

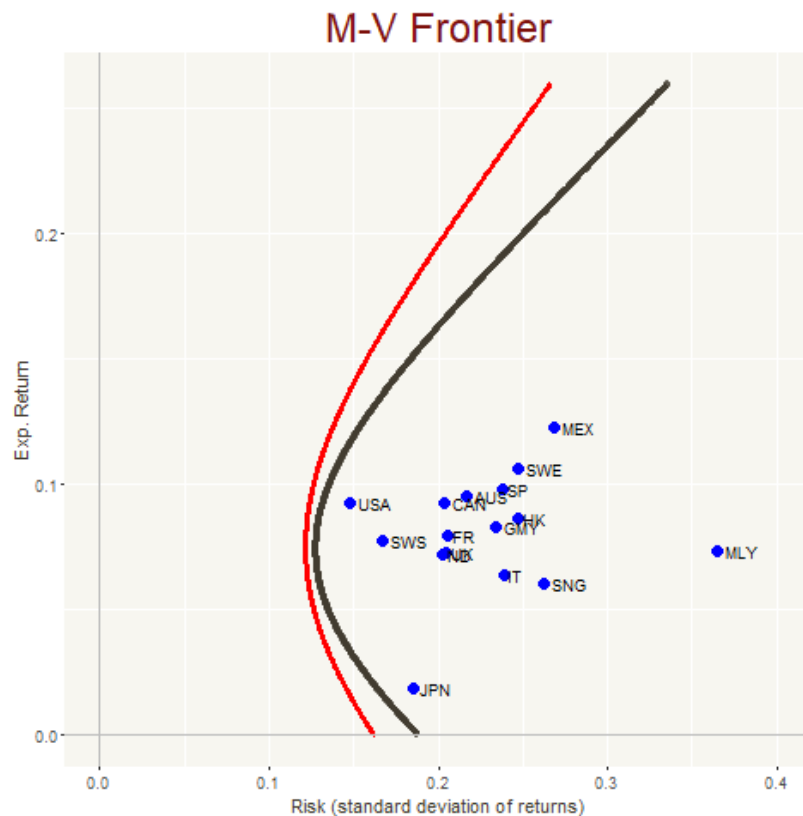
# FIN2010 Financial Management

## Lecture 11: Personal Investment – Financial Products

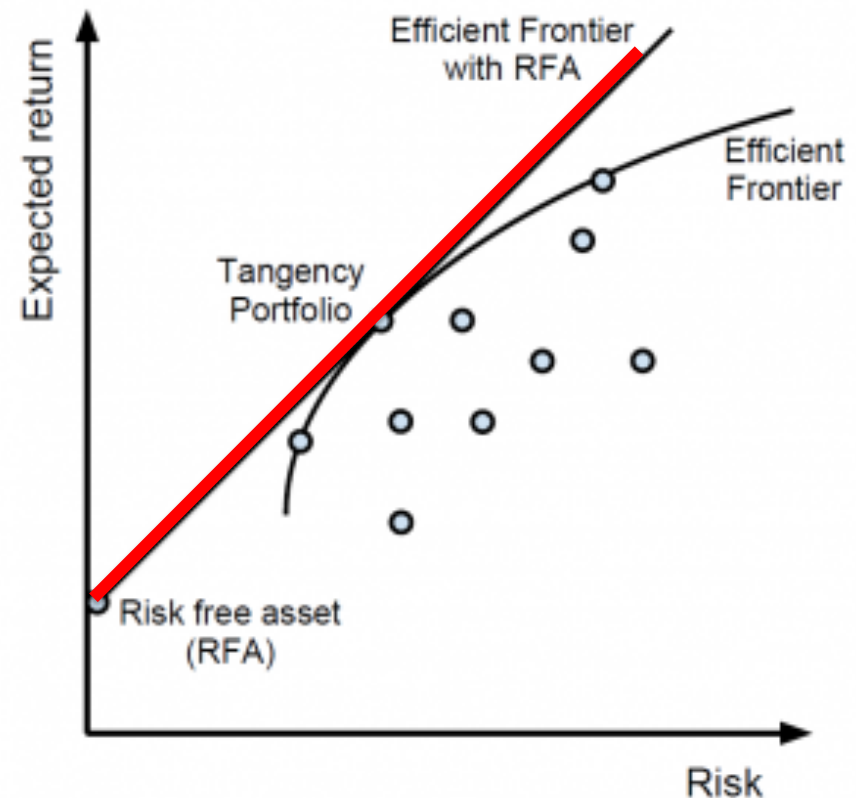


# Review—Efficient Frontier

- Efficient frontier: the curve (or line) that shows the minimum risk that can be achieved for each level of required return



With only risky assets



After adding a risk-free asset

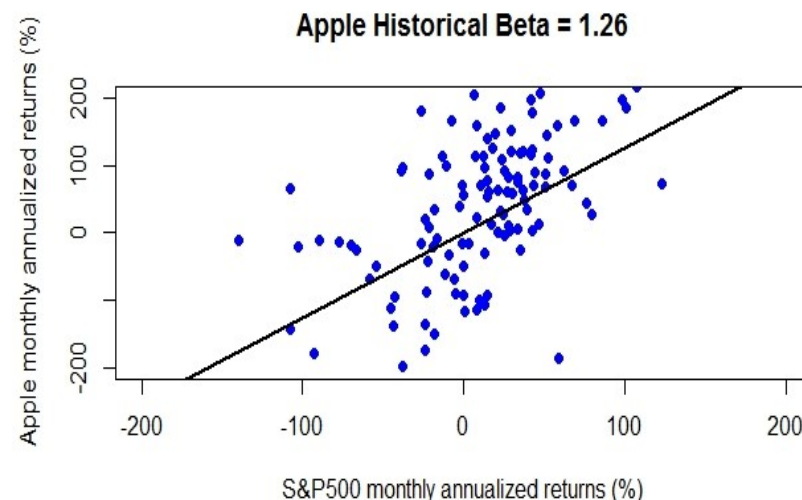
# Review—CAPM

- CAPM establishes the relationship between expected return and systematic risks

$$\frac{E[R_i] - R_f}{\beta_i} = \frac{E[R_m] - R_f}{\beta_m} \quad \text{or} \quad E[R_i] - R_f = \beta_i(E[R_m] - R_f)$$

