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The Small Island Housing Affordability Crisis: Structural Constraints, Market Dynamics and Potential Solutions in Paphos, Cyprus

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DECLARATION

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All sources of information have been acknowledged by means of references.

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ABSTRACT

The issue of housing affordability in Paphos, Cyprus relates to the structural mismatch between the paying capacity of the average household and the minimum viable development costs of standard specification medium-density dwellings. This misalignment is driven by an entrenched "island premium" resulting from import dependency for construction materials, mobilisation diseconomies for specialised labour, and logistical vulnerabilities that elevate capital and operational expenditures beyond levels affordable to median-income households.

This research adopts a mixed-methods sequential explanatory methodology. Detailed cost data from anonymised developer and quantity surveying sources were integrated with residual income affordability metrics and qualitative insights from key market actors. The residual valuation model identifies "feasibility deserts" where the developer's internal rate of return criteria cannot be achieved at a price which is accessible to a large proportion of the potential local owner occupier market.

Dual-market dynamics in Paphos, fuelled by foreign investment and tourism-linked demand, exacerbate these gaps by inflating land valuations and redirecting supply toward investor-oriented segments. Sensitivity analyses demonstrate that isolated demand-side subsidies or credit enhancements risk inflating prices without addressing underlying cost floors.

Supply-side interventions could include releasing public land with affordability covenants, cooperative procurement to reduce freight-related material surcharges on buildings, inclusionary zoning with density bonuses and streamlined planning processes, and integration of renewable-ready infrastructure to mitigate operational cost burdens.

Comparative analysis with Mediterranean island contexts such as Malta, Corsica, and the Balearics supports the transferability of these findings and highlights governance capacity as a critical enabler. The financial institutions' perspectives stress the role of lending practice, whether residual income is taken into account, and the very conservative approach taken to valuation in what is an extremely constrained economic environment.

Modern methods of construction and lifecycle cost savings offer additional pathways to compress the island premium when combined with targeted skill development and institutional coordination.

Overall, bridging the affordability-viability gap in Paphos, Cyprus demands multi-lever policy packages that simultaneously address fixed cost rigidities, valuation distortions, and tenure security to enable sustainable access to adequate housing for local households within a small island economic framework.

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ACRONYMS

AHURI Australian Housing and Urban Research Institute

BC Bare Construction (cost)

BCIS Building Cost Information Service

CBC Covered Balcony Convention

CLT Cross-Laminated Timber

COS Contract of Sales

COVID Coronavirus Disease 2019

CYSTAT Statistical Service of Cyprus

DC Development Cost

DCF Discounted Cash Flow

DLS Department of Lands and Surveys (Cyprus)

DSTI Debt-Service-to-Income (ratio)

ECB European Central Bank

EOA End of Analysis

EPC Energy Performance Certificate

EU European Union

EURIBOR Euro Interbank Offered Rate

EV Electric Vehicle

GDP Gross Domestic Product

GDV Gross Development Value

GHS General Household Survey

GIA Gross Internal Area

GIS Geographic Information System

HPL High-Pressure Laminate

HVAC Heating, Ventilation and Air Conditioning

ICMS International Construction Measurement Standards

IFC Industry Foundation Classes

IMF International Monetary Fund

IPMS International Property Measurement Standards

IPMSC International Property Measurement Standards Coalition

IRR Internal Rate of Return

IZ Inclusionary Zoning

KPMG KPMG (professional services firm)

LTV Loan-to-Value (ratio)

LVC Land Value Capture

MEP Mechanical, Electrical and Plumbing

MIM Market Information Memorandum

MMC Modern Methods of Construction

NIA Net Internal Area

NPV Net Present Value

NRM New Rules of Measurement (RICS)

NRM1 New Rules of Measurement, Volume 1

NZEB Nearly Zero-Energy Building

OAT One-At-a-Time (sensitivity analysis)

OECD Organisation for Economic Co-operation and Development

PC Prime Cost

PMT Payment (mortgage payment function)

QS Quantity Surveyor

RICS Royal Institution of Chartered Surveyors

SAGE SAGE Publishing / SAGE Journals

SIDS Small Island Developing States

SILC Statistics on Income and Living Conditions (EU-SILC)

SME Small and Medium-sized Enterprise

UK United Kingdom

UN United Nations

UNCTAD United Nations Conference on Trade and Development

UNECE United Nations Economic Commission for Europe

VAT Value Added Tax

€/m² Euros per square metre

± Plus or minus

CV Coefficient of Variation

e.g. For example

et al. And others

i.e. That is

IQR Interquartile Range

m² Square metres

n Sample size

p. Page

PIR Price-to-Income Ratio

RQ Research Question

SD Standard Deviation

vs. Versus

CHAPTER 1: INTRODUCTION

1.1 Background: The Housing Affordability

Affordability of housing has become a "hot" issue in recent years. Over the last decade (2015-2025) house prices have increased by more than 60% in real terms across the EU-27, and this far exceeds any increases in wages (around 22% over the same period). In urban areas, including tourist hotspots, the pressure on households is immense, and the social costs of so many failing to secure decent and sustainable housing are now increasingly apparent. The issue of housing affordability is, thus, not just a question of market fundamentals; it is also a major barometer of social equality and labour market flexibility.

The last decade has seen huge increases in house prices, relative to wage levels, across the EU and creating what some call a housing affordability crisis. Eurostat data show house prices across the EU-27 have risen by more than 60% in real terms over the last decade (2015-2025), against an increase of around 22% for average wages. This is a serious issue not only in potential real-estate bubble creation but also for the affordability of housing for tourists, second home buyers and permanent residents alike in popular hotspots and cities across Europe, affecting not only housing affordability but also social cohesion and labour market mobility.

The root causes of the current housing crisis stem from a combination of supply-side barriers to housing construction. Construction costs have risen by around 56% since 2010 and increased by 12% in 2022 alone, largely as a result of the energy crisis. As a result, property developers have taken little to no advantage of increased demand for housing and have essentially stopped development. The "financialisation" of housing, which treats homes as commodities to be bought and sold on the global market rather than as part of a broader economic and social process, is also contributing to the current crisis. Much of the investment in housing is now provided by foreign capital seeking to achieve quick returns on investment, as opposed to the investment of local wages in housing construction. The European housing affordability crisis is pan-European but very uneven between Member States.

The EU average housing cost overburden rate i.e. the percentage of the population that spends in excess of 40% of their disposable income on housing, is 8.2% (Eurostat, 2025). This hides large country differences with more than a quarter of the population in Greece being overburdened at 29.4% well above pre-crisis levels reflecting severe economic scarring. While other countries such as Estonia and Portugal also have high rates of housing cost overburden (24.5% and 20.5% respectively), it is interesting to note that at 14.5% Denmark has the highest rate in the EU mainly due to the high cost of housing in the urban areas.

The crisis is fuelled by a convergence of supply-side constraints. Construction costs have surged by approximately 56% between 2010 and 2024, with a dramatic 12% spike in 2022 alone, driven by the energy crisis and supply chain ruptures following geopolitical instability (Consilium, 2025). This

inflation has eroded developer margins, stalling new project starts even as demand intensifies. Simultaneously, the "financialisation" of housing, where residential property is treated as a global asset class rather than a social good, has injected speculative capital into local markets, driving prices beyond the reach of local wage earners (Wetzstein, 2017; Aalbers, 2016).

While the crisis is pan-European, its impact is asymmetric. The EU average housing cost overburden rate i.e. the percentage of the population spending more than 40% of disposable income on housing, stands at 8.2% (Eurostat, 2025). However, this aggregate figure masks profound disparities. Greece records an overburden rate of 29.4%, reflecting deep structural economic scarring, while Denmark records 14.5%, driven by high urbanisation costs (Eurostat, 2023).The pan-European housing cost overburden rate stands at 8.2% (Eurostat, 2025). Huge differences between countries can however be observed. Long-term, structural economic problems create pressure on the housing market in countries like Greece where housing cost overburden amounts to 29.4%. In other countries with high house prices the main pressure lies in the housing cost of highly urbanised areas, like Denmark where 14.5% of the working population is spending more than 40% of their income on housing.

Cyprus reports a ratDespite having one of the lowest housing cost overburden rates in the EU at 2.9%, Cyprus historically has had homeownership rates of over 70%. However for new generations of Cypriots the housing market seems to be out of reach for young families trying to get onto the housing ladder. This could create a generational divide and leave future generations renting in a market where historically ownership has been the norm. This dissertation explores how the housing market in Paphos has developed to prevent new entrants to the housing market.

1.2 Small Island Vulnerabilities

The literature review on small island economies argues that states such as Cyprus and Malta face what has been termed a "double jeopardy": they must contend with the same inflationary pressures as the continent i.e. rising material costs, labour shortages and regulatory compliance, while also managing structural constraints unique to their geography. Briguglio (1995; 2022), in his work on Small Island Developing States (SIDS), identifies economic vulnerability as a function of openness, export concentration and remoteness. For housing markets, this is hypothesised to translate into a structural "island premium."

Structural characteristics define the island development context. Import dependency is near total for construction materials. Lacking domestic steel, timber or glass industries, islands import most building components. Moullier (2009; 2015) estimates that freight, insurance and port handling add a 20-40% premium to the landed cost of materials compared to mainland Europe. Scale diseconomies prevent efficiency. Armstrong and Read (2002) note that small populations cannot support the specialised suppliers or large-scale contractors found in larger economies, leading to "thin markets" with limited competition and higher unit costs.

Comparatively, Malta and Cyprus share these vulnerabilities but have diverged in outcomes. Malta, with its high population density, has adopted a high-density development model (7-8 storey apartment blocks) that achieves some economies of scale, however at the cost of urban congestion. Cyprus, by contrast, has largely retained a low-density model (villas and 2-3 storey blocks), exacerbating land consumption and infrastructure costs per unit. This divergence highlights that planning policy determines whether structural constraints amplify or moderate the baseline viability of development projects.

1.3 The Cyprus Context

Cyprus exemplifies the acute challenges of a small island economy in transition. Following the 2013 financial crisis, the economy has staged a robust recovery, culminating in credit rating upgrades to investment grade in 2024-2025. Real estate and construction have been central to this recovery, contributing approximately 15% to Gross Value Added (CYSTAT, 2024). However, this reliance is argued to have produced what has been described as a "dual market" structure, a characterisation this dissertation treats as a hypothesis rather than an established fact.

According to PwC Cyprus (2024), approximately 67% of transaction value in the real estate sector is residential, but a significant portion is driven by foreign investment. The legacy of the Citizenship-by-Investment programme, though terminated, established Cyprus as a destination for global capital. This has bifurcated the market: a high-end segment catering to foreign investors (including UK, Russia, Israel and Lebanon) and expatriates, and a local segment struggling with stagnant wages.

National median gross annual earnings stand at approximately €23,500 (CYSTAT, 2024), significantly below the EU average, yet property prices have rebounded by approximately 50% from their 2016 lows (Central Bank of Cyprus, 2025).

Regional disparities are pronounced. Nicosia, the capital, is driven by domestic demand and civil service employment. Limassol has become a global business hub with high-rise towers and prices rivalling European capitals. Paphos, the focus of this study, occupies a unique position as a tourism and lifestyle hub. With tourism contributing 15-18% of GDP and employing approximately 25% of the coastal workforce, the housing market in Paphos is inextricably linked to the visitor economy. This creates competition for land between residential and tourism uses, further constraining supply.

1.4 Paphos as Critical Case Study

Paphos serves as a critical case study for the affordability crisis in secondary tourism cities. As the legendary birthplace of Aphrodite and a UNESCO World Heritage site, it attracts significant lifestyle migration. Transaction data for 2024 shows Paphos accounting for approximately €1.01 billion in real estate value, or 18% of the national total (PwC, 2024). Crucially, foreign buyers are the dominant market force, accounting for 32% of district-wide transactions and 35-45% in coastal zones.

This external demand appears, on the basis of descriptive evidence, to set a price floor for land and construction that may be decoupled from local economic realities. While residential prices have

continued to appreciate, local wages in Paphos trail the national average by roughly 10%. The "time-on-market" for properties averages 147 days (Theocharous et al., 2022), indicating a market that is active but selective.

Development patterns are shifting from sprawling villas to medium-density apartments, reflecting land scarcity and changing buyer preferences, yet planning constraints, including low density zones and archaeological protection, limit the speed of this transition.

1.5 Problem Statement and Research Gap

New housing prices are rising in Paphos at a time when wages are stagnant. It is said that foreigners are accounting for the vast majority of property purchases. Developers are complaining about the high costs of construction. This suggests an affordability-viability gap in Paphos: new-build property prices are beyond the means of local households yet are claimed by developers to represent the minimum needed for project "viability".

An assessment of the existence and magnitude of the gap is treated as an empirical question of the study. The discussion of the gap is laid out in Chapter 3 followed by its measurement in Chapter 4. Whether or not a gap is found, a further issue concerns its source: is it due to market inefficiencies earning speculative "super-profits" or is it due to fundamental structural costs associated with a small island economy?

Although considerable attention has been devoted to researching and attempting to explain the concept of affordability in relation to housing, the vast majority of such studies have focused on the major cities of the mainland continent. The experience of affordability, as it relates to housing, in secondary cities on small island states has been the subject of relatively little research. Affordability studies rely on the use of national data which does not capture local particularities. The available study on affordability in Paphos relies on national data relating to the residential sector as well as tourist accommodation. There is no available benchmark relating to construction costs in Paphos that can isolate the so-called "island premium" from other relevant variables influencing house prices. Such information is essential to allow for an informed economic analysis of market failure in small economies such as Cyprus.

1.6 Research Questions

This dissertation addresses the following research questions:

RQ1: What are the elemental construction cost structures for medium-density residential developments in Paphos, and how do they compare to Mediterranean benchmarks?

RQ2: What is the magnitude and composition of the affordability-viability gap for households across income quintiles?

RQ3: To what extent are small island characteristics (import dependency, scale diseconomies, dual-market dynamics) determinants of development feasibility?

1.7 Research Objectives

The objectives are to:

Develop a framework addressing the legacy of the crisis and tourism volatility for the Paphos area, taking into account small island characteristics and the variability of key tourism demand parameters.

Construction of an empirical cost database for 25 on-going or completed medium-density housing projects currently or recently under construction in Paphos (2019-2025).

Create a residual valuation model appropriate to local circumstances to establish the break-even price of the sale for the developer.

Calculate affordability thresholds with available data from the CYSTAT and common criteria used for lending in the area.

Sensitivity and scenario analysis to identify the key sensitivities influencing development risk.

Compare findings with Malta and mainland Europe to isolate the specific "island effect."

1.8 Scope, Delimitations and Structure

This research intends to map the current situation and current trends of the housing market of Paphos District, focusing on the City of Paphos and suburbs and excluding mountain villages. For the purpose of this research, the time frame considered is from 2019 until early 2026. This time frame includes the COVID shock, the subsequent collapse and the following rapid return to growth of the highly dependent on tourism market, and post-COVID period with higher interest rates, slowly increasing property prices and growth of housing market. The different types of housing projects to be analysed have specific criteria. In order to achieve the research goals, certain criteria have been deliberately set as strict rules to consider specific types of housing projects, focusing on medium-size dwellings for regular quality and standard specifications. Small to medium-size, homogeneous medium-density housing projects (residential developments) consisting of 4 to 36 units are considered in the research. Large, luxury single stand-alone houses, and social housing, which form what has been referred to as the "missing middle", are excluded from the scope of the research.

The study does not utilize a dynamic multi-period simulation but rather a static residual valuation approach. A discounted cash flow (DCF) analysis is not used here since the goal of the study is to develop a cross-sectional benchmarking of the "viability bases" and not to evaluate single projects over time based on the timing of their cash flows. Access to cost data is limited by commercial confidentiality; data is anonymised and aggregated.

The research findings are discussed and presented in five chapters. Chapter 2 reviews the literature and links together the diverse findings to establish five key bodies of literature. Chapter 3 outlines the methodology adopted in this study, Chapter 4 presents the empirical findings of the cost analysis of construction projects and the results are critiqued through the theoretical framework developed in Chapter 2. In the final chapter, the findings of this research are summarised and a number of policy recommendations are made to the industry as well as suggestions for potential future research.

CHAPTER 2: LITERATURE REVIEW

This chapter presents a critical and thorough review of the existing academic knowledge pertinent to housing affordability, the structures of construction costs and the feasibility of residential development within constrained island markets. The review examines five distinct, yet interconnected bodies of literature, ultimately leading to the development of a conceptual framework specifically tailored for small island economies.

2.1 Theoretical Approaches to Housing Affordability

Housing affordability is not an absolute concept, but rather a relational one, a function of the relation between housing costs, household income and the wider socio – economic circumstances of the household (Stone, 2006). This relationship can be interpreted in numerous ways. Operationally the literature has yielded competing frameworks instead of a single measure of affordability. The choice between these frameworks is not neutral. Each framework embodies different assumptions about what a household should be able to afford, and what costs they should be willing to incur in order to obtain housing.

This introduction sets out a critical overview of six of the most influential approaches that have shaped academic and policy discussions on housing affordability, before outlining the theoretical underpinnings of the empirical work that follows.

Using material produced in the U.S.A., U.K. and Australia where the concept of affordability has been theoretically and empirically explored, the paper criticises current mainstream methodologies for measuring housing affordability and examines their relevance to the Paphos region of Cyprus. The methods' ability to deal with a restricted sales base, a considerable number of foreign investors and a limited formalised rental contract market is questioned. In addition, the prevailing owner occupation dominated housing market in many countries is contrasted with the situation in Paphos.

