

Independent Investment Project Report: Solar-Powered Rural House

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September 2025

Abstract

This report analyzes a real estate investment project involving the self-managed construction of a solar-powered rural house near Zhengzhou, China. The investment decision was based on a combination of qualitative and quantitative factors, including prevailing macroeconomic trends and a discounted cash flow (DCF) valuation. The project's internal rate of return (IRR) was calculated to be between 5.7% and 13.6%, a return that significantly outperformed many conventional Chinese investment portfolios during the same period.

Investment Decision Context

The investment was initiated before 2017 based on the observation of several macroeconomic signals pointing to a potentially negative economic outlook in China, including a trend of isolation from international markets, high levels of local government debt, and declining employment and birth rates. While these qualitative factors influenced the long-term trend analysis, the decision-making process was ultimately refined using quantitative DCF models to evaluate and optimize the investment choice.

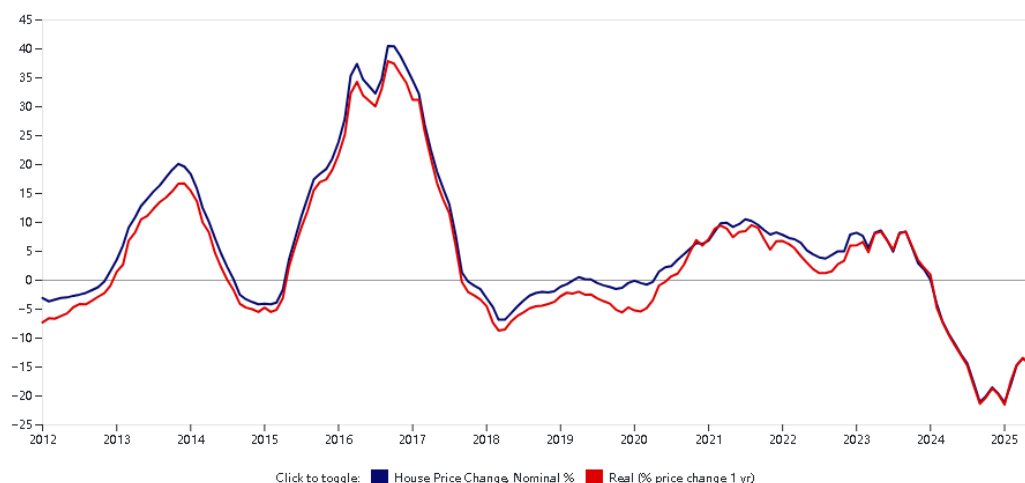
Although the decision relied on data available prior to 2017, this report also presents relevant market trends through 2025.

China's Investment Landscape in 2016

China offered a broad mix of investment vehicles:

- **Equities:** The Shanghai Composite Index remained volatile after the 2015 crash, delivering a full-year return of about –12.3%.
- **Bonds:** Ten-year government yields hovered near 1.8%–2%, with slightly higher returns for policy-bank and corporate bonds—insufficient to offset inflation and currency risk.
- **P2P Lending:** Platforms promised 8%–15% annual returns but were largely unregulated; by 2020 most had collapsed following widespread fraud.
- **Urban Real Estate:** After more than a decade of strong price growth, major-city housing prices were high relative to rental yields, limiting future upside. (Global Property Guide)

China's house price annual change:

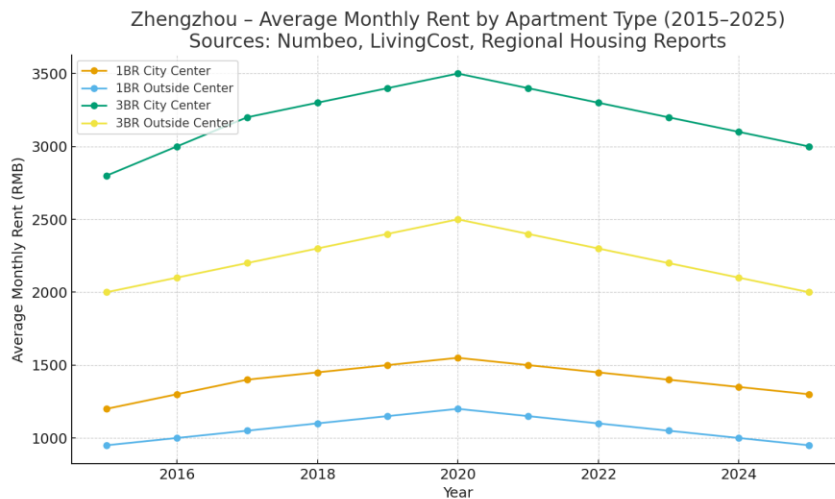
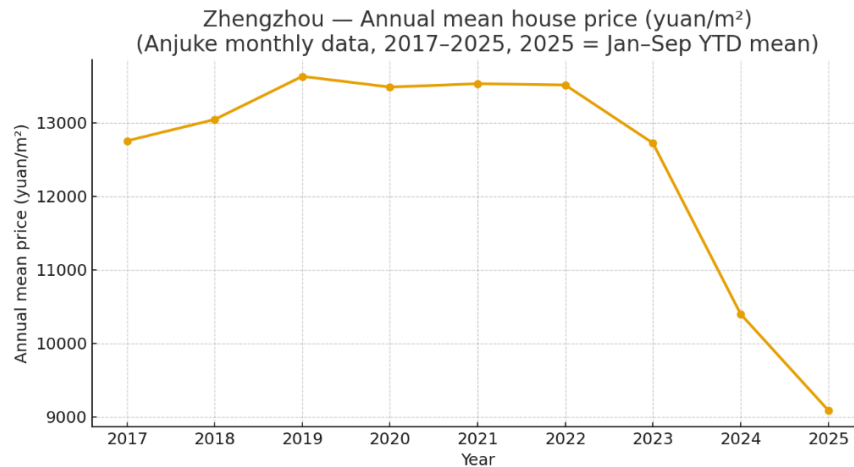