- The required risk premium is proportional to the exposure to the market risk ( $\beta$ )
- Estimation:  $\beta_i = \frac{\text{Cov}(R_i, R_m)}{\text{Var}(R_m)}$ , the slope of a linear regression
- $R_i = \alpha_i + \beta_i R_m + \varepsilon_i$
- $\beta$  of a portfolio: weighted average of individual stock's beta

$$\beta_P = w_1\beta_1 + w_2\beta_2 + \cdots + w_n\beta_n$$



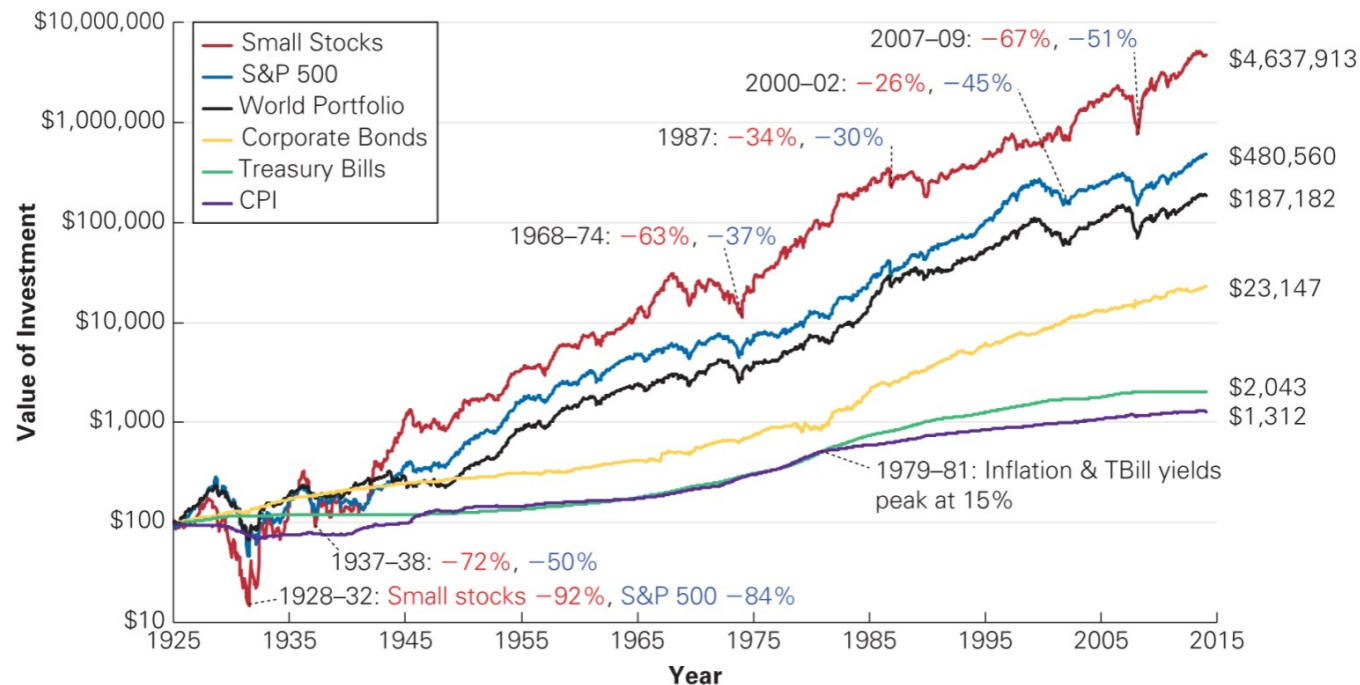
# Agenda

- Mutual Funds
- Exchange-traded Funds (ETFs)
- Private Funds
- Real Estate



# Making good investment decision is important!

- The power of compounding
  - The difference between 3%/yr and 8%/yr is huge after many years
- The majority of your income will be investment income rather than labor income when you get old
  - Assume you have 10M: ~0.8M per year investment income



# Disclaimer

- This purpose of this lecture and this course is not
  - To recommend any specific products
- Rather, it is
  - To let you know what options you have
  - To discuss the differences between products
  - To warn you of potential issues of investing in these products
  - To give you some examples of how to approach investment problems
- **I am not responsible for any financial losses that you incur.**



# Agenda

- Mutual Funds
- Exchange-traded Funds (ETFs)
- Private Funds
- Real Estate



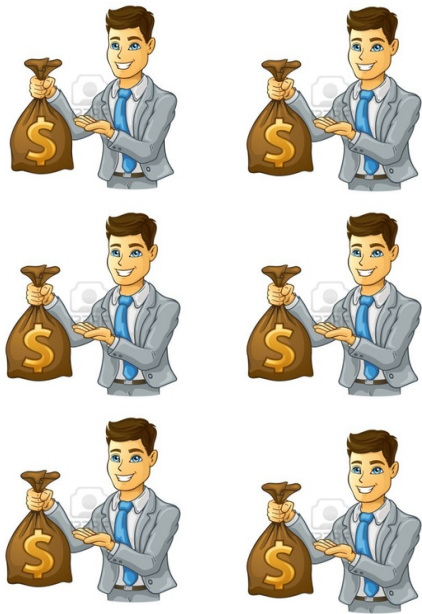
# Question you might have

- What is a mutual fund?
- Why do we need mutual funds?
- How do we invest in a mutual fund?
- What is the cost of investing in mutual funds?
- Do mutual fund managers beat the market?
- How do we pick a good mutual fund?
- Are there any red flags that I should avoid?





