.

Other Expenses

In addition to the Expenses indicated above, the SPC may, in exceptional circumstances, deduct costs that relate to the ETNs that arise outside the ordinary course of business such as taxes, litigation expenses and any other extraordinary expenses. These other expenses are for the account of the ETN Holders and, accordingly, will be reflected in the NAV.

Substitution of the current Underlying ETF for a new Underlying ETF

The SPC may change the Underlying ETF at its sole and absolute discretion. The circumstances under which the SPC may change the Underlying ETF include, but are not limited to:

- suspension of trading or delisting of the Shares on the official list of the Primary Exchange; and
- other conditions that may make it practically impossible to sell, purchase or obtain reasonable market prices for the Shares.

Should such conditions occur, the SPC, acting in good faith, must, decide whether to:

- substitute the current Underlying ETF with a new Underlying ETF, which new Underlying ETF shall, in all material respects, be substantially similar to the previous Underlying ETF; or
- exercise its right to Early Termination to redeem all of the outstanding ETNs.

In circumstances where the previous Underlying ETF is substituted for a new Underlying ETF, the SPC shall:

- inform the ETNs Holders by means of a notification on the website of the Stock Exchange at www.aix.kz;
- request the suspension of trading of the ETNs on the Stock Exchange;
- suspend the issuance and Redemptions of the ETNs;
- sell, on a best efforts basis, Shares in the previous Underlying ETF;
- purchase, on a best efforts basis, shares in the new Underlying ETF;
- calculate and publish the new NAV; and
- seek a lifting of the trading suspension on the Stock Exchange in respect of the ETNs.

Dividends and distributions received from the Shares

Any net cash dividends or other distributions associated with the Underlying ETF and paid to the SPC shall be retained by the SPC and may be used to cover the Expenses of the SPC. The ETN holders have no right or entitlement to any such dividends or other distributions.

The SPC has the right to use any cash owned by it for the purchase of Shares.

Changes to this Securities Note

The SPC may amend or change this Securities Note at any time in its sole and absolute discretion by the issuance of a supplementary Securities Note.

RISK FACTORS

Your investment in the ETNs will involve risks. The ETNs are not secured debt and are riskier than ordinary unsecured debt securities. As described in more detail below, the trading price of the ETNs may vary considerably before the Maturity Date due to, among other things, fluctuations in the markets and other events that are difficult to predict and beyond control of the SPC. This Section of the Securities Note describes additional risks related to these ETNs. In addition to these additional risks specific to these ETNs, you need to review the general risks associated with the ETNs in the respective section of the Registration Document and the Prospectus Summary, which are incorporated by reference in this Securities Note.

Besides, there are also risks related to the Underlying ETF as described below.

The SPC urges you to read the following information about these risks, together with the other information in the Prospectus, before investing in the ETNs.

RISK FACTORS RELATED TO THE ETNs

Concentration risk.

Almost all of the assets of the SPC are invested in the Shares, which creates a significant concentration on the Underlying ETF. Any negative movements in the price of Shares will directly adversely affect the NAV and the market price of ETNs.

The Underlying ETF may be replaced upon the occurrence of certain adverse events

If certain adverse events were to occur (including but not limited to suspension of trading or delisting of the Shares from the official list of the Primary Exchange) which make it practically impossible to sell or purchase, or (as the case may be) to obtain reasonable market prices for the Shares, then the SPC must, acting in the good faith, decide whether to substitute the current Underlying ETF with a new Underlying ETF, which new Underlying ETF shall, in all material respects, be substantially similar to the previous Underlying ETF, or exercise Early Termination to redeem all of the outstanding ETNs.

The SPC is a recently established entity with limited track record of operation

The SPC has been established on 18 May 2022 and has limited track record of operation. The SPC is a special purpose vehicle with a passive investment strategy and the asset classes in which it can invest are limited. Investments by the ETN Holders will be used by the SPC to purchase Permitted Assets only. Accordingly, the prospects of the SPC are fully dependent on the market demand for its ETNs and the performance of the Underlying ETF.

RISK FACTORS RELATED TO THE UNDERLYING ETF

Below are the principal risks related to the Underlying ETF taken from the prospectus of the Underlying ETF as of the date of this Securities Note. Potential investors are urged to read the full description of risks associated with the Underlying ETF in the most recent prospectus of the Underlying ETF available at <https://investor.vanguard.com/investment-products/etfs> prior to the purchase of any ETNs. The prospectus of the Underlying ETF might be changed/updated by the Underlying ETF from time to time as well as risk factors involved.

The Underlying ETF is subject to certain risks, including the principal risks noted below, any of which may adversely affect the Underlying ETF's net asset value per share, trading price, yield, total return and ability to meet its investment objective. The order of the below risk factors does not indicate the significance of any particular risk factor. The terms used in this Section are defined in the prospectus of the Underlying ETF.

An investment in the Fund could lose money over short or long periods of time. You should expect the Fund's share price and total return to fluctuate within a wide range. The Fund is subject to the following risks, which could affect the Fund's performance:

Industry concentration risk, which is the chance that the stocks of REITs and other real estate-related investments will decline because of adverse developments affecting the real estate industry and real property values. Because the Fund concentrates its assets in these stocks, industry concentration risk is high.

Interest rate risk, which is the chance that REIT stock prices overall will decline and that the cost of borrowing for REITs will increase because of rising interest rates. Interest rate risk is high for the Fund.

Stock market risk, which is the chance that stock prices overall will decline. Stock markets tend to move in cycles, with periods of rising prices and periods of falling prices. The Fund's target index may, at times, become focused in stocks of a limited number of companies, which could cause the Fund to underperform the overall stock market.

Asset concentration risk, which is the chance that, because the Fund's target index (and therefore the Fund) tends to be heavily weighted in its ten largest holdings, the Fund's performance may be hurt disproportionately by the poor performance of relatively few stocks.

Investment style risk, which is the chance that returns from the stocks of REITs and other real estate-related investments—which typically are small- or mid-capitalization stocks—will trail returns from the overall stock market. Historically, these stocks have performed quite differently from the overall market.

Nondiversification risk, which is the chance that the Fund may invest a greater percentage of its assets in a particular issuer or group of issuers or may own larger positions of an issuer's voting stock than a diversified fund.

Because ETF Shares are traded on an exchange, they are subject to additional risks:

- The Fund's ETF Shares are listed for trading on NYSE Arca and are bought and sold on the secondary market at market prices. Although it is expected that the market price of an ETF Share typically will approximate its net asset value (NAV), there may be times when the market price and the NAV differ significantly. Thus, you may pay more or less than NAV when you buy ETF Shares on the secondary market, and you may receive more or less than NAV when you sell those shares.
- Although the Fund's ETF Shares are listed for trading on NYSE Arca, it is possible that an active trading market may not be maintained.
- Trading of the Fund's ETF Shares may be halted by the activation of individual or marketwide trading halts (which halt trading for a specific period of time when the price of a particular security or overall market prices decline by a specified percentage). Trading of the Fund's ETF Shares may also be halted if (1) the shares are delisted from NYSE Arca without first being listed on another exchange or (2) NYSE Arca officials determine that such action is appropriate in the interest of a fair and orderly market or for the protection of investors.

An investment in the Fund is not a deposit of a bank and is not insured or guaranteed by the Federal Deposit Insurance Corporation or any other government agency.

Borrowing. A fund's ability to borrow money is limited by its investment policies and limitations; by the 1940 Act; and by applicable exemptions, no-action letters, interpretations, and other pronouncements issued from time to time by the SEC and its staff or any other regulatory authority with jurisdiction. Under the 1940 Act, a fund is required to maintain continuous asset coverage (i.e., total assets including borrowings, less liabilities exclusive of borrowings) of 300% of the amount borrowed, with an exception for borrowings not in excess of 5% of the fund's total assets (at the time of borrowing) made for temporary or emergency purposes. Any borrowings for temporary purposes in excess of 5% of the fund's total assets must maintain continuous asset coverage. If the 300% asset coverage should decline as a result of market fluctuations or for other reasons, a fund may be required to sell some of its portfolio holdings within three days (excluding Sundays and holidays) to reduce the debt and restore the 300% asset coverage, even though it may be disadvantageous from an investment standpoint to sell securities at that time. Borrowing will tend to exaggerate the effect on net asset value of any increase or decrease in the market value of a fund's portfolio. Money borrowed will be subject to interest costs that may or may not be recovered by earnings on the securities purchased with the proceeds of such borrowing. A fund also may be required to maintain minimum average balances in connection with a borrowing or to pay a commitment or other fee to maintain a line of credit; either of these requirements would increase the cost of borrowing over the stated interest rate. A borrowing transaction will not be considered to constitute the issuance, by a fund, of a "senior security," as that term is defined in Section 18(g) of the 1940 Act, and therefore such transaction will not be subject to the 300% asset coverage requirement otherwise applicable to borrowings by a fund, if the fund complies with Rule 18f-4 under the 1940 Act.

Common Stock. Common stock represents an equity or ownership interest in an issuer. Common stock typically entitles the owner to vote on the election of directors and other important matters, as well as to receive dividends on such stock. In the event an issuer is liquidated or declares bankruptcy, the claims of owners of bonds, other debt holders, and owners of preferred stock take precedence over the claims of those who own common stock.

