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FACULTY OF THE BUILT ENVIRONMENT
BARTLETT SCHOOL OF PLANNING

**Real estate investment for individuals in France: Assessment of
practitioners' buy to let strategy.**

Denis SAPHORE

Being a dissertation submitted to the faculty of The Built Environment as part of the requirements for the award of the MSc International Real Estate and Planning at University College London: I declare that this dissertation is entirely my own work and that ideas, data and images, as well as direct quotations, drawn from elsewhere are identified and referenced.

Denis SAPHORE

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List of acronyms

ALUR:	Law for housing accessibility and refurbished Urbanism)
ANAH:	National Agency for Housing,
APCR:	Authority for Prudential Monitoring
APL:	Help for Housing
BIC:	Industrial And Commercial Benefits
ESRB:	European Systemic Risk Board
CGED:	Council for the Environment and Sustainable Development
HCSF:	High Council for Financial Stability
INSEE:	National Institute of Statistics and Economic Studies
IMF:	International Monetary Fund
IRL:	Housing Rent Reference Index
LMNP:	Non-Professional Landlord for Furnished Housing
LMP:	Professional Landlord for Furnished Housing
OLL:	Local Observatory for Rents
OECD:	Organisation for Economic Co-operation and Development
PTZ:	Zero Interest rate Loan

Abstract

Over the past years in France, due to changes, especially in credit conditions, a consensus emerged from practitioners' literature on an ideal buy to let strategy for individuals to start real estate investment. However, this literature is unbalanced and suffers from a lack of evidence. This dissertation aims to fill this gap providing solid rationales with reference to proven economic fundamentals. Investigations rely on secondary data analysis, completed by numerical evidence. Results show that practitioners' statements allow taking the most of actual policies, taxation, capital, and housing market conditions.

Also, investigations provide an update of current housing market conditions, assessing main trends for change, and their concerns for the strategy and its durability. Findings in this concern show that these trends are predominantly aligned with strategy due to need for refurbishments, the adaptation of housing to current needs (esp. furnished housing), and potential migrations outward metropolises. Nevertheless, it also evidences the main risks for the durability of this strategy that should be monitored, especially the regulation of debt ratio calculation method.

Finally, this dissertation participates in research in real estate investment in French residential market it highlights gaps in some specific points and opens the field to further researches in this field.

Keywords:

Real Estate Investment, France, Residential market, Buy-to-let Strategy, Policies, Macroeconomic, LMNP, Secondary cities,

Introduction

In France, housing parc is increasing consistently since 1984 (INSEE, 2019) with a growing share of private landlords (INSEE, 2020). Over the past years, real estate investment knew a substantial increase mostly driven by improvement in credit conditions. In 2019, investments represented more than 1/4th of the acquisitions (Century 21, 2020). Globally reports converge on the fact that 2019 was a record year for both prices and volumes of sale with the threshold of one million annual transactions reached.

In parallel, there is a consensus in practitioners' literature on a buy to let strategy in the residential market. However, it suffers from a lack of balanced point of views, evidence, references to economic fundamentals, etc.

This dissertation aims to complete/ fill the gap across current literature by critically assessing from an investor standpoint, the pros and cons of the recommended strategy with reference to academical research, proven economic theories. It seeks to provide robust evidence from market studies, references to proven economic fundamentals and numerical evidence. It will constitute an interesting complementary standpoint, what is more at the start of a global economic crisis, with market indicators raising the doubt on financial stability.

It relies mainly on secondary data collection and interpretation. Five objectives are set:

- 1- Define the strategy, demonstrating the consensus and points of divergence through the current literature.
- 2- Study current and future impacts of the sanitary crisis on the economy and the residential market.
- 3- Risk/ return analysis of strategy determinants allowing to increase profitability
- 4- Provide numerical evidence through financial simulations
- 5- Group previous findings to draw findings about optimal strategy and provide further elements for reflection

To answer these objectives, the dissertation follows the following outline:

A context part:

Introduced with a brief overview of the housing and private rental markets, this part analyses the relation between the past 20 years housing price rise and the improvement in lending conditions with reference to DiPasquale quadrant (graph 6, p.8). It ends highlighting the adverse impact of credit conditions softening for macro-economic risk, constituting the foundation for objective 2.

Literature review:

Divided between two complementary subparts:

Theoretical literature: links between this literature and the rest of the dissertation will provide a great added value and complementary standpoint to current practitioners' literature. It focusses on price dynamics and investment theories field studies. This part introduces grounding notions essential to further the reflection and analysis of the problem.

Practitioners' literature: aiming to demonstrate the consensus, points of divergence around the investment strategy, and gaps the dissertation aims to fill. This subpart answers the 1st objective.

Conceptual/ theoretical context:

It investigates rationales behind current policies and regulations in place as well as trends for change. This understanding will allow linking investor's recommendations with policies demonstrating coherence, limitations, and fears; to draw hypothesis about optimal strategies that would be validated and critically assessed with quantitative simulations. This part ends with a general and topical debate offering lessons and reflections for issues beyond the specific case of analysis.

Explanation of research design and method:

It defines the method and design used for the subsequent parts. Each following sections correspond to an objective, from two to five, as the first objective has already been answered in the literature review.

Context

A. Introduction to housing and private landlord markets

Referring to INSEE data, see table 1 below, on the 1st January 2019, metropolitan France accounted for 35.7 million of housing for 64.8 million of inhabitants (INSEE, 2019). In 35 years, 11 million of new housings appeared. Half of this increase is due to population growth, and the other half, to a reduction in household size (INSEE, 2020). However, vacancies increased quicker than new housing, reaching 8.4% in 2019; it represents 3 millions of vacant housing whose 2.2 million belong to individuals, and 40% are located in metropolises and medium-sized cities (ANAH, 2020). Nevertheless, these numbers should be interpreted carefully as it also accounts for housing between two leases (BFM Business, 2020).

	1984	2019	Average annual increase 1984-2019
Number of Main homes (in million)	24.368	35.672	1.1%
Vacancy rate (%)	7.7%	8.4%	1.3%
Number of inhabitants in metropolitan France (in million)	54.9	64.8	0.52%
Average Household size (in number of people per household)	2.69	2.18	-0.54%

Table 1: Repartition of the housing stock according to the occupancy/ exploitation category

Source: Own design, data from (INSEE, 2019; INSEE, 2020)

Table 2 below shows that between 2001 and 2019, the share of owners increased by 1.8% and remained stable at 57.7% since 2013. The share of tenants remained slightly below 40% and the share of public landlord decreased in aid of private. Then the private landlord market represents a growing share of the housing market and a growing market.

	2001	2004	2007	2010	2013	2016	2019
Owner	55.9%	56.6%	57.2%	57.5%	57.7%	57.7%	57.7%
Total Tenant	39.7%	39.4%	39.3%	39.4%	39.5%	39.8%	39.9%
Tenants With Public landlord	17.9%	17.7%	17.5%	17.3%	17.2%	17.1%	17%
Tenants with Private landlord	21.8%	21.7%	21.8%	22.1%	22.3%	22.7%	22.9%
Other statute (mainly people accommodated for free)	4.4%	4%	3.5%	3.1%	2.8%	2.5%	2.4%

Table 2: Share in occupancy/ ownership statute for main residencies

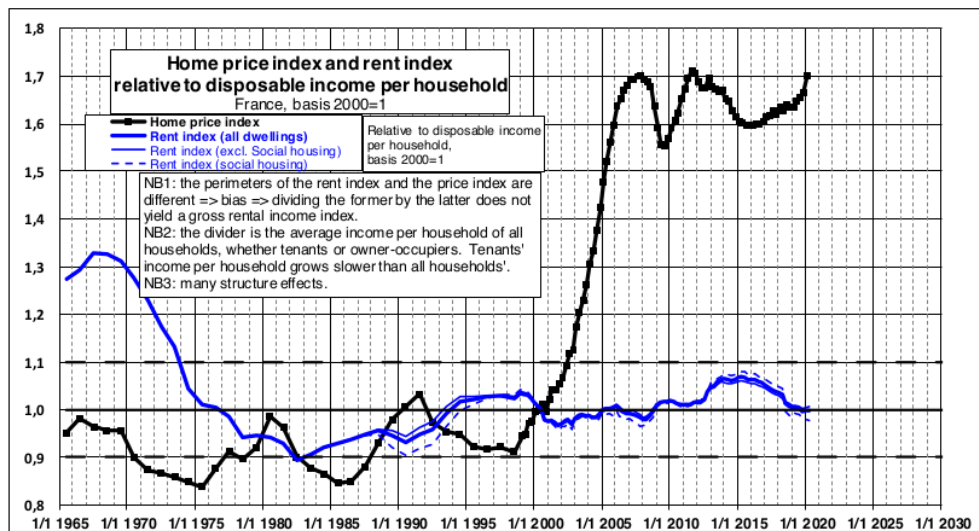
Source: (INSEE, 2020)

B. Impact of capital market on housing prices

Graph 1 below, shows that since 1998 housing price, at the contrary of rents, became disconnected with households' incomes. This part analyses the implication of capital market in the increase of housing prices, with reference to fundamental economic theories using DiPasquale quadrant.

For the analysis and understanding of this part, it is essential to explain the specificities of the capital market in France, especially:

- The French mortgage market is mostly fixed rate (Global Property Guide, 2020)
- The possibility of buying with no down payment. The loan covers the property price, plus the transaction costs, plus the eventual works. Practitioners call it a "110% loan" because of notary fees equivalent to 7-8% of the transaction price.



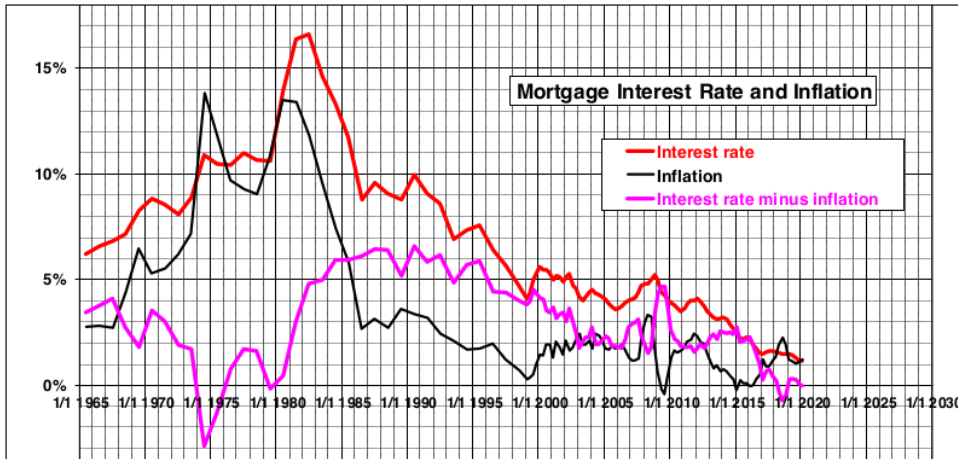
Graph 1: Home price index and rent index relative to disposable income per household. France, basis 2000=1

Source: (CGEDD, 2020)

1. Historical evidence

Past 20 years price rise is consistent with the improvement in credit conditions; as well as with economic trends. It is possible to identify the following periods:

Early 1980 to 1998: interest rates continuously decreased from over 15% to 5%, which was the lowest historical rate at this time, see graph 2 below.



Graph 2: Mortgage interest rate and inflation

Source: (CGEDD, 2020)

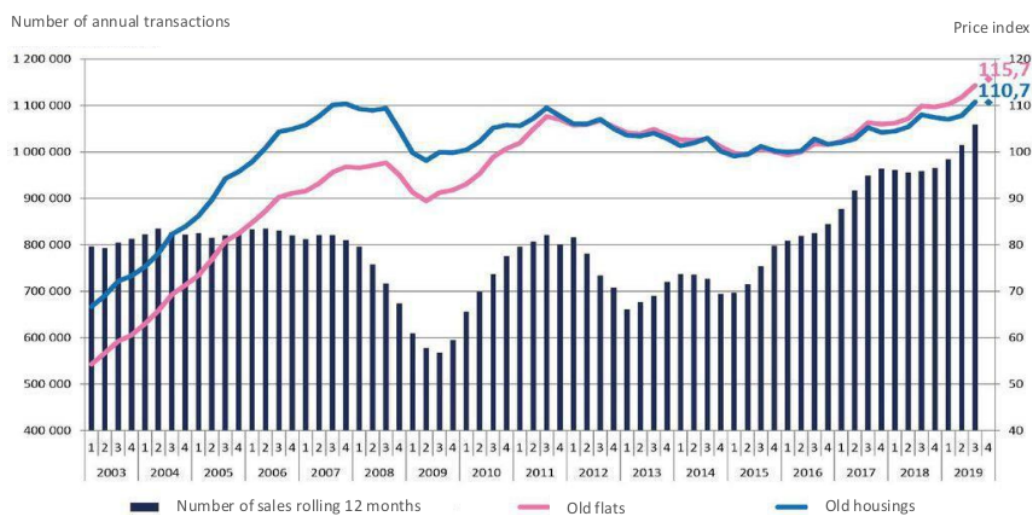
1998- 2008: Prices knew a massive rise. The ratio house price/ salary almost doubled, see graph 1 above. In parallel, interest rates remained below 5%, and their difference with inflation decreased (see graph 2 above); borrowing money became cheaper. Consequently, average loan length increased significantly: plus five years between 2001 to 2008, see graph 3 below.



Graph 3: Residential market, average property loan length (in months) for individuals.

Source : (L'Observatoire Credit Logement/ CSA, 2020)

2008-2015: Graph 4 below, evidence successive impacts of 2008 financial crisis and 2012 national fiscal reforms (e.g. suppression of zero-interest loans for buyers) on prices and volumes of transactions; despite the implementation of a non-conventional financial politic at European level with a decrease in interest rates and personal contribution, see graph 5 p.7 (Couppey-Soubeyran, Tripier, & Châteauneuf-Malclès, 2019; FranceTerme, 2018).



Graph 4: Number of sales/transactions and price indices in the old residential market

Source : (PAP.fr, 2019)

2015-end 2019: With better economic conditions, prices and volumes of transaction increased again and reached their highest historical level in 2019 simultaneously, see graph 4 above. Interest rates continued to decrease and loan length to increase.

End 2019- March 2020: HCSF (High Council for Financial Safety) incentives to banks had a slight impact on lending conditions (e.g. personal contributions increased by 11.1% on the first two months of 2020).

March 2020-Now: COVID crisis led to containment and restrictions measures resulting in a significant drop in the economy. This had a measurable impact on banks' lending conditions, with a significant rise in interest rates of 14 points from 1.15% in March to 1.29% in June (L'Observatoire Credit Logement, 2020).