# What is a Mutual Fund?



Many Investors



Mutual Fund



Financial Markets

- Mostly open-ended: anyone can invest or redeem at any time
- \$19 trillion assets under management (AUM) in the US<sup>[1]</sup>, \$2 trillion in China<sup>[2]</sup>, \$50 trillion globally<sup>[3]</sup> at the end of 2018

# Why do We Need Mutual Funds?

## Why can't we invest directly?

- Retail traders severely underperform the market
  - See [Prof. Shuai Ye's speech](#) on this topic
- It is hard to benefit from diversification as an individual investor
  - Especially for foreign stocks and fixed income assets
- Investment requires attention and expertise
  - Individual investors generally underperform the market<sup>[1]</sup>
  - Individual investors suffer from many psychological biases

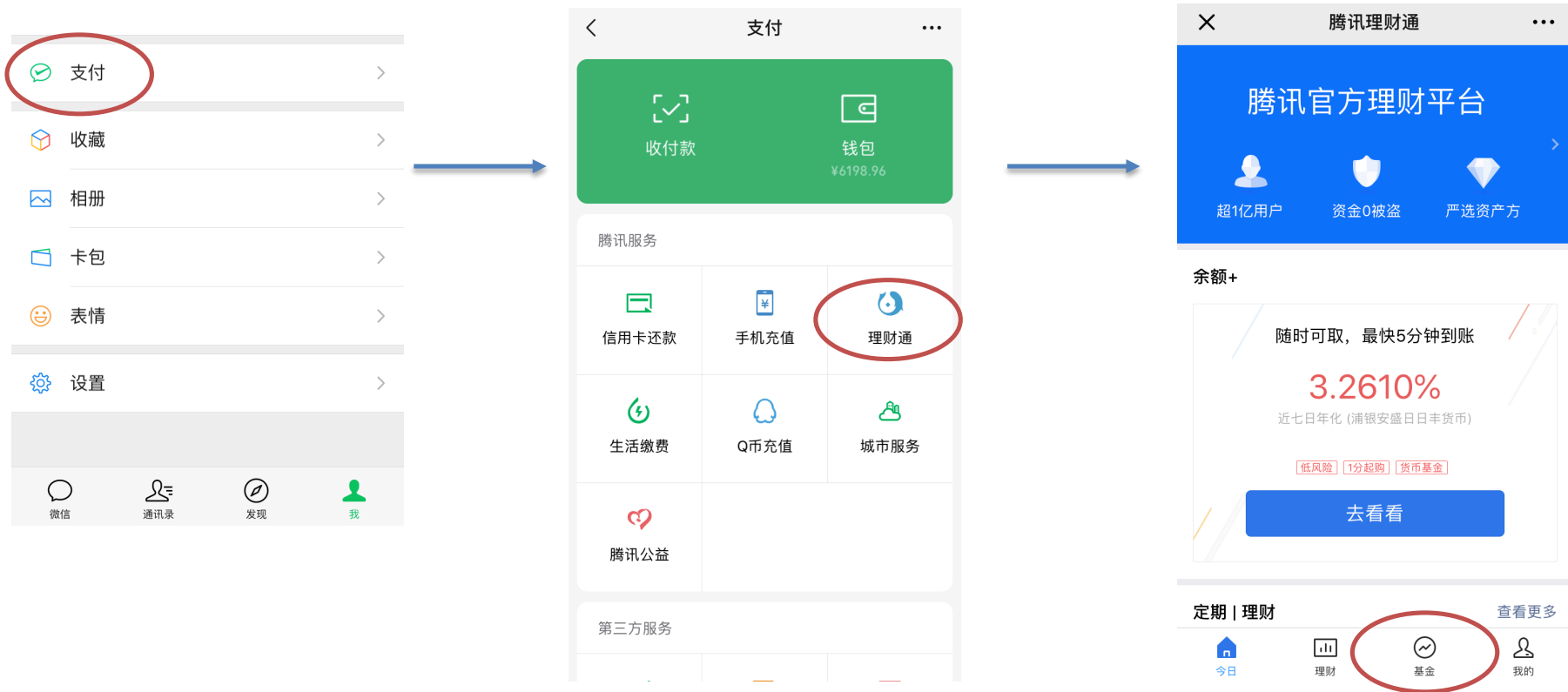


# How do We Invest in a Mutual Fund?

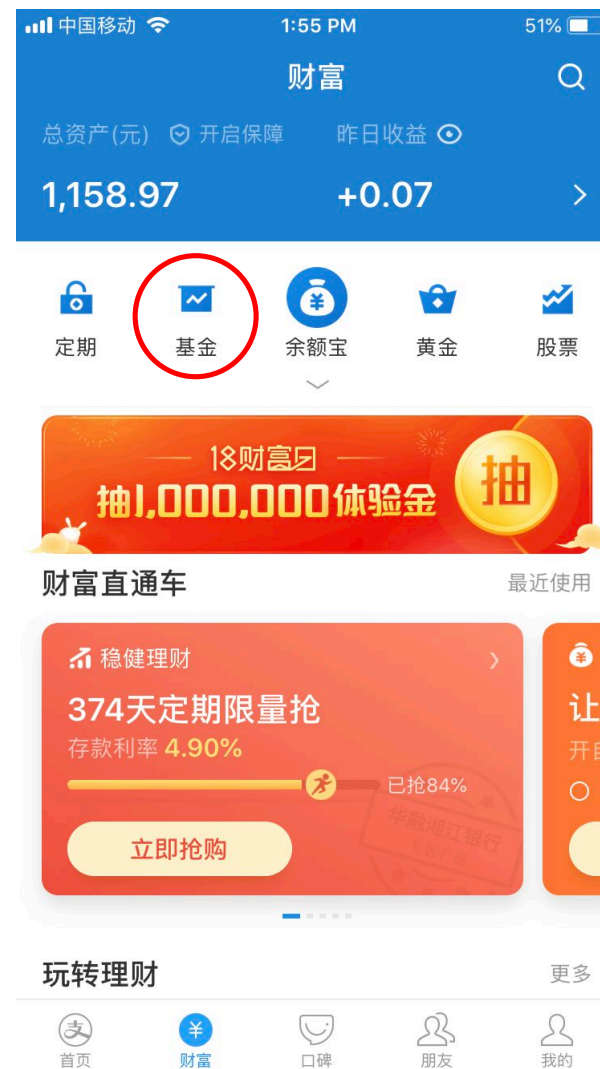
- Directly on the mutual fund company's APP
  - Only include funds in this company
  - Get discounts on sales fee (front load)
- Through platforms such as WeChat, Alipay, Tiantian
  - Include almost all available funds in China
- Through a bank (not recommended!)
  - Usually only offer limited funds that have partnership with the bank
  - Usually charges higher fees.



# Mutual Funds on WeChat



# Mutual Funds on Alipay



# Costs of Investing in Mutual Funds

- Management fee
  - Typically 1.5% per year for actively managed funds, deducted daily
  - Passively managed indexed funds have lower fees around 0.5%
- Trust fee (only in China)
  - Paid to the banks that holds the assets, typically 0.1% to 0.2%
- Front load (the percentage deducted when one purchases)
  - Typically 1.5%. Some funds might charge up to 5%
  - Most likely only charged when investing through banks. If investing through other channels, front load is usually waived (on MF company's app) or reduced (on 3<sup>rd</sup> party platform like WeChat and Alipay)
- Rear load (payment charged if you sell early)
  - Can be avoided by holding the fund for long term



# Example of Mutual Fund Fees

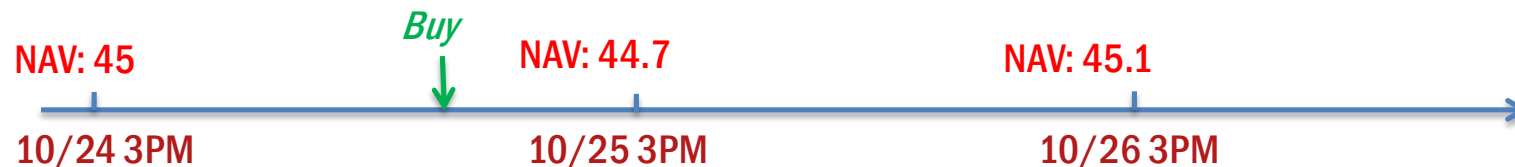
- Good source for mutual fund information:
  - Morningstar (晨星网 <http://cn.morningstar.com/main/default.aspx>)
