

Pension funds investments in infrastructure

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Abstract: *This essay discusses the reasons why infrastructure investment is attractive to pension funds investors and four different selected vehicles and their pros and cons. The long-term nature of infrastructure assets investments can be matched with long-term liabilities of pension funds. Pension funds investors tend to prefer a cautious and conservative investment strategy which is consistent with the characteristics of infrastructure assets. I choose the Sizewell C nuclear power plant project and two unlisted infrastructure funds as examples of direct equity investment vehicle and private infrastructure funds vehicle respectively. This essay also covers telecommunication and digital infrastructure sector that has good development trends and the same characteristics as traditional infrastructure. The individual and business demand for more efficient internet connection and 5G upgrades have been stimulating the demand for digital infrastructure since these infrastructure assets are the basis of any data transmission and communication.*

Keywords: *Pension funds investments, Infrastructure, Investment vehicles*

1. Introduction

Institutional investors especially pension funds are taking a more proactive part in infrastructure investments and this part will briefly illustrate the rationale for pension funds investment in infrastructure assets. Pension funds are buy-and-hold investors whose primary focus is on long-term revenue instead of capital accumulation. When investment or solvency regulations require a relatively conservative investment approach, the large mass of pension funds typically would be more interested in investments with lower risk (Croce 2011). Investments in infrastructure are appealing to pension funds since infrastructure investments are expected to produce favorable returns that exceed the yields in the fixed income market. But they need to undertake higher risk due to relatively higher volatility. Projects for infrastructure generally are long-term investments which can be matched with long period liabilities of pension funds (Croce 2011). Some infrastructure investment opportunities can provide attractive asset characteristics that pension funds are seeking. By learning from AMP capital, those characteristics include hedges against economic recession, steady predictable returns, high entry barriers and no correlation with traditional asset classes. Those infrastructure assets that provide fundamental services are less affected by the economic downturn because residents use them every day and rely on them. As illustrated by guest speaker James Wardlow from CAMPBELL LUTYENS, one of the winning infrastructure sectors during the period of the economic downturn due to the pandemic is the utilities sector. Water firms and electricity delivery assets are unlikely to suffer any lack of profits since residents keep consuming at comparable rates, although the industrial demand for electricity and water declined. The revenue of some certain forms of infrastructure assets such as schools and roads come from government agencies or government, which provides a comparatively high level of security. Inflation-related infrastructure assets can hedge the vulnerability of pension funds to rising inflation. Also, many infrastructure assets such as energy and gas delivery grids can provide steady cash flow because they have regulatory mechanisms. Some social infrastructure assets like hospitals that have a lifespan of over 30 years have long-term contracts with governments, which guarantee a predictable income. Some infrastructure assets also create significant entry barriers, reducing exposure to competition and threats from new competitors because the relatively high fixed cost and long construction period can lead to natural monopolies. Moreover, investors can use infrastructure assets to diversify their portfolios since the returns are commonly not correlated to those traditional assets such as bonds and shares. In this case, the overall risk of the portfolio can be reduced as the level of diversification increases.

2. Investment vehicles

From the above discussion, it is clear that different infrastructure assets are characterized by different features, some of which are beneficial for pension funds investments. This is the main reason why pension funds institutional investors are interested in infrastructure investments. This part will discuss several distinctive vehicles that can be used by pension funds investors to gain exposure to infrastructure assets and illustrate the vehicles I choose. These investment vehicles can be divided into two categories, one is debt vehicles and the other is equity vehicles. Debt vehicles include infrastructure debt funds and direct debt financing such as corporate bonds and project infrastructure debt. Investors can directly lend to infrastructure companies or operators of specific projects through buying corporate bonds or project bonds. They can also invest via infrastructure debt funds that are well managed by specialists. Equity vehicles include listed infrastructure funds, unlisted infrastructure funds, listed direct equity investment and unlisted direct equity investment. Investors can buy shares of listed infrastructure companies or invest in listed or unlisted infrastructure equity funds. Also, they can invest directly in the private project company in the form of equity. The characteristics of different infrastructure assets are diverse and not all investments have identical risk and return, so investors should consider both the nature of assets and allocation to infrastructure in the portfolio while selecting investment vehicles (Della Croce and Sharma 2014).