Convertible Securities. Convertible securities are hybrid securities that combine the investment characteristics of bonds and common stocks. Convertible securities typically consist of debt securities or preferred stock that may be converted (on a voluntary or mandatory basis) within a specified period of time (normally for the entire life of the security) into a certain amount of common stock or other equity security of the same or a different issuer at a predetermined price. Convertible securities also include debt securities with warrants or common stock attached and derivatives combining the features of debt securities and equity securities. Other convertible securities with features and risks not specifically referred to herein may become available in the future. Convertible securities involve risks similar to those of both fixed

income and equity securities. In a corporation's capital structure, convertible securities are senior to common stock but are usually subordinated to senior debt obligations of the issuer. The market value of a convertible security is a function of its "investment value" and its "conversion value." A security's "investment value" represents the value of the security without its conversion feature (i.e., a nonconvertible debt security). The investment value may be determined by reference to its credit quality and the current value of its yield to maturity or probable call date. At any given time, investment value is dependent upon such factors as the general level of interest rates, the yield of similar nonconvertible securities, the financial strength of the issuer, and the seniority of the security in the issuer's capital structure. A security's "conversion value" is determined by multiplying the number of shares the holder is entitled to receive upon conversion or exchange by the current price of the underlying security. If the conversion value of a convertible security is significantly below its investment value, the convertible security will trade like nonconvertible debt or preferred stock and its market value will not be influenced greatly by fluctuations in the market price of the underlying security. In that circumstance, the convertible security takes on the characteristics of a bond, and its price moves in the opposite direction from interest rates. Conversely, if the conversion value of a convertible security is near or above its investment value, the market value of the convertible security will be more heavily influenced by fluctuations in the market price of the underlying security. In that case, the convertible security's price may be as volatile as that of common stock. Because both interest rates and market movements can influence its value, a convertible security generally is not as sensitive to interest rates as a similar debt security, nor is it as sensitive to changes in share price as its underlying equity security. Convertible securities are often rated below investment-grade or are not rated, and they are generally subject to a high degree of credit risk. Although all markets are prone to change over time, the generally high rate at which convertible securities are retired (through mandatory or scheduled conversions by issuers or through voluntary redemptions by holders) and replaced with newly issued convertible securities may cause the convertible securities market to change more rapidly than other markets. For example, a concentration of available convertible securities in a few economic sectors could elevate the sensitivity of the convertible securities market to the volatility of the equity markets and to the specific risks of those sectors. Moreover, convertible securities with innovative structures, such as mandatory-conversion securities and equity-linked securities, have increased the sensitivity of the convertible securities market to the volatility of the equity markets and to the special risks of those innovations, which may include risks different from, and possibly greater than, those associated with traditional convertible securities. A convertible security may be subject to redemption at the option of the issuer at a price set in the governing instrument of the convertible security. If a convertible security held by a fund is subject to such redemption option and is called for redemption, the fund must allow the issuer to redeem the security, convert it into the underlying common stock, or sell the security to a third party.

Cybersecurity Risks. The increased use of technology to conduct business could subject a fund and its third-party service providers (including, but not limited to, investment advisors, transfer agents, and custodians) to risks associated with cybersecurity. In general, a cybersecurity incident can occur as a result of a deliberate attack designed to gain unauthorized access to digital systems. If the attack is successful, an unauthorized person or persons could misappropriate assets or sensitive information, corrupt data, or cause operational disruption. A cybersecurity incident could also occur unintentionally if, for example, an authorized person inadvertently released proprietary or confidential information. Vanguard has developed robust technological safeguards and business continuity plans to prevent, or reduce the impact of, potential cybersecurity incidents. Additionally, Vanguard has a process for assessing the information security and/or cybersecurity programs implemented by a fund's third-party service providers, which helps minimize the risk of potential incidents that could impact a Vanguard fund or its shareholders. Despite these measures, a cybersecurity incident still has the potential to disrupt business operations, which could negatively impact a fund and/or its shareholders. Some examples of negative impacts that could occur as a result of a cybersecurity incident include, but are not limited to, the following: a fund may be unable to calculate its net asset value (NAV), a fund's shareholders may be unable to transact business, a fund may be unable to process transactions, or a fund may be unable to safeguard its data or the personal information of its shareholders.

Derivatives. A derivative is a financial instrument that has a value based on—or "derived from"—the values of other assets, reference rates, or indexes. Derivatives may relate to a wide variety of underlying references, such as commodities, stocks, bonds, interest rates, currency exchange rates, and related indexes. Derivatives include futures contracts and options on futures contracts, certain forward-commitment transactions, options on securities, caps, floors, collars, swap agreements, and certain other financial instruments. Some derivatives, such as futures contracts and certain options, are traded on U.S. commodity and securities exchanges, while other derivatives, such as swap agreements, may be privately negotiated and entered into in the over-the-counter market (OTC Derivatives) or may be cleared through a clearinghouse (Cleared Derivatives) and traded on an exchange or swap execution facility. As a result of the Dodd-Frank Wall Street Reform and Consumer Protection Act (the Dodd-Frank Act), certain swap agreements, such as certain standardized credit default and interest rate swap agreements, must be cleared through a clearinghouse and traded on an exchange or swap execution facility. This could result in an increase in the overall costs of such transactions. While the intent of derivatives regulatory reform is to mitigate risks associated with derivatives markets, the regulations could, among other things, increase liquidity and decrease pricing for more standardized products while decreasing liquidity and increasing pricing for less standardized products. The risks associated with the use of derivatives are different from, and possibly greater than, the risks associated with investing directly in the securities or assets on which the derivatives are based. Derivatives may be used for a variety of purposes, including—but not limited to—hedging, managing risk, seeking to stay fully

invested, seeking to reduce transaction costs, seeking to simulate an investment in equity or debt securities or other investments, and seeking to add value by using derivatives to more efficiently implement portfolio positions when derivatives are favorably priced relative to equity or debt securities or other investments. Some investors may use derivatives primarily for speculative purposes while other uses of derivatives may not constitute speculation. There is no assurance that any derivatives strategy used by a fund's advisor will succeed. The other parties to a fund's OTC Derivatives contracts (usually referred to as "counterparties") will not be considered the issuers thereof for purposes of certain provisions of the 1940 Act and the IRC, although such OTC Derivatives may qualify as securities or investments under such laws. A fund's advisor(s), however, will monitor and adjust, as appropriate, the fund's credit risk exposure to OTC Derivative counterparties. Derivative products are highly specialized instruments that require investment techniques and risk analyses different from those associated with stocks, bonds, and other traditional investments. The use of a derivative requires an understanding not only of the underlying instrument but also of the derivative itself, without the benefit of observing the performance of the derivative under all possible market conditions. When a fund enters into a Cleared Derivative, an initial margin deposit with a Futures Commission Merchant (FCM) is required. Initial margin deposits are typically calculated as an amount equal to the volatility in market value of a Cleared Derivative over a fixed period. If the value of the fund's Cleared Derivatives declines, the fund will be required to make additional "variation margin" payments to the FCM to settle the change in value. If the value of the fund's Cleared Derivatives increases, the FCM will be required to make additional "variation margin" payments to the fund to settle the change in value. This process is known as "marking-to-market" and is calculated on a daily basis. For OTC Derivatives, a fund is subject to the risk that a loss may be sustained as a result of the insolvency or bankruptcy of the counterparty or the failure of the counterparty to make required payments or otherwise comply with the terms of the contract. Additionally, the use of credit derivatives can result in losses if a fund's advisor does not correctly evaluate the creditworthiness of the issuer on which the credit derivative is based. Derivatives may be subject to liquidity risk, which exists when a particular derivative is difficult to purchase or sell. If a derivative transaction is particularly large or if the relevant market is illiquid (as is the case with certain OTC Derivatives), it may not be possible to initiate a transaction or liquidate a position at an advantageous time or price. Derivatives may be subject to pricing or "basis" risk, which exists when a particular derivative becomes extraordinarily expensive relative to historical prices or the prices of corresponding cash market instruments. Under certain market conditions, it may not be economically feasible to initiate a transaction or liquidate a position in time to avoid a loss or take advantage of an opportunity. Because certain derivatives have a leverage component, adverse changes in the value or level of the underlying asset, reference rate, or index can result in a loss substantially greater than the amount invested in the derivative itself. Certain derivatives have the potential for unlimited loss, regardless of the size of the initial investment. A derivative transaction will not be considered to constitute the issuance, by a fund, of a "senior security," as that term is defined in Section 18(g) of the 1940 Act, and therefore such transaction will not be subject to the 300% asset coverage requirement otherwise applicable to borrowings by a fund, if the fund covers the transaction in accordance with the requirements described under the heading "Borrowing." Like most other investments, derivative instruments are subject to the risk that the market value of the instrument will change in a way detrimental to a fund's interest. A fund bears the risk that its advisor will incorrectly forecast future market trends or the values of assets, reference rates, indexes, or other financial or economic factors in establishing derivative positions for the fund. If the advisor attempts to use a derivative as a hedge against, or as a substitute for, a portfolio investment, the fund will be exposed to the risk that the derivative will have or will develop imperfect or no correlation with the portfolio investment. This could cause substantial losses for the fund. Although hedging strategies involving derivative instruments can reduce the risk of loss, they can also reduce the opportunity for gain or even result in losses by offsetting favorable price movements in other fund investments. Many derivatives (in particular, OTC Derivatives) are complex and often valued subjectively. Improper valuations can result in increased cash payment requirements to counterparties or a loss of value to a fund. On October 28, 2020, the Securities and Exchange Commission adopted new regulations governing the use of derivatives by registered investment companies ("Rule 18f-4"). The Funds will be required to implement and comply with Rule 18f-4 by August 19, 2022. Once implemented, Rule 18f-4 will impose limits on the amount of derivatives a fund can enter into, eliminate the asset segregation framework currently used by funds to comply with Section 18 of the Investment Company Act of 1940, as amended, treat derivatives as senior securities and require funds whose use of derivatives is more than a limited specified exposure amount to establish and maintain a comprehensive derivatives risk management program and appoint a derivatives risk manager. Each Fund intends to comply with Rule 4.5 under the Commodity Exchange Act (CEA), under which a fund may be excluded from the definition of the term Commodity Pool Operator (CPO) if the fund meets certain conditions such as limiting its investments in certain CEA-regulated instruments (e.g., futures, options, or swaps) and complying with certain marketing restrictions. Accordingly, Vanguard is not subject to registration or regulation as a CPO with respect to each Fund under the CEA. A Fund will only enter into futures contracts and futures options that are traded on a U.S. or foreign exchange, board of trade, or similar entity or that are quoted on an automated quotation system.