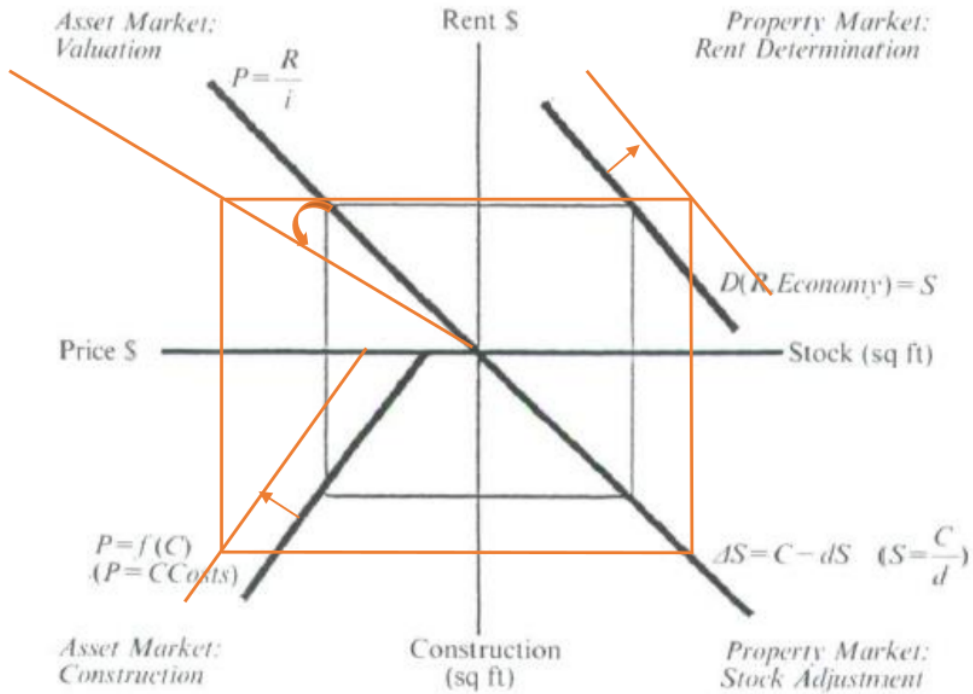


Graph 5: Average rate of personal contribution, residential market base 100 for 2015

Source : (L'Observatoire Credit Logement/CSA, 2020)

2. Economic rationales: Analysis through DiPasquale model

Graph 6 below, shows an interpretation of the past 20 years market evolution with reference to DiPasquale quadrant.



Graph 6: Quadrant model from DiPasquale and Wheaton

Source: Adapted from (DiPasquale & Wheaton, 1992)

Starting from NE quadrant:

As stated in subpart A, over the past 20 years, housing stock increased significantly. Demand curve shifted due to improvement in credit conditions and expectation for further increase in price. Indeed, longer loans and lower interest rates “imply that for the same annual payment (rent), households can afford to pay a higher purchase (asset) price.” (DiPasquale & Wheaton, 1992); and decrease in personal contribution helped households, especially first-time buyers, to enter the market (Marty, 2020). Also, price increase combined with a myopic vision from investors and households provoked a further increase in demand despite price rise, either by fear for not being able to enter the market in the future, either for the expectation of capital gain (Mourouzi-Sivitanidou, 2020). It explains why in 1998-2008 and 2015-2019, despite price rise volumes of transactions remained constant or even increased. This myopic vision led to a globalised bubble in 2008 as show graph 15 p.34 completed by graphs appendix 1 and 2.

NW quadrant:

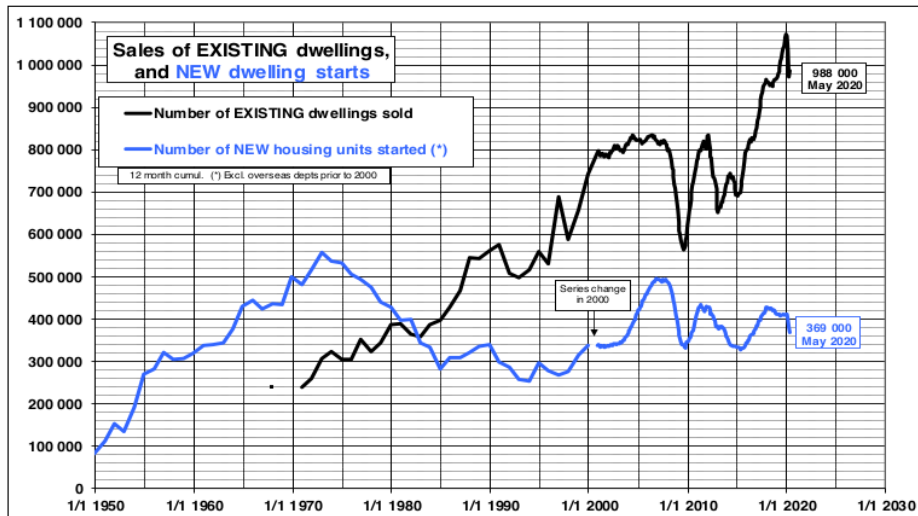
For owner-occupiers, a single decision determines both price and rents, which is here equivalent to monthly repayments and ownership related costs. As shows graph 1, p.4, prices increased significantly, but rents remained globally constant. It means that the cap rate decreased. It is due to improvement in lending conditions: "For investors, as borrowing interest rates are lower, yield the investors need is lower." (Delagrandanne J. , L'investissement immobilier locatif intelligent, 2017) Then beneficial the impact of softening credit condition is compensated by its impact on price increase (De Bandt, Knetsch, Peñalosa, & Zollino, 2010, pp. xii, preface)

SW quadrant:

Price of factors of production, especially land and minimum construction standards (i.e. energy performance, safety norms, etc.) increased significantly producing a shift in the supply curve. Indeed, since 2000 , construction costs (excluding land) increased by 57% (INSEE, 2020), and constructible land price almost tripled between 2000 and 2018 (Notaires.fr, 2020). Overall, the index for housing price (including both new and old housing) increased by 139% (INSEE, 2020); this, in addition with supply elasticity, explains why construction levels increase remained moderated compared to house price one.

SE quadrant:

Graph 7 below shows that construction levels increased significantly between 1998 and 2008 (from 280,000 to 500,000 new dwelling started); since they kept fluctuating between 330,000 and 440,000 new units; and recently decreased due to COVID 19 crisis. Construction levels resulted in an increase in housing stock over this period. Ray's slope does not change as nothing let supposed that the depreciation rate changed over the past 20 years. All of this explains the outward shift for both constructions and stock.



Graph 7: Sales of existing dwellings and new dwelling starts, rolling 12 months.
 Source: (CGEDD, 2020)

This analysis provides rationales behind the past 20 years market evolution. Then improvement in credit conditions for buyers participated in housing price rise. However, this represents an adverse impact in several aspects, especially financial and macro-economic stability, which is the concern of the following subpart.

3. *Credit conditions' impact on macro-economic risk*

Observations from the different macroprudential organisms (IMF, 2019; ESRB, 2019; HCSF, 2019) converged on the fact that deterioration in lending standards harmed prices, households' indebtedness, and banks financial pressure. They identified these vulnerabilities in the residential real estate sector as a source of systemic risk to financial stability (ESRB, 2019).

Due to lower interest rates and decline in their difference with inflation, banks suffered from lower margins on new loans since 2012. As the French mortgage system is mostly fixed rates, IR drop led to a high volume of loan transfers and renegotiations especially between 2015 and 2017 which adversely impacted the profitability of outstanding housing loans for banks with a drop of around 60 basis points between 2016 and 2019, or around 6 billion euros per year (HCSF, 2019).

As seen previously, prices rise was driven by softer credit conditions. Econometric models: "indicate that overall prices for the whole of France are not overvalued" (HCSF, 2019). However, it hides local trends with a rise in prices in Coastal regions and Urban centres. For example, between 2015 and 2019, Paris prices grew by 22.5%, Lyon by 26.5% and also grew substantially in other metropolises (HCSF, 2019). As shows graph 15, p.32, these metropolises suffer from local bubbles.

An economic crisis would lead to price adjustment provoking negative wealth effect that might lead households to lower their consumption (ESRB, 2019). Also, a rise in unemployment might cause an increase in loans delinquencies and a decrease in households consumption due to tighter budgets. High indebtedness would reinforce the negative wealth effect caused by price adjustment exacerbating the economic downturn (HCSF, 2019). Then: "the ESRB considers the main vulnerabilities to be high and increasing household indebtedness associated with a recent deterioration in lending standards." (ESRB, 2019).

To tackle it, in 2019, HCSF published recommendations for bank lending conditions. These were to do not accept loans longer than 25 years and do not overpass 33% debt ratio. Also, it noticed the growing share of loans with low personal contribution but did not set any requirements about it (HCSF, 2019). The complementary notice associated with recommendations clarifies the debt ratio calculation (HCSF, 2019). HCSF's recommendation is a soft incentive with a 15% allowance reserved mainly to main residency loans and first times buyers. However, last data from APCR (the authority in charge of banks and insurance

company monitoring) shows that banks became slightly stricter but are very far from HCSF recommendations. Also, the Governor of the Banque de France insists on the need to increase mortgage rates (Le Blog Patrimoine, 2020).

Nevertheless, a range of factors, especially weak collateral effect, important social safety net, and fixed mortgage rates let suppose that France's housing market is likely to be much less prone to sharp upturns and downturns than housing markets in other countries (Global Property Guide, 2020; ESRB, 2019).

Literature review

A. Academic literature: Price dynamics and investment theories

Academic literature aims to set some basic principles for investment directly linked to the topic to be able to refer to them. Several points will be developed separately:

1. *Direct real estate*

Real estate is an asset that can be traded directly and indirectly (with shares/ equities). Difference between both is interesting for the understanding of direct real estate characteristics, see table 3 below. Indeed, direct real estate is illiquid. It involves high transaction costs; consequently, it is slower to trade and involves medium/ long term management (for buy to let investment strategies). However, despite these limitations, the main interest of real estate is that it allows leverage.

Shares / equities	Direct Property
<ul style="list-style-type: none">• Homogeneous• Liquid• Central marketplace• Low transaction costs• Easily & quickly traded• Many buyers/seller• High turnover potential• Mobile / fluid asset• Responds quickly to market information• Can be ST / MT / LT holding.• More informed knowledge base.	<ul style="list-style-type: none">• Heterogeneous• Illiquid• No central marketplace• High transaction costs• Slower to trade• Limited buyers/sellers• 'Lumpy' asset• Immobile: location specific• Inelastic in the short term.• Typically a MT – LT holding.• Imperfect knowledge base.

Table 3: Direct property asset characteristics compared to shares/equities
Source: (Livingstone, 2020)

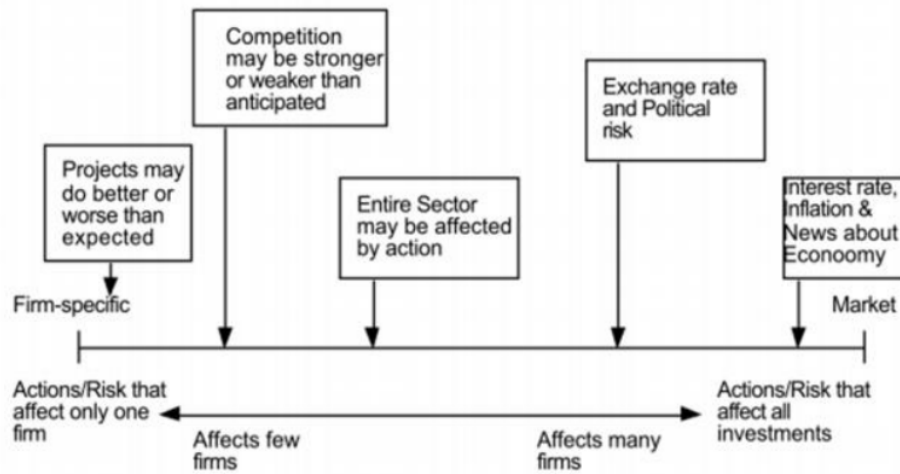
2. *Risk, return and diversification*

The aim for investors is to maximise return minimising risk. Risk can be divided into two types:

- Unsystematic risk: "Risks affecting particular investments and over which the investor has some control" " (Isaac & John, 2011, p. 234)

- Systematic risk: "Caused by extrinsic factors which affect all investments and over which the property investor has no control" (Isaac & John, 2011, p. 234)

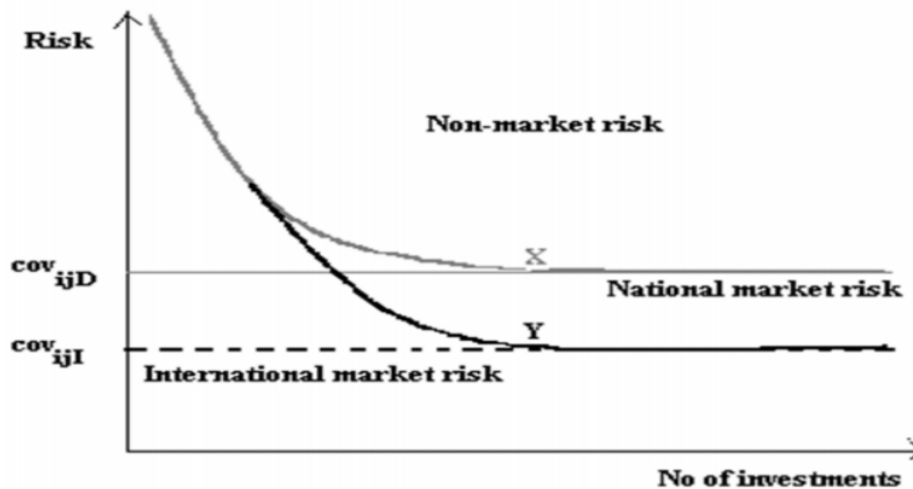
Graph 8 below shows some examples of systematic and unsystematic risks.



Graph 8: Market spectrum: specific/unspecific risks

Source: Damodaran, A. (2002: 67)

Despite investors cannot mitigate systematic risk, portfolio risk can be mitigated through diversification. As shows graph 9 below, the higher the number of investments, the lower the risk as it becomes spread over the different investments. This statement is particularly true for direct real estate, which is a heterogeneous asset.