  - 天天基金网 (<http://fund.eastmoney.com/>)
  - Example: [040002](#)
- Buying from a channel other than banks can get you a front load deduction (example: Wechat)

费用信息	
管理费	1.00%
托管费	0.20%
销售服务费	-
最小投资额度	
申购	1.00元
增购	-元
申购费	
前端收费	费率
A < 100.0万元	1.50%
100.0 ≤ A < 1,000.0万元	1.20%
A ≥ 1,000.0万元	1,000.00元
后端收费	费率
赎回费	
分层标准	费率
A < 7.0天	1.50%
A ≥ 7.0天	0.00%



# The actual purchase and sale

- Unlike stocks, when you submit an order to invest/redeem a fund, it does not get executed right away
  - Instead, it occurs at the end-of-day (3PM) at net asset value (NAV) price
- 基金净值
- Every order from the past 24 hours gets the same price, which is the NAV
  - Suppose you want to invest \$10,000 at 10/25 11AM, you will get  $\$10,000 / \$44.7$  which is 223.71 shares





# Fund Types

- Management styles

- Active: try to beat benchmarks through identifying good investment
- Passive: aim to track the benchmarks by replicating the index components(lower fees)

- Asset types

股票型

- Equity fund: invest in stocks

債券型

- Fixed income fund: invest in government, corporate or municipal bonds

混合型

- Mixed: invest in both stocks and bonds

貨幣型

- Money market: invest in short-term assets and generate low but safe returns

- Fund of funds (FOF): invest in a portfolio of funds (May need to pay management fee twice!)

- Qualified domestic institutional investor (QDII): allows you to invest in foreign assets



# Do US managers beat the market?

- For actively managed US equity funds: **NO**
- For actively managed US bond funds: **only enough to cover the fees**

	1962-2006		1962-1983		1984-2006		1962-1992		1993-2006	
	EW	VW	EW	VW	EW	VW	EW	VW	EW	VW
Funds	819		246		1374		331		1921	
AUM	410.7		136.7		675.8		179.0		933.2	

Part A: Three-factor and four-factor  $\alpha$  estimates (monthly values multiplied by 12)

Net Returns										
Three factor										
12 * $\alpha$	-0.52	-0.49	-0.23	-0.08	-0.94	-0.80	-0.08	-0.16	-1.44	-1.16
t( $\alpha$ )	-1.38	-1.67	-0.37	-0.17	-2.21	-2.62	-0.17	-0.41	-2.56	-3.09
Four factor										
12 * $\alpha$	-0.85	-0.86	-1.25	-0.87	-0.91	-0.93	-0.86	-0.71	-1.38	-1.38
t( $\alpha$ )	-2.19	-2.90	-2.08	-1.75	-2.08	-2.98	-1.92	-1.84	-2.39	-3.68

Active fund managers earn negative alphas on average!