Environmental, Social, and Governance (ESG) Considerations. ESG risk factors, either quantitative or qualitative, may be used as a component of certain funds' investment processes as a means to assess risk (e.g., risk analysis, credit analysis, or investment opportunities) as the advisor deems appropriate. The weight given to ESG factors may vary across types of investments, industries, regions, and issuers; may change over time; and not every ESG factor may be identified or evaluated. Consideration of ESG factors may affect a fund's exposure to certain issuers or industries. The advisor's assessment of an issuer may differ from that of other funds or an investor's assessment of such issuer. As a result, securities

selected by the advisor may not reflect the beliefs and values of any particular investor. The advisor may be dependent on the availability of timely, complete, and accurate ESG data being reported by issuers and/or third-party research providers to evaluate ESG factors. ESG factors are often not uniformly measured or defined, which could impact an advisor's ability to assess an issuer. Where ESG risk factor analysis is used as one part of an overall investment process (as may be the case for actively managed funds included in this Statement of Additional Information), such funds may still invest in securities of issuers that all market participants may not view as ESG-focused or that may be viewed as having a high ESG risk profile. For funds advised by Vanguard, Vanguard's Investment Stewardship Team, on behalf of the Board of Trustees of each Vanguard-advised fund, administers proxy voting, engagement, and advocacy for the equity holdings of the Vanguard-advised funds. The Investment Stewardship Team may engage with issuers to better understand how they are addressing material risks, including ESG risks. Specifically, the Investment Stewardship Team may engage with companies on how they disclose significant risks to shareholders, develop their risk mitigation approach, and report on progress. For funds advised by third-party advisory firms independent of Vanguard, such third-party advisory firms are responsible for administration of proxy voting and engagement with respect to the equity holdings they manage on behalf of the fund. A fund's advisors may consider environmental risks such as climate change to be a material risk to many companies and their shareholders' long-term financial success. As a result, certain advisors will engage with particular issuers held by a fund to advocate for science-based targets to address long-term risk to shareholder value resulting from climate change as long as such targets are not contrary to the investment objective and strategy of the fund. Each fund has adopted procedures and guidelines for monitoring portfolio holding human rights practices and violations pursuant to which it may assess regulatory, reputational, or other risks associated with the alleged activity. In extraordinary circumstances a fund may divest of a portfolio holding where doing so is deemed appropriate.

Exchange-Traded Funds. A fund may purchase shares of exchange-traded funds (ETFs). Typically, a fund would purchase ETF shares for the same reason it would purchase (and as an alternative to purchasing) futures contracts: to obtain exposure to all or a portion of the stock or bond market. ETF shares enjoy several advantages over futures. Depending on the market, the holding period, and other factors, ETF shares can be less costly and more tax-efficient than futures. In addition, ETF shares can be purchased for smaller sums, offer exposure to market sectors and styles for which there is no suitable or liquid futures contract, and do not involve leverage. An investment in an ETF generally presents the same principal risks as an investment in a conventional fund (i.e., one that is not exchange-traded) that has the same investment objective, strategies, and policies. The price of an ETF can fluctuate within a wide range, and a fund could lose money investing in an ETF if the prices of the securities owned by the ETF go down. In addition, ETFs are subject to the following risks that do not apply to conventional funds: (1) the market price of an ETF's shares may trade at a discount or a premium to their net asset value; (2) an active trading market for an ETF's shares may not develop or be maintained; and (3) trading of an ETF's shares may be halted by the activation of individual or marketwide trading halts (which halt trading for a specific period of time when the price of a particular security or overall market prices decline by a specified percentage). Trading of an ETF's shares may also be halted if the shares are delisted from the exchange without first being listed on another exchange or if the listing exchange's officials determine that such action is appropriate in the interest of a fair and orderly market or for the protection of investors. Most ETFs are investment companies. Therefore, a fund's purchases of ETF shares generally are subject to the limitations on, and the risks of, a fund's investments in other investment companies, which are described under the heading "Other Investment Companies." Vanguard ETF® Shares are exchange-traded shares that represent an interest in an investment portfolio held by Vanguard funds. A fund's investments in Vanguard ETF Shares are also generally subject to the descriptions, limitations, and risks described under the heading "Other Investment Companies," except as provided by exemptive orders granted by the SEC that permit registered investment companies to invest in a Vanguard fund that issues ETF Shares beyond the limits of Section 12(d)(1) of the 1940 Act, subject to certain terms and conditions. In connection with the recent adoption of new Rule 12d1-4 under the 1940 Act, the orders were rescinded on January 19, 2022, and a fund's investments in Vanguard ETF Shares beyond the limits of Section 12(d)(1) are subject to the conditions of Rule 12d1-4, as described under the heading "Other Investment Companies." Please note that Vanguard Real Estate Index Fund is not able to rely on the SEC exemptive orders granted to Vanguard or Rule 12d1-4 because it may invest a portion of its assets in a wholly owned subsidiary, as defined by the 1940 Act, which is itself a registered investment company. Accordingly, investment companies seeking to invest in Vanguard Real Estate Index Fund must adhere to the limits set forth in Section 12(d)(1) of the 1940 Act.

Futures Contracts and Options on Futures Contracts. Futures contracts and options on futures contracts are derivatives. A futures contract is a standardized agreement between two parties to buy or sell at a specific time in the future a specific quantity of a commodity at a specific price. The commodity may consist of an asset, a reference rate, or an index. A security futures contract relates to the sale of a specific quantity of shares of a single equity security or a narrow-based securities index. The value of a futures contract tends to increase and decrease in tandem with the value of the underlying commodity. The buyer of a futures contract enters into an agreement to purchase the underlying commodity on the settlement date and is said to be "long" the contract. The seller of a futures contract enters into an agreement to sell the underlying commodity on the settlement date and is said to be "short" the contract. The price at which a futures contract is entered into is established either in the electronic marketplace or by open outcry on the floor of an exchange between exchange members acting as traders or brokers. Open futures contracts can be liquidated or closed out by physical delivery of the underlying commodity or payment of the cash settlement amount on the settlement date, depending on the terms of the particular contract. Some financial futures contracts (such as security futures) provide for physical settlement

at maturity. Other financial futures contracts (such as those relating to interest rates, foreign currencies, and broad-based securities indexes) generally provide for cash settlement at maturity. In the case of cash-settled futures contracts, the cash settlement amount is equal to the difference between the final settlement or market price for the relevant commodity on the last trading day of the contract and the price for the relevant commodity agreed upon at the outset of the contract. Most futures contracts, however, are not held until maturity but instead are “offset” before the settlement date through the establishment of an opposite and equal futures position. The purchaser or seller of a futures contract is not required to deliver or pay for the underlying commodity unless the contract is held until the settlement date. However, both the purchaser and seller are required to deposit “initial margin” with a futures commission merchant (FCM) when the futures contract is entered into. Initial margin deposits are typically calculated as an amount equal to the volatility in market value of a contract over a fixed period. If the value of the fund’s position declines, the fund will be required to make additional “variation margin” payments to the FCM to settle the change in value. If the value of the fund’s position increases, the FCM will be required to make additional “variation margin” payments to the fund to settle the change in value. This process is known as “marking-to-market” and is calculated on a daily basis. A futures transaction will not be considered to constitute the issuance, by a fund, of a “senior security,” as that term is defined in Section 18(g) of the 1940 Act, and therefore such transaction will not be subject to the 300% asset coverage requirement otherwise applicable to borrowings by a fund, if the fund covers the transaction in accordance with the requirements described under the heading “Borrowing.” An option on a futures contract (or futures option) conveys the right, but not the obligation, to purchase (in the case of a call option) or sell (in the case of a put option) a specific futures contract at a specific price (called the “exercise” or “strike” price) any time before the option expires. The seller of an option is called an option writer. The purchase price of an option is called the premium. The potential loss to an option buyer is limited to the amount of the premium plus transaction costs. This will be the case, for example, if the option is held and not exercised prior to its expiration date. Generally, an option writer sells options with the goal of obtaining the premium paid by the option buyer. If an option sold by an option writer expires without being exercised, the writer retains the full amount of the premium. The option writer, however, has unlimited economic risk because its potential loss, except to the extent offset by the premium received when the option was written, is equal to the amount the option is “in-the-money” at the expiration date. A call option is in-the-money if the value of the underlying futures contract exceeds the exercise price of the option. A put option is in-the-money if the exercise price of the option exceeds the value of the underlying futures contract. Generally, any profit realized by an option buyer represents a loss for the option writer. A fund that takes the position of a writer of a futures option is required to deposit and maintain initial and variation margin with respect to the option, as previously described in the case of futures contracts. A futures option transaction will not be considered to constitute the issuance, by a fund, of a “senior security,” as that term is defined in Section 18(g) of the 1940 Act, and therefore such transaction will not be subject to the 300% asset coverage requirement otherwise applicable to borrowings by a fund, if the fund covers the transaction in accordance with the requirements described under the heading “Borrowing.” Each Fund’s obligations under futures contracts will not exceed 20% of its total assets.