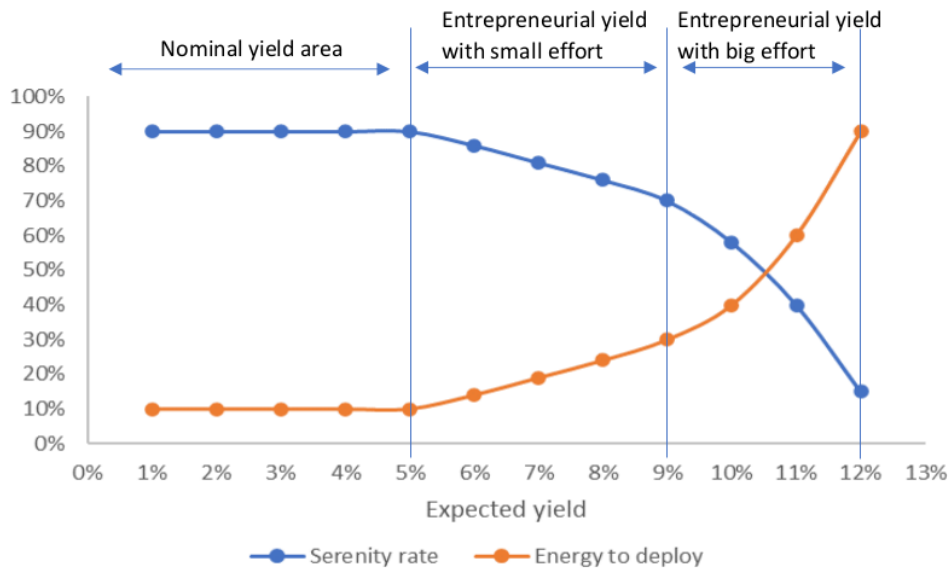


Graph 9: Evolution of risk in function of number of investments

Source: (Livingstone, 2020)

3. Refurbishments and entrepreneurial yield

However, time and effort are two other vital components to consider in addition to risk and return. In this concern, (Piketty, 2013) differentiates “nominal” and “entrepreneurial” yields. He explains that historically, capital interest rate is on average around 5%. Then profitability higher than 5% often results from additional work in real estate investment this can be further researched to find a good deal, refurbishments, more management as short time rental, etc. Resulting additional return is called entrepreneurial yield. Following Piketty works, Delagrèdanne developed the following representation of risk/ return relation accounting for entrepreneurial yield and effort.



Graph 10: Entrepreneurial yield graph

Source: (Delagrèdanne J., 2017, p. 60)

This graph breaks-down expected yield in three areas:

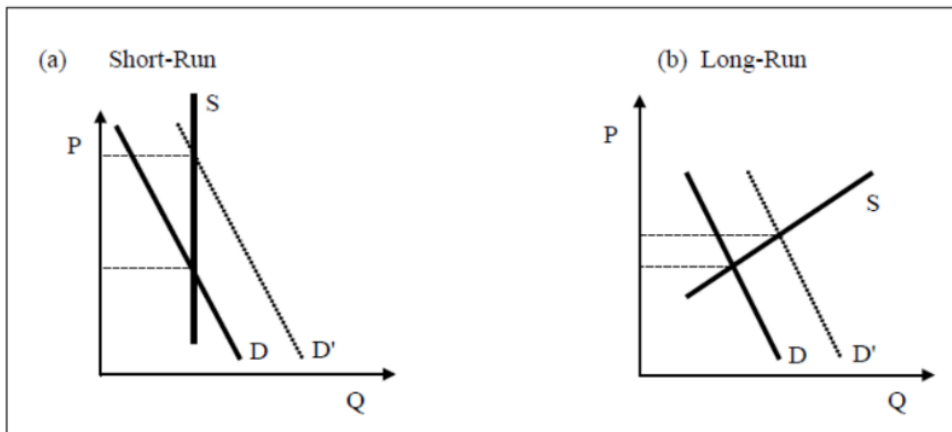
- **The zone of nominal profitability ($\leq 5\%$ gross profitability)** this correspond to an easy-to-find asset with low efforts and minimum management.
- **The zone of entrepreneurial profitability with small effort ($< 5\%$ gross profitability $\leq 9\%$),** both serenity and energy evolve linearly. Actions allow to increase yield, but these remain reasonable.
- **The zone of entrepreneurial profitability with significant effort ($> 9\%$),** energy to deploy and serenity rate evolve exponentially.

The main ideas behind it are that additional time and energy for researches, refurbishments, and management should result and are an opportunity to increase yield and that high yield. And positive cash flows are obtained with additional efforts as additional researches, additional management (i.e. short time rent), major refurbishments.

4. Price dynamics and cycles

Context part already discussed fundamental laws of supply and demand through the analysis of DiPasquale model. However, “An important drawback of this framework is that it is not easy to trace out the intermediate steps as the market moves to its new equilibrium.” (DiPasquale & Wheaton, 1992).

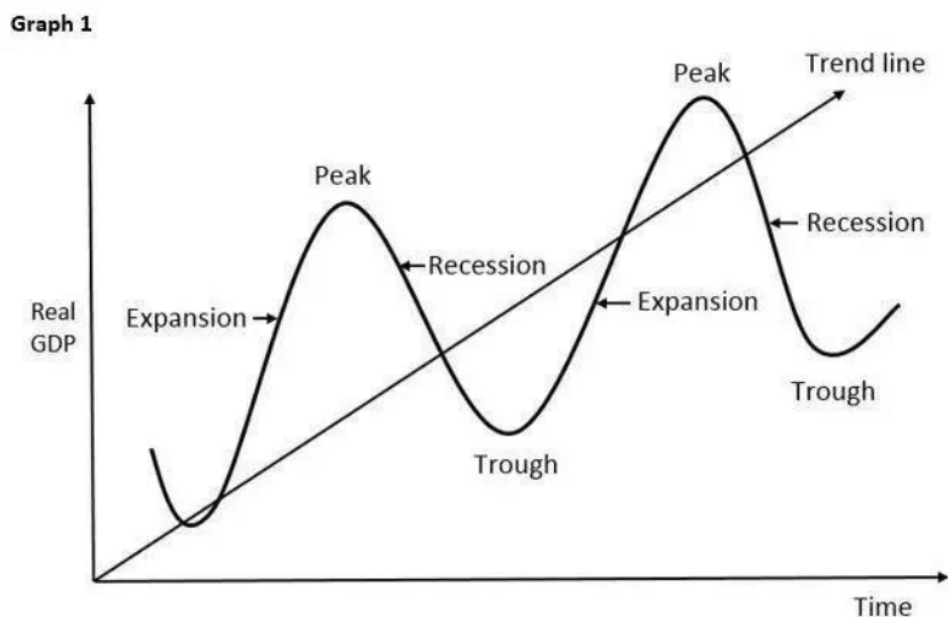
As shows graph 11 below, a quick drop of demand (D) is on the short-run fully absorbed by price (P) rise because supply needs time to adapt to a change in demand. The lags, and then the magnitude and length of boom and bust cycles, depends on inefficiencies. Studies concur on the fact that policies can address inefficiencies (Iacoviello, De Bandt, Knetsch, Peñalosa, & Francesco, 2010).



Graph 11: Short-Run VS Long-Run Price Changes
Source: (Mourouzi-Sivitanidou, 2020)

One of the main determinants for supply and demand is the global economic context. As shows a wide range of literature referring to economic and historical evidence, this evolves by a cyclical way. Cycles are “The name given to peaks and troughs in property values, which seem to occur every **10-12 years**. The term describes the process of market adjustment which

takes place when too much property is produced relative to the demand for it. The trough part of the cycle usually follows a long period of sustained economic growth at the end of which the banks have often become overexposed to toxic property loans.” (Isaac & John, 2011, p. 59). As shows graph 12 below, cycles can be divided down into four stages:



Graph 12: The Four Stages of an Economic Cycle

Source: (Cliffcore, 2020)

Also, several families of cycles can be identified (Barras, 2009, p. 29) identified four of them from Short cycles (4-5 years) to long waves (up to 50 years due to world economic changes). Complementarily, (Delagrannan J. , 2017, pp. 39-40) evidences the seasonality of the French housing market with a gap between prices in Autumn and Spring. Winter is less favourable to projects and savings have been jeopardised during holidays, and Christmas break is arriving. At the opposite, spring is more favourable to projects, and parents want to go quickly to get their kids settled for next school year.

B. Objective 1: Practitioners' literature: evidence of consensus and points of divergence

"I prefer something sure and that I enjoy now (a positive cash flow) to something hypothetical in 20 years (a potential capital gain on resale" (Delagrèdanne, 2017, p. Back Cover).

According to the evolution of credit conditions, policies, and taxation over the last two decades, there is a consensus in practitioners' literature about the strategy for individuals to start real estate investment.

The main aim of this strategy is to generate positive cash flows with high leverage (100 or 110%) in order to be able to get a growing borrowing capacity and enchain investments without being limited by the need to recover a significant share of the next investment value. This strategy relies on the way bank account for rental incomes in borrowing capacity calculation. Most of the banks apply a 70% safety coefficient to rental incomes. If depreciated rental incomes are bigger than loan payments, borrowing capacity increases. This will be further in objective 4.

However, this is possible only with high gross profitability and the optimisation of resulting cash flows through taxation and financing choices. To meet this profitability level, two points are essential: invest in suitable cities and target assets with refurbishments. This latter associated with furnished exploitation allows benefiting from interesting tax abatements. Credit is an additional lever as increasing loan length allow to increase cash flows mechanically.

Going into the details, consensus and divergence for each specific point are the following:

- **City size:**

"To my mind, B2 cities are the best compromise between a reasonable cost allowing to meet profitability driving to positive cash-flows with a small personal contribution being serene about the demand to rent and future city evolution" (Delagrèdanne J. , 2017, pp. 72-73),

As explained later in Conceptual/ theoretical context, zone B2 cities are medium-size cities (between 50,000 and 250,000 inhabitants) and close municipalities belonging to their agglomeration. The blog (Mieux Vivre de Votre Argent, 2019) states that "it is in the cities below 100 000 inhabitants that investors will reach their best rates of profitability".

However, practitioners' commonly agree on avoiding rural areas where demand is too low. Globally, there is a consensus on the fact that smaller cities have higher profitability but higher vacancy and lower potential for capital increase. This point will be further investigated in objective 3.

- **Refurbishments**

As seen literature review part A, refurbishment constitute a possibility for entrepreneurial yield and then to negotiate higher gross yield. Then refurbishment works are deductible from taxable income. Then, *"The investor wins on two fronts: on the one hand, his gross return is better, and on the other hand, his net return is improved by the tax deductibility for the works."* (Delagrannane, 2015)

- **Exploitation choice and resulting taxation**

Tax regime depends on both the mode of exploitation (furnished/ unfurnished) and acquisition (individual/ society), see graph 16, p.34. In this concern, it is essential to state that "individuals tax system are always more advantageous to start" (Montella, 2019, p. 132). There is a consensus between practitioners (Montella, 2019), blogs (la-lmnp.fr, 2020?), and even Government reports (IGF & CGEDD, 2016) on the interest of the furnished market for investors. Due to higher rents for rental assets than not rental, higher deductions, and more liquid assets. Rationales, limitations, and fears will be assessed in objective 3.

- **Credit length**

Most of the literature state that the ideal loan length is 20 years. "Today, with interest rates for 20 years loan around 2%, the ideal loan length is manifestly 20 years. Shorter would deteriorate too much the cash flow. Furthermore, 25 years should be avoided as it would lead to a too-small capital repayment in the first years." (Delagrannane J. , 2017, p. 50). Despite rates are now widely below 2%, "the length of a loan should never be above 20 years, so the gain is small compared to the cost of a few additional years" (Immobilier Danger, 2020). Then "30 years long loans should be certainly banned as they constitute a money pit, total borrowing cost doing a huge incremental jump." (Partners Finances, 2018).

This point will be evidenced and further discussed in objective 4 with a comparison of cash flows and cost and capital for 15, 20, 25- and 30-years loans.

- **Debt ratio calculation method and borrowing capacity**

“Differential calculation for debt ratio advantages rental investment” (Delagrandanne J. , 2017, p. 161)

Also, two calculation methods exist for debt ratio: the classic and compensation methods. Practitioners converge on the interest and importance for compensation method “If you want to enchain investments, at a point, you will have to find a bank which uses compensation method.” (Delagrandanne J. , 2017, p. 90). It is the case of many banks (Ever Invest, 2020).

Now that practitioners’ strategy is clearly defined, the rest of the dissertation will attempt to provide rationales and numerical evidence for points stated above. It will also investigate sources of fear/risks for this strategy, due to the macro-economic context, policies changes. This latter is the concern of the following part.

Conceptual/ theoretical context: Housing Policies

This part investigates the main policies influencing the private rental market. How and why these policies are in place, concerns, and eventual fears for investors relating to stated strategy.

A. Policy rationales: Challenges facing the housing market

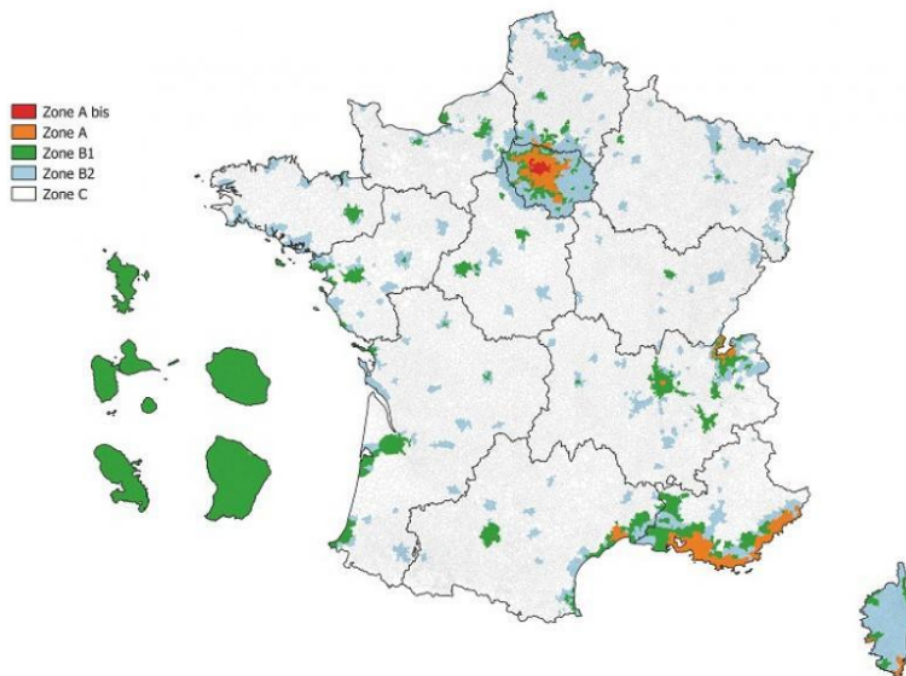
The main concern for the Government is to promote accessibility for housing dealing with a range of factors especially financial safety (as discussed in context), change in population needs due to social changes (i.e. increase in students' and professional mobility, and household restructuration), and energy transition.

Indeed, housing is a pillar for ecologic transition: "Nationally, building sector represents about 1/4th of greenhouse gas emissions, whose 2/3rd come from the Residential market" (Gouv.fr, 2020). About 1% of the parc is renewed every year (CNAM, 2015), which means that 70% of today's building stock will still be there by 2050. In parallel, 11.7% of household still suffered from fuel poverty in 2018 (ONPE, 2020). And "Private rental housing parc accounts for almost 6.5 million housing whose 3.1 million are EPC bands F or G. These energy-consuming buildings are occupied by 1.7 million of very modest households facing high charges" (Plan Batiment Durable , 2019). Then housing energy improvement has a double goal: meet carbon abatement targets and tackle fuel poverty through lower charges.

B. Current Actions

To adapt the market to current and future needs, the Government acts on several levers of actions. This part details some of the most important one in relation to current challenges.