2.1.1 The Ratio Approach and the 30% Income Rule

The most commonly used international affordability metric is the housing expenditure-to-income ratio. In Australia, most analyses adhere to a 30% rule, i.e., housing is deemed affordable to householders (including owner occupiers) when costs to buyers and renters are below 30%. This rule has its antecedents in US policy, where the 1969 Brooke Amendment on public housing rents specified that rent should not exceed 25% of income. However, by the early 1980s, Congress had increased this threshold to 30% with the stated intention of lowering federal expenditure on housing (Lerman and Reeder 1987). For Herbert et al (2018), the 30% threshold is still too high.

Criticism of the ratio approach is widespread with many arguing it is a simplistic tool for governments to assess housing affordability. Hulchanski (1995, p. 47) suggested that "using the proportion of income spent on rent as a measure of affordability is administratively convenient and lacks conceptual rigour". The fixed percentage does not allow for the differential household compositions and family sizes; nor does it allow for the different patterns of non-housing expenditure

costs for different household types. Using the income to rent ratio to assess housing affordability has been found to consistently misclassify households in both directions in a Canadian context (Stone, 2006). For example a high-income household could be portrayed as bearing an unaffordable burden when in reality they were comfortably affording their housing costs. Alternatively a low-income household could be portrayed as being affordable when in reality the household was spending less than 30% of their income on housing but struggling to make ends meet. Empirical evidence supports both effects (Herbert et al., 2018; Ben-Shahar and Warszawski, 2016) who found significant over and under estimation errors across the income distribution, with the largest distortions affecting the very low-income and very high-income groups.

The ratio measure persists primarily because of its simplicity and comparability over time and space, rather than the theoretical soundness of the measure (Jewkes and Delgadillo, 2010). From a practical perspective, Gan and Hill (2009) argue that such time and space comparability is one of the ratio measure's strengths for macro-level monitoring of poverty and inequality as the basis for policy making, over the need for greater accuracy at the household level.

Affordability in housing is assessed via the ratio approach and this is a common method used in the policies and strategies developed in Cyprus. Seen from the outside OECD (2024) housing cost data show that Cypriot housing affordability is no worse than the EU average for a number of member states. However, this masks significant variations at country level. For example, Beyer and Biljanovska (2023) showed that price-to-income ratios in Limassol are approximately one-fifth higher than in Nicosia and one-third higher than in Paphos, with significant variation even within wider districts. Affordability needs to be assessed at the sub-market level in order to understand and address serious affordability problems which the current official approach fails to identify.

2.1.2 The Residual Income Approach

The residual income approach is the most theoretically robust alternative to the ratio. Introduced by Stone (1993; 2006), the method asks a direct question: after a household pays for housing, is what remains sufficient to cover a minimum acceptable standard of non-housing consumption? Housing is affordable only if the residual meets or exceeds that minimum; otherwise, the household is what Stone (1993; 2006) terms shelter-poor, a condition in which housing expenditure is crowding out essential needs including food, clothing, transport, healthcare and childcare.

The minimum is estimated using budget standards, that is, itemised assessments of the minimum acceptable cost of non-housing necessities, adjusted for household size and composition (Bradshaw, 1993; Saunders et al., 1998). Affordability is then determined by whether the income remaining after housing covers that budget. Burke et al. (2014) demonstrated the practical value of this approach, showing that the residual income approach captures how housing stress varies across household types in ways that the ratio conceals, identifying hardship among larger and lower-income households.

The approach carries practical costs. Defining a minimum non-housing budget involves normative judgement that is contested and culturally specific (Saunders, 2004), and the method requires detailed household expenditure data and localised cost-of-living data that are not available in all research contexts (Gabriel et al., 2005). Stone (2006) acknowledges these implementation challenges but argues they are the price of conceptual robustness, particularly stressing that the question of whether housing is genuinely affordable cannot be answered without knowing what is left over. Stone and Burke (2011) later showed that in practice, well-specified residual income and ratio approaches often yield similar aggregate estimates in large datasets, with differences concentrated at the household type level, precisely where policy precision matters the most.

A related formulation is Kutty's (2005) concept of "housing-induced poverty", which defines housing as unaffordable when, after paying for it, the household's remaining income falls below the poverty line. This is simpler to operationalise than Stone's full budget-standard method and may offer a viable pathway for contexts, such as Cyprus, where detailed household budget standards have not been published. In Cyprus, the absence of a published household budget standard equivalent to the UK Family Budget Unit or Australian AHURI standards means that a fully operational residual income measure cannot be directly applied. This study addresses the gap by using the residual income framework as the primary conceptual lens while supplementing it with the ratio approach for comparability purposes, as described in Section 2.1.7.

2.1.3 Housing Stress and the 30/40 Approach

Using a simple rule, a hybrid of the ratio and residual approaches to measuring housing affordability was used in the Australian policy literature to identify what came to be known as "housing stress". The 30/40 rule identified those households in the lowest 40% of income (residual approach) who were also spending more than 30% of their income on housing costs (ratio approach). The rule selected the threshold for both components and in doing so drew attention to those households for whom the ratio rule is most likely to classify them incorrectly, those in the lower end of the income distribution.

Although the so-called higher-income group misclassification problem has some policy relevance, as argued in Yates et al. (2007), it is less of an issue for those with higher incomes above the 40th percentile, who are likely to consume at adequate levels on non-housing goods while still spending 30% of their income on housing. The use of the 30/40 benchmark does provide measures of housing stress similar to those derived from residual income calculations for middle income households, and it serves as a useful screening device.

The method does not measure degree of stress; it merely determines whether or not a household is unaffordable, without any indication of how unaffordable they are. It does not allow for variation in household size or expenditure patterns. The same methodology was employed in an earlier study on housing affordability in Cyprus (Yates et al., 2007). This paper, however, reveals a very tight distribution of buyer incomes below the price of the existing housing stock, which shifts the focus

away from a study of affordability as a question of income distribution and the level of affordability, below a certain threshold, and towards an absolute affordability gap.

2.1.4 Lifecycle and Intertemporal Affordability

Affordability is often viewed as a static quality and it is common for analysis to focus on affordability at a particular point in time. However, existing approaches fail to accurately measure the affordability of homeownership, which is a long-term decision with far reaching financial consequences.

At the time of mortgaging, the monthly payments might look steep but as the household's income increases, the burden recedes. Even more, the effect of subsequent inflation would steadily erode the real value of the fixed nominal payments over time. Rowley and Ong (2013) extend this consideration and ask whether households have sufficient current income to service their current level of mortgage payments, and also have enough buffer to withstand future household shocks (job loss, family change events etc) without having to sell their housing. Ong et al. (2014) term this long-run ownership sustainability. Vulnerable groups include older homeowners on fixed incomes, and first time buyers who have entered the housing market with high loan-to-value ratios in a rapidly appreciating housing market.

This study investigates whether or not an affordable household at entry remains affordable over time. The literature has not addressed this important question because existing measures of the affordability ratio do not capture any risk and the time dimension is ignored. As with any study that projects forward in time, the findings are subject to several assumptions regarding future income growth, future interest rates and future capital gains on owner occupied housing. This uncertainty is acknowledged in the study by Bourassa and Hoesli (2010).

The analysis in Beyer and Biljanovska (2023) is of particular relevance to the Cypriot economy given that a large share of the housing stock of outstanding mortgages is secured by variable interest rates and, since 2020, housing prices growth has been below that of housing incomes. At the same time, this means that the capacity to service debt of new borrowers is reduced, albeit only marginally above the threshold perceived to be sensitive by households.

2.1.5 Locational Affordability and Housing-Transportation Costs

The focus on locational affordability goes beyond the cost of the home itself. Other expenses in the household budget vary by location as well. In Haas et al. (2006) the authors explore the transport costs that flow from where people choose to live for work and shopping etc. They argue that these costs need to be taken into account in measuring affordability, and suggest a threshold of 45% of household income for the combined housing and transport costs. A number of studies have since investigated these issues in various countries. They show that the conventional focus on housing cost does not adequately capture the true cost to households of suburbanisation. For example, in the Australian city of Canberra, Dodson and Sipe (2008) found that many outer suburban households

had very high total H+T costs, significantly greater than their inner suburban counterparts, even where housing costs as a proportion of income were below commonly cited affordability thresholds. Studies in European cities (Papa and Coppola, 2012) have adapted this approach, using accessibility to urban employment in the urban area as a key measure of the costs and benefits of suburbanisation.

The results presented here have some utility in a descriptive sense; however, when making comparisons between various places, other factors are considered that affect the decision of where to live that cannot simply be "netted out" of a cost comparison. Other considerations such as schools, work locations, family and friends, and other urban amenities can outweigh money considerations for most households, and the H+T framework has its greatest utility as a diagnostic framework for viewing the structure of an urban area.

The paper refers to the concept and outlines the components of a proposed H+T (Housing and Transportation) framework. However, it is not put into practice, due to the nature of the study, which is looking at development projects within, or on the edge of, Paphos town. As a result, there is little variation between the individual studies undertaken in terms of the additional burden that long trips to town place on commuters. As a result, the costs of transport to a project are unlikely to make a significant difference to judgements made about the affordability of a project.

2.1.6 Comparative Perspectives and Conceptual Synthesis

Simple ratio approaches to assessing housing affordability have some inherent limitations. While a number of alternative approaches have been proposed in the literature, each of these has its own limitations and attempts have been made to synthesise the best features of the ratio approach within a more comprehensive affordability framework. In an early paper on this topic, Gabriel et al. (2005) observed that there are three different affordability criteria that can be used when assessing housing affordability, and that no one measure can address all three criteria (purchase affordability, repayment affordability and rental affordability). This paper provides a brief review of both the simple ratio approach and some of the alternative approaches to assessing housing affordability, with a particular focus on the limitations of each, as well as recent attempts to develop a more comprehensive affordability framework. It then examines the merits of residual income approaches as an alternative measure of affordability, highlighting the specific limitations of this approach, as well as some of the advantages it has over the simple ratio approach for cross-country comparison purposes. Specifically, the paper highlights why residual income approaches are more sensitive to local factors and to differences in living costs and in purchasing power between locations, and why the simple ratio approach is very insensitive to these factors, producing very spurious cross-country comparisons of housing affordability in different countries at very different stages of economic development.

Wetzstein (2017) points to three structural factors driving an unprecedented global affordability crisis. These include the rapid re-urbanisation of both capital and labour, more than a decade of cheap credit since the GFC, and growing levels of intra-society inequality. An alternative reading locates

the root of the affordability crisis in the financialisation of housing, whereby the process of investment in housing becomes disconnected from its use-value as shelter for households and is driven by the particular characteristics of housing as an investable asset for capital. While Aalbers (2016) and Madden and Marcuse (2016) make this broader claim, Fernandez and Aalbers (2016) observe that financialisation operates differently across different institutional contexts. This paper examines the specific form that financialisation has taken in the post-2013 banking crisis context of Cyprus, where constraints on domestic credit have not stopped a foreign investment flow into real estate. Shi et al. (2016) suggest that in order to address these complexities a multidimensional approach is required, incorporating different ways of conceptualising affordability through the use of ratios, residual income approaches, and spatial perspectives.

However, the effects of housing unaffordability are not solely attributed to market-level factors. The supply-constrained framework of the financialised residential property market is itself shaped by broader structural factors, which are particularly evident in Paphos. According to the IMF (2023, 2024), the price of housing in Paphos has been sustained above its fundamental value in the post-2022 period by sustained demand from foreign buyers, by the immigration to Cyprus of displaced persons from other countries who purchase homes in Paphos to reside there, and possibly by the entry of investors into the market. Financialisation of housing thus is highly concentrated in its effects. CYSTAT (2024b) and PwC Cyprus (2025) both indicate that a significant proportion of all housing transactions in Paphos are for the purposes of investors, and "buy to let" second homes, in contrast to the majority of transactions in other regions of Cyprus that are for the purposes of the purchase of a primary home by resident buyers. Financial capacity of foreign buyers clearly outstrips financial capacity of resident buyers in Paphos. This means that, in practice, price is not constrained by reference to domestic household income. Standard measures of affordability are not up-to-date and require revision given the current disconnection between price and affordability. Although renowned housing analyst Glaeser and colleague Gyourko (2018) point to the supply of housing as the main cause of unaffordability in housing markets, arguing that supply inelasticity, primarily regulatory in nature, is the primary cause of affordability crises in the housing markets of developed economies, supply inelasticity of the Paphos market provides strong evidence to the contrary, arguing that it is the supply-constrained framework that is most appropriate for analysing and addressing issues of housing unaffordability in this sub-market.

The Eurostat (2024) Housing in Europe publication confirms that Cyprus records the highest rate of under-occupied dwellings (71.3%) in the EU, against an EU average of 33.3%. On the other hand, the levels of housing cost overburden in Cyprus are amongst the lowest within the EU. While this can be considered as a positive aspect, it does not represent a success story regarding affordability of housing for supplying the needs of the resident population.

2.1.7 Affordability Definition Adopted for This Study

After exploring current affordability indicators this paper develops a hybrid multidimensional affordability framework which links demand side affordability indicators with a range of supply side development constraints information. The framework is then applied to the Paphos region which is portrayed as thin and dualistic within the context of an economically small island state. The foreign demand profile of Paphos, serious deficiencies in the published household expenditure data for the island, and the supply constrained housing market for a variety of planning and construction cost related reasons are also highlighted.

The residual income approach (Stone, 1993, 2006) was the chosen conceptual approach on the demand side for the current study. The ratio approach (Section 2.1.1) had the obvious limitation of not being able to identify the very rich and the very poor in any local study; indeed it is precisely the very rich and the very poor that are the households of interest in any local analysis on affordability of housing for low-income individuals. A further advantage of the residual income approach is that it takes into account the different needs of households of different sizes with different compositions facing the same cost of owner occupation. The household budget standard for the two scenarios created for the study is not available in published sources for Cyprus. Consequently, the thresholds for residual income were approached using available household expenditure data. The 30% ratio was used as a secondary reference figure to allow comparison with other studies, and to make it easy to cross-reference with available data. The 30% ratio was, however, used as the basis for the calculations for the affordability threshold. This report provides a conceptual interpretation of the affordability question using the residual income approach. The approach looks at affordability from the perspective of whether post-housing income is sufficient to meet other human needs, expressed as a ratio that defines the affordability threshold.

This study does not develop an understanding of the concept of Human Transport Costs (H+T). All of the projects included in the empirical sections of the study are located either within the boundaries of the urban centre of Paphos or very close to them. This lack of variation in distance to urban services makes it unlikely that calculation of actual transport costs would add greatly to the understanding of affordability for these study households. While the study has not pursued the H+T concept in any depth, it is seen as relevant in a full evaluation of the peripheral development options that are being proposed and as a tool in future research.

Affordability in restricted markets such as small island economies is primarily a function of supply. This research explores the affordability–viability gap between what households are able to pay for new residential supply and the minimum cost at which that supply can be delivered to the market. The affordability–viability gap is identified as a structural issue resulting from a combination of foreign investment and affordability concerns, the incomes of local householders and the cost of the supply to market. It is addressed through means other than demand-side subsidies to purchase, and

is informed by financialisation and political-economy literature (Wetzstein, 2017; Aalbers, 2016; Madden and Marcuse, 2016).

For the price driver of foreign demand to quality and quantity, Paphos price reference see Beyer and Biljanovski (2023). The viability affordability gap then becomes a function of two variables: the minimum development cost stack that cannot be reduced below a minimum threshold, and the local income function representing the distribution of income amongst local households. The empirical chapters that follow aim to provide a basis for a calculation of the minimum cost stack based on real estate projects completed in the Region of Paphos. Chapter 2 thus begins with a review of the construction costs literature to establish the factors that affect minimum cost and the shortcomings of commonly used cost benchmarks in relation to the Paphos context.

2.2 Construction Cost Structures in Residential Development

The composition of residential construction costs and the factors affecting them are crucial to assessing the development potential of a site and the issue of housing affordability. While residential construction costs can vary by +30% from city to city, they do not primarily reflect material costs, which are global in nature. Instead, physical constraints, labour market rigidities and regulatory restrictions have a marked effect. The typical industrial structure of the residential construction sector is highly organised, frequently highly fragmented with multiple firm owners, project-based organisation, site-based production methods and little opportunities for mass production. As a result, productivity tends to be lower than in other industries. Optimal firm size has been argued to be in the order of 100-500 units per year, after which bureaucratic diseconomies of scale predominate. Specialisation gains are often not realised at smaller scales.

Cypriot real estate developers based in Paphos report that they are capable of building and delivering up to 50 residential units within a single year, which is however below their actual production. Other factors affecting supply of residential real estate include the small size of the local market, the high import content of construction materials and the restrictive nature of the planning system. The available literature on the Cypriot housing market is complemented by the empirical evidence provided in Pashardes and Savva (2009) for the Cypriot case. The paper reports on an empirical investigation of the dynamics of the housing market. A hedonic price function for the Cypriot house price is estimated using annual census data for the period 1988-2008. The results indicate that construction material and labour costs, as well as population growth and income, explain a significant proportion of the variation in house price.