Futures Contracts and Options on Futures Contracts—Risks. The risk of loss in trading futures contracts and in writing futures options can be substantial because of the low margin deposits required, the extremely high degree of leverage involved in futures and options pricing, and the potential high volatility of the futures markets. As a result, a relatively small price movement in a futures position may result in immediate and substantial loss (or gain) for the investor. For example, if at the time of purchase, 10% of the value of the futures contract is deposited as margin, a subsequent 10% decrease in the value of the futures contract would result in a total loss of the margin deposit, before any deduction for the transaction costs, if the account were then closed out. A 15% decrease would result in a loss equal to 150% of the original margin deposit if the contract were closed out. Thus, a purchase or sale of a futures contract, and the writing of a futures option, may result in losses in excess of the amount invested in the position. In the event of adverse price movements, a fund would continue to be required to make daily cash payments to maintain its required margin. In such situations, if the fund has insufficient cash, it may have to sell portfolio securities to meet daily margin requirements (and segregation requirements, if applicable) at a time when it may be disadvantageous to do so. In addition, on the settlement date, a fund may be required to make delivery of the instruments underlying the futures positions it holds. A fund could suffer losses if it is unable to close out a futures contract or a futures option because of an illiquid secondary market. Futures contracts and futures options may be closed out only on an exchange that provides a secondary market for such products. However, there can be no assurance that a liquid secondary market will exist for any particular futures product at any specific time. Thus, it may not be possible to close a futures or option position. Moreover, most futures exchanges limit the amount of fluctuation permitted in futures contract prices during a single trading day. The daily limit establishes the maximum amount that the price of a futures contract may vary either up or down from the previous day’s settlement price at the end of a trading session. Once the daily limit has been reached in a particular type of contract, no trades may be made on that day at a price beyond that limit. The daily limit governs only price movement during a particular trading day, and therefore does not limit potential losses because the limit may prevent the liquidation of unfavorable positions. Futures contract prices have occasionally moved to the daily limit for several consecutive trading days with little or no trading, thereby preventing prompt liquidation of future positions and subjecting some futures traders to substantial losses. The inability to close futures and options positions also could have an adverse impact on the ability to hedge a portfolio investment or to establish a substitute for a portfolio investment. U.S. Treasury futures are generally not subject to such daily limits. A fund bears the risk that its advisor will incorrectly predict future market trends. If the advisor attempts to use a futures contract or a futures option as a hedge against, or as a substitute for, a portfolio

investment, the fund will be exposed to the risk that the futures position will have or will develop imperfect or no correlation with the portfolio investment. This could cause substantial losses for the fund. Although hedging strategies involving futures products can reduce the risk of loss, they can also reduce the opportunity for gain or even result in losses by offsetting favorable price movements in other fund investments. A fund could lose margin payments it has deposited with its FCM if, for example, the FCM breaches its agreement with the fund or becomes insolvent or goes into bankruptcy. In that event, the fund may be entitled to return of margin owed to it only in proportion to the amount received by the FCM's other customers, potentially resulting in losses to the fund

Interfund Borrowing and Lending. The SEC has granted an exemption permitting registered open-end Vanguard funds to participate in Vanguard's interfund lending program. This program allows the Vanguard funds to borrow money from and lend money to each other for temporary or emergency purposes. The program is subject to a number of conditions, including, among other things, the requirements that (1) no fund may borrow or lend money through the program unless it receives a more favorable interest rate than is typically available from a bank for a comparable transaction, (2) no fund may lend money if the loan would cause its aggregate outstanding loans through the program to exceed 15% of its net assets at the time of the loan, and (3) a fund's interfund loans to any one fund shall not exceed 5% of the lending fund's net assets. In addition, a Vanguard fund may participate in the program only if and to the extent that such participation is consistent with the fund's investment objective and investment policies. The boards of trustees of the Vanguard funds are responsible for overseeing the interfund lending program. Any delay in repayment to a lending fund could result in a lost investment opportunity or additional borrowing costs.

Investing for Control. Each Vanguard fund invests in securities and other instruments for the sole purpose of achieving a specific investment objective. As such, a Vanguard fund does not seek to acquire, individually or collectively with any other Vanguard fund, enough of a company's outstanding voting stock to have control over management decisions. A Vanguard fund does not invest for the purpose of controlling a company's management.

Market Disruption. Significant market disruptions, such as those caused by pandemics, natural or environmental disasters, war, acts of terrorism, or other events, can adversely affect local and global markets and normal market operations. Market disruptions may exacerbate political, social, and economic risks discussed above and in a fund's prospectus. Additionally, market disruptions may result in increased market volatility; regulatory trading halts; closure of domestic or foreign exchanges, markets, or governments; or market participants operating pursuant to business continuity plans for indeterminate periods of time. Such events can be highly disruptive to economies and markets and significantly impact individual companies, sectors, industries, markets, currencies, interest and inflation rates, credit ratings, investor sentiment, and other factors affecting the value of a fund's investments and operation of a fund. These events could also result in the closure of businesses that are integral to a fund's operations or otherwise disrupt the ability of employees of fund service providers to perform essential tasks on behalf of a fund.

Options. An option is a derivative. An option on a security (or index) is a contract that gives the holder of the option, in return for the payment of a "premium," the right, but not the obligation, to buy from (in the case of a call option) or sell to (in the case of a put option) the writer of the option the security underlying the option (or the cash value of the index) at a specified exercise price prior to the expiration date of the option. The writer of an option on a security has the obligation upon exercise of the option to deliver the underlying security upon payment of the exercise price (in the case of a call option) or to pay the exercise price upon delivery of the underlying security (in the case of a put option). The writer of an option on an index has the obligation upon exercise of the option to pay an amount equal to the cash value of the index minus the exercise price, multiplied by the specified multiplier for the index option. The multiplier for an index option determines the size of the investment position the option represents. Unlike exchange-traded options, which are standardized with respect to the underlying instrument, expiration date, contract size, and strike price, the terms of over-the-counter (OTC) options (options not traded on exchanges) generally are established through negotiation with the other party to the option contract. Although this type of arrangement allows the purchaser or writer greater flexibility to tailor an option to its needs, OTC options generally involve credit risk to the counterparty, whereas for exchange-traded, centrally cleared options, credit risk is mutualized through the involvement of the applicable clearing house. The buyer (or holder) of an option is said to be "long" the option, while the seller (or writer) of an option is said to be "short" the option. A call option grants to the holder the right to buy (and obligates the writer to sell) the underlying security at the strike price, which is the predetermined price at which the option may be exercised. A put option grants to the holder the right to sell (and obligates the writer to buy) the underlying security at the strike price. The purchase price of an option is called the "premium." The potential loss to an option buyer is limited to the amount of the premium plus transaction costs. This will be the case if the option is held and not exercised prior to its expiration date. Generally, an option writer sells options with the goal of obtaining the premium paid by the option buyer, but that person could also seek to profit from an anticipated rise or decline in option prices. If an option sold by an option writer expires without being exercised, the writer retains the full amount of the premium. The option writer, however, has unlimited economic risk because its potential loss, except to the extent offset by the premium received when the option was written, is equal to the amount the option is "in-the-money" at the expiration date. A call option is in-the-money if the value of the underlying position exceeds the exercise price of the option. A put option is in-the-money if the exercise price of the option exceeds the value of the underlying position. Generally, any profit realized by an option buyer represents a loss for the option writer. The writing

of an option will not be considered to constitute the issuance, by a fund, of a “senior security,” as that term is defined in Section 18(g) of the 1940 Act, and therefore such transaction will not be subject to the 300% asset coverage requirement otherwise applicable to borrowings by a fund, if the fund covers the transaction in accordance with the requirements described under the heading “Borrowing.” If a trading market, in particular options, were to become unavailable, investors in those options (such as the funds) would be unable to close out their positions until trading resumes, and they may be faced with substantial losses if the value of the underlying instrument moves adversely during that time. Even if the market were to remain available, there may be times when options prices will not maintain their customary or anticipated relationships to the prices of the underlying instruments and related instruments. Lack of investor interest, changes in volatility, or other factors or conditions might adversely affect the liquidity, efficiency, continuity, or even the orderliness of the market for particular options. A fund bears the risk that its advisor will not accurately predict future market trends. If the advisor attempts to use an option as a hedge against, or as a substitute for, a portfolio investment, the fund will be exposed to the risk that the option will have or will develop imperfect or no correlation with the portfolio investment, which could cause substantial losses for the fund. Although hedging strategies involving options can reduce the risk of loss, they can also reduce the opportunity for gain or even result in losses by offsetting favorable price movements in other fund investments. Many options, in particular OTC options, are complex and often valued based on subjective factors. Improper valuations can result in increased cash payment requirements to counterparties or a loss of value to a fund.