To better target incentives, Government differentiated cities by zones according to their market tension, see map 1 below. A market is tight when supply is lower than demand; reciprocally a market is relaxed when supply answers demand (Gouv.fr, 2020). Determination of market tension relies on statistic criteria based on territorial dynamics, price, and rents. Zones Abis to B1 are considered as tight markets with Abis is the tightest one, attributed to Paris and some inner suburbs. Zone C is the most relaxed one, corresponding to rural areas. As stated previously, the zone recommended by investors is B2. It corresponds to medium-size cities and close communes within an urban area between 50,000 and 250,000 inhabitants (Delagrannan J. , 2017, p. 72).



Map 1: Territorial zoning for the housing market

Source: (Gouv.fr, 2020).

Current incentives in place include:

- **Laws**

To promote affordability and mitigate prices, the Government implemented in 2018 and 2019 ELAN and ALUR laws, limiting rent levels in tight markets (ANIL, 2020; ANIL, 2020).

- **Financial Incentives**

Also, to limit price rise, the Government supported the increase in the available building stock, by not strengthening the minimum construction standards, and encouraging put back vacant housing on the market. To do so, the Government implemented “MaPrimeRenov” and VISALE guaranty. The latter protects landlords; in case of uncollectable rents. Government pay them until 36 months, and the guaranty is free for both landlords and tenants (VISALE, n.d.; Action Logement, n.d.). It constitutes a help for less attractive profiles (i.e. students, young professionals) to meet a place to rent, and then participate in their mobility.

“MaPrimeRenov” is a financial incentive (until €20,000) for the energetic refurbishment of private housing. It is not subject to incomes and targeted to participate in the refurbishment of 200,000 and 500,000 housing in 2020 and 2021.

Finally, tax abatement policies help to promote affordability, accessibility for modest households and, refurbishments and investments in derelict by encouraging landlords through tax. The main policies in place are PINEL, Denormandie, Cosse and ELAN. All of them at the exception of Denormandie are quinquennium updates of previous policies. Denormandie law aims to encourage investment/revitalisation in 222 cities of average 30,000 people where the vital need for refurbishment resulted in the pauperisation and desertion from city centres. It is part of the national public-private partnership “Action Coeur de Ville” launched in 2019 and aiming to invest five billion euros from 2019 to 2022 in derelict cities (Dereix & Kislig, 2020, p. 40).

These policies are completed by direct financial helps for modest households called PTZ (help to buy) and APL (help to rent).

- **Financial safety**

An additional challenge for accessibility is not to hurt financial safety. As explained in context, HCSF published incentives for banks’ lending conditions, but banks are still far from these requirements. By one side, there is a need to regulate the market; by another side,

practitioners state that capital regulation is not for now and that banks will maintain low interest rates to encourage economic relaunch (Le Monde, 2020; La Tribune, 2019).

C. Conclusion of dissertation preparatory part

Policy changes and trends are aligned with investors' strategy in many aspects; especially the needs and incentives for refurbishment works and investment in secondary cities. According to the Plan for energetic refurbishment of buildings, further incentives should be implemented in the future to accelerate the energy transition. (Gouv.fr, 2018). As an example, in 2021, "MaPrimeRenov" will be extended to co-properties and landlords (Gouv.fr, 2020). Also, economic relaunch plan increased budget for this grant by two billion euros spread over 2021 and 2022 and "efforts in housing refurbishment field should be increased to reach 2030 and 2050 targets" (Gouv.fr, 2020).

The national program Action Coeur de Ville for investment in secondary cities; as well as the control of rent level and increase in tight markets represents an additional motivation for the choice of B2 zone cities.

Globally, this "preparatory part" shows that strategy presented by investors is aligned with both capital market trends and governmental policies. However, it raises several questions, especially the following one that will be investigated in the subsequent parts of this dissertation:

- 1- Linking macro-prudential organisms reports with the current crisis, what is the risk and potential repercussion for the residential market, especially in B2 cities?
- 2- Literature review states that higher yield, especially in transparent markets, was coming from either a higher risk, higher effort, or both. In this concern, for strategy determinants allowing to increase the yield (investment in B2 cities and refurbishments), is the ratio incremental yield on incremental risk and effort beneficial for investors?
- 3- Non-Professional Furnished Rental (LMNP) tax system is considered as a fiscal niche very appreciated by investors for the abatements and amortisations it allows. However, it is limited to an income threshold. Then what does the transition to the professional statute means, is this beneficial for investors and is the strategy still interesting when reaching professional status?

Explanation of research design and method

The research method for this dissertation is mainly the interpretation of secondary data and reference to relevant literature completed by numerical evidence in objective 4. Method for each objective is:

Objective 1: Define the strategy by demonstrating the consensus and points of divergence through the literature.

This first objective has been addressed and developed through the literature review.

Objective 2: Study the French rental residential market, its shifters and evolution from a macro-economic perspective.

This objective will be fulfilled with evidence from literature and related secondary data interpretation (especially from OECD, European Commission, INSEE, Observatoire Credit Logement). Also, some interesting links with economic fundamentals will be done.

Objective 3: Risk/ return analysis of strategy determinants allowing to increase profitability

This part aims to discuss the risk/ return ratio for strategy determinants providing incremental yield. These are investments in smaller cities and refurbishment works coupled with LMNP taxation. Methods used for both globally rely on secondary data collection and literature.

For investment in B2 type city: data about price, rents, vacancies will be gathered and cross-analysed, providing a comparison between big and smaller cities. Data for prices, rents, and profitability data come from a mortgage broker (meilleurs agents, 2020) widely recommended by professionals. For refurbishments coupled with taxation, literature review aims to provide rationales for the interests of LMNP tax system from reference to specialised literature. This will provide grounding for 4th objective numerical evidence.

Objective 4: Run financial simulations

Financial simulations will provide numerical evidence of the arguments stated in the course of the dissertation. Four case studies will be run. Specific methodology, assumptions, formulas are explained at the beginning of the section.

Objective 5: Group previous parts to draw findings about optimal strategy and provide further elements for reflection

This part consists in a discussion merging the previous findings to conclude about optimal strategy; eventual limitations and fears; trends to survey and axis that deserve further reflection.

Due consideration to research ethics

This dissertation relies only on secondary publicly available data. It does not involve any ethical risk and does not involve any participants or type of personal data.

Also, no fieldwork is required the form is returned blank in appendix 12. Risk assessment was considered with main risks, hazard and control measures summarised in table appendix 11.

The student filled the initial ethical assessment in the best of its knowledge, took knowledge of the professional codes of conduct available in its field (UCL, 2020) and aims to respect them.

Objective 2: Study current and future impacts of the sanitary crisis on the economy and the residential market

As stated in the context, capital market vulnerabilities, especially the high level of household indebtedness, represent a risk for the housing market and financial stability. In the event of a macroeconomic shock, which is currently happening, high indebtedness associated with localised housing bubbles might lead to a contraction of consumption and second-run effects to financial stability. From these findings, this part investigates the current and potential future repercussions of COVID crisis on the economy and residential market.

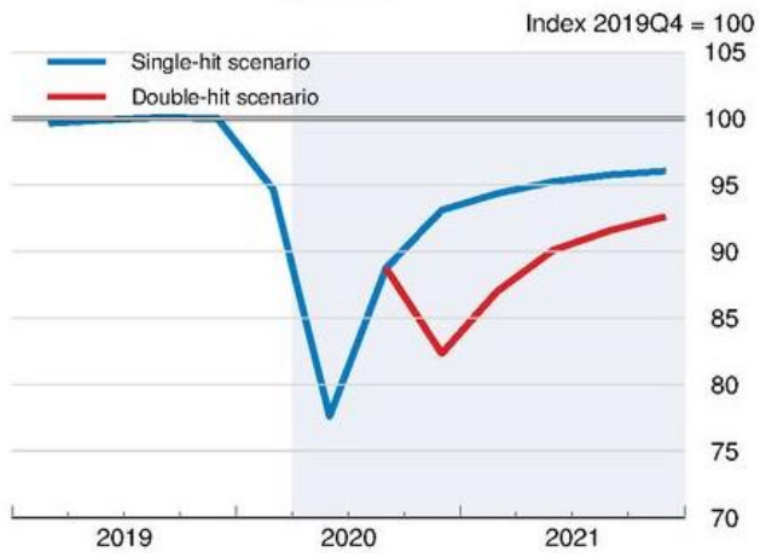
A. Impact on the economy

In France, pressure on the healthcare system led to a strict two months containment starting from mid-March. The activity got back gradually from the 11th May, but several restrictions remain. It resulted in a significant drop in economic activity. During the first quarter 2020, quarter-on-quarter GDP contracted by 5.3% and all expenditures component have been adversely impacted (European Commission, 2020).

“Rapid fiscal measures have reinforced the healthcare system and protected jobs and firms” (OECD, 2020). To protect firms and employees, the Government launched a package worth €110 billion, equivalent to 4% of the country’s GDP (Global Property Guide, 2020).

For companies, tax deferrals and financial helps (i.e. solidarity fund, equity injection, etc.) were implemented (OECD, 2020). For employees, there was a strengthening and massive implementation of short-time work schemes, see data appendix 3. These measures allowed for the moment to keep the unemployment rate at a similar level than last year, but these are temporary and expensive for Government (DARES, 2020).

As seen, the crisis already had a significant impact on the economy; however, its future impact widely depends on the evolution of the epidemic and capacity of the country to handle it. In this concern, OECD (Organisation for Economic Co-operation and Development) developed two scenarios: a single hit scenario (pandemic contained by the summer) and a double hit scenario (a second virus outbreak in autumn), whose impact on GDP is represented on graph 14 below.



Graph 13: Forecasted evolution of Real GDP in case of single and double-hit scenario
 Source: (OECD, 2020)

In the case of a single hit scenario, real GDP is expected to fall by 11.4% in 2020 and rebound by 7.7% in 2021. These figures are respectively 14.1% and 5.2% for the double-hit scenarios. Also, the unemployment rate is expected to peak at 12.4% or 13.7% respectively by end 2020; fiscal deficit is expected to reach 10.4% or 12.0% of GDP in 2020; and debt to GDP ratio to reach 116% or 126% by end-2021 (OECD, 2020). These forecasts are consistent with those from the European Commission (European Commission, 2020).

B. Impact on the housing sector

On the short run, due to lockdown, transactions, and new constructions dropped significantly. For the 2nd semester 2020, transactions volumes and number of loans are already respectively 38.6% and 36.8% lower than last year (L'Observatoire Credit Logement, 2020). Almost all of the construction sites were stopped during the containment (Franceinfo, 2020), participating in delays and increase in the lack for housing.

Also, banks increased their rates in reaction to the crisis with an increase of 14 points during the 1st semester 2020 (L'Observatoire Credit Logement, 2020). However, prices remain resilient and even increased by 1.16% in Q1 2020 (Global Property Guide, 2020; Notaires.fr, 2020). It is mainly due to market inefficiencies (Mourouzi-Sivitanidou, 2020), as an example transactions last about 2/3 months (Immobilier Danger, 2020) then current transaction prices result from market conditions of several months ago.

On the long run: Once ephemeral helps from the estate will end and gaps filled, the adverse impact of COVID on the economy and housing sector will be felt. Adverse economic conditions (esp. rise in unemployment and drop in GDP), and strengthening in credit conditions will adversely impact both demand and prices for housing. Referring to DiPasquale quadrant there will be a shift in demand due to economic conditions, this will provoke a contraction in all the other variables of the quadrant, and potentially a clockwise rotation of the ray in NW quadrant if IR increases significantly. Coherently, practitioners expect a drop in price whose order for magnitude depends on pandemic evolution (Lapalus, 2020). As conclude the notaries: "If containment is extended or implemented again, and no answer is found to fight the virus: then the crisis would take another size with important unemployment, a drop in household revenues, and low economic growth. Mechanically, volumes of transactions and prices would drop significantly reflecting the economic crisis that succeeds to the sanitary one" (Notaires.fr, 2020). However, this analysis hides regional trends due to bubble localised in metropolises. This will be addressed during the following objective.

C. Conclusion for objective 2

Referring to economic cycles, the only certainty is that 2019 was a peak. At this time economy started to contract and the World is at the dawn of an important economic recession. Whose impact has been postponed for the moment thanks to protectionist measures. Recession size and length will depend on pandemic evolution and management. Last numbers show by one side a contamination relaunch, but from another side, a rate of death and intensive care admission still low that can be due to better care of patients and show the resilience of healthcare system (Le Monde, 2020). Also, a lot depends on September resumption and Government presented on the 3rd of September its €100 billion economic relaunch plan (Gouv.fr, 2020).

Objective 3: Risk/ return analysis of strategy determinants allowing to increase profitability

Referring to the literature review, the return on investment is proportional to risk, time, and energy spent. This part investigates the risk, time, energy/ return ratio for determinants allowing incremental yield and determines whether they are favourable for investors or not.

These are:

- Invest in smaller cities
- Pair incremental entrepreneurial yield through refurbishments with the advantages of the furnished tax system

A. Risk/ return ratio for investment in B2 cities

1. Return

Table 4 below, based on data from table appendix 4, evidences the negative relationship between city size, market tension and gross profitability to rent. It shows that differences in profitability between small and big cities are due to the evolution of differences in price to buy and price to rent between tight and relaxed market. Between zones A and B2 prices to buy are more than twice higher when prices to rent are only 50% higher, resulting in better profitability in smaller cities.

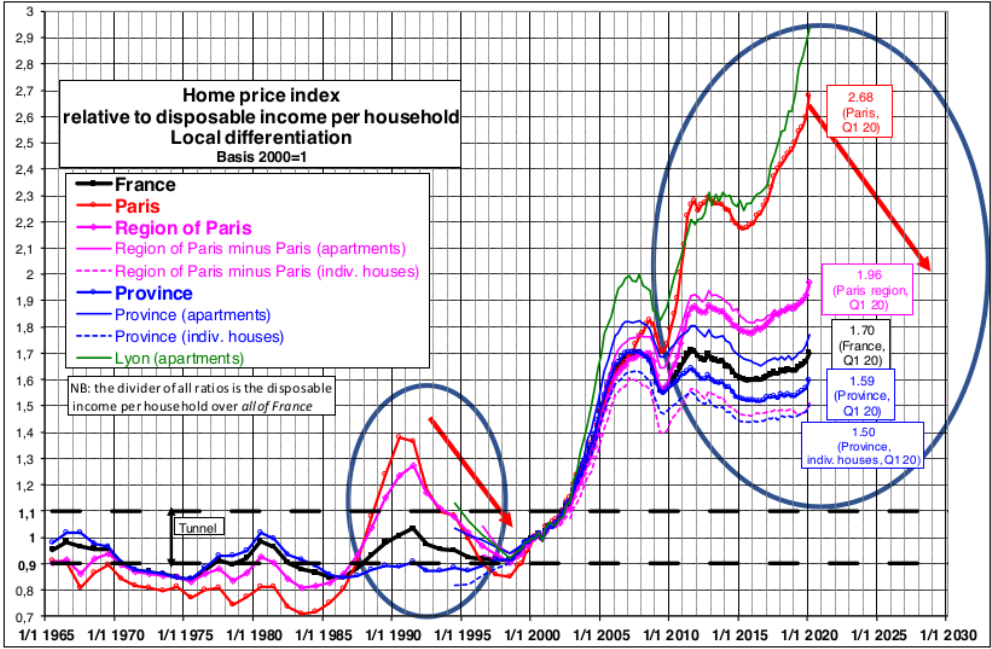
Zone/ city	Average price to buy (€/m2)	Average price for rent (€/m2/month)	Average gross profitabilitiy (%)
A bis	10,586.00 €	28.50 €	3.23%
A	3,339.55 €	12.72 €	4.79%
B1	2,282.46 €	10.29 €	5.76%
B2	1,407.54 €	8.12 €	7.12%
10 most profitable cities in the 100 biggest	1,115.60 €	8.28 €	8.95%

Table 4: Average price and gross rental profitability by city type.