2.2.1 Elemental Cost Classification and Measurement

Construction costs are often expressed as elemental quantities representing the building that have been "unpicked" and measured in a specific way. The RICS New Rules of Measurement (NRM) has provided the industry with a mechanism for measuring construction costs in a way that enables comparison of building costs through standardised measurement of the elements of cost (RoM 2017

Construction Measurement). Costs can be reported across a number of cost elements, for example substructure, superstructure, finishes, services and external works distinct from preliminaries, overheads and profit. International consistency of cost reporting from a professional and regulatory perspective has recently been improved by the International Construction Measurement Standards (ICMS) initiative (IPMSC, 2017, 2019). Through the use of standardised elemental measurement, when paired with project specific factors for adjustment, improved estimating accuracy has been reported (Matipa et al., 2010; Smith and Jaggar, 2019).

The most well known benchmark for real estate in Cyprus is the RICS/KPMG Cyprus Property Index which is published on a quarterly basis and provides data on residential sales prices and rental yields by district. However, this benchmark does not provide any information relating to underlying costs. The statistical service of Cyprus (CYSTAT) publishes average construction cost per m² based on information collected by the Building Permits service. Additionally, CYSTAT periodically publishes a Price Index of Construction Materials. This is the only official data available for the sector and, while useful as a general indicator, it is not sufficient for planning individual projects due to underdeclaration by practitioners of the cost of the permit and because soft and hard construction costs are not separated, as well as the effect that different building specifications can have.

Apostolidis et al. (2023) utilise around 80% of the total available apartment transfer records from the Cyprus Department of Lands and Survey for the period 2015 to 2022. The thin housing market in Cyprus, coupled with the extreme heterogeneity of the properties, poses challenges for the conventional construction of indices based on sale and rent contract observations. However, transaction-based models based on micro-level data records provide the most reliable and stable price indices. The paper employs this methodology in constructing an index for apartments in Cyprus.

2.2.2 Parametric Cost Modelling and Estimation

Many Parametric cost models have been developed to forecast the construction cost of a new project by linking a set of independent variables to past data. The most common independent variable used in cost models is gross floor area expressed in square metres or number of units and typically stated in €/m². Such variables serve as proxies for the underlying complexity of the building. In the pioneering work by Skitmore and Patchell (1990) the variables were described as building size (gross floor area), the actual number of similar products, number of storeys to construct, the level of detail required in the production information and the location of the site. The studies referenced in this paper have improved the accuracy of the variables recently used in cost models by utilising new machine learning techniques. Elhegazy et al. (2022) analyzed 50 models from the last two decades that were developed for project prediction. The analysis revealed that while Machine Learning techniques have the capability of reaching high accuracy levels and are increasingly being used, simple regression models remain sufficiently transparent and are adequate for predictive purposes, especially when dealing with small sample sizes typical of secondary markets with very limited historical data for actual projects.

The deeper limitation of parametric models, however, is not statistical but compositional. Cost per m² collapses projects of fundamentally different character into a single number: a high-specification coastal apartment and a modestly finished inland dwelling may share an identical €/m² figure while differing in almost every material and labour input (Flanagan et al., 2005). In Paphos, the market spans precisely this range. CYSTAT (2024b) confirms that Paphos records the highest share of foreign buyers among all Cypriot districts, with coastal zones such as Kato Paphos and Coral Bay commanding specifications and land values incomparable with inland suburban sites. Applying a single benchmark across this range, as any aggregate official data source must, generates what Flanagan et al. (2005) call "specification confounding," a problem severe enough to render district-level €/m² averages analytically unusable for project-level feasibility work.

Geographic transferability poses a further constraint. Lowe et al. (2006) found that UK-calibrated models overestimated Irish or Spanish costs by more than 30%. Construction management practices in Cyprus have Greek civil-law origins and post-independence techniques have been influenced by British methods. However, quantity surveying practices have been influenced by the RICS, whilst the environment within the building industry in Cyprus is very different from that found in Northern Europe. As a consequence any parametric studies that have been undertaken in these markets require careful adjustment to allow applicability to the projects under study in Paphos.

2.2.3 Supply Chain Dynamics and Material Cost Transmission

The supply chain for the construction industry is long and multi-layered, with shocks to inputs propagating through the supply chain slowly and unevenly over time (Pindyck and Rotemberg, 1990). The COVID-19 period provides a dramatic illustration of this phenomenon, with US lumber prices more than tripling between 2020 and 2022, accounting for approximately 35% of overall construction cost increases while representing only about 8% of normal costs. Goodman and Mayer (2022) predicted that it will take about 12-18 months to return to market normal.

Cyprus small island economy has a very high import propensity. However, unlike most non-EU economies, Cypriot wood and wood products have no tariffs. Thus, non-tariff barriers, most importantly, the time and cost of importing structural steel, special finishes and insulation products to the island from the mainlands of Europe and Asia constitute the transmission mechanism of import prices to construction cost. Studies on long run price determination of single family dwellings for Cyprus (Pashardes and Savva, 2009) found that the most important determinant of house price is the cost of construction, and therefore, import prices of materials for construction are transmitted quickly to construction cost. The 2021-3 period has seen a sharp and generalised increase in construction cost across the EU, with most EU member states recording double digit percentage increases in construction cost in 2022 (Eurostat, 2024). The pattern of increase in construction cost in Cyprus has been somewhat slower, differing from that prevailing in Northern Europe mainly due to differences in construction methods. According to CYSTAT (2025) Price Index of Construction Materials for Q4 2024 the annual variation for the period 2024Q4 compared to the same period of the previous

year was about 0.2% decrease, below the EU average decrease. Road haulage cost from import port of Limassol is added to the cost of the materials in Paphos in contrast to Nicosia.

2.2.4 Economies of Scale in Residential Construction

Economic theory generally posits that as scale of production increases, unit costs of production decrease. Residential construction, however, produces mixed results. Larger builders have greater volume purchasing power to negotiate lower materials and labour costs, and are able to spread fixed overheads over higher volumes of output. However, very large projects are frequently characterised by increasing co-ordination and management costs. There is evidence in other construction sectors, such as office buildings, of large projects being more expensive than medium-sized ones (Gann, 1996, 2002; Ball, 1988; Somerville, 2001).

In terms of a U-shaped scale effect, some studies have found that costs per unit are highest for very small projects, decrease to a minimum at a medium scale of production, and then increase again (Flynn, 1987). The scale effects in house building are also influenced by the market structure of the builder's organisation. In a highly competitive industry, the builder is unlikely to achieve economies of scale because the market structure does not allow it. A fragmented industry, on the other hand, may not be of a sufficient scale to tackle small island projects.

The efficiency threshold proposed by Ball (2003) provides a relevant benchmark for the Paphos real estate market. CYSTAT (2024a) building permit data record 1,184 authorised dwelling units across Paphos in 2024, representing 10.5% of the national total. The volume is too thin for any individual developer to approach the thresholds at which bulk purchasing and overhead amortisation become meaningful (Somerville, 2001).

The local construction market is primarily made up of small to medium size companies operating in all regions as opposed to big players that dominate in bigger markets such as Western Europe. According to the European Commission business surveys for Cyprus (2024), the market continues to face a severe shortage of skilled labour which is also putting pressure on wages that the size of a project may not be able to support.

2.2.5 Innovation and Modern Methods of Construction (MMC)

Weak rates of productivity growth in the construction industry have become a growing concern. Implementation of an industrialised construction methodology is considered as a means to increase construction’s productivity. This methodology entails off-site manufacturing, modular approaches and prefabrication, thereby, a multitude of studies have been dedicated to such topic (Goodier and Gibb, 2007; Pan et al., 2012). Barbosa et al. (2017) is an exception among them, in which poor levels of productivity growth are highlighted for the sector.

Systematic reviews of the evidence report on average savings of 6-14% in costs. These savings are generally achieved through reduced labour inputs and earlier completion of the construction process (Mao et al., 2016; Pan et al., 2012). Typically such savings are realised where there is scope for

standardised design approaches to repeat construction on a large scale (i.e. >50 units) – a common feature of larger markets in mainland countries but less typical of small island markets (Smith, 2014).

Jiang et al (2019) report that many established modular construction companies have large fixed capital tied up in equipment and so have a minimum efficient output above 200-300 units per year. Modular approaches have many benefits and a number of firms have undertaken building using this approach. However, there is a risk that firms entering this market may not have sufficient volume to make it successful (Rahman, 2014). However, innovation in the approach, such as the "mobile micro-factory" (Lawson et al, 2020), could help to address these scale issues.

Modern methods of construction are not prevalent in the residential construction market in Cyprus. Current methods of construction for single family dwellings include the use of an in-situ reinforced concrete frame with blockwork panels inserted between. The design of the building is influenced by seismic design considerations, climatic factors, the skills of the local construction work force, and the availability of building materials. Currently there are no initiatives at government, developer or industry level promoting off-site construction methods. The main cause of the current housing supply problem is felt by both the IMF (2023) and the European Commission (2023) to be related to the rigid planning system and the current lack of housing supply, and not with the methods of construction currently used.

For this study, the implication is practical rather than theoretical: MMC cannot be modelled as a cost-reduction option available to Paphos developers. Labour scarcity functions as a fixed structural cost driver and the cost stack must be analysed on that basis.

2.2.6 Soft Costs: Finance, Fees and Developers Profit

Non-construction costs account for a larger share of total residential development expenditure than is often acknowledged in cost benchmarking literature. Although a standard list of Non-construction costs can be provided (land acquisition cost, sum of professional fees, construction-related fees (i.e. statutory and building permitting costs), development finance, contingency and developer profit), their relative importance can differ across countries as well as for different types of projects.

The average level of soft costs as a percentage of hard costs in new construction projects in California was found by Quigley and Raphael (2005) to be approximately 38%, with land costs averaging 19%, and finance and other costs averaging 11%. The soft costs associated with residential development appraisal were found by Isaac and O'Leary (2012) to be approximately 30-40%. The developer profit in market-rate projects is typically modelled as a minimum of 15-20% of the gross development value, and can be considered as hard economic facts rather than organisational conventions.

Fees for professional services can vary greatly. In the Watermeyer book on professional services' fees published in 2012 it was noted that in thin or concentrated markets of professional services in small island economies the professional tends to charge higher than the guideline scales suggested for a more intensive professional services market in large urban centres. Such added charges are not

necessarily due to inefficiency on the part of the professional. In practice they can be difficult to alter. The practice experience is that for building projects in Cyprus, the combined fees for architect, structural engineer, mechanical and electrical engineer and quantity surveyor can range from 6% to 10% plus VAT, i.e. potentially above the upper end of the international norm.

The plan and permit soft costs associated with new construction have risen as a percentage of construction costs over the decades and have continued to rise in recent years. In order to determine the US real cost of regulations Emrath and Liu issued a study on the subject in 2018. Jackson (2016) noted that time plays a large role in the approval of construction plans and that said process can be quite costly due, in part, to the fact that time is money and builders are paying interest on the cost of the land acquisition and other pre-construction soft costs while waiting for the next approval or, perhaps, denial of a building permit. In a totally unrelated area of regulation, residential building permits in Cyprus fell by 4.4% in 2024 to 10,835 from 11,351 the previous year. The cause of the decrease is the changes scheduled to go into effect on 1st January 2024. Planning authority will be handled at the local level by the new District Self-Government Organisations (DSGOs). The Ippodamos system for the electronic submission and processing of permits is now mandatory. The initial transition period has been marked by longer than usual approval times (CYSTAT, 2024a). This means that users of each project will face a real cost in the coming year.

The cost of development finance is a function of the prevailing borrowing rate, the loan to cost ratio and the investment time horizon. However, whilst the post 2012-2013 banking crisis in Cyprus meant that commercial banking rates for development finance have remained at a high level compared to the low ECB policy rate, the approval process involved in both lender and consultancy approvals has been such that the finance costs are projected to be in excess of 15% of the development costs. Central Bank of Cyprus (2024).

While there are other "soft costs" that are normally excluded from development appraisal models (in the property research literature), there is also the Value Added Tax (VAT) that is payable by the developer at a rate of 19% on all new residential developments (provided the residences are offered for sale). The residences that are offered for sale as owner occupation, meeting specific criteria (subject to size and value thresholds), attract a reduced rate of 5% however this is not relevant to the more investor, buy-to-let and foreign-buyer focused market that currently prevails in Paphos. In these cases the full rate of 19% is levied. For the owner occupation residences that attract the reduced rate, the VAT is non-recoverable to the buyer. Home buyers in Paphos therefore have to consider this additional cost when considering new residential offerings (Isaac and O'Leary, 2012).

Land cost is the third cost, which varies dramatically along Paphos' length. Therefore, soft costs must also be treated as location specific. Foreign demand for foreign real estate that is located in Cyprus, particularly along the coast, continues to support real estate prices above their value based on local affordability and supports the developer's margin. This factor is the main driver of the developer's margin. According to the IMF (2024), Article IV Consultation Report on Cyprus, foreign

buyers are mainly concentrated along the coast. Foreign buyers represent the highest percentage of real estate transactions in Paphos, which is the district with the highest percentage of foreign buyers across all of Cyprus. This means that premium locations will have a land price many times higher than locations with less potential. Consequently, it is not feasible to treat Paphos as a singular market for the purposes of developing a reasonable assumption for soft costs and the required developer profit margin. The same applies to locations within Paphos.

The developer profit margin or residual claim on turnover is the perceived risk adjusted return required by investors for a speculative project. This is increased by the long approval and construction period; the high VAT share of investor facing projects; the limited depth of the market of affordable residential housing for sale to owner occupiers; and the general illiquidity of the thin market of a small island sub-market. However, according to PwC in Cyprus (2025) developers can expect margins of 15% to 25% based on Gross Development Value (GDV) on market price residential schemes in Paphos. This excess risk adjusted return required by developers reflects the limited number of developers that are active in a competitive market; and the resultant limited competition between them in the Paphos residential market. From a general practitioner perspective established developers are able to offer a repeat sales business to their established client base thereby competing away excessive margins in a more mature and deeper residential market such as exists in the UK and other parts of Europe (Isaac and O'Leary, 2012).

2.2.7 Cost Structure Synthesis, Research Gaps and Analytical Framework Adopted

The cost of delivering residential developments should be viewed in terms of a series of "layers", each containing the cost drivers created by market, regulatory and location factors, rather than simply being expressed as a € cost per m², which is amenable to simplistic comparison. Standardised construction costings follow frameworks such as the New Rules of Measurement (NRM) and the International Construction Measurement Standards (ICMS) and categorise the different cost layers, albeit those layers create most variation between different developments and housing markets. The factors creating variation between developments include, for example, labour rates prevailing in the local and/or wider labour market, the efficiency of the planning regime, the cost of finance, the cost and efficiency of import logistics and the scale and organisational form of the project. Affordability of housing is deteriorating in terms of actual and relative price (IMF 2023, 2024), Beyer and Biljanovska (2023) and in coastal locations, notably Paphos and Limassol, worst of all. PwC Cyprus (2025) documents that 93% of residential transactions above €1.5 million in 2024 were concentrated in Limassol and Paphos, reflecting the dual-market dynamic in which foreign and luxury demand pulls specifications and land values beyond the reach of domestic buyers.

Three interlocking gaps characterise the current state of knowledge.

Construction cost studies generally are associated with large industrialised markets, particularly urban centres. However, relatively little research has focused on less liquid secondary city markets and those that are supply constrained. Small island economies, indeed, are singularly

underrepresented in the literature except to illustrate their greater vulnerability. Yet, no studies have appeared in the international construction economics literature relating to Cyprus. This thin sub-market, located on the west coast of the island, is a prime destination for the tourism market, attracting a high level of demand, foreign and local, and as such deserves special attention. While empirical findings from large, liquid markets have been calibrating downwards for their application in less developed markets, the small island economy provides a particularly difficult environment in which to apply such models. The Paphos sub-market is therefore studied in depth within this context.

A second problem arises: the measurement and modelling gap, i.e. the lack of adequate empirical information relevant to building costs. The empirical information that does exist is often presented in a form that is very inadequate for a buildability assessment, e.g. simple €/m² figures or rough hard and soft cost categories (e.g. foundations, structure, services, planning, etc.). There is little information available on this finer level of detail from the various sources that provide information on construction costs, whether from professional bodies (e.g. RICS) or from individual consultants (e.g. Flanagan et al., 2005). This lack of adequate information also extends to the small number of parametric models for construction costs that have been set up and calibrated from available data (Elhegazy et al., 2022), as opposed to the larger number that have been set up for other types of buildings and in other markets (e.g. Lowe et al., 2006).

Thirdly, there is a dynamics and feasibility gap with regard to how construction costs react to input shocks, in market conditions in a constrained island environment, and how this in turn affects affordability and viability. Static feasibility models which have been used for residential construction do not include the potential for supply chain disruption, the time cost of obtaining approvals, Value Added Tax (VAT) as a percentage of the construction cost, and economies of scale, (Jackson, 2016). For Cyprus in the period 2020 onwards, there are a number of issues that affect residential construction costs. These include supply-chain disruption from the global COVID-19 health-crisis, a sharp and continuing increase in building-construction cost (at a slower rate than the rest of the Euro Area), (Eurostat, 2024), the planned reform of the planning system in 2024, (CYSTAT, 2024a), and sharp and continuing increases in foreign demand for owner-occupied residential property in the island, (IMF, 2024). From a supply-side perspective, Beyer and Biljanovska (2023), and the IMF (2023) argue for government intervention to increase the supply of owner-occupied housing for sale on the market. The combination of these shocks has not been addressed using the available data.