Based on the discussion above, I will diversify my investments with four types of vehicles in my portfolio to get access to infrastructure assets. 40% of the budget will be invested through infrastructure debt funds and 60% of it will be invested in the form of equity. 20% of the equity investment will be allocated to direct private equity investment in infrastructure projects or companies, and the proportion for listed infrastructure funds and that for unlisted infrastructure funds are the same, which is 40%. The reason for choosing the four types of vehicles is that the combination of them can satisfy my investment strategy. There are three principles for my investment strategy which are set based on the nature of pension funds and characteristics of the vehicles. Firstly, pension savers' need for long-term steady and predictable cash flows should be satisfied. Secondly, the investment returns should be maximized with acceptable risk intervals. Thirdly, investments should be diversified through using multiple vehicles and the improved liquidity desire needs to be taken into account. Because bank capitalization regulations like Basel III severely affect the banks' ability to lend to infrastructure projects, infrastructure debt funds are sold as an alternative to conventional debt from banks by general partner firms (prequin 2012). Such funds have offered a credit spread of 100 to 300 basis points above comparable government securities on average according to the report from Schroders (2017). It means that debt funds can offer a relatively safer way to gain higher yield than public bonds. Moreover, it is the fact that most infrastructure projects have high leverage ratios, which provides substantial opportunities for institutional investors to invest in senior debt. Infrastructure senior debt holders are exposed to less risk compared to equity holders since they have priority recourse to debts if investments fail. In particular, given the long lifespan of infrastructure assets, infrastructure senior debt can be long-dated, sometimes inflation-related, which offers an approach to access long-term steady returns and a higher yield than investment in government bonds or securities with manageable risks. I would like to invest via debt funds to include these investments in the fixed income allocation of my portfolio. However, the tradeoff is that investors are unlikely to get access to their money easily until investments mature, in other word, investments via infrastructure debt are not easily tradeable, but illiquidity premium is provided as compensation.

Direct private equity investment is a vehicle that can help investors gain tighter control over the infrastructure assets in their portfolios and avoid paying infrastructure fund managers costly management fees. Also, it makes it easier for pension funds investors to hold assets for the long term which is matched with the long-term liabilities instead of being restricted to the infrastructure equity funds lifespan. Most closed-end infrastructure funds offer a lifetime of around 10 years and direct investment in those assets that can be kept for up to 30 to 50 years are appealing to pension funds investors. Direct investment can avoid the expensive management fees paid for fund managers. That is why I select direct investment to structure my portfolio. However, the long holding period of infrastructure assets makes it difficult for investors to exit from direct investments and thus should bear a significant liquidity risk. Most infrastructure assets are capital intensive and investments in a single infrastructure asset requires large capital and internal resources, which increases the concentration risk. Additionally, the investors can be exposed to high political and regulatory risk through investing a large amount of capital into a single asset over a long period since in this case, it is difficult for investors to respond timely and flexibly when a country where the asset is based changes the legal

frameworks. Moreover, investments via this vehicle require a substantial amount of specialist knowledge and regulation of governance.

Listed infrastructure funds invest in a number of diverse listed infrastructure stocks, which enables investors to diversify by geography and asset class. Portfolio diversification can eliminate single-asset risk and reduce exposure to political and regulatory risk of single governments. Inherently, listed infrastructure funds allow for greater diversification of the market risks of an individual enterprise. Such funds are highly liquid since they include a variety of listed securities so that they can be acquired and sold quickly and efficiently on capital markets. Listed infrastructure generally perform better than the broader market either in absolute or in risk-adjusted terms according to the report from Schroders (2017). As the investment insight of Morgan Stanley (2016) indicated that the return of global listed infrastructure described by the DJBGI index has historically reached the return requirements well, with IRRs in the range of 5-19% and achieving 8%-9% over the long term. To a great degree, the requirement for a large capital can be avoided by investing in listed infrastructure funds, eliminating the concentration risks when investors gain exposure to infrastructure assets. This vehicle can satisfy the desire for more liquidity of my investment principle. But meanwhile, listed funds are more volatile and more related to the stock market, which means they are easier to be influenced by economic cycles.

Unlisted infrastructure fund is a route for pension funds investors to gain exposure to unlisted infrastructure equity through external fund managers. Institutional investors invest in unlisted infrastructure funds as limited partners and general partner invests the money collected in various infrastructure assets on behalf of those institutional investors. Those funds are either open-ended or close-ended and focus on unlisted infrastructure assets such as airports, toll roads, telecommunications, electricity generation and transmission etc. Unlisted funds are generally uncorrelated to economic cycle and exhibit relatively less volatility compared to listed funds. Unlisted strategies follow the private equity model, charging 1.5% of committed capital including undrawn amounts per annum plus a performance fee which is 10-20% of returns in excess of the hurdle rate, while Listed strategies generally charge less than 1% management fees referring to the report from Schroders (2017). The high management fees of unlisted funds reduce expected net returns dramatically. Therefore, I believe the portfolio structured by combining four vehicles with distinguished features discussed above is expected to provide long term predictable returns with acceptable uncertainty.