Note: Prices already account for notary fees

This difference in profitability between B2 type and metropolises comes from the difference in evolution between rent to income ratio (see graph appendix 5) and price to income ratio between over the past 20 years (see graph 15 below): “ As in medium-size cities prices almost did not move since 2007, but interest rates reduced, the differential between rental return

and interest rates has rarely been that big and then that beneficial” (Delagrannan J. , 2017, p. 38). However, previous the analysis was not considering vacancies, bad debts and potential capital gains or loss.



Graph 14: Home price index relative to disposable income per household. Local differentiation Basis 2000=1

Source: (CGEDD, 2020)

2. Risks

- Capital loss and gain

As stated in context and as shows graph 15 above, metropolises, especially Paris and Lyon, are currently facing a housing price bubble. It illustrates the potential for price adjustment in metropolises through the example of Paris and Lyon: “housing price in Paris should lower by 35% to reach Province price levels” (Le Blog Patrimoine, 2020).

Once the economy will expand again, prices will increase again. Nevertheless, looking at the actual borrowing conditions and the willing from macroprudential organisms to regulate the capital market, the question that arises is: will prices in metropolises subject to bubbles fully recover to current levels, and if yes in how long?

- Vacancies and bad debts

As evidence table 5 below, the smaller the urban unit, the higher vacancies. However, cross-analysing table 5 below and 4 above, it appears that the incremental return for investing in secondary cities is more significant than potential losses due to higher vacancy rates.

	<i>Main housing</i>	<i>Secondary housing</i>	<i>Vacant</i>	<i>Total</i>	<i>Ratio vacant/main housing</i>
<i>Parisian urban area</i>	4,673	222	372	5,266	7.96%
<i>Urban Units ≥ 100,000 people</i>	9,107	554	833	10,494	9.15%
<i>Urban units < 100,00 people</i>	9,224	1,376	1,040	11,640	11.27%
<i>Rural area</i>	6,144	1,389	739	8,272	12.03%
<i>Total</i>	29,147	3,541	2,983	35,672	10.23%

Table 5: Number of main, secondary, and vacant housing (in thousands) according to the size of the urban area

Source: (INSEE, 2019)

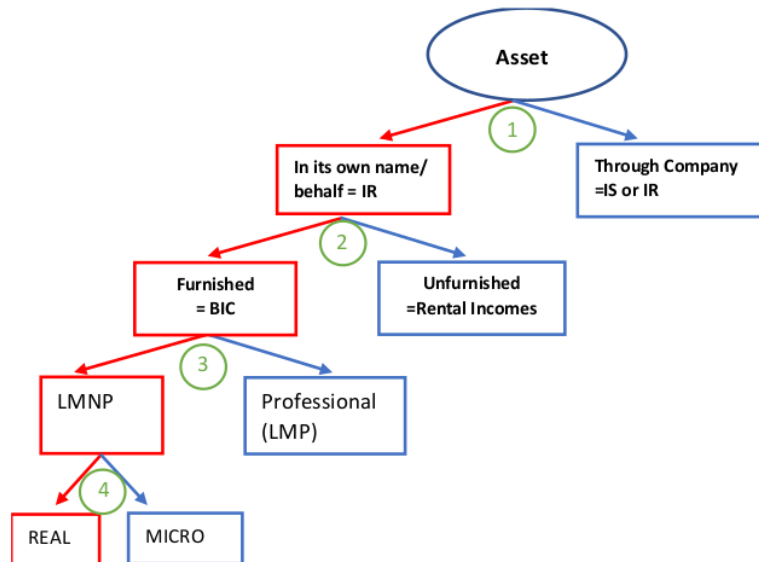
Another risk can be unpaid rents. There is potentially a difference between metropolises and secondary cities due to the difference in socio-professional categories (there are more executives in bigger cities). However, according to the few information available levels of uncollectable rents are low (toutsurmesfinances.com, 2014; BFM Buisness, 2020), and guaranties as VISALE are developed to protect owners from it.

B. Taxation limitations

Refurbishments are a way to implement entrepreneurial yield. Coupled with the furnished tax system, it allows to benefit from interesting tax abatements and then to “win on both fronts”. This part aims to provide rationales behind this statement studying further the tax system. Findings will be numerically evidenced in objective 4.

1. LMNP advantages

For a better understanding, graph 16 below summarises the different steps leading to LMNP status. Choice of exploitation (furnished/ unfurnished) determines the incomes stream category for rental incomes, and resulting abatements rules (BIC/ Property revenues).



Graph 15: Pathway to LMNP status

Source: Own design, inspired by (Montella, 2019, pp. 39-53)

Investor chooses the Lump-sum system. It should be the same for all the assets, and it determines rules for tax abatements. As shows table 6 below, MICRO rate corresponds to a fixed abatement on rental incomes. The REAL lump-sum system becomes compulsory after a certain threshold of rental incomes and is extremely interesting for two reasons:

- 1- All the charges linked to the activity, see table 6 below, are deductible if they can be justified and are not excessive (Montella, 2019, p. 60).
- 2- The amortisation: “It corresponds to a loss of value due to the wear of the asset”. (Montella, 2019, p. 62). It allows to regularly deduct the value of the walls, furniture, in addition with refurbishments and to deduct them from taxable income.

Then when charges deducted from taxes are greater than annual rental incomes, they can be postponed over the following years. This is called an accounting deficit. For LMNP status, deficits from a new acquisition can be deducted from all BIC incomes for a maximum of 10 years; and in LMP on all income streams without time limitation.

Then using the REAL lump-sum system, refurbishments become very interesting as they allow to negotiate an asset for lower cost, to do improvement works (including refurbishment, division, optimisation, extension, etc.), and to deduct their costs from taxes.

The flip side is the decrease of cash flows over the holding period due to the end of the deficit resulting in decreasing cash flows and lowering in amortisation due to decrease in loan interest payments that are deductible. This is called the “scissor effect”. However, reinvesting regularly allows to create deficit again and to minimise taxes.

Rental model	Tax system name	MICRO rate	REAL lump-sum system, deductible charges	Lease length	Rental price
Unfurnished	Property revenues	30%	Loan interests, joint ownership charges, refurbishment, maintenance, insurance, property tax, etc.	Min 3 years	Lower
Furnished	BIC – LMNP or LMP	50%	Same than unfurnished plus travel expenses, restaurants, amortization	Max 1 year	Higher

Table 6: Furnished VS unfurnished summarising comparative table

Source: Own design, inspired by (Wangen, 2019; Montella, 2019, p. 50)

Also, furnished assets have shorter leases, and allow a higher rental price, which results in higher profitability and liquidity (IGF & CGEDD, 2016).

However, a concern with this strategy is the change of status between LMNP and LMP.

Indeed, landlords automatically become LMP when they fulfil the following conditions:

- The sum of the rental incomes (including charges) is above the 23,000€ threshold. Then with as gross profitability of 10%, entry ticket for LMP is about 230,000€.
- The total rental incomes are higher than the other incomes of the fiscal households.

The following section discusses the consequences for this change.

2. *Consequences for LMP transition*

From a taxation standpoint, becoming LMP means:

- Deficits (excepted amortisation, e.g. refurbishments) can be deducted from other income streams without limitation. Then more significant refurbishments can be done to deduct them from other income streams (i.e. salary) (Montella, 2019, p. 64).
- Rental revenues are subject to the social security contribution these are between 23 to 45% with a minimum annual contribution of 1200-1500 (Montella, 2019, p. 64).
- Taxation on capital gain benefit from abatements if the asset is rented since 5 years or more (Montella, 2019, p. 64); however it is, as every LMP income is subject to social security contribution (Montella, 2019, p. 121).

C. *Conclusion for objective 3*

Determinants allowing incremental yield (investment in B2 cities and refurbishments) are widely beneficial for investors.

Comparison between metropolises and B2 type cities gross profitability, vacancy, and potential capital gains indicate a better risk/return ratio for investment in smaller cities. This analysis, and consequently evolution for both prices and vacancies, is subject to local trends as migrations, improvement in transport, etc. In this concern, the actual crisis can lead to the migration from metropolises to smaller cities: "Impact of remote working, unemployment and traumatism linked with containment will encourage city-dwellers, often owning small surfaces, to move further away where prices are lower, quality of life better and where it is easier to go through the crisis" (Achille, 2020).

Mixing furnished tax abatements with refurbishments and regular new acquisition allows to take the most of tax system for individuals' rental incomes annihilating taxable income. LMP transition does not seem to be an issue, tax ratio is higher than tax bracket (see appendix 6) but professional status it allows bigger abatements for rental incomes and capital gains. However, further investigations can be led into the taxation of assets during the transition between LMNP and LMP, its consequences, and how to optimise it.

Objective 4: Numerical evidence through financial simulations

This part aims to provide numerical evidence to some of the elements discussed earlier through different case studies and their analysis. These are:

- **Case study 1: Impact of refurbishment on cash flows**
- **Case study 2: Debt ratio calculation: The impact of fix charges on borrowing capacity for both classic and compensation methods**
- **Case study 3: Debt ratio calculation: Impact of subsequent operations on borrowing capacity; investigation of minimum return**
- **Case study 4: Loan length: a comparison of resulting CF, incremental borrowing capacity, incremental loan cost due to interests/ insurance rates.**

Subpart A explains methodology, data, and assumptions; subpart B formula used; subpart C presents and analyses results.

A. Methodology, data, and assumptions

For all case studies, salary is assumed to be €2,000. It is close to the median salary for French citizens (INSEE, 2020).

- **Case study 1:**

This case study evidences impact of refurbishments on after tax-cash flows. To do so, three scenarios are set (see table 7 below).

	Scenario 1 : No refurbishments	Scenario 2: Small refurbishments (i.e. finishing works, small repairs)	Scenario 3: Major refurbishments (i.e. division)
Price to buy (€/m ²)	€1,115	€850	€600
Refurbishment (€/m ²)	€0	€265	€515
Refurbishment length (months)	0	3	6
Total price (€/m ²)	€1,115		
Price to rent (€/m ² / month)	€8.28		

Table 7: Scenarios for property price to buy and refurbishments

Note: prices to buy already include notary fees.

To isolate the impact of tax abatement refurbishment costs is fully compensated by price to buy. Usually the bigger refurbishments are, the lower the total price. Also, the impact of wall and furniture amortisation is neglected.

To be coherent, prices and rent levels correspond to characteristics of the “10 most profitable cities with the top 100”, see table 4 p.31.

Other assumptions are:

Property size= 100m²

Vacancy=2 months

- **Case study 2:**

It introduces the way debt ratio is calculated and differences between both methods. It aims to show differences in monthly repayment according to both methods and amounts of monthly charges (charges accounted are only fix charges as rents, current loans, alimony, etc.)

Three monthly charges scenarios are set:

- €0 monthly charges (case of someone accommodated for free without kids/ alimony and credits).
- €500
- €900

- **Case study 3:**

It investigates how subsequent buy to let operations impact borrowing capacity according to both calculation methods. Assumptions are the following:

Current charges= 500€

Loan repayment= 300€

Expected rents= 500€

- **Case study 4:**

It assesses the impact of loan length on borrowing capacity, total loan cost and cash flow. To do so, two tables will be done:

- A first one compares, for the same monthly repayment (660€), the maximum borrowing capacity, cost of interests, and cost of insurance according to different loan length.
- A second one compares, for the same amount of money borrowed (100,000€), the incremental cash flows, and costs for different loan lengths.

Interest rates are based on 3rd quartile borrowing rates in June 2020, see table 8 below:

Loan 1: 15 years	Loan 2: 20 years	Loan 3: 25 years loan	Loan 4:30 years
1.15%	1.35%	1.60%	1.90%

Table 8: 3rd quartile borrowing rates in June 2020 according to loan lengths

Source: (L'Observatoire Credit Logement, 2020)

Note: 30 years is assumed by linear extrapolation

Insurance rate= 0.2% of the remaining capital

B. Formulas

$$\text{Debt ratio} = \frac{\text{Charges}}{\text{Net monthly salary} + \text{rents out of charges} \times 70\%}$$

Equation 1: Debt ratio formula, classic method

Source : (Delagrandanne J. , 2017, p. 89) p89

$$\text{Debt ratio} = \frac{\text{Charges} - \text{rents out of charges} \times 70\%}{\text{Net monthly salary}}$$

Equation 2: Debt ratio formula, compensation method

Source : (Delagrandanne J. , 2017, p. 89)

$$PVA = PMT \cdot \frac{1 - \frac{1}{\left(1 + \frac{i}{m}\right)^{n \cdot m}}}{i/m}$$

Equation 3: Maximum borrowing capacity from PMT

Source : (Addae-Dapaah, 2020)

C. Results and analysis

- Case study 1: Impact of refurbishment on cash flows

Annual after-tax cash flows for the three scenarios are in table appendix 7, and details about calculations are presented in appendix 8 presenting tables for scenario 3. Results are coherent with expectations. The more significant refurbishments are, the longer the cash flows remain positive. Also, it shows that to reach 10 years deficit, important refurbishments should be implemented.

For the analysis of the results, it is essential to add that, as investor's net annual income is assumed to be 24,000€, it means that additional taxable incomes will be taxed at 14% in the limit of 3,794€ before he reaches the bracket of 30% tax, see appendix 6. Then, the impact of tax abatements through refurbishments would be more significant when reaching the next income tax bracket.

- **Case study 2: Debt ratio calculation: The impact of fix charges on borrowing capacity for both Classic and compensation method**

Rearranging equations 1 and 2, it is possible to calculate the maximum monthly repayment, see example below:

$$\text{Max monthly repayment (classic method)} = 33\% \times (2000 + 828 \times 70\%) - 500 = 351.27\text{€}$$

Table 9 below shows maximum monthly payments according to different scenarios and methods. It shows the direct impact of fixed charges that are directly subtracted from monthly repayments capacity.

	Classic method	Compensation method
Case 1: No charges	€ 851.27	€ 1,239.60
Case 2: 500€ charges	€ 351.27	€ 739.60
Case 3: 900€ charges	-€ 48.73	€ 339.60

Table 9: Maximum monthly loan payment according to calculation methods and amounts of current charges

From monthly repayments, it is possible to calculate maximum borrowing capacity using equation 3. Table 10 below shows resulting borrowing capacities assuming 20 years loan length, IR=1.35%, and insurance rates of 0.20%.