OTC Swap Agreements. An over-the-counter (OTC) swap agreement, which is a type of derivative, is an agreement between two parties (counterparties) to exchange payments at specified dates (periodic payment dates) on the basis of a specified amount (notional amount) with the payments calculated with reference to a specified asset, reference rate, or index. Examples of OTC swap agreements include, but are not limited to, interest rate swaps, credit default swaps, equity swaps, commodity swaps, foreign currency swaps, index swaps, excess return swaps, and total return swaps. Most OTC swap agreements provide that when the periodic payment dates for both parties are the same, payments are netted and only the net amount is paid to the counterparty entitled to receive the net payment. Consequently, a fund’s current obligations (or rights) under an OTC swap agreement will generally be equal only to the net amount to be paid or received under the agreement, based on the relative values of the positions held by each counterparty. OTC swap agreements allow for a wide variety of transactions. For example, fixed rate payments may be exchanged for floating rate payments; U.S. dollar-denominated payments may be exchanged for payments denominated in a different currency; and payments tied to the price of one asset, reference rate, or index may be exchanged for payments tied to the price of another asset, reference rate, or index. An OTC option on an OTC swap agreement, also called a “swaption,” is an option that gives the buyer the right, but not the obligation, to enter into a swap on a future date in exchange for paying a market-based “premium.” A receiver swaption gives the owner the right to receive the total return of a specified asset, reference rate, or index. A payer swaption gives the owner the right to pay the total return of a specified asset, reference rate, or index. Swaptions also include options that allow an existing swap to be terminated or extended by one of the counterparties. The use of OTC swap agreements by a fund entails certain risks, which may be different from, or possibly greater than, the risks associated with investing directly in the securities and other investments that are the referenced asset for the swap agreement. OTC swaps are highly specialized instruments that require investment techniques, risk analyses, and tax planning different from those associated with stocks, bonds, and other traditional investments. The use of an OTC swap requires an understanding not only of the referenced asset, reference rate, or index but also of the swap itself, without the benefit of observing the performance of the swap under all possible market conditions. OTC swap agreements may be subject to liquidity risk, which exists when a particular swap is difficult to purchase or sell. If an OTC swap transaction is particularly large or if the relevant market is illiquid (as is the case with many OTC swaps), it may not be possible to initiate a transaction or liquidate a position at an advantageous time or price, which may result in significant losses. In addition, OTC swap transactions may be subject to a fund’s limitation on investments in illiquid securities. OTC swap agreements may be subject to pricing risk, which exists when a particular swap becomes extraordinarily expensive or inexpensive relative to historical prices or the prices of corresponding cash market instruments. Under certain market conditions, it may not be economically feasible to initiate a transaction or liquidate a position in time to avoid a loss or take advantage of an opportunity or to realize the intrinsic value of the OTC swap agreement. Because certain OTC swap agreements have a leverage component, adverse changes in the value or level of the underlying asset, reference rate, or index can result in a loss substantially greater than the amount invested in the swap itself. Certain OTC swaps have the potential for unlimited loss, regardless of the size of the initial investment. A leveraged OTC swap transaction will not be considered to constitute the issuance, by a fund, of a “senior security,” as that term is defined in Section 18(g) of the 1940 Act, and therefore such transaction will not be subject to the 300% asset coverage requirement otherwise applicable to borrowings by a fund, if the fund covers the transaction in accordance with the requirements described under the heading “Borrowing.” Like most other investments, OTC swap agreements are subject to the risk that the market value of the instrument will change in a way detrimental to a fund’s interest. A fund bears the risk that its advisor will not accurately forecast future market trends or the values of assets, reference rates, indexes, or other economic factors in establishing OTC swap positions for the fund. If the advisor attempts to use an OTC swap as a hedge against, or as a substitute for, a portfolio investment, the fund will be exposed to the risk that the OTC swap will have or will develop imperfect or no correlation with the portfolio investment. This could cause substantial losses for the fund. Although hedging strategies involving OTC swap instruments can reduce the risk of loss, they can also reduce the opportunity for gain or even result in losses by offsetting favorable price movements in other fund investments. Many OTC swaps are complex and often

valued subjectively. Improper valuations can result in increased cash payment requirements to counterparties or a loss of value to a fund. The use of an OTC swap agreement also involves the risk that a loss may be sustained as a result of the insolvency or bankruptcy of the counterparty or the failure of the counterparty to make required payments or otherwise comply with the terms of the agreement. Additionally, the use of credit default swaps can result in losses if a fund's advisor does not correctly evaluate the creditworthiness of the issuer on which the credit swap is based.

Other Investment Companies. A fund may invest in other investment companies to the extent permitted by applicable law or SEC exemption. Under Section 12(d)(1) of the 1940 Act, a fund may invest up to 10% of its assets in shares of investment companies generally and up to 5% of its assets in any one investment company, as long as no investment represents more than 3% of the voting stock of an acquired investment company. In addition, no funds for which Vanguard acts as an advisor may, in the aggregate, own more than 10% of the voting stock of a closed-end investment company. The 1940 Act and related rules provide certain exemptions from these restrictions, for example, for funds that invest in other funds within the same group of investment companies. Vanguard also has obtained SEC exemptive orders that allow registered investment companies to invest in the issuing funds beyond the limits of Section 12(d)(1), subject to certain terms and conditions, including the requirement to enter into a participation agreement with Vanguard. The SEC recently adopted changes to the regulatory framework for fund of funds arrangements, and, as a result, Vanguard's exemptive orders were rescinded by the SEC on January 19, 2022. However, effective January 19, 2022, new Rule 12d1-4 under the 1940 Act permits registered investment companies to invest in other registered investment companies beyond the limits in Section 12(d)(1), subject to certain conditions, including that the funds enter into a fund of funds investment agreement. If a fund invests in other investment companies, shareholders will bear not only their proportionate share of the fund's expenses (including operating expenses and the fees of the advisor), but they also may indirectly bear similar expenses of the underlying investment companies. Certain investment companies, such as business development companies (BDCs), are more akin to operating companies and, as such, their expenses are not direct expenses paid by fund shareholders and are not used to calculate the fund's net asset value. SEC rules nevertheless require that any expenses incurred by a BDC be included in a fund's expense ratio as "Acquired Fund Fees and Expenses." The expense ratio of a fund that holds a BDC will thus overstate what the fund actually spends on portfolio management, administrative services, and other shareholder services by an amount equal to these Acquired Fund Fees and Expenses. The Acquired Fund Fees and Expenses are not included in a fund's financial statements, which provide a clearer picture of a fund's actual operating expenses. Shareholders would also be exposed to the risks associated not only with the investments of the fund but also with the portfolio investments of the underlying investment companies. Certain types of investment companies, such as closed-end investment companies, issue a fixed number of shares that typically trade on a stock exchange or over-the-counter at a premium or discount to their net asset value. Others are continuously offered at net asset value but also may be traded on the secondary market. A fund may be limited to purchasing a particular share class of other investment companies (underlying funds). In certain cases, an investor may be able to purchase lower-cost shares of such underlying funds separately, and therefore be able to construct, and maintain over time, a similar portfolio of investments while incurring lower overall expenses.

Preferred Stock. Preferred stock represents an equity or ownership interest in an issuer. Preferred stock normally pays dividends at a specified rate and has precedence over common stock in the event the issuer is liquidated or declares bankruptcy. However, in the event an issuer is liquidated or declares bankruptcy, the claims of owners of bonds take precedence over the claims of those who own preferred and common stock. Preferred stock, unlike common stock, often has a stated dividend rate payable from the corporation's earnings. Preferred stock dividends may be cumulative or noncumulative, participating, or auction rate. "Cumulative" dividend provisions require all or a portion of prior unpaid dividends to be paid before dividends can be paid to the issuer's common stock. "Participating" preferred stock may be entitled to a dividend exceeding the stated dividend in certain cases. If interest rates rise, the fixed dividend on preferred stocks may be less attractive, causing the price of such stocks to decline. Preferred stock may have mandatory sinking fund provisions, as well as provisions allowing the stock to be called or redeemed, which can limit the benefit of a decline in interest rates. Preferred stock is subject to many of the risks to which common stock and debt securities are subject. In addition, preferred stock may be subject to more abrupt or erratic price movements than common stock or debt securities because preferred stock may trade with less frequency and in more limited volume.

Real Estate Investment Trusts (REITs). An equity REIT owns real estate properties directly and generates income from rental and lease payments. Equity REITs also have the potential to generate capital gains as properties are sold at a profit. A mortgage REIT makes construction, development, and long-term mortgage loans to commercial real estate developers and earns interest income on these loans. A hybrid REIT holds both properties and mortgages. To avoid taxation at the corporate level, REITs must distribute most of their earnings to shareholders. Investments in REITs are subject to many of the same risks as direct investments in real estate. In general, real estate values can be affected by a variety of factors, including, but not limited to, supply and demand for properties, general or local economic conditions, and the strength of specific industries that rent properties. Ultimately, a REIT's performance depends on the types and locations of the properties it owns and on how well the REIT manages its properties. For example, rental income could decline because of extended vacancies, increased competition from nearby properties, tenants' failure to pay rent, regulatory limitations on rents, fluctuations in rental income, variations in market rental rates, or incompetent management. Property values could decrease because of overbuilding in the area, environmental liabilities, uninsured damages caused by natural

disasters, a general decline in the neighborhood, losses because of casualty or condemnation, increases in property taxes, or changes in zoning laws. The value of a REIT may also be affected by changes in interest rates. Rising interest rates generally increase the cost of financing for real estate projects, which could cause the value of an equity REIT to decline. During periods of declining interest rates, mortgagors may elect to prepay mortgages held by mortgage REITs, which could lower or diminish the yield on the REIT. REITs are also subject to heavy cash-flow dependency, default by borrowers, and changes in tax and regulatory requirements. In addition, a REIT may fail to meet the requirements for qualification and taxation as a REIT under the IRC and/or fail to maintain exemption from the 1940 Act.

Reliance on Service Providers, Data Providers, and Other Technology. Vanguard funds rely upon the performance of service providers to execute several key functions, which may include functions integral to a fund's operations. Failure by any service provider to carry out its obligations to a fund could disrupt the business of the fund and could have an adverse effect on the fund's performance. A fund's service providers' reliance on certain technology or information vendors (e.g., trading systems, investment analysis tools, benchmark analytics, and tax and accounting tools) could also adversely affect a fund and its shareholders. For example, a fund's investment advisor may use models and/or data with respect to potential investments for the fund. When models or data prove to be incorrect or incomplete, any decisions made in reliance upon such models or data expose a fund to potential risks.