3. Sizewell C Nuclear Power Plant Project

I select the investment in Sizewell C nuclear power plant by the vehicle of direct investment in a specific project as an example to discuss how I will allocate money and the rationale for the investment, as well as the risks associated with the investment. The construction of new nuclear power stations in the UK is becoming an increasingly critical component of satisfying energy needs as the country shifts further away from its dependence on fossil fuels. Nuclear energy is vital to keeping the lights on across the country, supplying 21% of the country's electricity and serving as a backup during severe weather events. By 2030, 14 of the 15 nuclear power plants currently operating in the UK are due to come offline, reducing electricity generation by the equivalent of 35% of the UK's total electricity. Sizewell C power plant in Suffolk which will be built by EDF Energy and China General Nuclear Power Group (CGN) is projected to be constructed in 2022 and estimated to take minimum 10 years to complete. The power plant will cost at least £20 bn and generate 7% of the UK's needs for electricity. I will invest £0.2 bn in the project via direct private equity investment. The investment in this project represents only 10% of the total budget due to the relatively high risk associated with the nature of direct investment vehicle and the capital-intensive feature of the power plant. The majority of the cost of the nuclear power plant is the up-front construction cost and the construction phase will last for 10 years or more. And the payback time can be over 30 years. Because of the long construction period and payback time, investors are more likely to be exposed to financial risks from incorrect forecasts and potential demand shifts. Several risks that need to be taken into account. Firstly, Construction risk will continue to be a major risk for investors. During the construction of a nuclear power plant, actual construction times and costs can greatly exceed initial estimates. The delays and cost overruns at the Olkiluoto and Flamanville nuclear power projects are examples. Additionally, the technical complexity of nuclear power plants is more likely to present relatively high risks in the period of operation, including equipment breakdowns and unplanned stoppages. The incidents during operation lead to reduced electricity production and additional repair and maintenance costs. Apart from that, changes in government and/or nuclear policy may undermine fiscal, financial or contractual arrangements. Additional regulatory requirements may result in forced abandonment of the plant under construction or premature closure of the plant in operation (NEA 2009). Another risk is the market risk since the

market for nuclear-produced electricity will vanish by the time of other new plants are completed despite the increasing electricity demand. The falling production costs of other renewable energy could erode the market for nuclear power.

4. Preferred Unlisted infrastructure funds and sectors

As discussed above, 40% of the equity investment (£ 480 mn) will be allocated to unlisted infrastructure funds. I would select AXA Infrastructure Generation III whose data is available and Equitix VI whose net IRR can be inferred from historical data to calculate the return of my investment in these two unlisted infrastructure funds. These two funds were chosen because of their historical good performance. The Equitix VI fund focuses on identifying PFI/PPP opportunities in the UK targeting social infrastructure. The fund builds a diversified portfolio of projects, including the areas of healthcare, education, social housing and government office space. AXA Infrastructure Generation III focus on infrastructure projects in transportation, energy, telecommunication and public infrastructure. The investment concentrated on core infrastructure is more likely to bring steady incomes with a narrow range of expected return. Based on the data on preqin, the average net IRR of Equitix funds series is 10.88%, so the net IRR for Equitix VI will be around 10% according to reasonable assumption. The accurate net IRR for AXA III fund is 14.4%.

In terms of a specific sector, I would like to choose the telecommunication and digital infrastructure. Infrastructure assets for connectivity include wireless broadcast towers and fixed-orbit satellite towers. I choose this sector because of the growing individual and business demand for faster and more efficient network transmission and the same advantages as many traditional infrastructures. Because of the pandemic, the UK has experienced several times of national lockdowns and the vast majority of people have been asked to work from home or take online courses, which has shown a huge increase in the need for reliable and stable network transmission. The Cisco Annual Internet Report (2018-2023) illustrates the increasing demand for internet connections by data. The report shows that the total number of Internet users worldwide is expected to grow at a CAGR of 6% from 3.9 billion in 2018 to 5.3 billion in 2023. In other words, the number of users represents 51% of the global population in 2018 and 66% by 2023. Besides, The Internet of Things has already connected people, data, things and processes through networks. Machine to Machine connections will rise from 6.1 billion in 2018 to 14.7 billion by 2023. Digital infrastructure is the backbone for all communications and information delivery and the rapid increase in the demand for data has accelerated the need for digital infrastructure investment. Digital infrastructures provide essential internet connection services and can generate steady, predictable and contractual returns like traditional infrastructure. Therefore, I believe investments in telecom and digital infrastructure will have a good performance though it is still a growth sector with real operational risks. As a hot research technology, moving target tracking technology has been widely used in various fields. With the help of low cost, low power consumption, self-organization and high error tolerance of wireless sensor networks, moving target tracking based on wireless sensor networks also has broad application prospects.

5. Conclusion

In conclusion, investments infrastructure assets are appealing to pension funds because of the long-term predictable stable cash flows which match the long-term liability of pension funds. The four vehicles I choose have their advantages and disadvantages and the advantages can be reduced by including multiple vehicles in a portfolio. Also, multiple vehicles can fit my investment strategy better. Direct private equity investment can help investors exercise tighter control over the infrastructure assets in portfolios and avoid paying expensive management fees that investments via unlisted funds should pay. On the other hand, listed funds can help eliminate the concentration risk associated with direct investment in projects and increase the liquidity of the portfolio. Additionally, Unlisted funds are typically uncorrelated with economic cycle, which can provide more stable incomes. Infrastructure debt funds can decrease the risk of the whole portfolio. As for the telecommunication and digital infrastructure sector, the trend of this sector is linked to the technological updates and demand for data transmission. In the coming years, more digital infrastructure will be needed due to the 5G upgrades. Investments in this sector can generate long-term returns with low uncertainty which are guaranteed by long-term contracts.

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