While the gaps in the framework and scale of the current studies (Section 2.6) and those referred to in the introduction are acknowledged, these are addressed in this study through empirical research, using project cost data collected from a variety of sectors in the region of Paphos. The following sections detail how the conceptual cost-stack is operationalised in this study.

In reviewing available material on the subject, it appears that there is no benchmark, parametric or composite method for analysing the Paphos real estate housing market. Based on the methodological conclusions made on the available literature regarding the analysis of housing market, the current

study adopts a methodological stance appropriate for the analysis and description of Paphos sub-market. That stance is not grounded in any of the currently available benchmarks, parametric models or housing market indices; Paphos itself constitutes a thin, highly specificationally heterogeneous sub-market remote from the general market.

The cost analysis is undertaken on the basis of the elemental cost stack for the project, and costs are classified in line with the cost classifications suggested by RICS (2021) NRM1 and ICMS (IPMSC, 2019). The bill classification convention is used for classification of cost elements for the purpose of preparation of the primary bill of quantities commonly practiced by local quantity surveying practices. Hard construction costs are classified into building materials and materials and labour services provided by the respective trades for analysis. These trade categories are further analyzed into Basic and Specialty categories. The Basic categories consist of items such as substructure, earthworks, structural concrete frame, building envelope (masonry, plastering, waterproofing, and external thermal insulation covering walls and facades) and internal finishes, internal, and coverings (walls and ceilings including floors, partitioning, painting, tiling, carpentry, joinery, flooring, glazed screens, etc. and other coverings). External works and drainage and specialist sub-contract and provisional sum packages for mechanical and electrical services, elevator installation of lifts, aluminium glazing, and other nominated works and materials and works services also form part of the analysis. Land acquisition cost is treated as a separate input to the cost considerations of the development appraisal as opposed to the hard construction costs. Land price is determined by the dual-market demand mechanism and not by the cost of provision of construction services. Land prices are traded in the market for developed plots. Separate consideration is also given to professional fees and charges for obtaining necessary statutory approvals and permits, and development finance cost. All cost elements are treated as VAT exempt. VAT is then modelled separately at the appropriate rate for the specific transaction (5% for owner occupier transactions on residential homes and 19% for investment and foreign buyer transactions etc.). Developer profit is modelled as a fixed percentage of the GDV, as used by earlier studies on affordability such as Isaac and O'Leary (2012) and Smith and Jaggar (2019). The residual land value (RLV) is the key indicator of land value in the study and is determined by the GDV less the total construction cost plus the fixed margin of developer profit as per Section 2.2.6. Other items specific to the Cyprus context are also treated correctly in the cost models, such as the existence of a dual rate of VAT of 5% and 19%. Affordability is measured as cost per square metre of Gross Internal Area (GIA) as per NRM1 (RIBA Business Information Group 2016) and ICMS (Smith and Jaggar 2019). Thus whilst different elements are quantified differently at a low level of granularity, the method is consistent at a higher level of granularity to enable comparison with other countries.

The empirical research is based on actual construction costs and development budgets of on-going residential projects under construction, operating in the Paphos market. This choice is based on two findings from the existing research literature. Firstly, Apostolidis et al. (2023) found that in order to

acquire reliable cost and price intelligence for the Cyprus market, primary data from individual construction projects is required, instead of indexation from alternative sources. Secondly, Elhegazy et al. (2022) and Lowe et al. (2006) suggest that the analysis of bills of quantities is fundamental for the calculation of construction costs. Bills of Quantities (BoQ) – a detailed, specification-controlled cost source for a specific project – provided the basis for empirical observation in this study, as official aggregate sources and parametric models were not considered suitable for this analysis.

Scale inefficiency and the absence of MMC savings are treated as structural factors affecting the Paphos market, rather than as variables to be modelled. The data supplied by the CYSTAT (2024a) with regard to building permit activity, and the information in respect of sector structure provided by PwC Cyprus (2025), is taken into account. Given that there is no off-site construction capacity in the residential building sector in Cyprus, there are no benefits from bulk-purchasing scale economies that local builders may seek to exploit. As such, the assumed cost stack is entirely labour intensive, import-oriented and highly disaggregated and does not include elements of alternative configurations that may exist in other markets but do not exist in Paphos. Thus, all "production" is highly fragmented and does not incorporate efficiencies that might derive from a hybrid "production method".

The "cost stack" is used here to analyze the affordability-viability problem in Cypriot housing which emerges as the central policy issue in the two Country Reports (Beyer and Biljanovska, 2023; IMF, 2023). The analytical objective is to identify the root of the price that makes housing non-viable and to gauge the elasticity of hard construction costs, VAT, interest rates, land prices and developers' margins to further policy adjustments.

The findings of this study are then discussed in the light of existing supply-side affordability literature to the sector, both prior to the publication of this book and within its subsequent pages. They are also used as a basis to discuss the findings within the relevant housing policy context for the case of Cyprus.

2.3 Residential Development Feasibility Models

The feasibility analysis of development projects uses the techniques of urban economics, finance and decision making to establish whether a project is potentially viable. This paper reviews the models used by researchers and property consultants to undertake such analyses. It briefly describes the theoretical basis of each model, discusses its application requirements and overall performance.

2.3.1 The Residual Valuation Model

A popular method used to estimate the value of the land and assess the potential of a site for development is known as the residual approach. This method calculates the residual land value by subtracting all other development costs, including construction, professional fees, finance costs, contingency and the required developer profit from the Gross Development Value (GDV) of the completed project (Millington, 2000; Havard, 2008).

Land Value = Development Land Value (GDV) - (Construction Cost + Professional Fees + Finance + Profit + Contingency)

The methodological formula used to establish the maximum price that a developer is willing to pay for the purchase of the "sites" and still obtain a reasonable return on the investment, is well established and is a common criterion for identifying the viability of a project. It is often used by professionals as a yardstick for decision making for the purchase of potential development sites. Utilising the "residual model", this research aims to investigate the redevelopment potential of sites in Paphos and attempt to identify the level of affordability in terms of price. Due to a number of external factors, primarily related to price, the "viability gap" may be created, leaving the potential for development out of reach. This study aims to investigate and highlight the issues associated with redevelopment in Paphos and make recommendations for increasing the potential for affordable housing in the area.

The Byrne/Cadman method of valuing the investment potential of affordable housing has two main limitations. The first is that it is based on a static valuation method that does not recognise that time is of the essence when evaluating cash flow and that the timing of the construction process and of sales of units is critical. Given the long term nature of large development programmes and the uncertainty of the planning process in Cyprus, this can be important. In addition, with the uncertainty of the Ippodamos scheme transition planned for 2024 (CYSTAT, 2024a) a project considered to be viable at the appraisal stage could quickly become unviable if the scheme is extended by six to twelve months. This would result in higher finance costs whether bank or investor financed. The Byrne/Cadman method is also very sensitive to assumptions and land forms a thin margin at the bottom of a long stack of costs. Consequently, even small changes in the GDV or construction costs can very rapidly turn initial positive results into negative results. A sensitivity analysis undertaken by French (2020) supported this finding in relation to affordable housing in Paphos and the difficulties that exist in removing land value from a residual model. A 5% decrease in potential GDV coupled with a 5% increase in construction costs could easily eliminate land value altogether in comparison to the thin margins currently operating in the market place in Cyprus.

Residual valuation is a relatively simple method of appraisal that is very popular in practice because it is easy to understand. While there are a number of inherent limitations to its use, both a scenario analysis and a sensitivity analysis have been added to this paper in order to temper some of the criticisms noted by Wyatt (2013).

2.3.2 Discounted Cash Flow (DCF) Analysis

Discounted Cash Flow (DCF) analysis is used in residual valuation to model the time profile of cash in and cash out over time and value it at present using a risk adjusted discount rate. The outcome of the DCF analysis is presented as Net Present Value (NPV) or Internal Rate of Return (IRR). DCF analysis is useful for valuing different programmes and differing cash inflow and outflow profiles over time. The time value of money is a key consideration in the discounting process (Hoesli and

MacGregor, 2000). The DCF approach may also incorporate real options logic. The decision to progress a project contains a number of options: the option to delay, the option to phase, the option to abandon. Some of these options cannot be valued by static appraisal methods but can be valued using DCF (Baum and Crosby, 2008; Geltner et al., 2014; Geltner and de Neufville, 2018).

Discounted Cashflow (DCF) valuation can be fraught with problems, particularly where a number of assumptions have to be made about cash flows over time, construction periods and sales rates, all of which can be highly uncertain (French and Gabrielli, 2004). The choice of the appropriate discount rate may also prove to be a methodological problem, where market estimates of required returns are based upon a CAPM or WACC that do not reflect project specific risks where markets are thin or illiquid and there are no systematic risk measures available (Fisher and Young, 2000).

In Paphos, the absence of a deep comparable transaction database means that discount rates must be estimated in combination with practitioner norms rather than derived from market data, introducing a source of judgement that is unavoidable but should be explicitly acknowledged in any DCF-based analysis. The forecasting error problem compounds this: DCF models frequently diverge from realised outcomes, with Pyhrr et al. (1999) and Bulloch and Sullivan (2010) both documenting systematic optimism bias in project appraisals, discussed further in Section 2.3.6.

The report does not undertake a discounted cashflow (DCF) appraisal of the returns on each of the projects. Instead, it attempts to measure and explain the affordability-viability gap for the 25 projects studied. A residual model is used to measure the affordability-viability gap for each project as a single figure which can be compared with other projects, whether they are large or small, in different parts of the country or of different designs. Whilst DCF provides a means of measuring the time profile of returns on a project, in the absence of project-specific information on the phasing of construction and sale, and with the thinness of the market for residential land and the comparable transaction database, a static residual model is the more appropriate technique for this study. However, the study addresses the temporal limitations of the static residual model through a deterministic sensitivity analysis to test the robustness of the results to key assumptions regarding the input variables.

2.3.3 Sensitivity Analysis and Scenario Modelling

Estimating the residual value, the future potential of the completed development, adds uncertainty to the appraisal process. Performing sensitivity analysis tests the robustness, or value, of the crucial assumptions and determines which assumption affects the project value the most. There are two approaches to sensitivity analysis; the deterministic one-way sensitivity (French, 2001) and the scenario modelling. The scenario approach models three different scenarios i.e. an optimistic, a base and a pessimistic scenario. Correlations between variables are also addressed (Hoesli et al, 2006). Empirical studies showed that a 10% change in the assumed end value of a project would account for an increase/decrease of 35% to 40% in its NPV (Leung and Hui, 2002). Gross Development Value (GDV) is normally the key factor that affects the sensitivities of land value estimates.

The study examines the feasibility of Affordable Housing strategies in Paphos through an analysis of three different scenarios. Both a base case scenario, based on specific cost and value information from the Paphos project bills of quantities and current market conditions, are contrasted with two affordability extreme scenarios. The two scenarios that test affordability extreme limits simultaneously alter the variables of construction cost, Gross Development Value, land value and finance cost in order to determine the most optimum combination to make Affordable Housing strategies viable.

2.3.4 Monte Carlo Simulation and Probabilistic Modelling

While most analysis tools allow the user to create alternate scenarios to test various "what if" situations, many analysis tools take this a step further and add probability to all uncertain variables. Thousands of versions of the same analysis are then run to develop a probability distribution of potential project outcomes, expressed as an average or percentage of times the IRR equals, for example, or exceeds a specified level. This type of simulation is called a Monte Carlo analysis (Hoesli et al., 2006, Pyhrr et al., 1999). This method of additional outcomes is far preferable to creating additional scenarios.

However, this method is very data-driven and requires a high degree of statistical expertise which may not be so readily available in secondary or small island markets (French, 2001). For the Paphos case study there is a lack of sufficient comparable project data available to calibrate the probability distributions for the construction cost and the GDV in order to utilise the Monte Carlo simulation method. Although it is recognised that this method can be employed if comparable data exists to run the simulation on the specific project under study.

2.3.5 Hurdle Rates and Developer Decision-Making

Hurdle rates are the minimum return thresholds required before a developer commits to a project and are a critical but theoretically underdeveloped element of the feasibility literature. Their practical importance is substantial: a project that is technically feasible at a given construction cost and GDV may nonetheless not be brought forward if it fails to meet the developer's hurdle, making hurdle rates a direct link between cost structure and housing supply.

Empirical evidence consistently shows that developer hurdle rates exceed the returns implied by standard cost-of-capital models. Titman (1985), in a seminal analysis of urban land development under uncertainty, demonstrates that developers rationally delay construction when the option value of waiting exceeds the opportunity cost of idle land, producing a wedge between technical feasibility and actual supply response. Crosby and Henneberry (2016), examining the English development market, find that viability assessments are frequently structured backwards from desired profit margins rather than derived from market evidence, with target returns of 15-20% on GDV commonly applied regardless of market conditions. These findings are directly relevant to Paphos: in a thin market characterised by demand uncertainty and extended approval timelines, developers rationally apply higher hurdle rates than cost-of-capital logic alone would justify, which in practice means that

schemes viable at a 10-12% return are not brought forward because they fall below the developer's required margin. High hurdle rates can therefore suppress supply even when feasibility is technically positive, with direct implications for the affordability-viability gap.

2.3.6 Empirical Validation Used in this Study

The gap between projected and realised feasibility outcomes is well documented and systematic. Bulloch and Sullivan (2010) find an average absolute error of 27% in total cost estimates and 31% in end value projections across a large sample of Australian residential projects, with costs underestimated in 68% of cases and values overestimated in 64%, a consistent optimism bias that mirrors findings in the infrastructure cost estimation literature (Flyvbjerg et al., 2002).

Pyhrr et al. (1999) find that apartment projects approved at market cycle peaks realised returns approximately 42% below initial projections, reflecting both cyclical GDV correction and construction cost overruns. These findings reinforce the methodological position taken in this study: feasibility models provide analytical structure and a basis for comparison, but they should not be treated as predictive instruments, particularly in thin or volatile markets. The use of actual bills of quantities as the cost input rather than benchmark estimates partially addresses the cost-side component of this error, since actual measured costs are more accurate than modelled estimates. The GDV-side uncertainty remains, and the scenario analysis employed in this study is designed to make that uncertainty explicit rather than conceal it within a single-point estimate.

2.4 Constraints in Housing Markets in Small and Island Economies

Affordable housing supply strategies designed on a large industrial scale for metropolitan areas in continental economies are not likely to address housing affordability in Small Economies. The particular characteristics of Small Island Developing States (SIDS) and similar economies create unique and difficult housing affordability and feasibility problems. One of the characteristics of SIDS is that they are remote from their principal markets. The scale of housing requirements within the boundaries of such small economies also creates special problems. Above all, the small economies are generally unable to absorb substantial additional costs arising from measures proposed to make housing more affordable. These factors demand serious attention in examining housing affordability issues.

2.4.1 Defining and Characterising Small Island Economies

SIDS are often characterised by the United Nations through a combination of population size, geographical isolation, economic openness, vulnerability and ecological fragility. The classification of SIDS has been used and reinforced by the United Nations General Assembly through various resolutions in the aftermath of the World Summit on Sustainable Development held in Barbados in 1994 (UN General Assembly, 2005). In terms of the specific economic characteristics of small economies the two most noted works are Armstrong and Read (2002). They not only extended the economic characteristics of small economies, but also provided the most cited definition of the subject to date. Their work identified a number of key structural features of small economies,

including economic openness, import dependency, concentration in a few activities, limited endowments of natural resources and vulnerability to external events including natural disasters. In terms of housing markets two of these characteristics are of particular significance: import dependency and scale constraints (Briguglio, 1995; Armstrong and Read, 2002).

2.4.2 Economic Vulnerability and Resilience

This study employs a vulnerability-resilience approach introduced by Briguglio (1995, 2022) highlighting tourism destinations' inherent vulnerabilities, caused by various structural deficiencies including remoteness, lack of diversification and fluctuations in price and demand for commodities and services traded in external markets. However, it also considers the quality of resilience generated by local institutions, enterprises and households in facing such challenges.

Considering the implications for the housing market, in a highly globalised economy, import dependence on materials and equipment implies that its development can be vulnerable to exchange rate fluctuations and commodity cycles. Thin domestic markets are unable to reap scale economies that reduce the unit cost of delivery. The lack of well-developed supplier networks and associated high logistics costs and potential time-delays to source goods, all stem from the small size of economies. Furthermore, external factors influence cyclical demand volatility, influenced by factors such as tourism and foreign investment. These can create price volatility unrelated to changes in income. Armstrong and Read (2002) addressed such external factors and their impacts on small island economies in general. This article updates such an approach through an examination of the impacts of COVID-19. The experience of the residential housing market in Cypriot (as reported by the IMF (2023) and Beyer and Biljanovska (2023) for 2020–22) is used to illustrate such impacts.

Small island markets typically face what Armstrong and Read (2002) term a "smallness premium," estimated at 15-30% above comparable mainland costs, arising from the combination of logistics costs, small-order purchasing penalties and limited competitive pressure in local supply chains.

2.4.3 Construction Sector Characteristics

In addition to the universal cost drivers discussed in Section 2.2, the construction industry in small island economies faces a unique set of challenges. Bold: High import dependency: 70-85% of building materials are imported, with the cost of freight and duties adding an additional 20-40% to the actual price of the materials (Moullier, 2009; 2015).