Repurchase Agreements. A repurchase agreement is an agreement under which a fund acquires a debt security (generally a security issued by the U.S. government or an agency thereof, a banker's acceptance, or a certificate of deposit) from a bank, a broker, a dealer, or another counterparty that meets minimum credit requirements and simultaneously agrees to resell such security to the seller at an agreed-upon price and date (normally, the next business day). Because the security purchased constitutes collateral for the repurchase obligation, a repurchase agreement may be considered a loan that is collateralized by the security purchased. The resale price reflects an agreed-upon interest rate effective for the period the instrument is held by a fund and is unrelated to the interest rate on the underlying instrument. In these transactions, the securities acquired by a fund (including accrued interest earned thereon) must have a total value in excess of the value of the repurchase agreement and be held by a custodian bank until repurchased. In addition, the investment advisor will monitor a fund's repurchase agreement transactions generally and will evaluate the creditworthiness of any bank, broker, dealer, or other counterparty that meets minimum credit requirements to a repurchase agreement relating to a fund. The aggregate amount of any such agreements is not limited, except to the extent required by law. The use of repurchase agreements involves certain risks. One risk is the seller's ability to pay the agreed-upon repurchase price on the repurchase date. If the seller defaults, the fund may incur costs in disposing of the collateral, which would reduce the amount realized thereon. If the seller seeks relief under bankruptcy laws, the disposition of the collateral may be delayed or limited. For example, if the other party to the agreement becomes insolvent and subject to liquidation or reorganization under bankruptcy or other laws, a court may determine that the underlying security is collateral for a loan by the fund not within its control, and therefore the realization by the fund on such collateral may be automatically stayed. Finally, it is possible that the fund may not be able to substantiate its interest in the underlying security and may be deemed an unsecured creditor of the other party to the agreement.

Restricted and Illiquid Securities/Investments (including Private Placements). Illiquid securities/investments are investments that a fund reasonably expects cannot be sold or disposed of in current market conditions in seven calendar days or less without the sale or disposition significantly changing the market value of the investment. The SEC generally limits aggregate holdings of illiquid securities/investments by a mutual fund to 15% of its net assets (5% for money market funds). A fund may experience difficulty valuing and selling illiquid securities/investments and, in some cases, may be unable to value or sell certain illiquid securities for an indefinite period of time. Illiquid securities may include a wide variety of investments, such as (1) repurchase agreements maturing in more than seven days (unless the agreements have demand/redemption features), (2) OTC options contracts and certain other derivatives (including certain swap agreements), (3) fixed time deposits that are not subject to prepayment or do not provide for withdrawal penalties upon prepayment (other than overnight deposits), (4) certain loan interests and other direct debt instruments, (5) certain municipal lease obligations, (6) private equity investments, (7) commercial paper issued pursuant to Section 4(a)(2) of the 1933 Act, and (8) securities whose disposition is restricted under the federal securities laws. Illiquid securities/investments may include restricted, privately placed securities (such as private investments in public equity (PIPEs) or special purpose acquisition companies (SPACs)) that, under the federal securities laws, generally may be resold only to qualified institutional buyers. If a market develops for a restricted security held by a fund, it may be treated as a liquid security in accordance with guidelines approved by the board of trustees.

Reverse Repurchase Agreements. In a reverse repurchase agreement, a fund sells a security to another party, such as a bank or broker-dealer, in return for cash and agrees to repurchase that security at an agreed-upon price and time. Under a reverse repurchase agreement, the fund continues to receive any principal and interest payments on the underlying security during the term of the agreement. Reverse repurchase agreements involve the risk that the market value of securities retained by the fund may decline below the repurchase price of the securities sold by the fund that it is obligated to repurchase. In addition to the risk of such a loss, fees charged to the fund may exceed the return the fund earns from investing the proceeds received from the reverse repurchase agreement transaction. A reverse repurchase agreement may be considered a borrowing transaction for purposes of the 1940 Act. A reverse repurchase agreement transaction will not

be considered to constitute the issuance, by a fund, of a “senior security,” as that term is defined in Section 18(g) of the 1940 Act, and therefore such transaction will not be subject to the 300% asset coverage requirement otherwise applicable to borrowings by a fund, if the fund covers the transaction in accordance with the requirements described under the heading “Borrowing.” A fund will enter into reverse repurchase agreements only with parties whose creditworthiness has been reviewed and found satisfactory by the advisor. If the buyer in a reverse repurchase agreement becomes insolvent or files for bankruptcy, a fund’s use of proceeds from the sale may be restricted while the other party or its trustee or receiver determines if it will honor the fund’s right to repurchase the securities. If the fund is unable to recover the securities it sold in a reverse repurchase agreement, it would realize a loss equal to the difference between the value of the securities and the payment it received for them.

Securities Lending. A fund may lend its securities to financial institutions (typically brokers, dealers, and banks) to generate income for the fund. There are certain risks associated with lending securities, including counterparty, credit, market, regulatory, and operational risks. The advisor considers the creditworthiness of the borrower, among other factors, in making decisions with respect to the lending of securities, subject to oversight by the board of trustees. If the borrower defaults on its obligation to return the securities lent because of insolvency or other reasons, a fund could experience delays and costs in recovering the securities lent or in gaining access to the collateral. These delays and costs could be greater for certain types of foreign securities, as well as certain types of borrowers that are subject to global regulatory regimes. If a fund is not able to recover the securities lent, the fund may sell the collateral and purchase a replacement security in the market. Collateral investments are subject to market appreciation or depreciation. The value of the collateral could decrease below the value of the replacement investment by the time the replacement investment is purchased. Currently, a fund invests cash collateral into Vanguard Market Liquidity Fund, an affiliated money market fund that invests in high-quality, short-term money market instruments. The terms and the structure of the loan arrangements, as well as the aggregate amount of securities loans, must be consistent with the 1940 Act and the rules or interpretations of the SEC thereunder. These provisions limit the amount of securities a fund may lend to 33⅓% of the fund’s total assets and require that (1) the borrower pledge and maintain with the fund collateral consisting of cash, an irrevocable letter of credit, or securities issued or guaranteed by the U.S. government having at all times not less than 100% of the value of the securities lent; (2) the borrower add to such collateral whenever the price of the securities lent rises (i.e., the borrower “marks to market” on a daily basis); (3) the loan be made subject to termination by the fund at any time; and (4) the fund receives reasonable interest on the loan (which may include the fund investing any cash collateral in interest-bearing short-term investments), any distribution on the lent securities, and any increase in their market value. Loan arrangements made by a fund will comply with any other applicable regulatory requirements. At the present time, the SEC does not object if an investment company pays reasonable negotiated fees in connection with lent securities, so long as such fees are set forth in a written contract and approved by the investment company’s trustees. In addition, voting rights pass with the lent securities, but if a fund has knowledge that a material event will occur affecting securities on loan, and in respect to which the holder of the securities will be entitled to vote or consent, the lender must be entitled to call the loaned securities in time to vote or consent. A fund bears the risk that there may be a delay in the return of the securities, which may impair the fund’s ability to vote on such a matter. See Tax Status of the Funds for information about certain tax consequences related to a fund’s securities lending activities. Pursuant to Vanguard’s securities lending policy, Vanguard’s fixed income and money market funds are not permitted to, and do not, lend their investment securities.

Tax Matters—Federal Tax Discussion. Discussion herein of U.S. federal income tax matters summarizes some of the important, generally applicable U.S. federal tax considerations relevant to investment in a fund based on the IRC, U.S. Treasury regulations, and other applicable authorities. These authorities are subject to change by legislative, administrative, or judicial action, possibly with retroactive effect. Each Fund has not requested and will not request an advance ruling from the Internal Revenue Service (IRS) as to the U.S. federal income tax matters discussed in this Statement of Additional Information. In some cases, a fund’s tax position may be uncertain under current tax law and an adverse determination or future guidance by the IRS with respect to such a position could adversely affect the fund and its shareholders, including the fund’s ability to continue to qualify as a regulated investment company or to continue to pursue its current investment strategy. A shareholder should consult his or her tax professional for information regarding the particular situation and the possible application of U.S. federal, state, local, foreign, and other taxes.

Tax Matters—Federal Tax Treatment of Derivatives, Hedging, and Related Transactions. A fund’s transactions in derivative instruments (including, but not limited to, options, futures, forward contracts, and swap agreements), as well as any of the fund’s hedging, short sale, securities loan, or similar transactions, may be subject to one or more special tax rules that accelerate income to the fund, defer losses to the fund, cause adjustments in the holding periods of the fund’s securities, convert long-term capital gains into short-term capital gains, or convert short-term capital losses into long-term capital losses. These rules could therefore affect the amount, timing, and character of distributions to shareholders. Because these and other tax rules applicable to these types of transactions are in some cases uncertain under current law, an adverse determination or future guidance by the IRS with respect to these rules (which determination or guidance could be retroactive) may affect whether a fund has made sufficient distributions, and otherwise satisfied the relevant requirements, to maintain its qualification as a regulated investment company and avoid a fund-level tax.

Tax Matters—Real Estate Mortgage Investment Conduits. If a fund invests directly or indirectly, including through a REIT or other pass-through entity, in residual interests in real estate mortgage investment conduits (REMICs) or equity interests in taxable mortgage pools (TMPs), a portion of the fund’s income that is attributable to a residual interest in a REMIC or an equity interest in a TMP (such portion referred to in the IRC as an “excess inclusion”) will be subject to U.S. federal income tax in all events—including potentially at the fund level—under a notice issued by the IRS in October 2006 and U.S. Treasury regulations that have yet to be issued but may apply retroactively. This notice also provides, and the regulations are expected to provide, that excess inclusion income of a regulated investment company will be allocated to shareholders of the regulated investment company in proportion to the dividends received by such shareholders, with the same consequences as if the shareholders held the related interest directly. In general, excess inclusion income allocated to shareholders (1) cannot be offset by net operating losses (subject to a limited exception for certain thrift institutions); (2) will constitute unrelated business taxable income (UBTI) to entities (including a qualified pension plan, an individual retirement account, a 401(k) plan, a Keogh plan, or other tax-exempt entity) subject to tax on UBTI, thereby potentially requiring such an entity, which otherwise might not be required, to file a tax return and pay tax on such income; and (3) in the case of a non-U.S. investor, will not qualify for any reduction in U.S. federal withholding tax. A shareholder will be subject to U.S. federal income tax on such inclusions notwithstanding any exemption from such income tax otherwise available under the IRC. As a result, a fund investing in such interests may not be suitable for charitable remainder trusts. See “Tax Matters—Tax-Exempt Investors.”