Gross Returns										
Three factor										
12 * $\alpha$	0.61	0.26	0.74	0.53	0.36	0.10	0.97	0.52	-0.10	-0.23
t( $\alpha$ )	1.61	0.89	1.21	1.04	0.85	0.32	2.14	1.38	-0.18	-0.61
Four factor										
12 * $\alpha$	0.29	-0.11	-0.29	-0.27	0.39	-0.03	0.18	-0.02	-0.03	-0.45
t( $\alpha$ )	0.74	-0.35	-0.49	-0.53	0.90	-0.09	0.41	-0.06	-0.06	-1.20

Source



# Do Chinese managers beat the market?

- Active equity funds: **yes, partly from using insiders' information**

The table shows the annualized intercepts ( $12*\alpha$ ) and t-statistics (in parentheses) for the CAPM, FF3F, and FF3F+MOM versions of Regression (1) estimated on equal-weighted (EW) and value-weighted (VW) net and gross returns on the portfolios of actively managed stock mutual funds. The table also shows the slopes for factors. For the market slope, t-statistic tests whether  $\beta$  is different from 1 instead of 0. Net returns are those received by investors. Gross returns are net returns plus 1/12 of a fund's expense ratio for the year. The data cover 418 funds from July 2003 to June 2014.

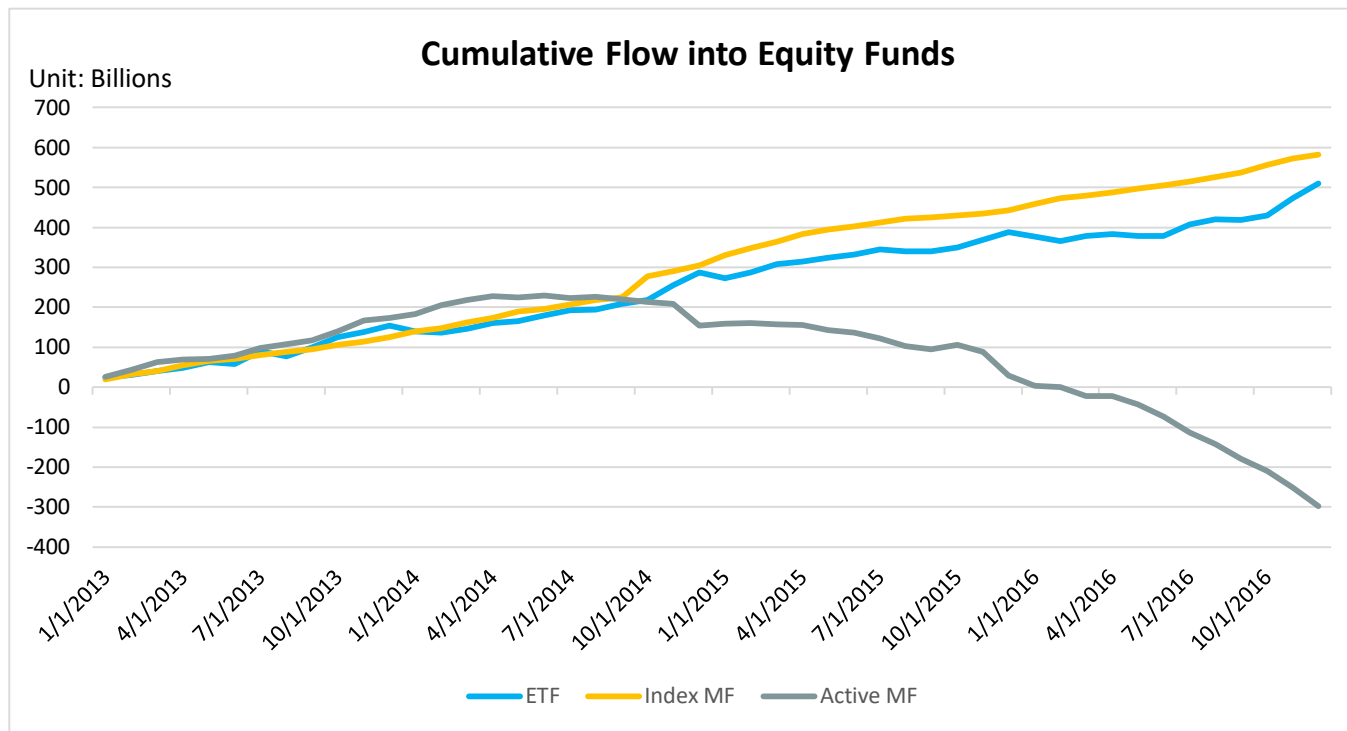
		12*α		Rm-Rf	SMB	HML	MOM	R-sq
		Net	Gross					
Equal-Weighted Returns								
CAPM	6.30	8.05	0.71					0.86
	(2.35)	(3.01)	(-11.81)					
FF3F	10.66	12.41	0.76	-0.24	-0.46			0.93
	(5.36)	(6.23)	(-12.88)	(-6.84)	(-8.42)			
FF3F+MOM	8.94	10.68	0.77	-0.17	-0.34	0.26		0.94
	(5.00)	(5.98)	(-13.66)	(-5.21)	(-6.38)	(6.01)		
Value-Weighted Returns								
CAPM	4.75	6.50	0.72					0.86
	(1.78)	(2.43)	(-11.39)					
FF3F	9.34	11.08	0.77	-0.28	-0.45			0.93
	(4.91)	(5.83)	(-12.82)	(-8.27)	(-8.52)			
FF3F+MOM	7.80	9.55	0.78	-0.22	-0.34	0.23		0.95
	(4.49)	(5.49)	(-13.40)	(-6.75)	(-6.52)	(5.49)		

[Source](#)



# How do I Pick a Good Mutual Fund?

- First step: passive or active?
  - In the US, investors are moving away from active mutual funds



- In China, maybe active funds still provide some value now, but it is uncertain (1) if they can keep generating positive return after fees, and (2) if you can identify good funds.