	Classic method	Compensation method
Case 1: No charges	€ 175,574.07	€ 255,667.56
Case 2: 500€ charges	€ 72,449.04	€ 152,542.54
Case 3: 900€ charges	€ -	€ 70,042.52

Table 10: Maximum borrowing capacity according to table 10 loan payments

Results table 9 and 10 demonstrate the interest in the compensation method. Now the question we can wonder is, how is borrowing capacity accounted after successive operations?

- **Case study 3: Debt ratio calculation: Impact of subsequent operations on borrowing capacity; investigation of minimum return**

With the current situation debt ratio is equal to 25% (€500/€2,000).

As show tables 11 below, for the chosen example, with classic method debt ratio increased when with the compensation method it decreases, allowing a greater borrowing capacity for the next purchase. It is because the difference between 70% of rental incomes (70% corresponding to bank safety coefficient) and loan repayments is positive.

However, the question arising from this result is: what is the maximum borrowing capacity with the compensation method then as if the investment is profitable enough, debt ratio decreases? A logical answer would be that monthly repayment for the next asset is still limited to 1/3rd of the current monthly incomes.

	Classic method		Compensation method	
Monthly repayment	€	300.00	€	300.00
Rental income	€	500.00	€	500.00
Bank safety coefficient		70%		70%
Debt ratio		34.0%		22.5%

Table 11: Comparison classic, compensation methods debt ratio

As an order for magnitude, 300€ monthly repayment on 20 years with 1.35% interest rates and 0.20% fix insurance rates allow a 61,875€ borrowing capacity. For 500€ rental incomes, it represents 9.7% gross profitability.

Then compensation method grouped with profitable investment allows maintain or even increase borrowing capacity. With regular reinvestments of incremental borrowing capacity, it potentially allows to generate a snowball effect like compound interests. However, this is subject to time limitations. Firstly, for the whole acquisition, refurbishment, commercialisation process, and secondly for management: “10 million invested in stock exchange at 5% interests it means 41,000 gross income. When for housing it represents hundreds of flats whose management becomes impossible at individual level.” (Delagrandanne J. , 2018).



Objective 5: Group previous parts to draw findings about optimal strategy and provide further elements for reflection

This part merges findings to define the optimal strategy comparing it with practitioners' statements, and eventual axes for further reflection. Globally, computations and findings are aligned with practitioners' literature. Targeting cash flows instead of a potential capital gain is aligned with capital market trends and the willing from macro-prudential organisms to regulate it. Then, investing in assets to refurbish in B2 cities and exploit them furnished allows to take the most of tax, policies, and market conditions. Regular acquisitions allow then to generate deficit constantly and to do not pay (or very few) taxes on rental incomes.

A. Optimal strategy

Reusing objective 1 layout, points for optimal strategy are:

Investment in B2 cities allows a better risk/return ratio than in bigger cities. Crossing analysis incremental gross return is widely more important than vacancies increase. Also, the potential capital gain is currently better in B2 cities as metropolises suffer from housing price bubbles. In reaction with the crisis, housing prices will drop everywhere; however, drop will be softer in smaller cities and will recover sooner than in metropolises with housing bubbles. Also, in the future potential market capital gain is expected to be driven by local trends like migration, connection improvement, local economic growth, etc. instead than by improvement in capital market conditions.

Rent limitation policies in tight markets, incentives for investments in secondary cities (e.g. Denormandie tax abatement policy), and consequences of the sanitary crisis on inhabitants way of life are additional reasons for investment in cities zone B2.

Refurbishments are a way to implement entrepreneurial yield. They are aligned with the Government's need to accelerate the energy transition, promote affordability, and adapt housing stock to social changes and needs. Also, gradual targets for energy improvement of housing stock forecast a growing budget in this field (Le Monde, 2020), as shows the increasing budget for "MaPrimeRenov", and the additional share of the economic relaunch plan dedicated to building ecologic transition (Gouv.fr, 2020). It represents an opportunity for investors.

Furnished exploitation, allows benefiting from higher gross profitability, liquidity, and interesting tax abatements. Associated with refurbishments it allows to generate accountable deficit annihilating taxable incomes for several years

B. Fears

Two main risks emerge from the capital market and policies. These are a change in taxation for rental incomes and change in lending conditions. At this time, practitioners, and reports concord on the fact that policies and banks economy will encourage spending to mitigate consumption contraction; and that consequently, market regulation is not for now (Le Monde, 2020; La Tribune, 2019).

However, changes in the debt ratio calculation method, as introduced by HCSF's additional notice (HCSF, 2019), would force investors to review their strategy. Indeed, as evidenced in objective 4 3rd case study, with classic calculation successive investments, even if they are very profitable, will make grow debt ratio and the 33% limit will be reached quickly. However, for the moment, HCSF's recommendations are soft and not respected (APCR, 2020), and economic conditions do not allow capital market regulations. However, both risks should be surveyed carefully. If one of those or both would happen in the future, then investors might have to head toward buy to sale investments.

C. Trends for change

Also, this dissertation identified three main trends for change. These are the COVID crisis (especially its evolution and resulting economic and social impacts), policies and borrowing conditions evolution. For the moment, the three of them are aligned with the strategy, encouraging for investments in secondary cities and refurbishments.

Conclusion

This dissertation investigated the optimal buy to let strategy for individuals in the French Housing market. It provides a substantial update of current politic economic, housing, and capital market conditions and evolutions, as well as their concerns for stated strategy. Objective, as well as questions arising from the “preparatory part”, were successfully answered through the content of the report. They allowed filling the gaps across the current literature, linking practitioners’ statements with findings from investigations. Findings rely on secondary data, interpreted, and analysed with reference to proven economic rationales, and completed with numerical evidence

Conclusions evidence that strategy presented through practitioners’ literature allows investors to take the most of current taxation, policies, capital, and housing market conditions. It also identified three main trends for change (Policy challenges, economic and social impact of the sanitary crisis and capital market regulation) that are widely favourable to this strategy. The three of them will be interesting to monitor for the optimisation of the strategy through the evolution of the context.

Indeed, investment, housing refurbishments and furnished exploitation answer some of the challenges Government is facing, related to the improvement and adaptation of the housing park to current needs, especially energy transition. In this concern, further incentives are expected in the future and assessing how investors can make the most of them is an interesting field of research. The economic and social impact of the sanitary crisis is a second trend for change, encouraging investment in secondary cities. Thirdly, the capital market has a significant impact on the housing market. And capital market regulation represents fear for investors, especially the willing for HCSF to regulate calculation for borrowing capacity. At this point, regulation seems to have been postponed due to the need to encourage spending. However, fears arose from this field especially

Finally, in addition with these three trends highlighted, this dissertation opens the field to further researches on some specific points especially the financial impact of transition between LMNP and LMP and how to optimise it and the limitations for compensation method borrowing capacity.

Appendixes:

Table of appendixes:

Appendix 1: Borrowing time allowing to buy the same house for the same effort rate and same personal contribution.

Appendix 2: Affordability index, first time buyers, basis T1 2000=1

Appendix 3: Evolution of the use of short-time work scheme in France since March 2020 (start of the containment)

Appendix 4: Data table for the 100 biggest cities in France

Appendix 5: Principal residence rent index relative to disposable income per household (basis 2000=1)

Appendix 6: Tax brackets according to annual incomes

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Appendix 8: Calculation details case study 4 for 3rd scenario

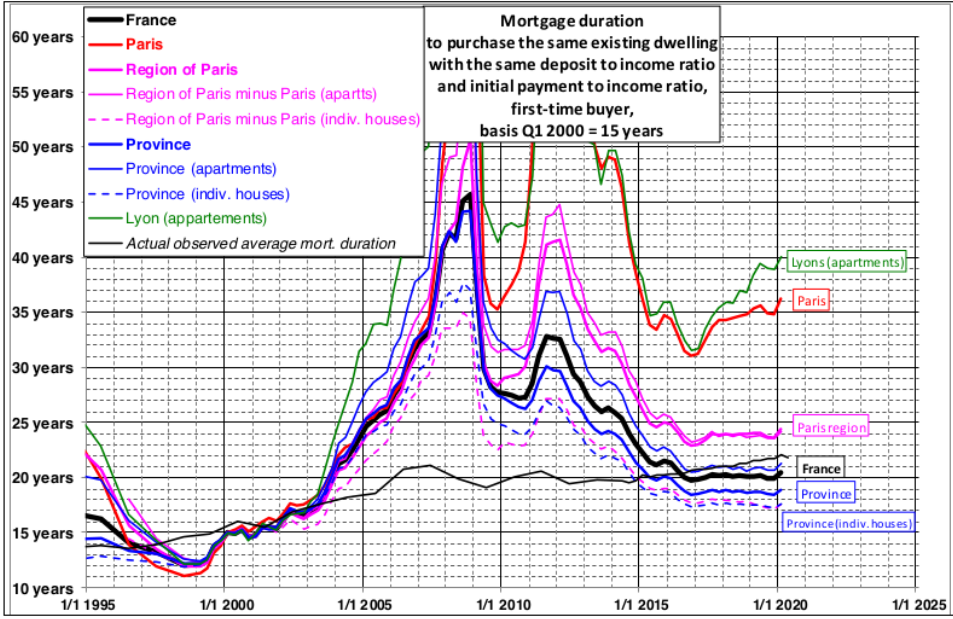
Appendix 9: Comparison of borrowing capacity and incremental cost for 15 to 30 years loan length for 660 euros monthly repayment.

Appendix 10: Comparison of borrowing capacity and incremental cost for 15 to 30 years loan length with a same repayment.

Appendix 11: Risk assessment table

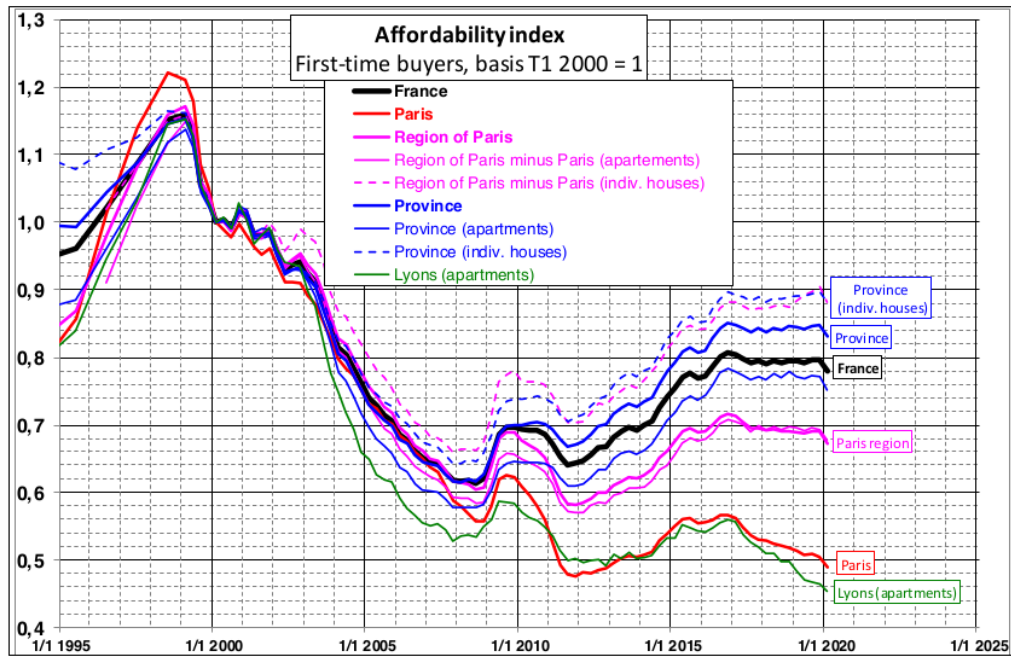
Appendix 12: Risk assessment form, field/ location work

Appendix 1: Borrowing time allowing to buy the same house for the same effort rate and same personal contribution.



Source: (CGEDD, 2020)

Appendix 2: Affordability index, first time buyers, basis T1 2000=1



Source: (CGEDD, 2020)

Appendix 3: Evolution of the use of short-time work scheme in France since March 2020 (start of the containment)

Month	March	April	May	June
Number of employees in short-time scheme (in million)	7.2	8.8	7.9	4.5
Equivalent of full-time jobs in short-time scheme (in million)	2.2	5.6	3	1.5
Cost of the incentive (Billion €)	3.3	8.9	5	2.4
Rate of Demands for compensation/ preliminary demands (In number of demands)	91%	92%	79%	37%
Rate of Demands for compensation/ preliminary demands (In number of employees)	59%	66%	53%	24%

Source: (DARES, 2020)

Note: According to these numbers short time scheme was use by 45% of private sector employees for the month of April. It differs widely with numbers relayed by and politics medias (Le Figaro, 2020). A potential reason is that they were talking about Preliminary Demands instead of Demands for Compensation.