In addition to facing higher than average building costs due to factors such as land prices and the requirement to import materials and expert labour, small island construction economies additionally have to contend with a number of labour market constraints that push construction costs in these locations above those on mainland economies of a similar size. Even in locations where there are limited local numbers of specialist tradespeople, their wage levels and conditions of employment can be driven quite high by the limited numbers available in the local labour market. In some cases specialist and plant skills may even be imported from overseas in order to attempt to overcome a lack

of capacity in the local construction sector. However, while it may be possible for a small economy to establish a competitive construction economy, even in the face of quite severe labour market rigidities (Priemus and Hall, 2004), in practice it is the higher wage levels for scarce building craft skills, together with the costs of bringing in additional labour to work on sites, that in practice present a cost floor that cannot be undercut by builders operating in other locations (Ball, 2003).

Furthermore, the very small size of the construction industry on most island economies is such that there are often very few opportunities to achieve savings through production scale benefits that might be available on a larger island or even mainland economy.

2.4.4 Land Markets and Competing Uses

In small island economies with limited land, increasing pressure from residential, tourism development and other uses for the land makes this an important issue. While there is little empirical work on land supply constraints and housing price in small economies, Saiz (2010) is the most cited study on the topic in larger mainland economies and suggests that geographic constraint is a powerful determinant of long-run house price levels. However, one would expect the impact to be even greater in island economies where, aside from distance, virtually all of the potentially developable land within a given commute is in fact developable.

In areas with a coast or environmental protection, the potential construction land is very limited and, as a result, highly volatile. In many island destinations, the land prices are determined by the willingness-to-pay of foreign buyers with higher incomes than those of local residents, creating a dual market where local households are priced out not by local economic failure, but by the higher price of land in relation to their incomes (Cocola-Gant, 2018; Glaeser and Gyourko, 2018). This is the reality on many tourist island destinations around the world (Saiz, 2010).

One of the reasons behind this huge imbalance could be the global capital competing with local incomes for the available land supply, thus creating an affordability-viability gap, a problem that prevails in Paphos and other tourist destinations.

2.4.5 The Cyprus Housing Market Context

The Cypriot economy is of a small island state size plus a population of approximately 1.25 million people, heavily relying on imports, with an emphasis on the services and tourism sectors. Even though the economy is not considered as a Small Island Developing State (SIDS), which is a UN categorisation reserved for SIDS outside the EU, common features with economies that have been classified as SIDS are observed.

The Cypriot housing market has experienced a series of structural shocks in the last fifteen years. The most notable was the 2013 banking crisis which had a sharp negative effect on demand and supply. In 2015–19 the Citizenship by Investment Programme sharply increased foreign demand for housing, particularly in Limassol and Paphos. From 2020 onwards supply has been affected by the COVID-19 crisis, while prices have continued to increase, driven by renewed foreign demand and a

massive influx of displaced people from neighbouring countries due to the recent geopolitical events in the region.

In addition to the market dynamics and characteristics, the above section deals with the institutional sources referring to buyers. The same sources reveal that foreign buyers are the dominant buyers of real estate in the coastal districts. In fact, according to PwC Cyprus (2025), 93% of all sales of new and resale houses and apartments valued at €1.5 million plus took place in 2024 in the Limassol and Paphos districts. Foreign buyers are also very active in the sales and purchase of real estate in Paphos, which records the highest percentage of foreign buyers in Cyprus (CYSTAT, 2024b). These high-value transactions reflect the dual-demand dynamics at the market level, discussed in Section 2.2.7.

CYSTAT (2024a) Building Permits data report average declared construction costs per m², but as discussed in Section 2.2.1, permit declarations systematically understate actual costs. The figure is therefore retained as an official benchmark with the caveat that it represents a lower bound on actual construction expenditure, consistent with the measurement gap this study addresses empirically.

Average income for all persons in Cyprus was €20,667 in 2024, according to annual data from the Survey on Income and Living Conditions (EU-SILC) conducted by the Statistical Service of Cyprus (CYSTAT). This national average gives a very poor indication of the real purchasing power of many lower-income households, particularly those living inland in relatively impoverished areas such as Paphos, as opposed to those lucky enough to own premium properties in the more desirable locations along the coast. The Central Bank of Cyprus' Real Estate Information System has reported a Residential Property Price Index (RPPI) for Q4 2024, which showed that Paphos once again topped the table with year-on-year growth of 13.4%, well above the other districts. This far-exceeds growth in income and will be seen as exacerbating the affordability problem, according to the IMF.

The Central Bank of Cyprus (2024; 2025) Residential Property Price Index records Paphos as the district with the strongest year-on-year price appreciation in Q4 2024 at 13.4%, confirming the sustained divergence between price growth and income growth that the IMF (2024) identifies as the principal affordability deterioration mechanism in coastal Cyprus.

2.4.6 Tourism-Driven Gentrification

Tourism-driven demand for housing generates visitor and/or investor demand that slowly is displaced by residential demand to create a tourist or secondary housing market. In well-known tourist destinations, whether they be coastal resorts or major cities across Europe, research has mapped the emergence of short-term rental platforms like Airbnb and the associated investment purchases that have driven house prices and rents beyond local incomes. As noted by Wachsmuth and Weisler (2018), this trend has further spawned a rush to convert long-term rental properties into short-term holiday lets. See Gotham (2005) on tourism gentrification. Cocola-Gant (2015; 2018) offers empirical work on these developments in Barcelona.

Empirical evidence for the relationship between tourism intensity and housing prices is most advanced for a small European tourism economy—Croatia. Vizek et al. (2023) exploit substantial variation in tourism intensity across 556 municipalities in Croatia over the 2012–2019 period in a spatial Durbin panel model and find that tourism pressure on housing markets generates not only local price effects but also spatial spillovers to neighbouring municipalities. Mikulić et al. (2021) assess the relationship between tourism and housing affordability in 216 Croatian municipalities. The results reveal that an increase in tourism intensity leads to a worsening of affordability for local residents, with the negative impacts most pronounced during peak season. Furthermore, increased instability of income in the tourism sector, despite high wages, makes employees less eligible for mortgages.

Tourism is a significant industry in Paphos generating 15-18% of the island's GDP and providing employment along the coast. Given these factors, the dynamics at play in the market are particularly acute as foreign buyers push up prices beyond what local incomes can sustain, and as the seasonal nature of wages in the tourism industry further reduces the ability to service mortgages.

2.4.7 Comparative Small Island Markets

The issue of affordability in Paphos in relation to its cost can be viewed in the context of other similar small island economies. One relevant example is Malta, with a population of approximately 520,000 people, similar in size to the Paphos region. The island is also a tourist destination and its economy is largely dependant on tourism. In relation to construction costs, there is a current practitioner-based study for Malta, which is a useful source of information. Titled the KPMG Construction Cost Guide for Malta, the report is for 2024 and provides useful information in relation to the current construction costs for the island for comparison purposes. The report varies in cost from €900-2,000 per square metre depending on the specifications, which compare with current costs in Paphos. Moreover, there are similar patterns of affordability stress on young households, renters and low income households similar to those identified in Paphos where they are being increasingly priced out of the market by foreign investors.

While some studies on SIDS have undertaken Caribbean-based comparisons (such as Barbados, Jamaica and Trinidad and Tobago), these may not be relevant given that the SIDS under study are in a different part of the world with different tariff barriers, higher freight costs and a different regulatory environment. For other aspects of the research, there is relevant comparator material available on other EU Mediterranean island markets. While there is academic work on tourism-driven housing displacement in several parts of Spain (notably the Balearic Islands and the Canary Islands) much of this is in Spanish and not easily transferable, especially given the very different planning and fiscal frameworks that exist. However, the most useful comparator for this research is likely to be another EU island economy, namely that of Malta. This is because there are several key similarities between the two economies in terms of the structure of their coastal residential markets, the concentration of foreign ownership, their dependence on tourism, the limited depth and nature of

services markets and the high import content of their construction materials. Consequently, much can be learnt from the findings in relation to the cost-stack in Paphos.

2.5 Housing Policy Instruments and Supply-Side Interventions

Affordability-focused housing interventions can be categorized into two main types: supply-side interventions which seek to provide more housing, whether in terms of volume or quality, at lower cost; and demand-side interventions which seek to increase the capacity of households to purchase housing.

The theoretical case for prioritising supply-side strategies in inelastic supply environments is well advanced. Demand subsidies are unlikely to improve housing affordability by increasing access to the housing market for homeowners, because they are capitalised into house prices, enhancing the capital locked up in housing for existing owners rather than assisting new entrants. In contrast, in elastic-supply markets demand-side instruments are likely to be effective (Galster, 1997). However, for many cities and towns, housing affordability will require a supply-constrained focus. This paper adopts such a perspective, conceptualising and analysing housing affordability as a system, identifying why a demand-side focus on subsidies to households in need of affordable housing has not achieved its intended outcomes. A recent systematic review of international evidence on demand-side housing subsidies (Brackertz et al. 2015) for AHURI found landlords captured 30–78 % of the increases in housing assistance in the form of higher rent in supply constrained housing markets. The share of assistance captured by landlords in rental income, however, decreased as the supply elasticity of the local housing market increased about. While demand-side assistance can deliver short-term affordability benefits it is not a sustainable long-term strategy for addressing a structural shortfall in the supply of housing afforded by its current price to the needs of households. Worst of all, the "price-inflation" is most destructive exactly where affordable housing is needed most: in physically constrained "island markets", in "coastal" real estate speculation hotspots of the tourism industry, and in small to medium-sized secondary cities where the supply response to higher prices is limited. Wetzstein (2017) and Aalbers (2016) link the current housing affordability crisis with financialization of the housing stock, which is defined as increased investment in housing in terms of rent and ownership. But any measures to address affordability will be consumed by the very processes that drive housing prices above local income levels in the first place.

2.5.1 Planning Obligations and Inclusionary Zoning

Planning obligations are the primary mechanism through which planning systems in English-speaking countries extract affordable housing contributions from the development process. Crook and Whitehead (2002), in the most detailed empirical treatment of planning gain mechanisms in England, find that developer contributions through Section 106 agreements succeed in generating affordable supply from private development, but do so unevenly and with substantial transaction costs. Critically, they establish that the effectiveness of planning obligations is inseparable from development viability: obligation requirements set above the level consistent with a viable residual

land value suppress the development they aim to cross-subsidise, confirming that viability assessment is not merely a technical exercise but the central mechanism through which planning policy and development economics interact.

Inclusionary zoning in the US and its international equivalents have generated the most extensive empirical research on planning-based affordable housing delivery. The US literature has generally focused on strategies and results pertaining to particular initiatives. Of course, the international experience has also been subject to study, and the most comprehensive international comparative survey to date was conducted by Calavita and Mallach (2010). They found a lot of variation in results across many countries and cities. Inclusionary zoning design depends on the relation between the affordable unit requirement (the numerator) and the density bonus or cost offset that compensates for it (the denominator). In the end, schemes that do not sufficiently compensate developers for the internal cost of the cross-subsidy end up being the cause of development avoidance rather than development of affordable housing.

In a recent study, Wang, Kang and Fu (2025) undertook a causal analysis of the effects of Inclusionary Zones (IZ) policies, employing a quasi-experimental research design to examine a large sample of US municipalities. Their results indicate that, on average, IZ did not affect the level of housing permits or market rents. However, the data suggest that IZ increased residential home prices by 2.1% on average, with higher price gains resulting from mandatory IZ policies than from both voluntary and incentive-based approaches. While IZ may, therefore, achieve the goal of transferring affordable housing stock within the development process itself, this policy is not expected to contribute to increasing the overall housing supply. The gains in price from the more restrictive mandatory requirements could well offset the gains in affordability for non-beneficiaries, with the potential for development avoidance particularly acute in thin markets such as Paphos with very low levels of competitive new construction. The further increased costs that IZ imposes on developers are also likely to be accentuated by the very lower levels of land prices prevalent in this market.

There is no provision for planning obligations or inclusionary zoning in Cyprus, unlike in England, and whilst the national planning policy gives a bonus in the building coefficient to a developer who includes qualifying affordable housing in their development, this successful policy has not been implemented to date. A Working Paper published in March 2023 by the IMF on housing market policies in Europe noted that there was no mandatory planning-based mechanism for the delivery of affordable housing in Cyprus. The Ippodamo planning reform of 2024, however, introduced priority processing as a time-cost incentive for projects classified as low to medium risk, which would include those with affordable housing units. However, such initiatives are unlikely to address the underlying economics of affordable housing provision in a market where land prices are driven by demand from international property buyers.

2.5.2 Density Bonuses and Planning Incentives

Incentivisation is an alternative approach to the planning obligation. In effect it is a density bonus or over the shop development where the planning authority will grant a consent for a development with a greater floor space or residential units above that permitted by right in return for provision of affordable housing. In practice the density bonus is the major theoretical alternative to planning obligations as it offers the potential for increased gain from GDV for the developer compared to the fixed cost of a planning obligation. The question is whether this mechanism actually delivers affordable housing – ie whether the potential Gross Development Value uplift from the additional market-rate units exceeds the cost of the cross-subsidy to deliver the affordable units. This will be influenced by a number of factors including land values, construction costs and the "discounted market price" at which affordable homes must be sold (Calavita and Mallach, 2010).

In high land-value markets where density uplifts can yield large increases in Gross Development Value (GDV), density bonuses can deliver meaningful affordable provision without undermining the viability of a site. However, in markets where the uplift in GDV is limited due to affordable unit price notes being constrained by local incomes, the same mechanism is unlikely to generate sufficient cross-subsidy to deliver affordable provision.

The Paphos coastal district is a dual-market where new residential developments are largely targeted at the tourist market and at foreign owners who are often intent on renting the properties out to holidaymakers. Land values in such a market are set by international land values rather than by the developer's residual after enabling developer profit has been extracted, meaning that the increased Gross Development Value gained from further increasing the density of a site will be captured by higher land acquisition costs, thus not leading to additional affordable housing through density-based incentives being offered to developers as a planning obligation. This feature of land and property market dynamics has been highlighted in the planning obligations literature (notably Crook and Whitehead, 2002), and poses particular challenges in countries like Cyprus where there is a significant influence of foreign buyers in driving land values, particularly in coastal locations. As the IMF (2024) notes, experience to date with offering density-based incentives in the search for additional affordable housing in the coastal districts of Cyprus has been that it has not delivered additional housing below market price, for a number of reasons.

2.5.3 Rent Control and Rental Market Regulation

Regulated rents, or rent control, is the most studied policy among housing regulations. Kholodilin (2024), in a comprehensive review of over two hundred empirical rent control studies spanning more than six decades and six continents, finds that controlling or capping the rent or rent growth has the intended effect of reducing controlled rent or of curtailing growth of controlled rent. However, there are several unintended negative effects. Firstly, there are negative effects of regulated rents on the supply of rental housing. Because controlled rent or rent growth is below the level at which market price equals supply of rental housing, owners decrease their supply of rental housing in search of

higher profits elsewhere in the market. The vast majority of the twelve studies on effects of rent controls on rental housing supply found negative effects of controls on supply. The remaining four studies either found no significant effects (three studies) or were not classified in the literature review. Secondly, most studies find a "spillover" effect of regulated rents on unregulated rental housing, which are the vast majority upward pressures on rents in the unregulated segment of the housing market. Thirteen studies on resource allocation found misallocation of resources in search of higher returns in the housing market. The remaining three studies found no significant misallocation (two studies) or were not classified in the review. Seventeen studies on effects of rent controls on uncontrolled housing prices found the vast majority (14 studies) increased prices on uncontrolled housing. The remaining three studies found no significant effects (two studies) or were not classified in the review. The pattern of results for these three categories of studies is the reverse of the intent of rent control policies and are widely observed in many countries. This pattern of results across studies and countries is unusual in the literature on housing policy effects.

It turns out that the mechanism is difficult but not insurmountable. The paper that best identifies the causal mechanism is Diamond, McQuade, and Qian (2019). The authors use quasi-experimental variation created by the 1994 rent control expansion in San Francisco to study the effects of rent control on renters and owners. They find that rent control reduced the supply of rental housing by about 15%, primarily by inducing owners of certain controlled housing to either redevelop or convert to other uses in order to escape the effects of rent control. Most of the supply reductions come from a small set of properties and owners who were most affected by the rent control regime. In the short run, protected renters gained, while renters and new buyers in affected areas lost affordability. Looking to more recent work, a study of rent control and affordable supply finds that more restrictive rent control leads to a 10% decline in total rental units for sale or rent, but a 52% increase in units affordable to extremely low-income households, and a 46% decline in affordable units for moderate-income households. Stacy et al. (2025) find a distributional concentration effect – rent control makes housing more affordable to the most vulnerable while reducing affordable options for those just above them.

While rental market regulation is important in any tenure structure, the focus is often drawn away from the formal private rented sector in jurisdictions where the dominant tenure type is owner occupation and where investor transactions feature prominently. Affordability may be a concern but this is usually in relation to local residents who are employed and able to purchase their own home rather than affordability for rentals and secure protected tenancies in the private rental sector. In relation to the latter, what evidence exists on rent control and how might this be relevant to two new initiatives currently being developed in Cyprus to boost rental activity in Paphos and elsewhere? The first initiative centres on the Affordable Rent Tax Incentive Scheme (2024) with a view to encouraging existing stock into the rental market by offering tax incentives to owners to reduce their rental charges. Of particular import here is the aim not to reduce the existing rental stock – a well-

documented effect of rent regulation, see Diamond et al. (2019) and Kholodilin (2024). However, there is also a distributional aim but supply-side driven effect at play here, that is benefits accruing to owners and investors rather than protected tenants more commonly the subject of rent control policies. Support for this approach is found in Stacy et al. (2025).