# If You Want a Passive Mutual Fund...

- Find an index you want to track
  - US Stocks: S&P 500, Russell 3000, Total Market Index
  - Chinese stocks: 上证指数, 沪深300, etc.
  - Other foreign stocks: MSCI indexes
  - Bond: Barclay Aggregate, Treasury, Corporate, High Yield...
  - ...

Note: make sure you understand what the indexes include!
- Pick the one with the lowest fee
  - Typical management fee for Chinese index MF: 0.5%
  - In US, fees are usually below 0.1%
- Other considerations: Morningstar ratings, tracking error, fund size, reputation of the fund family



# If You Want an Active Mutual Fund...

- There is no easy way to identify talented managers yet
  - $$\begin{array}{ccc} \text{Return} & = & \text{skill} + \text{luck} \\ \text{(Observed)} & & \text{(Unobservable)} \end{array}$$
  - Chinese investors (in aggregate) do not have mutual fund selection ability<sup>[ref]</sup>
  - Some people may be able to identify talented managers, but it requires serious research effort
  - You can try doing your own research: [CSMAR](#)
- Past winners do not outperform in the future overall (performance not persistent)
  - In the short term, there is some persistence
  - For some asset classes like fixed-income and global equity, there is some evidence of persistence<sup>[ref]</sup>



# Agenda

- Mutual Funds
- **Exchange-traded Funds (ETFs)**
- Private Funds
- Real Estate



# What is an ETF?

- [Video](#)
- A fund traded on the exchange
  - When you invest, you buy from someone else on the exchange instead of giving the money to the manager
  - You need a brokerage account to buy ETFs
- Open-ended in the sense that it can be created and redeemed by designated agents only
- Most are indexed funds and have low fees
- \$3 trillion in the US, \$4 trillion globally





# Investing in ETFs vs. Mutual Funds

- When you invest in a mutual fund
  - You give money to the fund manager
  - Transaction only occurs at 3:00PM (cannot buy/sell intraday)
  - The manager buys assets
- When you invest in an ETF
  - You buy from someone else on the market
  - Transaction is instant
  - You pay brokerage fees and stamp taxes the way you do for stocks



# Reasons of Choosing ETFs

- Intraday transaction
- Better tracking
  - The ETF manager doesn't need to buy or sell when investors come and leave
- Low fee
  - China: most ETFs have management fees equal to 0.5%
  - US: fees usually around 0.1%
- Transparent
  - Most ETF publish daily holding, where mutual funds usually only publish monthly or quarter holdings
- Reasons of NOT choosing ETFs
  - You want active management
  - You don't have a brokerage account
  - If you want to buy small amounts repeatedly, trading costs are high



# Agenda

- Mutual Funds
- Exchange-traded Funds (ETFs)
- **Private Funds**
- Real Estate



# What are Private Funds?

- Two main types: hedge funds and private equity
- Funds subjected to much less regulation from the regulators
  - Cannot market themselves
  - Cannot take money from the public
  - Do not need to report anything to the public
  - Have much more flexibility
    - Can invest in any type of assets (like even arts, wines, antiques, etc.)
    - Can take leverage
    - Can refuse your investment, charge high fees, or impose restrictions when you want to take money out
- Mainly take money from institutional investors, like endowments and pension funds
- Usually charge much larger management fees
  - 1-2% asset, 15%-30% profit per year
- [Report on Chinese private funds industry](#)



# Largest Private Fund Companies

Rank	Manager	Assets (M)	Change from 2017
1	<b>Bridgewater Associates</b>	<b>\$132,756</b>	7.9%
2	<b>AQR Capital Mgmt.</b>	<b>\$83,700</b>	9.2%
3	<b>Man Group</b>	<b>\$59,100</b>	11.3%
4	<b>Renaissance Technologies</b>	<b>\$57,000</b>	17.3%
5	<b>Two Sigma</b>	<b>\$38,800</b>	9.6%
6	<b>Millennium Mgmt.</b>	<b>\$35,314</b>	2.7%
7	<b>Elliott Management</b>	<b>\$35,000</b>	7.0%
8	<b>Marshall Wace</b>	<b>\$34,800</b>	45.5%
9	<b>Davidson Kempner Capital Mgmt.</b>	<b>\$31,400</b>	15.9%
10	<b>Baupost Group</b>	<b>\$31,000</b>	-0.3%

[Source](#)

Some of the largest private fund companies in China:

滚雪球投资, 高毅资产, 深圳凯丰投资, 景林资产, 少数派投资, 幻方量化, 宽远资产, 九坤投资

[Source](#)



# Who can Invest?

- Institutions
- Accredited investor (合格投资者)
  - US requirement:
    - Annual earning > \$200K (\$300K for family) in the past 2 years or net worth > \$1M
  - Chinese requirement according to 《证券投资基金法》:
    - 1) For organizations: Net worth > ¥10M
    - 2) For individuals: Liquid asset > ¥3M or annual earning > ¥0.5M in the past 3 years



# Should I invest?

- Typical minimum investment: ¥ 1M
  - You really shouldn't put all your cash into a HF if all you have is ¥ 1M!
  - Diversifying your portfolio is important because a typical private equity only invest in 20 to 100 assets in order to pursue superior return.
- Some good funds may be closed to new investors
  - Most investment strategies have capacities. If a fund is too large, any trade will move the market too much.
  - In fact, many good mutual funds are also closed
- Bottom line: Invest if you are wealthy and know some good managers



# Agenda

- Mutual Funds
- Exchange-traded Funds (ETFs)
- Private Funds
- **Real Estate**





# Real Estate

- Cash flows



- Example problem (2019 Fall Final)

- Currently you have \$3 million. Starting from next month, you can save \$50,000 every month. Which of the following investments will generate the highest wealth after 10 years?
- 1) Invest in an equity fund
  - 2) Buy an expensive apartment that appreciates slowly
  - 3) Buy a cheaper apartment that appreciates faster



# Real Estate Example Problem (2019F Final)

3M now, 50k per month. What has the most FV in 10 years?