Tax Matters—Special Tax Rules for Non-U.S. Investors in Vanguard Real Estate Index Fund. Because of the nature of the Fund’s investments, the Fund is and expects to continue to be a “qualified investment entity” under Section 897(h) of the IRC. As a result, certain capital gain distributions from the Fund to non-U.S. investors that are attributable to the Fund’s direct or indirect investments in REITs could be subject to ordinary income treatment (regardless of any reporting by the Fund that such distribution is a short-term or long-term capital gain dividend that would otherwise be exempt from U.S. withholding), and thus subject to a 30% withholding tax rate (or a lower applicable treaty rate). For non-U.S. investors owning more than 5% of a class of the Fund, these distributions may be treated as gains “effectively connected” with the conduct of a “U.S. trade or business” and subject to applicable withholding taxes and to U.S. federal income taxation at graduated rates, as well as require the filing of U.S. federal income tax returns. Under certain circumstances, a greater-than-5% non-U.S. investor could also be subject to U.S. withholding tax on the redemption of its Fund shares or on certain return-of-capital distributions from the Fund, in which case such investor could also be required to file a U.S. federal income tax return and pay any additional taxes due in connection with the redemption or distribution. These and other U.S. tax rules governing the taxation of non-U.S. investors in U.S. real property interests is complex. Non-U.S. investors are urged to consult their tax advisor for more information about these rules.

Tax Matters—Tax Considerations for Non-U.S. Investors. U.S. withholding and estate taxes and certain U.S. tax reporting requirements may apply to any investments made by non-U.S. investors in Vanguard funds. Certain properly reported distributions of qualifying interest income or short-term capital gain made by a fund to its non-U.S. investors are exempt from U.S. withholding taxes, provided the investors furnish valid tax documentation (i.e., IRS Form W-8) certifying as to their non-U.S. status. A fund is permitted, but is not required, to report any of its distributions as eligible for such relief, and some distributions (e.g., distributions of interest a fund receives from non-U.S. issuers) are not eligible for this relief. For some funds, Vanguard has chosen to report qualifying distributions and apply the withholding exemption to those distributions when made to non-U.S. shareholders who invest directly with Vanguard. For other funds, Vanguard may choose not to apply the withholding exemption to qualifying fund distributions made to direct shareholders, but may provide the reporting to such shareholders. In these cases, a shareholder may be able to reclaim such withholding tax directly from the IRS. If shareholders hold fund shares (including ETF shares) through a broker or intermediary, their broker or intermediary may apply this relief to properly reported qualifying distributions made to shareholders with respect to those shares. If a shareholder’s broker or intermediary instead collects withholding tax where the fund has provided the proper reporting, the shareholder may be able to reclaim such withholding tax from the IRS. Please consult your broker or intermediary regarding the application of these rules. This relief does not apply to any withholding required under the Foreign Account Tax Compliance Act (FATCA), which generally requires a fund to obtain information sufficient to identify the status of each of its shareholders. If a shareholder fails to provide this information or otherwise fails to comply with FATCA, a fund may be required to withhold under FATCA at a rate of 30% with respect to that shareholder on fund distributions. Please consult your tax advisor for more information about these rules.

Other risk factors related to the Underlying ETF

Other risk factors related to the Underlying ETF are described in the Section entitled “Risk Factors” of the prospectus of the Underlying ETF issued in connection with the Shares and available at <https://investor.vanguard.com/investment-products/etfs>.

USE OF PROCEEDS

The net proceeds of the issue of the ETNs will be used by the SPC for investments in the Permitted Assets only.

UNDERLYING ETF

THE INFORMATION IN THIS SECTION HAS BEEN TAKEN “AS IS” FROM THE WEB-SITE ([HTTPS://INVESTOR.VANGUARD.COM/INVESTMENT-PRODUCTS/ETFS](https://investor.vanguard.com/investment-products/etfs)) MAINTAINED FOR THIS UNDERLYING ETF AND THE SPC SHALL NOT BE LIABLE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION CONTAINED IN THIS SECTION. BECAUSE THE PERFORMANCE OF THE UNDERLYING ETF DIRECTLY AFFECTS THE VALUE AND PRICE OF THE ETNS POTENTIAL INVESTORS SHOULD REVIEW INFORMATION ABOUT THE UNDERLYING ETF AVAILABLE AT THE WEB-SITE [HTTPS://INVESTOR.VANGUARD.COM/INVESTMENT-PRODUCTS/ETFS](https://investor.vanguard.com/investment-products/etfs) PRIOR TO PURCHASING ANY ETNS.

Overview

The return on the ETNs is linked to the performance of the Vanguard Real Estate ETF (NYSE ticker symbol: “VNQ”) (the “Underlying ETF”).

Key Facts

CUSIP	922908553	Fund management	Vanguard Equity Index Group
Management style	Index	Expense Ratio as of 25/05/2023	0.12%
Asset class	Domestic Stock - Sector-Specific		
Category	Real Estate		
Inception date	09/23/2004		

Portfolio characteristics (as of Jan 31, 2024)

Number of stocks	159	Foreign holdings	0.0%
P/E ratio	35.5x	Turnover rate (Fiscal Year-end 01/31/2024)	7.5%
P/B ratio	2.3x	Fund total net assets	\$62.2 B
Return on equity	7.3%	Share class total net assets	\$32.4 B

Holdings (as of Jan 31, 2024)

Holdings	Weight (%)	Issuer	Weight (%)
Vanguard Real Estate II Index Fund Institutional Plus Shares	13.07	Simon Property Group Inc.	2.96
Prologis Inc.	7.63	Realty Income Corp.	2.95
American Tower Corp.	5.95	Public Storage	2.92
Equinix Inc.	5.06	Welltower Inc.	2.82
Crown Castle International Corp.	3.06	Digital Realty Trust Inc.	2.69

Fees and Expenses Attributable to Underlying ETF

The following table describes the fees and expenses you may pay if you buy, hold, and sell Shares of the Underlying ETF. You may pay other fees, such as brokerage commissions and other fees to financial intermediaries, which are not reflected in the table below..

Shareholder Fees (Fees paid directly from your investment)

Transaction Fee on Purchases and Sales	None*
Transaction Fee on Reinvested Dividends	None*
Transaction Fee on Conversion to Shares	None*

* None through Vanguard (Broker fees vary)

Annual Fund Operating Expenses (Expenses that you pay each year as a percentage of the value of your investment)

Management Fees	0.11%
12b-1 Distribution Fee	None
Other Expenses	0.01%
Total Annual Fund Operating Expenses	0.12%

Portfolio Turnover

The Underlying ETF pays transaction costs, such as commissions, when it buys and sells securities (or “turns over” its portfolio). A higher portfolio turnover rate may indicate higher transaction costs and may result in more taxes when the Underlying ETF shares are held in a taxable account. These costs, which are not reflected in annual fund operating expenses, reduce the Underlying ETF’s performance. During the most recent fiscal year, the Underlying ETF’s portfolio turnover rate was 7% of the average value of its portfolio.

Principal Investment Strategies of Underlying ETF

The Underlying ETF employs an indexing investment approach designed to track the performance of the MSCI US Investable Market Real Estate 25/50 Index, an index that is made up of stocks of large, mid-size, and small U.S. companies within the real estate sector, as classified under the Global Industry Classification Standard (GICS). The GICS real estate sector is composed of equity real estate investment trusts (known as REITs), which include specialized REITs, and real estate management and development companies.

The Underlying ETF attempts to track the Index by investing all, or substantially all, of its assets—either directly or indirectly through a wholly owned subsidiary (the underlying fund), which is itself a registered investment company—in the stocks that make up the Index, holding each stock in approximately the same proportion as its weighting in the Index. The Underlying ETF may invest a portion of its assets in the underlying fund.

Additional information about Underlying ETF

For more information about Underlying ETF, visit the website at <https://investor.vanguard.com/investment-products/etfs>. Investment objectives, risks, charges, expenses, and other important information are contained in the prospectus of Underlying ETF; read and consider it carefully before investing.

SPC

iX US Real Estate SPC Limited, a special purpose company incorporated under the AIFC law on 18 May 2022 and governed by the AIFC Special Purpose Company Rules (AIFC Rules No. GR0001 of 2017). The LEI (Legal Entity Identifier) code of the SPC is 254900SFW07DG6ZJP616. The SPC passed the necessary resolutions by virtue of which the ETNs have been created.

In addition to incorporating the SPC, the Management Company incorporated a number of special purpose companies in the AIFC. Each special purpose company is expected to issue exchange traded notes linked to the performance of various securities where such notes are intended to be listed and traded on the Stock Exchange.

Main business purpose

iX US Real Estate SPC Limited is incorporated with the principal business purpose of issuing and maintaining ETNs, the purchase of which will enable the ETN holders to participate in the performance (i.e., gains or losses) of the Underlying ETF.

Legal form

iX US Real Estate SPC Limited is incorporated in the form of a special purpose company in accordance with the AIFC Special Purpose Company Rules (AIFC Rules No. GR0001 of 2017), adopted by the board of directors of the Astana Financial Services Authority JSC.

The AFSA Registrar of Companies has issued a certificate of incorporation with respect to the SPC on 18 May 2022 and included it into the AFSA's public register at <https://publicreg.myafsa.com/details/220540900307/>.