2.5.4 Land Value Capture and Affordable Housing Finance

Land value capture (LVC) is the public sector capturing a share of the increase in land value that results from government actions (including infrastructure and urban design strategies) or regulations (including zoning changes and the granting of planning permission). Korngold (2022), in a Lincoln Institute of Land Policy report documenting seven LVC instruments across US jurisdictions, demonstrates that LVC mechanisms, including development impact fees, mandatory inclusionary housing, incentive zoning and betterment levies, are legally established and practically operational in a range of contexts. The OECD and Lincoln Institute (2022) Global Compendium of Land Value Capture Policies extends the coverage of LVC instruments and practices globally, to more than sixty countries and economies, and identifies five basic categories of LVC instruments that are deployed by governments in nearly every part of the world.

Land Value Capture (LVC) has much to offer as a financing model for affordable housing. Land value uplift resulting from planning decisions and other infrastructure is publicly-created land value. It can be recouped to pay for affordable housing provision, ahead of sale to a developer, without cost to general taxation. LVC is potentially the most equitable of models for funding affordable housing as it aims to draw as much as possible of the uplift created by public investment directly to the purpose of financing new supply, rather than allowing it to go to landowners as a windfall, or adversely affecting people with no stake in the development. A report on the model was published by the UNECE in 2017: Land value capture and housing affordability.

However, while promising much, the practice remains someway off. There is the problem of the "estimation uncertainty" of the "but-for" land value, i.e. the land value that would have existed had the public intervention not occurred. Landowners and the development industry are likely to have already factored anticipated land value uplift into land values and will be wary of LVC. In addition, LVC necessitates substantial administrative capacity, including a property valuation system, a cadastral record, and effective enforcement capacity. Korngold (2022) comments that "many, if not most governments, and especially small ones," lack such capacity.

LVC has relevance in the Cyprus and Paphos context, in the context of the planning system and the broader policy intervention framework discussed in Section 2.6. Firstly the building coefficient is already used as a planning instrument to enable increased density and the value to overhead development is already captured and spent by landowners and developers. Secondly the land value increment created by high demand in coastal Paphos is a significant value increment that is publicly created through the planning permission, infrastructure and regulatory regime, that creates value by enhancing risk and certainty for investors in the land market. In relation to the IMF’s (2024)

recommendation for land cost containment in the coastal districts of Cyprus, no LVC mechanism currently captures a portion of the land value increment created in Paphos through planning permission and infrastructure investment.

Community land trusts (CLTs) are non-profit organisations that hold land in perpetuity and sell the property to residents on long ground leases. This way land is kept affordable for future generations. The model is well established in the US and increasingly used in the UK (Calavita and Mallach, 2010). To date there are no CLTs or similar community held land models in Cyprus.

2.5.5 Policy Instruments in the Cyprus and Paphos Context

Since 2023, the Cyprus government has introduced a variety of supply-side and tenure supportive measures aiming to address housing affordability. These measures operate at three levels: fiscal incentives to owners who supply affordable rental stock, planning incentives to encourage development for affordable ownership, and a change to the reduced rate of VAT payable by qualifying affordable ownership purchasers.

The Affordable Rent Tax Incentive Scheme introduced late in 2024 offers full income and corporate tax exemption together with Special Defence Contribution exemption on rental income for three years to landlords of qualifying residential properties which are let at thirty per cent below market rent levels. In addition to these tax benefits, landlords will be able to claim enhanced capital allowances on new buildings and equipment. The proposed grant of €15,000 to €35,000 for the renovation of vacant dwellings of fifteen years or more, to be let affordably at the qualifying rent for a four year period, complements these incentives. Current instruments are designed to activate the existing supply of vacant dwellings, which comprises the highest stock of under-occupied dwellings in the EU at 71.3% (Eurostat, 2024).

For new build residential property, VAT at the reduced rate of 5% will be applicable on the sale of the cost of construction of qualifying new dwellings intended for the owner-occupier of the property and which are intended to be the owner-occupier's main residence. The property must not exceed 130m² in terms of covered areas and the consideration must not exceed €350,000. Otherwise, the standard rate of VAT of 19% will apply (e.g. for sales of investment properties to property investors / buyers or to foreign buyers). This is an important factor to be considered when identifying potential development opportunities across Paphos and in structuring a development to target owner-occupying local buyers as opposed to the more prevalent investor / foreign buyer market. Furthermore, there is current consultation on the grant of a waiver of the transfer fee (payable at present on sale of property) provided VAT is paid on the sale of the new property and anticipated abolition of the Special Defence Contribution on rental income under the 2026 tax reforms.

Structural instruments for increasing affordable housing supply are missing from the Cypriot scene. Fiscal instruments that currently dominate the scene are insufficient to tackle the development economics problems associated with affordable housing supply. The limited range of instruments

and policies currently in place aim to make housing marginally more affordable, but substantial changes are needed to address the affordable housing shortage. Most effective affordable housing delivery mechanisms are those that embed affordable provision within the development appraisal process. The affordability requirement is assessed in the appraisal process and, if breached, then fiscal incentives are used to bridge the affordability-viability gap. However, in many instances it is unlikely that the affordability-viability gap can be bridged by incentives, as the structure of the appraisal process is designed to produce certain outcomes based on market value. Another category of interventions that have not been explored in Cyprus are those that capture land value and could potentially address one component of the affordability-viability gap. In Section 2.5.4, IMF (2023; 2024) list supply-side planning reform and land cost containment among the key interventions that are required in Cyprus in order to address the affordable housing shortage. The policy implications that emerge from the findings of this research are presented in the Concluding Chapters. These findings are interpreted and synthesised in Section 2.6.

2.6 Conceptual Framework: The Affordability-Viability Gap Model

The five bodies of literature reviewed in this chapter are derived from vastly different fields of housing economics, construction costs, development feasibility, island specific development barriers and housing policy orientations. Each body of literature employs different research methods in seeking to answer fundamentally different research questions. Although the literature under review does not constitute a unified field, it is important to consider the points of convergence with other bodies of literature as well as points of tension and conflict. Three convergences with other bodies of literature provided a conceptual basis for the subsequent empirical investigation. Two other tensions with other bodies of literature influenced the chosen methodological approach. In addition, four research gaps in the field were addressed in the empirical sections of the study.

This leads to some general observations on the matter which will subsequently be concretized in an Affordability-Viability Gap Model in this section.

2.6.1 Convergences Across the Five Literature Streams

All five streams of research within the field are characterised by a methodological perspective that seeks to question the transferability of best practice that has been developed on the mainland or in other non-EU island locations; a structural perspective which seeks to understand the impact of foreign and investor demand on the model that seeks to explain residential construction activity in such economies; and an analytical perspective which seeks to couple affordability with feasibility on a project by project basis.

2.6.2 Tensions Requiring Methodological Resolution

In order to operationalise this framework, there are two tensions in the literature that need to be addressed methodologically. Firstly, the unit of analysis tension between the affordability literature and the feasibility literature. The affordability literature tends to look at the issue of housing affordability at the household level using measures of household income and expenditure and

whether or not that results in a cost burden on the household. The feasibility literature on the other hand tends to take a project based perspective on the issue of housing feasibility and look at issues such as cost stacks, residual land values and the returns to the developer.

The two "price" literatures—on the affordability of housing to households and on the economic viability of urban projects—have rarely been brought together at the key points where their findings have policy relevance: what is the price of a house that a household considers affordable, and what is the price of a project economically viable? A key aspect of the difference between the two answers has rarely been quantified. This study aims to bridge the two household and project price literatures. A dual-residual methodology is developed that derives the real project costs of land-use change and physical construction from the bills of quantities submitted for each project. These project costs are then used to compute a residual appraisal of the market and affordable prices of each project, expressed as a GDV.

This method of assessing dual residuals has antecedents in the UK planning "viability" literature (Harman, 2012), particularly in relation to development viability testing and the RICS Affordable Housing Market Report (2012b). In these contexts, the affordability–viability gap is assessed by undertaking a viability appraisal at differing value assumptions and determining if the scheme is potentially viable and able to absorb affordable housing obligations, when presented in the market. In this study the method is used to benchmark and investigate the affordability–viability gap in a dual-demand island market.

In contrast to the many observations made about the structural vulnerabilities of the island economies, there is no attempt in the literature to apply its framework to a cost analysis at the project level which is just the sort of study that model builders need for their feasibility studies. Similarly, whilst studies have been undertaken of the construction industry on the main islands and on small islands, the evidence shows that the cost of providing the services of the industry is higher on the small island than on the mainland; but again, there is no attempt to analyse the cost structure of the construction industry in the island.

Methodological expertise is embodied in the field of construction economics to isolate and measure specific dimensions of construction activity. Yet, such analyses are almost entirely absent from small island economies. While all the parametric models, benchmarking databases, and scale economies studies for construction have been conducted in large urban economies, there is an empirical void regarding building projects in small island economies. This study addresses this gap for individual projects.

2.6.3 Four Research Gaps

Even after a decade of research there are four important gaps in current knowledge that this paper addresses in its empirical contribution.

Four research gaps emerge directly from the synthesis above, and each is addressed by this study's empirical contribution. The first is an empirical cost data gap, particularly within small island markets across the EU, for which there is a lack of published project-level construction cost data. Some insight into the costs and premiums associated with thin markets is provided by Somerville (2001) and Armstrong and Read (2002), whilst aggregate figures are available (CYSTAT, 2024a) (PwC Cyprus, 2025). However, there is no published source that can provide a useable, disaggregated, project-level construction cost figure for a "new residential construction" specification within Paphos. This empirical cost analysis addresses this key data gap by utilising the published bills of quantities from a number of current and recently completed construction projects within Paphos.

A second gap can be described as a framework transferability gap. The mainstream affordability frameworks (ratio, residual income, 30/40 rule) and the standard feasibility frameworks (residual valuation, DCF) together with cost estimation tools (parametric models and benchmarking (NRM/ICMS)) have all been developed for large, fluid, single-demand markets. There is no empirical evidence to support their transferability to dual-demand, import-dependent, tourism-influenced island markets. The theoretical framework that is set out in this section draws on the island structural constraint concept (Briguglio, 1995; 2022) and the mainstream affordability and feasibility frameworks in a way not previously attempted for the EU island context.

There is a development scale gap. There is a lack of coverage of the scale of small to medium-sized residential developments (less than 40 units) in the construction cost and feasibility literatures. Somerville (2001) identified developments of this size as being the most cost-efficient scale in US real estate markets, yet went on to comment on the lack of supporting empirical research. Even studies which identify efficiency thresholds for developers turn up figures well above typical levels of output in Paphos. The main existing studies on construction economics in Europe focus on large-scale developments and there is little or no reference to developers of this scale in thin sub-markets such as Paphos. This study aims to provide some much needed empirical evidence at this relevant scale.

A fourth supply-side feasibility quantification gap exists in relation to the affordability-viability gap of land supply for housing, recognized in planning terms by Crook and Whitehead (2002) concerning English planning obligations and by the IMF (2023, 2024) concerning affordability problems of housing supply in Cyprus. However, this affordability problem has not been quantified from bottom-up project cost data for Paphos. Consequently, the size of the affordability-viability gap is unknown, the principal cost barriers cannot be identified and the quantum of intervention required to overcome the problem cannot be determined. What follows offers a basis for housing policy design from empirical project cost data.

2.6.4 The Affordability-Viability Gap Model: Architecture

An integrated framework of analysis of the Affordability-Viability Gap is presented in a stylised format in Figure 2.1, spelling out all the causal links between the variables dealt with in the five strands of literature that have been reviewed in the book. The five components of the Model are portrayed as a chain of causality. The island structural constraints are identified as the exogenous cause of the supply-side cost floor and the demand-side purchasing ceiling. The affordability-viability gap is shown to arise from the difference between the two ceilings. The space for policy intervention is shown in the policy intervention zone where interventions can take place to increase affordability so as to close the affordability-viability gap. The model is presented in Figure 2.1.

The first element outlines some of the key island specific structural features presented in section 2.4 constraining potential outcomes of policy interventions.

There are two types of cost floors. The first one has already been discussed, namely the demand-side cost floor. The second one is supply-side, namely the cost of the land acquisition price according to the dual market plus the hard costs (ICMS, etc.) and the soft costs and profit of the developer, all of them increased by the structural constraints.

Ceilings on consumption can be defined from both the supply side and demand side. This report identifies a third demand side ceiling which is the purchasing power of consumers expressed as debt-service as a percentage of income. The indicator is derived using Stone residual income approach set at a debt-service threshold of 30% of household income. At a time when the median household income is already down, real purchasing power is significantly further eroded.

The fourth dimension of the affordability-viability gap is the size of the gap itself: the difference between the minimum viable price per m² that the supply-side determines is necessary for a project to proceed, and the maximum affordable price per m² that the demand-side can afford. This "gap" is the focus of the research report and is positive (i.e. requires intervention by a third party or policy) where the minimum price to deliver is greater than the maximum price that households on the medium income can afford. The dual-residual methodology enables the size of this gap to be precisely quantified in terms of either the shortfall in residual land value or the shortfall in Gross Development Value (GDV) per m². The size of this gap can then be precisely located within the cost stack that determines the price at which housing is supplied and the price that households can afford to pay.

The 5th element is the "policy intervention zone", comprising supply-cost reduction instruments, demand-enhancement instruments and market-restructuring instruments, which are applied on the "floor" (price policy), on the "ceiling" (tax policy) or on the "dual market mechanism" (financial and tax policy).

The model in Figure 2.1 offers an alternative to existing affordability-feasibility models in three important respects. Most affordability models treat structural factors as providing a "back drop"

against which an affordable home may be created. The real obstacle to creating an affordable home is seen as being outside the demand or supply parameters of the affordability models, therefore a new approach is required. The model joins the affordability and feasibility affordability models at the project level by using a dual residual. However, in this model the residual is derived from actual project cost not from affordability criteria. The model is tailored to the dual demand, island market under investigation. Foreign demand, import dependency cost transmission and scale diseconomy constraints are built into the model. These are a fundamental feature of the model as opposed to the qualifications that they represent in existing frameworks. Three methodologies to apply the model to affordability and viability are illustrated using twenty-five residential development projects in Paphos and yield the first affordability assessments at the project level for this market.

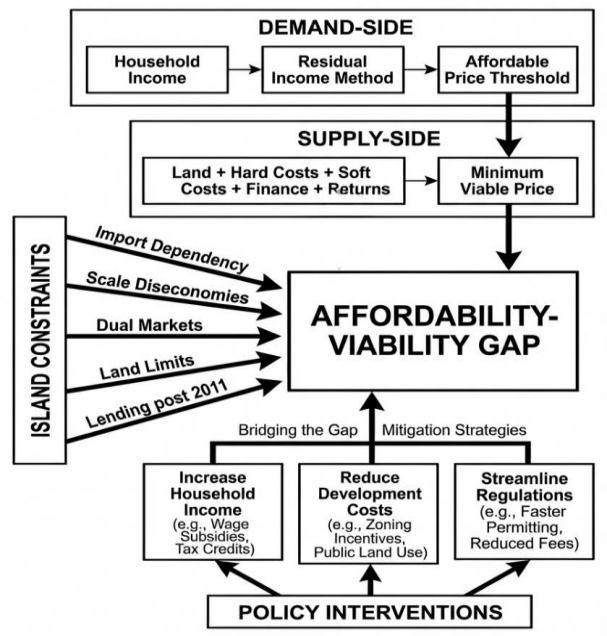

Figure 2.1: The Affordability–Viability Gap Model

CHAPTER 3: RESEARCH METHODOLOGY

The research methodology for addressing the affordability-viability gap issue in residential developments is highlighted in this chapter. The chapter is organised into seven sections. Section 3.1 discusses the philosophy underpinning this research and the research paradigm that has guided the researcher. Section 3.2 outlines the research design that was followed and explains how it relates to the broader framework that has been used as a blueprint for this study as outlined in Chapter 2. Section 3.3 discusses the sampling strategy that was followed for this study and also provides information regarding sample composition. This section explains how data was collected and analysed for the report. The methodologies used to collect the primary cost data, and any standardisation or scaling of the costs are explained in Section 3.4. Section 3.5 explains the methods used to analyse the cost data, including the dual-residual approach taken as the primary method of analysis for the report. Section 3.6 briefly outlines the ethical considerations made during the production of the report. Section 3.7 outlines the limitations of the methodology, and where possible details of the measures taken to mitigate these constraints.

3.1 Research Philosophy and Paradigm

3.1.1 Philosophical Positioning: Pragmatism

This study attempts to measure the affordability-viability gap for affordable housing using a hybrid model of objective and subjective criteria. The cost of reinforced concrete per m³ and the price of rebar per tonne are objective, measurable quantities that exist independently of the observer. However, how much any house is to be deemed ‘affordable housing‘ is a social and political construct that may vary considerably between different cultural, historical and economic contexts (Stone, 2006). The affordability-viability gap itself will exist as an objective fact measurable as the shortfall between the minimum price at which a developer is willing and able to deliver an affordable house and the maximum price at which a local household can afford to purchase it. It is the significance of this shortfall, and the reasons for its existence that will be entirely context dependent.