- Invest in an equity fund that generates 7% (APR, monthly).

$$- FV = 3M * \left(1 + \frac{7\%}{12}\right)^{120} + 50000 \frac{(1+7\%/12)^{120}-1}{7\%/12} = 14.683M$$

- Buy an apartment worth 10M. Take a 15-yr 7M mortgage with APR = 5.72% (monthly payment=58k). Rental income = 8000 per month. Annual price appreciation = 5% (EAR).

$$- FV = 10M * 1.05^{10} - 58000 \frac{1-(1+5.72\%/12)^{60}}{5.72\%/12} = 13.269M$$

- Buy an apartment worth 8.2M. Take a 10-yr 5.2M mortgage with APR = 5.72 % (monthly payment =57k). Rental income = \$7000 per month. Annual price appreciation = 6% (EAR).

$$- FV = 8.2M * 1.06^{10} = 14.685M$$



# Embedded Leverage in Real Estate

$$\text{Return} = \text{Lev} \cdot \Delta \text{Price}$$

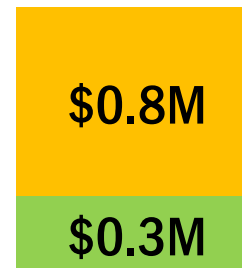
- House price: \$1,000,000. Down payment: \$200,000. Lev=5



Loan

Equity

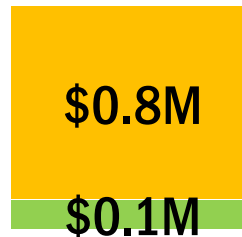
- Suppose price increases by 10%



Loan: 0 change

Equity: 50% increase

- Instead, if the price drops by 10%



Loan: 0 change

Equity: 50% decrease

# Equity vs. House

## The Rate of Return on Everything, 1870–2015

Table 5: Real rates of return on equity and housing

Country	Full Sample		Post 1950		Post 1980	
	Equity	Housing	Equity	Housing	Equity	Housing
Australia	7.81	6.37	7.57	8.29	8.78	7.16
Belgium	6.23	7.89	9.65	8.14	11.49	7.20
Denmark	7.22	8.10	9.33	7.04	12.57	5.14
Finland	9.98	9.58	12.81	11.18	16.17	9.47
France	3.25	6.54	6.38	10.38	11.07	6.39
Germany	6.85	7.82	7.52	5.29	10.06	4.12
Italy	7.32	4.77	6.18	5.55	9.45	4.57
Japan	6.09	6.54	6.32	6.74	5.79	3.58
Netherlands	7.09	7.28	9.41	8.53	11.90	6.41
Norway	5.95	8.03	7.08	9.10	11.76	9.81
Portugal	4.37	6.31	4.70	6.01	8.34	7.15
Spain	5.46	5.21	7.11	5.83	11.00	4.62
Sweden	7.98	8.30	11.30	8.94	15.74	9.00
Switzerland	6.71	5.63	8.73	5.64	10.06	6.19
UK	7.20	5.36	9.22	6.57	9.34	6.81
USA	8.39	6.03	8.75	5.62	9.09	5.66
Average, unweighted	6.60	7.25	8.24	7.46	10.68	6.42
Average, weighted	7.04	6.69	8.13	6.34	8.98	5.39