Articles of association of the SPC

The articles of association of the SPC provide that the purpose of the Company is limited to conducting the following Exempt Activities (as such term is defined in the AIFC Special Purpose Company Rules (AIFC Rules No. GR0001 of 2017)):

- (a) the issuance of exchange traded notes and conduct of any other transactions involving exchange traded notes;
 - (b) the acquisition (by way of leasing, title transfer, risk transfer or otherwise), the holding and the disposal of any asset (tangible or intangible, including, for example, receivables and Shares) in connection with and for the purpose of the transactions referred to in paragraph (a) above;
 - (c) the obtaining of any type of financing (banking or capital markets), the granting of any type of security interest over its assets, the providing of any indemnity or similar support for the benefit of its shareholders or any of its subsidiaries, or the entering into of any type of hedging arrangements, in connection with and for the purpose of the transactions referred to in paragraph (a) above;
 - (d) any other activity approved in writing by the Registrar of Companies of the AIFC;
 - (e) any activity ancillary to an activity mentioned in paragraphs (a) to (d); and
- any other lawful activity for which companies may be incorporated under the Companies Regulations.

In addition, in accordance with the articles of association of the SPC, the SPC shall be entitled to own and/or hold only those assets which are permitted to be owned or held under this Prospectus (as this Prospectus may be amended from time to time).

Directors

The Management Company, a wholly-owned subsidiary of AIX, act as the sole director and secretary of the SPC. The appointment of the Management Company, being a body corporate, as a director is permitted under Rule 6.1 of the AIFC Special Purpose Company Rules (AIFC Rules No. GR0001 of 2017).

Prospects of the Issuer

The SPC is a special purpose vehicle with a passive investment strategy and the asset classes in which it can invest are limited. Investments by the ETN Holders will be used by the SPC to purchase Permitted Assets only. Accordingly, the prospects of the SPC are fully dependent on the market demand for its ETNs and the performance of the Underlying ETF.

Auditor

The SPC has appointed IAC Russell Bedford A+ Partners LLP as its Auditor. The audited financial statements prepared in accordance with IFRS are published on the website of the Stock Exchange at www.aix.kz each year not later than the end of May.

Management Company

The SPC has appointed the Management Company, a wholly-owned subsidiary of AIX, as the Management Company, as described in the Registration Document. The Management Company and/or its affiliates is responsible for the provision of certain services and has a right to receive the management fee pursuant to the Management Agreement. The SPC is run operationally by the Management Company under the Management Agreement. The Management Company outsources some of its functions from AIX.

Working Capital Statement

AIX FM Limited acting as a Director for the SPC believes that in its opinion and based on the passive investment approach of the SPC, the working capital is sufficient for the SPC's present requirements for at least the next 12 months from the date of this Securities Note.

Additional information*Reasons for the offer*

The ETNs are offered to the potential investors in or from AIFC; net proceeds of the issue of the ETNs will be used by the SPC for investments in the Permitted Assets only. Estimated net amount of the proceeds is equal to the Initial Placement.

Creditworthiness of the Issuer

Information about the creditworthiness of the Issuer (earnings coverage ratio; any relevant credit ratings; any other risk factors that may affect the Issuer's ability to fulfil its obligations under the Notes, statement of capitalization and indebtedness) – not applicable.

Guarantees attached to the ETNs

There are no guarantees attached to the ETNs.

FINANCIAL INFORMATION OF THE SPC

FINANCIAL INFORMATION OF THE SPC

The financial information of the SPC below as at and for the year ended 31 December 2022 was derived from the SPC's Financial Statements 2022, which have been audited by Russell Bedford A+ Partners Ltd and were prepared in accordance with IFRS. You should read the following selected financial information in conjunction with the SPC's Financial Statements for the Year ended 31 December 2022 and the notes thereto which are included in the annual report of the SPC, published on the website of AIX.

Except for the information extracted from the Financial Statements this Securities Note do not include any audited or reviewed financial information.

KZT is the presentation currency for the Financial Statements. The Financial Statements and financial information included in this section have, unless otherwise noted, been presented in KZT. All amounts are presented in KZT thousands (unless otherwise noted).

Rounding

Certain figures included in this Section of the Securities Note have been subject to rounding adjustments. Accordingly, figures shown for the same category presented in different tables may vary slightly and figures shown as totals in certain tables may not be an arithmetic aggregation of the figures that precede them.

STATEMENT OF FINANCIAL POSITION OF THE ISSUER

The table below sets forth the statement of financial position of the SPC, as at 31 December 2022.

31 December 2022

Assets	
Cash and cash equivalents	2,962
Financial assets at fair value through profit or loss	87,270
Total assets	90,232
Equity	
Share capital	1
Retained earnings/(accumulated loss)	-
Total equity	1
Liabilities	
Financial liabilities at fair value through profit or loss	90,164
Other liabilities	67
Total liabilities	90,231
Total equity and liabilities	90,232

STATEMENT OF PROFIT AND LOSS AND OTHER COMPREHENSIVE INCOME OF THE SPC

The table below sets forth the statement of comprehensive income of the SPC for the year ended 31 December 2022.

**From the date of establishment to 31
December 2022**

Net gain/(loss) from changes in fair value of financial assets	(2,795)
Net gain/(loss) from changes in fair value of financial liabilities	1,859
Dividends income on financial assets	1,242
Operating income	306
Administrative expenses	(367)
Other income	117
Net gain/(loss) from foreign currencies	(9)
Profit before income tax expense	47

Income tax expense	(47)
Profit for the period	-
Other comprehensive income for the period	-
Total comprehensive income for the period	-

STATEMENT OF CASH FLOWS OF THE SPC

The table below sets forth the statement of cash flows of the SPC for the year ended 31 December 2022.

	From date of establishment to 31 December 2022
Investing activities	
Dividends received from financial assets	1,001
Net cash flows from investing activities	1,001
Financing activities	
Contribution of equity	1
Placement of exchange traded notes	2,003
Net cash flows from financing activities	2,004
Net increase/(decrease) in cash and cash equivalents	3,005
Effect of exchange rates changes on cash and cash equivalents	(43)
Cash and cash equivalents, at the beginning of the period	-
Cash and cash equivalents, at the end of the period	2,962

STATEMENT OF CHANGES IN EQUITY OF THE SPC

The table below sets forth the statement of changes in equity of the SPC, for the year ended 31 December 2022.

	Share capital	Retained earnings	Total equity
As at the date of establishment	-	-	-
Contribution of equity	1	-	-
Total comprehensive income for the period	-	-	-
As at 31 December 2022	1	-	1

SELECTED FINANCIAL INFORMATION

Below is the additional information on selected items.

Financial assets at fair value through profit or loss

As at 31 December 2022 financial assets at fair value through profit or loss include investment in the form of exchange traded fund.

Issuer	Currency	31 December 2022	
		Number of shares	Market value
Vanguard Real Estate ETF	US Dollar	2,287	87,270
		2,287	87,270

All financial assets are units in exchange traded fund (“ETF”) acquired in the transaction with related party Astana International Exchange Market Liquidity Services Ltd (“AIX MLS Ltd.”).

Changes in financial assets are as follow:

	Date of establishment	ETF/ETN exchange	Changes in fair value	Foreign exchange	31 December
2022	-	91,708	(2,795)	(1,643)	87,270

Financial liabilities at fair value through profit or loss

Issuer	Currency	31 December 2022	
		Number of ETNs	Market value
iX US Real Estate SPC Limited	US Dollar	151,889	90,164
		151,889	90,164

Financial liabilities at fair value through profit or loss include exchange traded notes (“ETN”) issued by the SPC and sold to the related party AIX MLS Ltd.

The ETNs are unsecured and can be redeemed by the SPC prior to maturity, which is 10 October 2032.

Changes in financial liabilities are as follow:

	Date of establishment	ETF/ETN exchange	Changes in fair value	Foreign exchange	31 December
2022	-	93,701	(1,859)	(1,678)	90,164

Administrative expenses

	From date of establishment to 31 December 2022
Withholding tax	229
Custodian service	70
Management fee	68
	367

Other income

Other income is a reimbursement of administrative expenses by the Management Company according to management agreement in amount of 117 thousand tenge.

Related Party Transactions

The major transactions with related parties for the period from 18 May to 31 December 2022 were as follows:

	From date of establishment to 31 December 2022
Administrative expenses	
AIX FM Ltd.	(68)

RESPONSIBILITY STATEMENT

Subject to the following paragraph, the SPC, having made all the reasonable enquiries, accepts responsibility for this Securities Note, the Prospectus Summary and the Registration Document (in accordance with Section 69 of the AIFC Framework Regulations №18 of 2018 and Part 1 of the AIFC Market Rules №FR0003 of 2017) and confirms that the Prospectus complies with the requirements set out in Section 69 of the AIFC Framework Regulations №18 of 2018 and Part 1 of the AIFC Market Rules №FR0003 of 2017 and contains all information which is material in the context of the issue of the ETNs, that the information contained in the Prospectus is correct to the best of its knowledge and that no material facts or circumstances have been omitted. The information in the Section “Underlying ETF” has been taken “as is” from the website (<https://investor.vanguard.com/investment-products/etfs>) maintained for the Underlying ETF and the SPC shall not be liable for the accuracy or completeness of the information contained in that Section. Because the performance of the Underlying ETF directly affects the value and price of the ETNs potential investors should review information about the Underlying ETF available at the website <https://investor.vanguard.com/investment-products/etfs> prior to purchasing any ETNs. The SPC confirms that such information has been accurately reproduced and is able to ascertain from the information published on the above-mentioned sources that no facts have been omitted which would render the reproduced information inaccurate or misleading. The source of information is identified where used. The SPC accepts responsibility for correctly extracting such information from the sources and confirms that such information has been correctly extracted from those sources.

Neither the delivery of the Prospectus nor the offering, sale or delivery of any ETNs shall in any circumstances create any implications that there has been no adverse change, or any event reasonably likely to involve an adverse change, in the condition (financial or otherwise) of the Issuer since the date of the Prospectus.