This hybrid character demands a research philosophy that can accommodate both measurement and interpretation without privileging one at the expense of the other. The pragmatist research philosophy, which is increasingly adopted in applied built environment research (Creswell and Plano Clark, 2018, Morgan, 2007, Kaushik and Walsh, 2019), acknowledges that both a positivist and an interpretivist approach to research investigation have roles to play in order to produce useful knowledge for the real world problems at hand. The principal purpose of this investigation is to develop empirical research that can inform the policies and decisions of the stakeholders involved with attempts to address the growing affordability problem in Paphos.

Using a pragmatist research methodology, the most appropriate methodological tools to answer the research questions were used without being constrained by specific paradigms (Johnson and Onwuegbuzie, 2004). A quantitative cost analysis of primary project data was conducted to determine the size of the "provision gap" and delineate its components. Secondary and market data

were analysed in order to locate the findings within broader trends associated with demand, price and policy implications for future provision. The study avoided the paradigmatic tensions that affect research that uses data and methods within a mixed methodology approach but within a purely positivist or purely interpretivist research framework.

The paper does not subscribe to a pure positivist or interpretivist view of methodology; such a position is not tenable given the socially constructed nature of affordability thresholds, the political economy of land markets, and the Cypriot planning institutional context. Nor does the paper treat the core analytical object of the study, a specific numerical value representing land costs, as proper objects of inquiry from an interpretivist perspective. Instead, the paper is predicated upon a pragmatist vantage point and employs both a rigorous method for measuring land costs while maintaining an interpretative stance vis-a-vis the land development policy context in Cyprus.

3.1.2 Theoretical Framework Guiding the Research

The study is underpinned by a synthesis of three theoretical lenses drawn from the literature. This is presented in Chapter 2 and translated into the Affordability-Viability Gap Model.

While an overall macroeconomic approach to studying economic vulnerability and resilience was initially pursued in Vulnerability-Resilience Framework for Small Islands (1995 and 2022), some specific aspects thereof are applied at micro or sector level in this study. Import dependence on basic materials for construction, scale diseconomies operating in the Paphos market and sensitivity to fluctuations in demand are factors which shape the cost structure of the Paphos market. Therefore, cost structures under study are not those of large economies on the continent but those of a small local market.

Secondly, the Residual Income Theory of Affordability (Stone, 1993; 2006; Burke et al., 2014) identifies the demand-side, purchasing ceiling. This theory looks at what price a household can afford to pay for a house or apartment whilst at the same time retaining sufficient residual income to meet other needs. The end result identifies the maximum Gross Development Value (GDV) for a project that can be on-sold to the local market.

Third, the literature on Land Economics and Supply Elasticity (Saiz, 2010; Glaeser and Gyourko, 2018) explains the mechanisms by which certain geographic and regulatory barriers to development (such as land supply inelasticity and regulatory limits to density) translate demand shocks into higher prices instead of additional supply in the near term. In the case of Paphos, this results in a persistent rather than a cyclical affordability-viability problem.

The markets for small island locations are small and hence inelastic in supply. The demand for such locations is frequently described by a dual market function. Small markets of this type frequently get caught in a persistent affordability-viability problem which the forces of the market may or may not be able to overcome. These issues are discussed in more detail in Section 3.5.

3.2 Research Design

3.2.1 Overall Design: Two-Phase Quantitative-Dominant with Secondary Data Contextualisation

The methodology of the study is quantitative-dominant. The research methodology consists of two phases.

Phase 1, the construction cost benchmarking phase, constitutes the empirical core of the study. It comprises the collection, standardisation and analysis of primary cost data from 25 residential development projects in Paphos. The raw cost data, obtained in the form of priced bills of quantities (BoQs), was mapped to a standardised 14-bill classification and subjected to two layers of normalisation. The first layer was specification standardisation through the removal of non-standard amenity costs ("extras stripping"). The second layer of normalisation was achieved by time normalisation to a common price benchmark of January 2026, by means of the relevant Price Index of Construction Materials as published by the CYSTAT. The normalised project cost data were presented in the form of construction costs per m2 of Gross Internal Area (GIA) unadjusted for the project size and cost, as well as cost adjusted to a specific cost level. The main advantage of the constructed project cost database is that the costs of the various elemental construction specifications can be compared to those of other projects of various sizes. The first research question is thus addressed, namely what the cost structures of the elemental construction costs of local residential development projects are and how do these compare with similar studies undertaken in the Mediterranean region.

The 14 bill classification system adopted in the Cost Maps, is the conventional Cyprus quantity surveying classification system and not the RICS New Rules of Measurement (NRM1) or the International Construction Measurement Standards (ICMS) elemental classification system, discussed in Section 2.2.1. Five principal arguments have been developed to justify the adoption of the traditional 14 bill classification system for Cost Maps instead of the two alternative approaches for classifying building work noted above. Firstly, all the 25 sampled BoQs have been produced in accordance with the conventional QS bills classification system used by local and international QS firms in the Cyprus construction market. Secondly, NRM1 is a UK based standard for measurement developed for application to construction practice in the UK. Although RICS (2021) states that all the elements of NRM1 have been tested and validated in practice, it also admits that local measurement conventions may differ and therefore the standard is "principally based on UK practice and may not fully apply in all other markets". The Cyprus construction market is a market that conducts the procurement and pricing of construction work within a hybrid of Greek civil-law conventions and post-independence British influenced provisions. In addition, the classification system used for the bills of quantities in the Cyprus construction market has developed and evolved in line with local construction procurement practices. Thirdly, the process of reclassifying the 14 BoQs into NRM elemental categories would have introduced classification judgement errors, particularly in relation to the detail required for the project planning and monitoring stages of the

construction information flows. The reclassification would have also resulted in a loss of the high level of detail in the local organisation of the construction information, i.e. the separation of External Insulation (Bill 9) as a distinct bill to reflect the NZEB regulations for the Mediterranean type of construction in Cyprus that NRM1 does not make. Fourthly, the consistent application of the 14-bill organisation of the BoQs to the 25 studied projects reduces the potential for cross-classification distortion as all the projects were compiled by Cypriot QS firms in accordance with the same QS convention. Fifthly, the study reports costs on a cost per m² GIA as the primary measurement parameter, consistent with common practice in the measurement of construction information using both the NRM1 and ICMS building construction classifications.

The affordability–viability assessment phase (Phase 2) utilises the developed cost database from Phase 1 to calculate the land cost, the soft costs (professional fees, government levies, VAT and finance costs) plus the profit the developer makes on the sale of the house and the market Gross Development Value (GDV) for each project. These values are then used to calculate the dual–residual values for each project studied. Phase 2 addresses the second and third research questions: what is the size of the gap between viability and affordability for each household income quintile and how do the small island context and specific project characteristics affect the development's feasibility. The land costs, the GDV and the soft costs are separately obtained and imported into the cost database at the point of analysis.

The two phases are brought together at the stage of interpretation, where the quantified gaps identified in Phase 2 are broken down using the different types of cost structures identified in Phase 1 and then explained using the relevant structural, market and institutional factors uncovered from secondary sources. This interpretation takes place in Chapter 5 (Discussion). The measured gap is connected to the mechanisms identified in the literature review and to the policy instruments reviewed in Section 2.5.

3.2.2 Justification for Design Choice

The research design is quantitative-dominant. The affordability-viability gap can only be examined in detail using specific project-level data. In turn, the two quantitative approaches of residual income to affordability (Stone, 2006) and residual valuation to feasibility (Millington, 2000, Isaac and O'Leary, 2012) only yield measurable results.

In terms of policy contribution, the study needs to get at the "gap" in some detail (i.e. identify specific cost-components driving the "gap") and have some estimate of the scale of intervention required to close the "gap". Qualitative research methods can help gain better understanding of issues around affordability pressures on residents, as well as the inner workings of the planning system (e.g. institutional dynamics, transaction costs etc). However these methods are not sufficient to address the research objectives.

Thirdly, this thesis is underpinned by a pragmatist philosophical perspective which enables the utilisation of secondary data analysis without the necessity for a qualitative component within the research. Secondary data consists of data that has already been gathered and published within reports and analyses produced by institutions, organisations and commercial companies including government statistical offices and market analysts. Within development appraisal, this approach is frequently used and often referred to as residual valuation. Such an approach typically employs a quantitative model with market analysis information inputted (Wyatt, 2013; Havard, 2008).

3.2.3 The Dual-Residual Appraisal Framework

This paper offers a new approach to identifying affordability in valuations by incorporating insights from the feasibility literature at the project level into the appraisal process and undertakes two residual valuations for each project.

The three methods for assessing a potential residential development site, are to apply a standard residual valuation model, to assess the development viability of the site based on the actual GDV of the project or a market derived GDV and to calculate the residual land value for the project. The development viability of a project is a concept frequently discussed in property research such as Millington (2000), Isaac and O'Leary (2012) and Wyatt (2013).

An additional residual model is provided using the same construction cost stacking methodology but using the maximum GDV for the site that a median-income household in Paphos could afford to pay. This residual model calculates the affordable residual GDV (residual) and then tests the viability of the project at affordable residual levels and calculates the shortfall.

This calculates the affordability-viability gap (the "gap"), the difference between the residual valuations at market GDV and at affordable GDV for the same project. This figure highlights how much of a development's market viability rests with the ability of potential buyers to pay a premium above the affordable threshold for the local market. It also clearly outlines where the greatest amount of the GDV is being spent within the development's overall cost stack.

This framework has precedent in the UK planning viability literature, and in particular within the school of thought regarding the testing of development viability. Typically such appraisals might be compared at varying value assumptions in order to determine whether a development is likely to be able to fund the provision of Planning Obligations including affordable housing etc. Here, however, such a logic is applied to a distinct question, namely that of the size of the affordability–viability (AV) gap in a dual demand market.

The dual-residual approach is then utilised in Phase 2 to derive improved estimates using the cost data developed in Phase 1 and the additional variables detailed in Section 3.2.1.

3.3 Sampling Strategy

3.3.1 Purposive Sampling Rationale

The research does not use probabilistic random sampling but instead employs a research sample using purposive, criterion-based sampling. According to Patton (2015) and Tongco (2007), the use of purposeful sampling aims to gain information richness in terms of studying a particular phenomenon in depth. Purposive sampling is frequently used in real estate research to gain access to individual projects on an ad-hoc basis, because of the highly commercial and sensitive nature of the information required. As such, project data are accessed on an individual basis in order to assist cost benchmarking or feasibility assessment (RICS, 2021; Ashworth et al., 2013).

The use of non-random sampling methodology in this study is justified on the grounds of both practicality and theoretical basis. The research question is to identify the costs of residential developments. If a random sampling methodology was to be adopted this would introduce unnecessary typological variables which would confuse the key characteristics of the target market segment which is under investigation in this study. Instead, a purposive methodology is used to investigate the Paphos real estate market within its specific environment by studying projects that meet specific inclusion criteria and can therefore be taken as representatives of the target market segment.

The paper is based on an epistemological commitment to purposive sampling and adopted a pragmatist approach and the logic of analytical generalisation. The paper's aims are to illuminate the way in which an affordability–viability gap emerges and how it operates within a specific policy environment for residential real estate developments in Paphos and to examine and explain the mechanisms behind that occurrence. The paper's findings cannot be generalised to assert that all Cypriot real estate developments will possess similar cost structures; they can, however, be generalised to other contexts in which similar theoretical elements are present and in which the same methodology has been employed for data gathering and analysis (Wyatt, 2013).

3.3.2 Inclusion and Exclusion Criteria

The projects to be studied were selected for the research on the basis of certain inclusions and exclusions. There were five inclusions and five exclusions criteria. The criteria were used in order to select a homogeneous sample of projects and at the same time to capture the full range of cost variations in the Paphos residential development market.

The first criterion for inclusion in the sample is that all projects are classified within the apartment (multi-unit) category of the Typology, which is here taken to be medium-density multi-storey apartment developments. The multi-storey apartment has become the most common form of new residential construction in recent years, representing the main source of new housing supply entering the housing market, in terms of volume, and superseding the more traditional detached-villa model (PwC Cyprus, 2025; CYSTAT, 2024a). The projects included in the sample vary in size. While the largest project in the sample comprises thirty-six apartments, the smallest contains only four

apartments. All projects, therefore, fall within the middle range of the scale, which comprised projects of a similar nature to those shown in Figure above (10-36 units). In terms of the number of units in the smaller end of the scale range (4-10 units), the bulk of the projects developed by SMEs and private developers are included in the sample. These small projects are often undertaken by small teams, and while there are many SMEs and private developers involved in the residential construction sector, the few corporate developers involved in the sector tend to dominate in terms of the volume of projects that they develop and complete. Including all the projects within the sample's size range allows for a full evaluation of the scale impacts on unit cost efficiency, rather than looking at the efficiency of projects that fall within an artificially narrow scale range (Ball, 2003; Somerville, 2001).

The second criterion concerns the geography of the Paphos District. This comprises the urban centre of Paphos, the coastal strip and the rest of the Paphos District, excluding the area of Polis, extending into the peri-urban and rural areas. The majority of the projects included in this research are found in the Paphos, Geroskipou, Pegeia, Mouttalos and Chloraka Municipalities. These municipalities comprise the core areas of residential development within the Paphos District, which is where the greatest levels of interaction occur between local and foreign demand for real-estate. The mountainous villages of Paphos District were not considered for this research, as the land prices in these areas are lower than in the coastal strip and the demand profile is quite different. The primary distinguishing factor is that these villages offer a tourism-free environment, and as such the buyers' profiles differ to those found purchasing real--estate in Paphos.

The third criterion screens for the passage of time to ensure that only the correct timeframes are captured within the sample. As such, only projects with bills of quantities submitted between October 2019 and November 2025 have been included. This timeframe captures the pre-COVID baseline (late 2019-early 2020), the "lockdown" period (2020-2021), the subsequent construction cost inflation (2022-2023) and the stabilisation of construction costs (2024-2025). Projects prior to late 2019 are not included as these will relate to the cost structure of previous market eras and are not relevant to this piece of research. Using the inflation adjustment methodology outlined in Section 3.4.5, the effect of time has then been neutralised to enable meaningful comparison.

The fourth criterion used in the search was that projects must be completed in terms of data. The criterion that projects have priced Bills of Quantities with sufficient detail to allow the information to be populated in the 14 bill categories defined in Section 3.4.2 meant that projects for which only totals had been completed, or where the BoQ tender information was not adequate for some reason, were excluded from the sample.

The fifth criterion concerns the procurement basis of the projects. Only those projects that were procured, through competitive tendering or by negotiated contract with a priced BoQ, are considered for inclusion in the sample. All cost data in the sample is actual; whether determined competitively or by professional negotiation and priced, the focus is on real data and how it is used in decision making.

The study does not include single-family "villas" (a bespoke and non-scalable building type), social or sub-market cost housing (a building type that operates in a different cost and procurement environment), mixed-use developments for which an appropriate separation of residential and commercial costs was not possible, and projects for which a complete BoQ was not available and/or could not be expressed in the standardised bill format developed for the sample.

3.3.3 Sample Composition

The final sample comprises 25 projects. This section describes the sample's composition across the key dimensions recorded in the project database.

The sample of case study projects included in this report varies in terms of development size from four dwellings to thirty-six dwellings. The spread of the sample across the different development sizes is demonstrated by the figure, where seven of the sample projects (28%) were small developments of 4–8 dwellings, ten (40%) were medium-sized developments of 9–16 dwellings, and the remainder (32%) were larger developments of 17–36 dwellings. This spread across the sizes of new residential developments active in the Paphos residential development market reflects the fact that whilst there are some large-volume house builders, the majority of new apartment schemes are provided by smaller-medium enterprises (SMEs) that build relatively small-scale projects.

Of the 25 sampled projects, thirteen (52%) are located in the Paphos urban centre, seven (28%) in the urban-coastal or coastal zones, three (12%) in rural locations and two (8%) in other parts of the Paphos district. The urban-dominant distribution reflects where new multi-unit residential development is currently taking place, largely within the municipal boundary of Paphos and immediately adjacent to it.

By developer type, eleven projects (44%) were produced by corporate developers producing more than 100 units per year across Cyprus, ten projects (40%) by SME developers producing 5-100 units per year, and four projects (16%) by private individuals commissioning single projects. This distribution reduces single-firm idiosyncrasy bias and captures the full organisational and purchasing power characteristics of the Paphos construction sector.

By procurement route, nineteen projects (76%) were procured through competitive tender with priced BoQs, five projects (20%) through negotiated contracts with priced BoQs, and one project (4%) through a negotiated contract on special terms. In the Cypriot construction industry, the majority of the projects for multi-unit residential developments are procured by competitive tender with priced Building Quantities (BoQs).

The sample of projects has been selected from October 2019 to November 2025. There are three projects from late 2019, one from 2020, two from 2021 and two from 2022. Four projects have been selected from 2023, five from 2024 and eight from 2025. There are more projects from 2024-2025 as it has been generally more challenging to obtain relevant data from the firms concerned for earlier

years. This sample therefore provides an excellent test of the methodology for inflation adjustment over a period with high cost increases (2021-2023) and more modest increases (2025).