Appendix 4: Data table for the 100 biggest cities in France

Ranking	City	City Type	Urban area of inhabitants	Number	City number of habitants	Average price to buy for flats (€/m2)	Average rent for flats (€/m2/month)	Gross profitability
1	Paris	Abis	10 733 971		2187 526	10586	28.5	3.23%
2	Lyon	A	1 651 853		516 092	4922	13	3.17%
3	Marseille	A	1 587 537		862 211	2862	12.1	5.07%
	- Aix-en-	A			142 482	4498	14.9	3.98%
4	Toulouse	B1	957 750		479 553	3306	11.9	4.32%
5	Bordeaux	B1	916 569		254 436	4272	13.4	3.76%
6	Lille-	A	1 041 389		232 787	3220	13.9	5.18%
	Roubaix					1572	8.8	6.72%
7	Nice	A	943 583		340 017	4055	15.4	4.56%
8	Nantes	B1	642 425		309 346	3386	11.6	4.11%
9	Strasbourg	B1	465 069		280 966	2969	11.9	4.81%
10	Rennes	B1	333 069		216 815	3296	11.5	4.19%
11	Grenoble	B1	509 860		158 454	2351	11.3	5.77%
12	Rouen	B1	467 763		110 145	2120	11	6.23%
13	Toulon	A	572 952		171 953	2490	10.9	5.25%
14	Montpelli	A	434 933		285 121	3040	12.7	5.01%
15	Douai - Le	B1	503 575		39 700	1562	8.4	6.45%
		B1			31 415	1469	8.8	7.19%
16	Avignon	B1	456 961		91 921	1836	9.5	6.21%
17	Saint-Étie	B2	374 175		172 565	993	7.5	9.06%
18	Tours	B1	353 836		135 787	2510	10.5	5.02%
19	Clermont	B1	267 680		143 886	1734	9.9	6.85%
20	Nancy	B1	285 577		104 286	1868	10.2	6.55%
21	Orléans	B1	278 952		116 685	2013	10	5.96%
22	Caen	B1	198 877		105 354	2121	10.7	6.05%
23	Angers	B1	226 322		152 960	2340	9.9	5.08%
24	Metz	B1	286 510		116 429	1805	9.6	6.38%
25	Dijon	B1	243 376		156 920	2105	10.7	6.10%
26	Béthune	B1	355 543		24 895	1429	8.1	6.80%
27	Valencien	B1	334 422		43 336	1791	9.5	6.37%
28	Le Mans	B2	209 766		142 946	1340	8.1	7.25%
29	Perpignar	B1	201 807		120 158	1456	8.4	6.92%
30	Reims	B1	212 323		182 460	2073	9.8	5.67%
31	Genève - /	A	180 236		35 712	3114	14.1	5.43%
32	Brest	B2	200 920		140 064	1562	8.2	6.30%
33	Bayonne	B1	239 605		51 228	3140	10.5	4.01%
34	Amiens	B1	163 876		134 057	2173	10.9	6.02%
35	Le Havre	B1	235 665		170 147	1742	9.5	6.54%
36	Mulhouse	B1	246 006		109 443	1089	8.4	9.26%
37	Limoges	B1	182 690		132 175	1313	8.2	7.49%
38	Nîmes	B1	185 295		150 610	1828	9.4	6.17%
39	Poitiers	B1	130 853		88 291	1615	9.5	7.06%
40	Dunkerqu	B2	175 635		87 353	1522	8.7	6.86%
41	Besançon	B2	135 349		115 934	1926	9.5	5.92%
42	Pau	B2	198 223		77 130	1589	8.8	6.65%
43	Annecy	B1	169 559		126 924	4477	13.7	3.67%
44	Chambéry	B1	189 063		58 919	2515	10.5	5.01%
45	Saint-Naz	B2	152 616		69 993	2032	8.8	5.20%
46	Lorient	B2	114 395		57 149	1667	8.8	6.33%
47	La Rochell	B1	128 876		75 735	3421	11.6	4.07%
48	Troyes	B2	136 727		61 652	1465	8.5	6.96%
49	Angoulêm	B2	109 208		41 740	1239	7.7	7.46%
50	Valence	B2	130 281		63 714	1629	8.7	6.41%

51	Béziers	B2	91 455	77 177	1389	7.6	6.57%
52	Saint-Brie	B2	94 429	44 372	1238	7.3	7.08%
53	Montbéliard	B2	106 143	25 395	1215	7.9	7.80%
54	Niort	B2	73 105	58 707	1284	7.6	7.10%
55	Vannes	B2	79 217	53 352	2564	9.4	4.40%
56	Chartres	B2	89 450	38 578	2017	10	5.95%
57	Bourges	B2	82 103	64 551	1248	8.2	7.88%
58	Thionville	B2	133 513	40 701	1935	9.4	5.83%
59	Chalon-su	B2	75 074	45 096	1067	7.9	8.88%
60	Colmar	B2	95 586	69 105	1801	9.4	6.26%
61	Arras	B2	87 028	41 019	1794	9.5	6.35%
62	Boulogne	B2	86 097	40 874	1338	8.2	7.35%
63	Calais	B2	99 641	73 911	1331	7.3	6.58%
64	Maubeuge	B2	111 368	29 944	997	7.9	9.51%
65	Blois	B2	66 798	46 086	1487	8.2	6.62%
66	Beauvais	B2	59 990	56 254	1637	9.5	6.96%
67	Quimper	B2	79 783	62 985	1399	8.1	6.95%
68	Bourg-en-	B2	60 586	41 527	1579	7.9	6.00%
69	Laval	B2	66 999	49 728	1458	7.7	6.34%
70	La Roche-	B2	53 741	54 372	1624	8.2	6.06%
71	Creil	B2	120 690	35 657	1446	10.8	8.96%
72	Cherbourg	B2	82 841	79 200	1478	9	7.31%
73	Cholet	B2	57 810	53 917	1454	7.7	6.35%
74	Tarbes	B2	75 506	41 518	1203	7.6	7.58%
75	Alès	B2	95 162	40 219	1358	7.3	6.45%
76	Vienne	B2	95 269	29 306	1509	7.8	6.20%
77	Belfort	B2	81 252	47 656	1157	8.5	8.82%
78	Évreux	B2	60 205	47 733	1407	9.5	8.10%
79	Agen	B2	80 999	33 576	1273	7.9	7.45%
80	Montauban	B2	78 754	60 810	1439	7.5	6.25%
81	Saint-Que	B2	63 740	53 816	1126	7.6	8.10%
82	Roanne	B2	80 022	34 366	1045	6.8	7.81%
83	Ajaccio	A	69 075	70 659	3260	11.5	4.23%
84	Périgueux	B2	65 292	29 966	1430	7.7	6.46%
85	Charlevill	B2	58 250	46 428	1058	6.9	7.83%
86	Brive-la-G	B2	75 110	46 916	1249	7.7	7.40%
87	Mâcon	B2	48 296	33 638	1376	7.3	6.37%
88	Sarrebrucl	B2	83 401	21 552	934	7.4	9.51%
89	Albi	B2	74 426	48 970	1731	7.9	5.48%
90	Carcasson	B2	48 642	46 031	1045	6.9	7.92%
91	Compiègn	B2	70 672	40 199	2134	11.1	6.24%
92	Nevers	B2	57 295	32 990	940	7.3	9.32%
93	Bastia	B2	67 985	45 715	2397	10.1	5.06%
94	Fréjus	B2	96 229	52 672	3702	12.6	4.08%
95	Bâle - Sair	B2	39 267	21 177	2145	10.4	5.82%
96	Cluses	B2	90 265	17 059	2128	10.2	5.75%
97	Narbonne	B2	53 594	54 700	1778	8.4	5.67%
98	Thonon-le	B2	76 801	34 756	3038	11.8	4.66%
99	Épinal	B2	61 475	31 740	1118	7	7.51%
100	Auxerre	B2	42 089	34 634	1321	8.2	7.45%

Sources:

City type: (Gouv.fr, 2020)

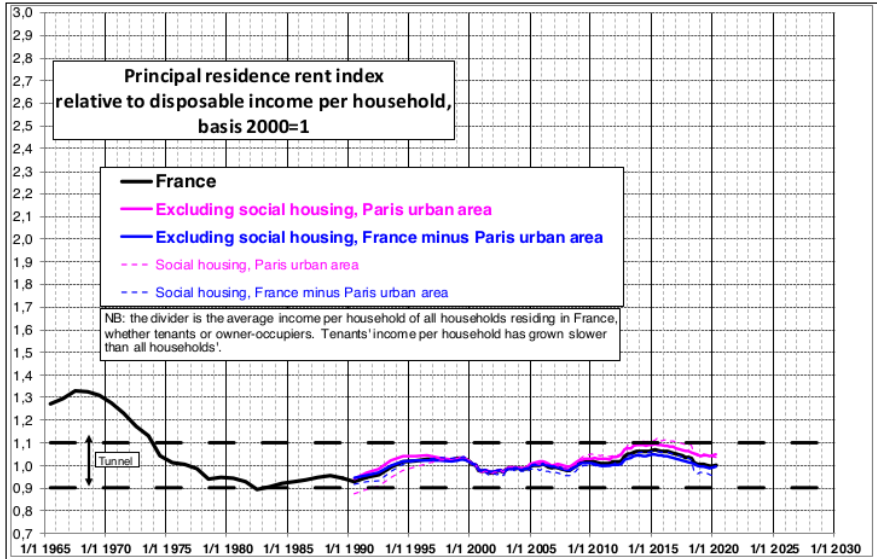
Number of inhabitants: (INSEE, 2019; Wikipedia, 2020) and Wikipedia

Price and rents: (meilleurs agents, 2020)

Note: To improve accuracy data can be crossed with data bases from other stakeholders (An independent website:

RendementLocatif, Notaries: Notaires.fr, Estate agency: Se Loger). However, data are consistent between the four of those.

Appendix 5: Principal residence rent index relative to disposable income per household (basis 2000=1)



Source: (CGEDD, 2020)

Appendix 6: Tax brackets according to annual incomes

From	To	Tax rate
<€10,064		0%
€10,065	€27,794	14%
€27,794	€74,517	30%
€74,517	€157,806	41%
>€ 157,806		45%

Source: Own-design from (Service-Public.fr, 2020)

Appendix 7: Case study 4: Summarising table

Year	0	1	2	3	4	5	6	7	8	9	10
Scenario 1	0	- 272.86 €	- 283.88 €	- 295.05 €	- 306.38 €	- 317.85 €	- 329.49 €	- 341.28 €	- 353.23 €	- 365.34 €	- 377.62 €
Scenario 2	0	- 2,258.75 €	225.25 €	225.25 €	225.25 €	225.25 €	225.25 €	225.25 €	- 18.99 €	- 365.34 €	- 377.62 €
Scenario 3	0	- 4,742.75 €	225.25 €	225.25 €	225.25 €	225.25 €	225.25 €	225.25 €	225.25 €	225.25 €	225.25 €
Year	11	12	13	14	15	16	17	18	19	20	
Scenario 1	- 390.06 €	- 402.68 €	- 415.46 €	- 428.42 €	- 441.56 €	- 454.87 €	- 468.36 €	- 482.04 €	- 495.90 €	- 509.96 €	
Scenario 2	- 390.06 €	- 402.68 €	- 415.46 €	- 428.42 €	- 441.56 €	- 454.87 €	- 468.36 €	- 482.04 €	- 495.90 €	- 509.96 €	
Scenario 3	- 390.06 €	- 402.68 €	- 415.46 €	- 428.42 €	- 441.56 €	- 454.87 €	- 468.36 €	- 482.04 €	- 495.90 €	- 509.96 €	

Appendix 8: Calculation details case study 4 for 3rd scenario

Year	0	1	2	3	4	5
PGI		4,968.00 €	9,936.00 €	9,936.00 €	9,936.00 €	9,936.00 €
Less vacancy and bad debt		1,656.00 €	1,656.00 €	1,656.00 €	1,656.00 €	1,656.00 €
EGI		3,312.00 €	8,280.00 €	8,280.00 €	8,280.00 €	8,280.00 €
Less operating expenses		1,490.40 €	1,490.40 €	1,490.40 €	1,490.40 €	1,490.40 €
NOI		1,821.60 €	6,789.60 €	6,789.60 €	6,789.60 €	6,789.60 €
ROI		2%	6%	6%	6%	6%
Debt service	0	1	2	3	4	5
		6,564.35 €	6,564.35 €	6,564.35 €	6,564.35 €	6,564.35 €
BTCF	0-	4,742.75 €	225.25 €	225.25 €	225.25 €	225.25 €
Equity/Reversion						
ATCF	-	4,742.75 €	225.25 €	225.25 €	225.25 €	225.25 €
Less taxes		- €	- €	- €	- €	- €
FINANCING CALCULATIONS						
Year	0	1	2	3	4	5
Outstanding Loan Balance	115,000.00 €	109,957.02 €	104,845.54 €	99,664.62 €	94,413.32 €	89,090.70 €
PMT	-	6,564.35 €	6,564.35 €	6,564.35 €	6,564.35 €	6,564.35 €
Principal Paid	-	5,042.98 €	5,111.48 €	5,180.92 €	5,251.29 €	5,322.63 €
Interest Paid	-	1,521.37 €	1,452.87 €	1,383.44 €	1,313.06 €	1,241.73 €
Insurance		219.91 €	209.69 €	199.33 €	188.83 €	178.18 €
TAXES CALCULATIONS						
Year	0	1	2	3	4	5
Taxes		- €	- €	- €	- €	- €
NOI		1,821.60 €	6,789.60 €	6,789.60 €	6,789.60 €	6,789.60 €
Less: Interest		1,521.37 €	1,452.87 €	1,383.44 €	1,313.06 €	1,241.73 €
Less loan insurance		219.91 €	209.69 €	199.33 €	188.83 €	178.18 €
Less charges		1,490.40 €	1,490.40 €	1,490.40 €	1,490.40 €	1,490.40 €
Less refurbishments		- €	3,636.64 €	3,716.43 €	3,797.31 €	3,879.29 €
Refurbishment deductible envelop	51,500.00 €	52,910.09 €	49,273.45 €	45,557.01 €	41,759.70 €	37,880.41 €
Taxable Capital gain						
Taxable Income		- €	- €	- €	- €	- €

6	7	8	9	10	11	12	13
9,936.00 €	9,936.00 €	9,936.00 €	9,936.00 €	9,936.00 €	9,936.00 €	9,936.00 €	9,936.00 €
1,656.00 €	1,656.00 €	1,656.00 €	1,656.00 €	1,656.00 €	1,656.00 €	1,656.00 €	1,656.00 €
8,280.00 €	8,280.00 €	8,280.00 €	8,280.00 €	8,280.00 €	8,280.00 €	8,280.00 €	8,280.00 €
1,490.40 €	1,490.40 €	1,490.40 €	1,490.40 €	1,490.40 €	1,490.40 €	1,490.40 €	1,490.40 €
6,789.60 €	6,789.60 €	6,789.60 €	6,789.60 €	6,789.60 €	6,789.60 €	6,789.60 €	6,789.60 €
6%	6%	6%	6%	6%	6%	6%	6%

6	7	8	9	10	11	12	13
6,564.35 €	6,564.35 €	6,564.35 €	6,564.35 €	6,564.35 €	6,564.35 €	6,564.35 €	6,564.35 €

225.25 €	225.25 €	225.25 €	225.25 €	225.25 €	225.25 €	225.25 €	225.25 €

225.25 €	225.25 €	225.25 €	225.25 €	225.25 €	- 390.06 €	- 402.68 €	- 415.46 €
€ -	€ -	€ -	€ -	€ -	615.31 €	627.93 €	640.71 €

6	7	8	9	10	11	12	13
83,695.77 €	78,227.56 €	72,685.07 €	67,067.29 €	61,373.19 €	55,601.76 €	49,751.92 €	43,822.62 €
€ 6,564.35	€ 6,564.35	€ 6,564.35	€ 6,564.35	€ 6,564.35	€ 6,564.35	€ 6,564.35	€ 6,564.35
€ 5,394.93	€ 5,468.21	€ 5,542.49	€ 5,617.78	€ 5,694.09	€ 5,771.44	€ 5,849.84	€ 5,929.30
€ 1,169.42	€ 1,096.14	€ 1,021.86	€ 946.57	€ 870.26	€ 792.91	€ 714.52	€ 635.05
€ 167.39	€ 156.46	€ 145.37	€ 134.13	€ 122.75	€ 111.20	€ 99.50	€ 87.65

6	7	8	9	10	11	12	13
- €	- €	- €	- €	- €	615.31 €	627.93 €	640.71 €
6,789.60 €	6,789.60 €	6,789.60 €	6,789.60 €	6,789.60 €	6,789.60 €	6,789.60 €	6,789.60 €
1,169.42 €	1,096.14 €	1,021.86 €	946.57 €	870.26 €	792.91 €	714.52 €	635.05 €
167.39 €	156.46 €	145.37 €	134.13 €	122.75 €	111.20 €	99.50 €	87.65 €
1,490.40 €	1,490.40 €	1,490.40 €	1,490.40 €	1,490.40 €	1,490.40 €	1,490.40 €	1,490.40 €
3,962.38 €	4,046.60 €	4,131.97 €	4,218.49 €	4,306.19 €	- €	- €	- €
33,918.02 €	29,871.42 €	25,739.45 €	21,520.96 €	17,214.77 €	- €	- €	- €
- €	- €	- €	- €	- €	4,395.08 €	4,485.18 €	4,576.50 €