Given these constraints, rural real estate emerged as an alternative worthy of detailed analysis.

Urban Housing Valuation

Average housing prices in Zhengzhou during 2017 far exceeded values justified by rental income.

A 120 m² three-bedroom apartment in central Zhengzhou averaged roughly ¥12,800/m² in 2017, or ¥1.54 million total. Average monthly rent was about ¥3,300 (Numbeo; LivingCost). Using a discounted-cash-flow (DCF) valuation with a 3% annual discount rate and a 70-year cash-flow horizon, the present value (PV) of rental income is approximately ¥1.16 million, below the market price even before management and maintenance costs. Similar calculations for rural property show PVs around ¥0.8 million for a 120 m² three-bedroom home, again highlighting limited rental-yield justification for prevailing market prices.



Policy Environment

Several government policies further reduced the attractiveness of urban investment while enhancing rural potential.

Anti-Speculation Measures (2016–2017):

- Two- to five-year resale restrictions
- Higher down-payment requirements (60%–80% for second homes)
- Tighter financing oversight

Rural Development Initiatives:

- Poverty Alleviation Campaign (2015) improved basic infrastructure and living

standards.

- Rural Revitalization Strategy (2017) promoted industrial, ecological, and cultural development, raising the long-term utility of rural housing.

Independent Rural House Construction Project

From 2018 to 2022 I planned and managed construction of a 500 m² (≈6,000 ft²) solar-powered prefabricated residence near Zhengzhou.

Key features included:

- **Risk Control:** Direct management avoided developer fraud and bankruptcy risk.
- **Quality Assurance:** My auditing and management background ensured compliance with rural residential regulations.
- **Cost Optimization:** I sourced materials, supervised the site, and managed the construction team to control expenses.
- **Customized Design:** Including a customized Solar power storage and supply system.

Cost and Market Comparison (thousand RMB)

Item	Market Regular Cost	Managed Project Cost
Supplier Investigation	0	150
Design	470	0
Construction Materials	900	900
Construction Team	600	600
Supervision	280	0
Tools & Miscellaneous	150	150
Total Investment	2,400	1,800

All items comply with Chinese rural-housing regulations. Values are simplified for clarity.

Market valuations for comparable rural houses are ¥3.5–4.0 million, while DCF calculations indicate a PV of about ¥3.0 million.

Return Metrics:

- Investment of ¥1.8 million → PV \approx ¥3 million after four years → IRR \approx 13.6%
- Including the imputed market cost of design and supervision (raising total investment to ¥2.4 million) → IRR \approx 5.7%

Limitations

- Future rental growth, maintenance costs, and potential macroeconomic shocks are not modeled quantitatively.
- Valuations depend on assumed stable discount rates.
- Construction labor costs in China are significantly lower than in many other countries, limiting the project's replicability elsewhere.

Summary

This independent project demonstrates a successful investment that I managed under challenging market conditions. Despite an environment marked by numerous negative factors, my self-directed construction of a solar-powered rural house achieved strong returns compared with traditional Chinese investment options from 2016 onward. Government rural-revitalization policies, combined with urban housing restrictions, further enhanced the strategic value of such investments. Despite inherent uncertainties—including maintenance expenses, demographic shifts, and macroeconomic risks—the project's internal rate of return (IRR) of **5.7%–13.6%** compares favorably with Chinese equities, bonds, and urban real estate during the same period.

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