# Real Estate in the Past 15 Years

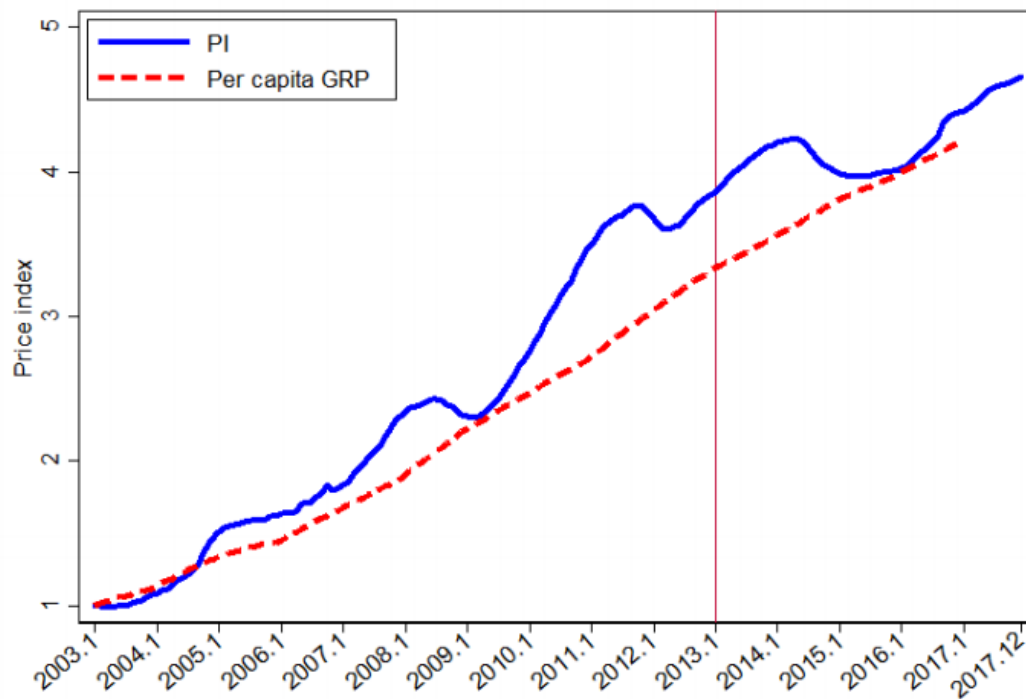


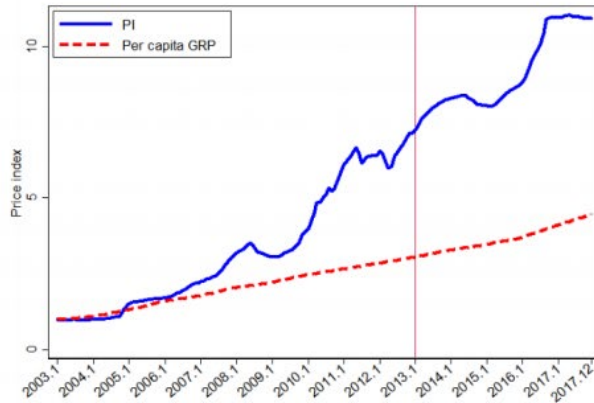
Figure 4: National Average Housing Price Index, 2003–2013

*Notes:* PI is weighted by urban population.

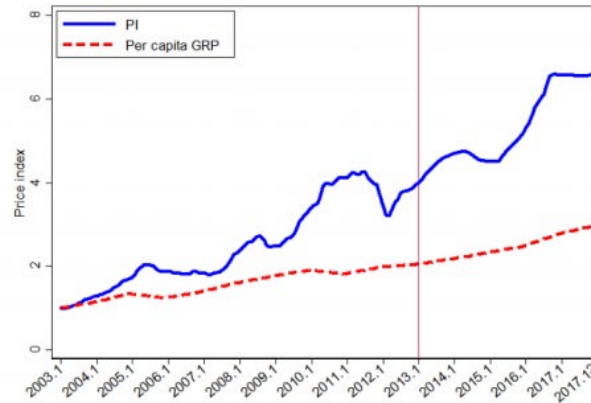
*Source:* Fang et al. (2016) and NBS.

# Real Estate—1<sup>st</sup> Tier Cities

A.Beijing

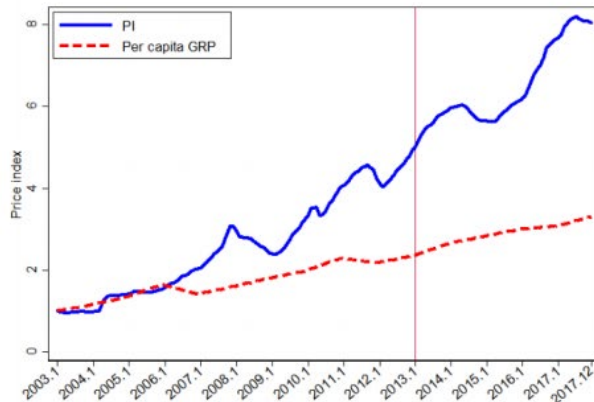


B.Shanghai

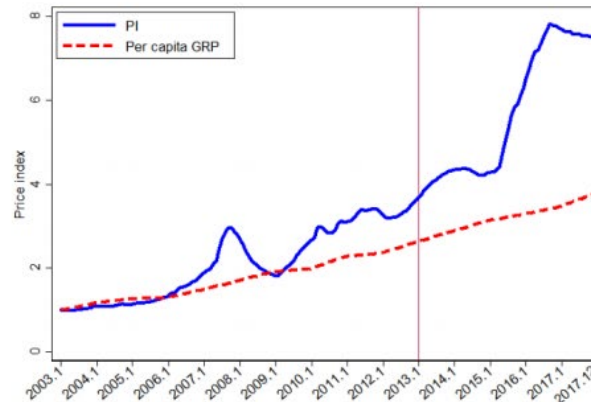


The price appreciations are particularly strong in Tier- I cities.

C.Guangzhou



D.Shenzhen



- Price ← **supply** and **demand**
- Historically, the real estate investment has been lucrative in China.
- Looking forward, a lot of uncertainties remain.

[Source](#)



# Real Estate Investment

- Pros:
  - Embedded leverage
  - Offers high return historically
- Cons:
  - Limits to buy/sell
  - Hard to diversify
  - A lot of uncertainties going forward



# An Alternative Way to Invest in Real Estate

- Real estate investment trust (REIT, 房地产信托基金):
  - conceptually similar to mutual funds
  - underlying assets are real estate
- Relatively small and under-developed market in mainland China
- Quite popular in other markets such as Hong Kong and the US
  - Example: LINK Reits (<https://www.linkreit.com/en/home/>)
- Pros:
  - High dividend: REITs are required by law to pay out at least 90% of their net income in the form of dividends
  - Offers diversification
  - Easy access to investors
  - Good liquidity





# Summary

- Mutual Funds

- Fee: management (0.5~1.5%), front/rear load
  - Front load can be waived (on MF app) or reduced (on WeChat and Alipay)
- Performance of active funds: bad for US Equity, okay for others

- ETFs

- Mostly index funds, low fee, instant transactions

- Private Funds

- Private funds with less regulation, cannot market to the public
- Only for wealthy investors with connections

- Real Estate

- Embedded leverage:  $\text{return on equity} = \text{leverage} * \text{return on asset}$
- REITs



# Next Time—Financial Derivatives

- What is a financial derivative?
- Why do we need derivatives?
- Commonly seen derivatives
  - Forward and futures
  - Options
  - Swaps
- Derivatives and the Great Financial Crisis