14	15	16	17	18	19	20
9,936.00 €	9,936.00 €	9,936.00 €	9,936.00 €	9,936.00 €	9,936.00 €	9,936.00 €
1,656.00 €	1,656.00 €	1,656.00 €	1,656.00 €	1,656.00 €	1,656.00 €	1,656.00 €
8,280.00 €	8,280.00 €	8,280.00 €	8,280.00 €	8,280.00 €	8,280.00 €	8,280.00 €
1,490.40 €	1,490.40 €	1,490.40 €	1,490.40 €	1,490.40 €	1,490.40 €	1,490.40 €
6,789.60 €	6,789.60 €	6,789.60 €	6,789.60 €	6,789.60 €	6,789.60 €	6,789.60 €
6%	6%	6%	6%	6%	6%	6%

14	15	16	17	18	19	20
6,564.35 €	6,564.35 €	6,564.35 €	6,564.35 €	6,564.35 €	6,564.35 €	6,564.35 €

225.25 €	225.25 €	225.25 €	225.25 €	225.25 €	225.25 €	225.25 €
						€ -

- 428.42 €	- 441.56 €	- 454.87 €	- 468.36 €	- 482.04 €	- 495.90 €	- 509.96 €
653.67 €	666.80 €	680.12 €	693.61 €	707.29 €	721.15 €	735.20 €

14	15	16	17	18	19	20
37,812.78 €	31,721.30 €	25,547.07 €	19,288.97 €	12,945.87 €	6,516.60 €	€ -
€ 6,564.35	€ 6,564.35	€ 6,564.35	€ 6,564.35	€ 6,564.35	€ 6,564.35	€ 6,564.35
€ 6,009.84	€ 6,091.48	€ 6,174.23	€ 6,258.10	€ 6,343.10	€ 6,429.27	€ 6,516.60
€ 554.51	€ 472.87	€ 390.13	€ 306.26	€ 221.25	€ 135.09	€ 47.75
75.63 €	63.44 €	51.09 €	38.58 €	25.89 €	13.03 €	€ -

14	15	16	17	18	19	20
653.67 €	666.80 €	680.12 €	693.61 €	707.29 €	721.15 €	735.20 €
6,789.60 €	6,789.60 €	6,789.60 €	6,789.60 €	6,789.60 €	6,789.60 €	6,789.60 €
554.51 €	472.87 €	390.13 €	306.26 €	221.25 €	135.09 €	47.75 €
75.63 €	63.44 €	51.09 €	38.58 €	25.89 €	13.03 €	- €
1,490.40 €	1,490.40 €	1,490.40 €	1,490.40 €	1,490.40 €	1,490.40 €	1,490.40 €
- €	- €	- €	- €	- €	- €	- €
- €	- €	- €	- €	- €	- €	- €
						€ -
4,669.06 €	4,762.88 €	4,857.98 €	4,954.36 €	5,052.06 €	5,151.08 €	5,251.45 €

Appendix 9: Comparison of borrowing capacity and incremental cost for 15 to 30 years loan length for 660 euros monthly repayment.

Loan length	15	20	25	30
IR	1.15%	1.35%	1.60%	1.90%
Borrowing capacity	€ 109,070.24	€ 138,749.39	€ 163,103.16	€ 181,001.00
Loan + insurance costs	€ 131,268.34	€ 184,617.27	€ 247,591.43	€ 325,841.49
Loan cost	€ 129,594.39	€ 181,729.19	€ 243,256.51	€ 319,913.87
Plus Insurance cost	€ 1,673.95	€ 2,888.08	€ 4,334.92	€ 5,927.62
Incremental borrowing capacity	-	€ 29,679.15	€ 24,353.77	€ 17,897.84
Incremental cost	-	€ 53,348.92	€ 62,974.16	€ 78,250.07
Ratio incremental borrowing capacity/cost		56%	39%	23%

Source: Own design

Appendix 10: Comparison of borrowing capacity and incremental cost for 15 to 30 years loan length with a same repayment.

Max monthly repayment	€ 621.70	€ 492.28	€ 421.27	€ 381.27
Monthly repayment (without insurance)	€ 605.11	€ 475.68	€ 404.65	€ 364.64
Max Insurance Cost	€ 16.58	€ 16.61	€ 16.62	€ 16.63
Outstanding loan balance	€ 118,817.37	€ 130,976.57	€ 149,142.73	€ 176,747.01
Insurance cost	€ 1,534.75	€ 2,081.51	€ 2,657.78	€ 3,274.91
Incremental cash flow		€ 129.44	€ 71.03	€ 40.01
Total Incremental loan cost		€ 12,705.96	€ 18,742.44	€ 28,221.42
Ratio incremental CF/loan cost		12%	5%	2%

Appendix 11: Risk assessment table

Hazard	Risk	Control Measures
Health – Medical conditions resulting from extended display screen equipment use	Risk of injury or ill health, including postural problems, visual problems and fatigue and stress	<ul style="list-style-type: none"> • To control for fatigue and stress, ensure postural and visual problems are dealt with and take sufficient breaks. Breaks should ensure the user varies their posture and changes visual demands • Space must be sufficient for postural changes and to provide freedom of movement while seated and while moving between furniture and equipment • Lighting levels must be sufficient for all tasks at the workstation e.g. reading or keyboard work. The light source can be natural or artificial or a combination of both. Measures must be taken to avoid reflections and glare • Noise from equipment should not distract the user thus impairing concentration or preventing normal conversation • Temperature and humidity may be affected by the heat emitted by workstation equipment. Ensure the work space has sufficient ventilation
Health – Medical conditions resulting from disease	Risk of contamination especially Covid or other	<ul style="list-style-type: none"> • Respect detachment and preventive measures • Limit exits and presence in public areas with many people • Keep healthy lifestyle • Control fatigue.

RISK ASSESSMENT FORM

FIELD / LOCATION WORK

The Approved Code of Practice - Management of Fieldwork should be referred to when completing this form

<http://www.ucl.ac.uk/estates/safetynet/guidance/fieldwork/acop.pdf>

DEPARTMENT/SECTION

LOCATION(S)

PERSONS COVERED BY THE RISK ASSESSMENT

BRIEF DESCRIPTION OF FIELDWORK

Consider, in turn, each hazard (white on black). If **NO** hazard exists select **NO** and move to next hazard section.

If a hazard does exist select **YES** and assess the risks that could arise from that hazard in the risk assessment box.

Where risks are identified that are not adequately controlled they must be brought to the attention of your Departmental Management who should put temporary control measures in place or stop the work. Detail such risks in the final section.

ENVIRONMENT

e.g. location, climate, terrain, neighbourhood, in outside organizations, pollution, animals.

The environment always represents a safety hazard. Use space below to identify and assess any risks associated with this hazard

Examples of risk: adverse weather, illness, hypothermia, assault, getting lost.
Is the risk high / medium / low ?

CONTROL MEASURES

Indicate which procedures are in place to control the identified risk

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

work abroad incorporates Foreign Office advice

participants have been trained and given all necessary information

only accredited centres are used for rural field work

participants will wear appropriate clothing and footwear for the specified environment

trained leaders accompany the trip

refuge is available

work in outside organisations is subject to their having satisfactory H&S procedures in place

OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

EMERGENCIES

Where emergencies may arise use space below to identify and assess any risks

e.g. fire, accidents

Examples of risk: loss of property, loss of life

CONTROL MEASURES

Indicate which procedures are in place to control the identified risk

- participants have registered with LOCATE at <http://www.fco.gov.uk/en/travel-and-living-abroad/>
- fire fighting equipment is carried on the trip and participants know how to use it
- contact numbers for emergency services are known to all participants
- participants have means of contacting emergency services
- participants have been trained and given all necessary information
- a plan for rescue has been formulated, all parties understand the procedure
- the plan for rescue /emergency has a reciprocal element
- OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

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EQUIPMENT

Is equipment used?

If 'No' move to next hazard
If 'Yes' use space below to identify and assess any risks

e.g. clothing, outboard motors.

Examples of risk: inappropriate, failure, insufficient training to use or repair, injury. Is the risk high / medium / low ?

CONTROL MEASURES

Indicate which procedures are in place to control the identified risk

- the departmental written Arrangement for equipment is followed
- participants have been provided with any necessary equipment appropriate for the work
- all equipment has been inspected, before issue, by a competent person
- all users have been advised of correct use
- special equipment is only issued to persons trained in its use by a competent person
- OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

LONE WORKING

Is lone working

If 'No' move to next hazard

[Redacted]
[Redacted]
e.g. alone or in isolation
lone interviews.

a possibility?

If 'Yes' use space below to identify and assess any risks

Examples of risk: difficult to summon help. Is the risk high / medium / low?

CONTROL MEASURES

Indicate which procedures are in place to control the identified risk

the departmental written Arrangement for lone/out of hours working for field work is followed
lone or isolated working is not allowed
location, route and expected time of return of lone workers is logged daily before work commences
all workers have the means of raising an alarm in the event of an emergency, e.g. phone, flare, whistle
all workers are fully familiar with emergency procedures
OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

ILL HEALTH

The possibility of ill health always represents a safety hazard. Use space below to identify and assess any risks associated with this Hazard.

e.g. accident, illness, personal attack, special personal considerations or vulnerabilities.

Examples of risk: injury, asthma, allergies. Is the risk high / medium / low?

CONTROL MEASURES

Indicate which procedures are in place to control the identified risk

<input type="checkbox"/>	an appropriate number of trained first-aiders and first aid kits are present on the field trip
<input type="checkbox"/>	all participants have had the necessary inoculations/ carry appropriate prophylactics
<input type="checkbox"/>	participants have been advised of the physical demands of the trip and are deemed to be physically suited
<input type="checkbox"/>	participants have been adequate advice on harmful plants, animals and substances they may encounter
<input type="checkbox"/>	participants who require medication have advised the leader of this and carry sufficient medication for their needs
<input type="checkbox"/>	OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

TRANSPORT

Will transport be required

NO

YES

Move to next hazard

Use space below to identify and assess any risks

e.g. hired vehicles

Examples of risk: accidents arising from lack of maintenance, suitability or training

Is the risk high / medium / low?

CONTROL MEASURES

Indicate which procedures are in place to control the identified risk

<input type="checkbox"/>	only public transport will be used
<input type="checkbox"/>	the vehicle will be hired from a reputable supplier
<input type="checkbox"/>	transport must be properly maintained in compliance with relevant national regulations
<input type="checkbox"/>	drivers comply with UCL Policy on Drivers http://www.ucl.ac.uk/hr/docs/college_drivers.php
<input type="checkbox"/>	drivers have been trained and hold the appropriate licence
<input type="checkbox"/>	there will be more than one driver to prevent driver/operator fatigue, and there will be adequate rest periods
<input type="checkbox"/>	sufficient spare parts carried to meet foreseeable emergencies
<input type="checkbox"/>	OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

DEALING WITH THE PUBLIC

Will people be dealing with public

If 'No' move to next hazard

If 'Yes' use space below to identify and assess any risks

e.g. interviews, observing

Examples of risk: personal attack, causing offence, being misinterpreted. Is the risk high / medium / low?

CONTROL MEASURES

Indicate which procedures are in place to control the identified risk

- all participants are trained in interviewing techniques
- interviews are contracted out to a third party
- advice and support from local groups has been sought
- participants do not wear clothes that might cause offence or attract unwanted attention
- interviews are conducted at neutral locations or where neither party could be at risk
- OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

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WORKING ON OR

Will people work on

If 'No' move to next hazard

NEAR WATER

or near water?

If 'Yes' use space below to identify and assess any risks

e.g. rivers, marshland, sea.

Examples of risk: drowning, malaria, hepatitis A, parasites. Is the risk high / medium / low?

CONTROL MEASURES

Indicate which procedures are in place to control the identified risk

- lone working on or near water will not be allowed
- coastguard information is understood; all work takes place outside those times when tides could prove a threat
- all participants are competent swimmers
- participants always wear adequate protective equipment, e.g. buoyancy aids, wellingtons
- boat is operated by a competent person
- all boats are equipped with an alternative means of propulsion e.g. oars
- participants have received any appropriate inoculations
- OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

MANUAL HANDLING (MH)

Do MH activities take place?

If 'No' move to next hazard
If 'Yes' use space below to identify and assess any risks

e.g. lifting, carrying, moving large or heavy equipment, physical unsuitability for the task.

Examples of risk: strain, cuts, broken bones. Is the risk high / medium / low?

CONTROL MEASURES

Indicate which procedures are in place to control the identified risk

- the departmental written Arrangement for MH is followed
- the supervisor has attended a MH risk assessment course
- all tasks are within reasonable limits, persons physically unsuited to the MH task are prohibited from such activities
- all persons performing MH tasks are adequately trained
- equipment components will be assembled on site
- any MH task outside the competence of staff will be done by contractors
- OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

SUBSTANCES	Will participants work with	<input type="checkbox"/>	If 'No' move to next hazard
	substances		If 'Yes' use space below to identify and assess any risks
<i>e.g. plants, chemical, biohazard, waste</i>	Examples of risk: ill health - poisoning, infection, illness, burns, cuts. Is the risk high / medium / low?		

CONTROL MEASURES	Indicate which procedures are in place to control the identified risk
<input type="checkbox"/>	the departmental written Arrangements for dealing with hazardous substances and waste are followed
<input type="checkbox"/>	all participants are given information, training and protective equipment for hazardous substances they may encounter
<input type="checkbox"/>	participants who have allergies have advised the leader of this and carry sufficient medication for their needs
<input type="checkbox"/>	waste is disposed of in a responsible manner
<input type="checkbox"/>	suitable containers are provided for hazardous waste
<input type="checkbox"/>	OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

OTHER HAZARDS	Have you identified any other hazards?	<input type="checkbox"/>	If 'No' move to next section
			If 'Yes' use space below to identify and assess any risks
<i>i.e. any other hazards must be noted and assessed here.</i>	Hazard:		
	Risk: is the risk	<input type="checkbox"/>	

CONTROL MEASURES	Give details of control measures in place to control the identified risks

Have you identified any risks that are not adequately controlled?	<input type="checkbox"/> NO <input type="checkbox"/> YES	Move to Declaration Use space below to identify the risk and what action was taken

Is this project subject to the UCL requirements on the ethics of Non-NHS Human Research?	<input type="checkbox"/>
If yes, please state your Project ID Number	<input type="text"/>

For more information, please refer to: <http://ethics.grad.ucl.ac.uk/>

DECLARATION

The work will be reassessed whenever there is a significant change and at least annually. Those participating in the work have read the assessment.

Select the appropriate statement:

I the undersigned have assessed the activity and associated risks and declare that there is no significant residual

risk

I the undersigned have assessed the activity and associated risks and declare that the risk will be controlled by

the method(s) listed above

NAME OF SUPERVISOR

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