Table 3.2: Project Sample - Summary (n=25)

Code	Location	Dev Type	Dev Scale	Procurement	BoQ Date	Apts	GIA (m²)	Total (€)	€/m² GIA
P001	Urban	SME Developer	Small (5–20 units/yr)	Competitive Tender (BoQ)	Aug 2025	8	754.4	1,608,675	2,132
P002	Urban	SME Developer	Medium (20–100 units/yr)	Competitive Tender (BoQ)	Nov 2024	17	1,965.8	4,391,658	2,234
P003	Urban	Private Individual	Micro (<5 units/yr)	Negotiated (BoQ)	May 2021	11	612.6	1106000	1,805
P004	Urban	SME Developer	Medium (20–100 units/yr)	Competitive Tender (BoQ)	Dec 2019	12	1,242.5	1,726,969	1,390
P005	Urban	SME Developer	Medium (20–100 units/yr)	Negotiated (BoQ)	Dec 2019	9	730.8	1,278,001	1,749
P006	Urban	SME Developer	Medium (20–100 units/yr)	Negotiated (BoQ)	Jul 2020	9	949.2	1,528,700	1,611
P007	Urban	SME Developer	Medium (20–100 units/yr)	Negotiated (BoQ)	May 2024	8	923.2	2,439,305	2,642
P008	Urban	SME Developer	Small (5–20 units/yr)	Competitive Tender (BoQ)	Sep 2025	26	1,372.0	2761550	2,013
P009	Rural	Private Individual	Micro (<5 units/yr)	Competitive Tender (BoQ)	Jul 2025	6	576	1308000	2,271
P010	Urban	Corporate Developer	Large (>100 units/yr)	Competitive Tender (BoQ)	Nov 2025	28	1,641.6	3197126	1,948
P011	Rural	SME Developer	Small (5–20 units/yr)	Competitive Tender (BoQ)	Mar 2025	8	575.7	1198000	2,081
P012	Urban-Coastal	SME Developer	Medium (20–100 units/yr)	Competitive Tender (BoQ)	Jun 2024	36	3,068.8	6316797	2,058
P013	Urban-Coastal	Corporate Developer	Large (>100 units/yr)	Competitive Tender (BoQ)	Nov 2024	20	1,720.4	3655000	2,124
P014	Urban	Corporate Developer	Large (>100 units/yr)	Competitive Tender (BoQ)	Jul 2024	8	1,362.3	2103526	1,544
P015	Urban	Corporate Developer	Large (>100 units/yr)	Competitive Tender (BoQ)	Jan 2025	10	817.3	1589487	1,945
P016	Urban-Coastal	Corporate Developer	Large (>100 units/yr)	Competitive Tender (BoQ)	Apr 2025	16	1,228.6	2,700,590	2,198
P017	Urban-Coastal	SME Developer	Small (5–20 units/yr)	Competitive Tender (BoQ)	Feb 2025	14	977.0	2200000	2,252
P018	Rural	Private Individual	Micro (<5 units/yr)	Negotiated (BoQ)	Aug 2023	5	448.8	1,054,495	2,350
P019	Urban-Coastal	Private Individual	Micro (<5 units/yr)	Competitive Tender (BoQ)	Oct 2023	6	579.6	1535951	2,650
P020	Urban	Corporate Developer	Large (>100 units/yr)	Competitive Tender (BoQ)	Sep 2023	8	688.1	1659000	2,411
P021	Urban	Corporate Developer	Large (>100 units/yr)	Competitive Tender (BoQ)	Jun 2023	16	1,202.7	2220000	1,846
P022	Coastal	Corporate Developer	Large (>100 units/yr)	Competitive Tender (BoQ)	Nov 2022	13	1,094.8	2298534	2,100
P023	Urban	Corporate Developer	Large (>100 units/yr)	Competitive Tender (BoQ)	May 2021	4	461.0	890000	1,931
P024	Urban-Coastal	Corporate Developer	Large (>100 units/yr)	Competitive Tender (BoQ)	Jun 2022	15	705.8	1600000	2,267
P025	Urban-Coastal	Corporate Developer	Large (>100 units/yr)	Negotiated (Special Terms)	Oct 2019	31	3,677.1	6,796,130	1,848

3.3.4 Representativeness and Sample Size Adequacy

This information is not publicly available. What is publicly available is the number of authorised dwelling units (single dwellings, town houses and multi unit developments such as apartments) which, according to CYSTAT (2024a) numbers 1,184 dwelling units in Paphos district in 2024. However, the number of multi unit residential projects (apartments) that commenced planning and construction between late 2019 and late 2025 in Paphos District is approximately 50-70 projects. As a result, the sample of 25 projects studied in this research represents approximately 25-40% of the total population of dwelling apartment projects that commenced planning and construction in Paphos District during this period of time. This report does not claim to be a census of the entire market but the sample used is considered representative and includes a cross section of varying price points.

The sample comprises 25 projects supplied by four different data sources (two QS firms and two developers). The issue of sample size for benchmarking construction costs in thin markets such as small islands is problematic and no formal standard is available. However, the sample size is sufficient for achieving progressively stable estimates of the mean of the sample. Section 3.4 describes the results of like-for-like comparisons and how the sample size is sufficient for specification control, the key issue from the RICS guidance on cost analysis (RICS, 2021). Section 3.4.4 outlines the baseline procedures that were used to standardise project cost after full adjustment for variables that affect the cost of the different projects. The removal of extras for different levels of amenities for comparable projects of different quality improved cost comparability.

The potential bias in access-dependent purposive sampling – that data providers (the sample) may differ in important ways from non-participants – was addressed in two ways. First, the sample drew on projects from four different sources: two QS firms and two developers. The projects were at all scales of developer, were procured by different methods and were located in different parts of the district. Second, the two QS firms concerned provided data for 19 of the 25 projects in the sample. The firms of the clients of the two QS firms concerned were also contacted and included as a non-participating firm in the study.

3.4 Data Collection

3.4.1 Primary Data: Sources and Access

The primary cost data were obtained from four sources, all provided under formal confidentiality agreements with anonymity of both project and firm maintained within the resulting report. Copies of the non-disclosure agreements are included in Appendix A.

For this cost benchmarking study, the majority of the data was provided by two independent quantity surveying practices, QS Firms A and B, who together contributed 76% (19 out of 25) of the projects used in the study. Twelve of the projects were sourced from QS Firm A, an independent quantity surveying practice with a large portfolio of current and completed projects in Paphos and Limassol. The remaining seven projects were sourced from QS Firm B, an independent Paphos focused QS practice. Multiple sources of project data are particularly valuable for a cost benchmarking study as

the typical source of project data for a developer client may not be as comprehensive as the data provided by a quantity surveying practice. QS Firm A conducts substantial quantities of quantity surveying services for a number of clients in both Paphos and Limassol and can therefore provide a valuable cross section of consistent data required for cost benchmarking purposes (Ashworth et al., 2013).

The third and fourth sources of data come from two development firms, referred to herein as Developer A and Developer B. Developer A is a large corporate developer constructing over 100 units per year, and provided three projects within the study for analysis. Developer B is an SME developer who is active in the Paphos urban market and provided three additional projects within the study. The data provided by these two developers is used within the study for two key purposes. Firstly, it provides primary data for the analysis of those projects not analyzed within the study from the QS firms. Secondly, it provides a further validation reference against which the reported cost structures from the QS firms can be checked for consistency. Where data was available from both the QS firms and the developer, the QS firm data was used as the primary data set as the QS firms are independent cost certifiers.

3.4.2 Bill of Quantities Structure: The 14-Bill Classification

The priced Bills of Quantities from the four sources of data were organised and mapped to a standardised 14-bill classification, i.e. Foundation Bill, Groundworks Bill etc., in line with the Quantity Surveying conventional approach to the organisation and pricing of residential construction works, standard practice within the Cyprus construction industry. The NRM elemental structure is not reflected in the local QS conventional classification system used for the pricing of the works from the 25 selected residential projects. The classification system enables the total construction cost of the works to be reported. The 14 bills are divided accordingly between those to be priced by the main contractor for the measured works scope of the building and the fourteen the Bill that includes the works of the nominated sub-contractor and the prime cost (PC) sums.

Bill 1-13, the main contractor's works breakdown is set out below: Bill 1 (Preliminary Works) Includes the site preparation works such as the demolition of structures, site clearance, removal of trees and other obstacles, site establishment, off-site manufacture of components, the design and construction of all temporary works, all costs associated with insurance and health and safety and the contractor's fees for the project management of the various elements of the construction process. Bill 2 (Earthworks) Includes all excavation, backfilling, grading and site compacting including the removal and/or disposal of all excavated material. Bill 3 (Concrete Works) Includes all in-situ reinforced concrete including foundations, columns, walls, footings, raft foundations, raft and waffle slabs, walls, steps, balconies, stadia, ramps, cores, staircases, walls and retaining walls. It also includes slab on ground, enlarged beam pockets, beam pockets, brick panel bases and all associated concrete works. Bill 4 (Brickworks) Includes all masonry infill walls, brick panels, built up walls, brick panel bases and all associated brickwork details. Bill 5 (Plastering) Includes all internal and

external render finishes, screeds and proprietary plaster systems. Bill 6 (Waterproofing and Insulation) Includes all damp-proofing membranes, roof waterproofing and all thermal insulation including wall insulation, floor insulation and ceiling insulation and tanking of areas as specified. Bill 7 (Dry Wall and Ceilings) Includes all plasterboard partitions, built up partitions, all suspended ceilings and dry-lining systems. Bill 8 (Floor and Wall Coverings) Includes all tiling, terrazzo, natural stone cladding and associated fixing and bedding, timber flooring including underlay, adhesive and screeding, carpet, laminated flooring, cork, linoleum, PVC coverings and matting. Includes all coving required to conceal joints between ceilings and walls. Bill 9 (External Insulation) Includes all external thermal insulation composite systems (ETICS) as detailed. Bill 10 (Paint Works) Includes all internal painting, varnishing and specialist coatings. Includes all external painting, varnishing and specialist coatings. Bill 11 (External Works) Includes all new landscaping, new paving, new boundary walls, car parking areas, new communal amenity areas, swimming pools and all associated external works. Bill 12 (External Drainage) Includes all below ground drainage including manholes, connections to existing drainage systems and new stormwater systems. Bill 13 (Builder's Works for Services) Includes all builder's work attendant upon the mechanical and electrical sub-contractors. Includes all associated work such as all required chasing and forming of openings in floors, walls and ceilings and making good of any damaged surfaces to receiving surfaces.

The classification contains a positional rule. Bills 7 and 8 are reversed from the typical QS order used in Cyprus. In the standardised mapping, Dry Wall and Ceilings were assigned to Bill 7 and Floor and Wall Coverings to Bill 8. This was critical in order to reverse the bill positions back to those observed in the 25 studied construction contracts and allow for meaningful comparison between them.

Bill 14 (Provisional and Prime Cost Sums) comprises costs for specified sub-contractor work and material allowances within the main contract price, which have been established as provisional or PC (Prime Cost) sums and are not included within measured quantities. Typical items would include mechanical services, electrical services, lift installation, aluminium façade and glazing, kitchen and bathroom fit-up allowances, and other specialist trade allowances. Bill 14 is provided in addition to Bills 1–13, each with distinct procurement strategies. Bills 1–13 include the competitively tendered or negotiated building works costs (main contractor works), whereas Bill 14 includes allowances for sub-contractor work that may exceed the provisional sums included within this Bill. A detailed breakdown of costs and the associated costs per m² are outlined, including Bills 1–13 to illustrate the main contractor's building works costs.

For the items, originally documented under the same project in the BoQs but with different bill number or classification, the items were reclassified to fit within the 14 bills structure, but with proper verification that the items were correctly mapped and cost allocated to the appropriate bill. All the bill-level detail for the full set of 25 projects is available in the spreadsheet file in the sheet named B-All Bills. This sheet contains the full bill-level information with original and discounted values as available.

3.4.3 Discount Treatment

Of the 25 projects studied, 11 incorporated the main contractor discount as a fixed amount or percentage off the tendered BoQ in the tendering process. The remaining 14 projects were either awarded at the tendered price or the price was negotiated with the contractor prior to the tender process with the competitive reduction incorporated in the tendered price.

These discount amounts have been recorded against the individual 14 bills as well as the two totals (original invoice and net invoice). All costs subsequently calculated are based on these net invoice figures, expressed per m², per apartment and as a "rebased baseline". The original costs have been recorded for historical purposes to allow comparison of the discount achieved through different procurement methods in the future.

3.4.4 Area Measurement Methodology

Measurements of floor areas in this study are in accordance with the International Property Measurement Standards (IPMS) issued by the International Property Measurement Standards Coalition (IPMSC). The IPMS for Property Evaluation (IPMS 2) has been used in conjunction with local measurement practices, common to Cypriot residential developments, to determine the Gross Floor Area (GFA).

Four area metrics are recorded for each project:

Net Internal Area (NIA) of the dwelling **(IPMS-A)** is the usable floor space inside the dwelling, excluding areas of common space, elements of the structure and services risers. Where available, IPMS-A figures have been sourced from the developers' sales brochures. As IPMS-A figures are the measure that determines the saleable area of the dwelling and hence the price of the dwelling, it is considered to be the market consistent figure to include in the series. In some cases, the floor plans provided by the architects have been measured to determine the IPMS-A.

The indicator **IPMS-B** has two dimensions of covered areas and unconvered areas (covered verandas, covered terraces and balconies; open balconies, unconvered terraces). Both are measured separately, because there are differences in costs for construction and in market value weights.

IPMS-C (Common Area) scope of work includes all of the Common Areas of the development including; entrance lobbies, stairwells, corridors, lift lobbies, plant rooms and refuse stores. Also included are the communal areas around amenity facilities such as the surrounds to pools, gymnasiums etc and roof terraces as applicable. The common area percentage can vary greatly from project to project as a result of the individual scale and configuration of each development, it is best to refer to the architectural plans for each specific project to determine this.

In the analysis, Gross Internal Area (GIA) is treated as equal to the sum of IPMS-A (all units), IPMS-B (covered and uncovered areas) and IPMS-C (common areas). This is the denominator for all costs per square metre throughout the report, adhering to the guidance on cost benchmarking provided by

the RICS (2021). Costs per square metre are therefore provided relative to Gross Internal Area, facilitating comparable analysis of different project scenarios.

When using areas extracted from a building company's brochure there is a risk of inconsistency in measurement due to the figures having been rounded off in the brochure and / or having been measured to different criteria to the architectural plans. On checking against the drawing derived measurements any discrepancy was found to be within a +3% error which for cost benchmarking purposes is considered to be acceptable error (RICS, 2021).

3.4.5 Baseline Standardisation: Specification Adjustment

Cost data have been collected and analysed for 25 individual construction projects of varying size and scope. These projects have been used to derive an average construction cost per m² for residential real estate projects. Some projects are simple residential floor-by-floor developments with a 24-hour concierge service. Others are more luxurious with underfloor heating, exterior finishes, smart home equipment and other sophisticated features. An average cost per m² for these various projects is dangerous and prone to "specification confounding" (Flanagan et al. 2005) whereby the basic construction cost to the affordability of a project is obscured by the differing project requirements for materials and labour. In order to address this requirement basic construction costs have been determined for each project. These basic construction costs have then been used to generate an average construction cost per m².

To address this issue to some extent, a baseline standardisation is employed, in order to remove the identifiable cost of the non-standard "extras" from the individual project. This removes the premium value of the additional amenities and produces an adjusted base cost for the equivalent building, constructed to a standard residential specification. The use of baseline standardisation is well established within the cost planning practice (Ashworth et al., 2013; Smith and Jaggar, 2019) and Cost Planning Book (RICS, 2021). It allows non-standard items to be either excluded or accounted for separately and reported on in order to facilitate meaningful comparison between the projects under consideration.

A total of 15 "extras" were captured, falling into 15 different categories of amenities. Each amenity was recorded as binary data (i.e. "Y" or "N") indicating whether it was offered. The amenities captured included communal swimming pool or private roof pools, underfloor heating or photovoltaics, roof gardens or penthouse terraces, BBQ facilities or HPL/premium cladding on facades, elevators, water features, bicycle parking or gymnasium, smart home automation, sauna or spa facilities, and premium landscaping. A further 10 separate categories were captured for smart home features. In addition to the amenities and smart home features, basement parking (yes or no) and EV charging stations (yes or no) were recorded.

For each of the identified extra costs a project specific cost has been determined using one of two approaches. The first approach has been to determine the specific cost from the BoQ where the

amenity has been listed as a discrete extra. In many cases this would include items such as a swimming pool, elevators and solar panels. The second approach has been to determine the cost where the amenity has been incorporated into the BoQ but not able to be costed out separately. An example of this would be premium external façade panels being incorporated into the external works bill or upgraded landscaping being incorporated into the standard landscaping bill. The cost of these items has been estimated based on professional judgement of comparable items on other current and completed projects in the sample as well as current market costs of the item. Each identified extra cost, the method used to determine the cost and the estimated cost have been recorded in the project database.

The adjusted base cost is calculated as:

Adjusted Base Cost (€) = Grand Total (Bills 1-14) − Total Extras Cost (€)

This is then expressed as an adjusted cost per m² GIA:

Adjusted Base Cost per m² = Adjusted Base Cost (€) / GIA (m²)

Five sources of variation are highlighted that cannot be removed by baseline standardisation.

When calculating the adjusted base cost of the building from which extras have been removed, the direct cost of the amenity is removed from the "extras" cost, but the indirect structural costs that the amenity imposed on the base building are not reversed. Therefore, the costs of the additional reinforced concrete, additional rebar, and additional waterproofing to the roof slab are not reversed when removing the rooftop swimming pool from the cost of the extras. Similarly, the additional screed depth, modified floor build up, and additional electrical distribution capacity to afford the increased power required for the underfloor heating are not reversed when removing the cost of the heating system from the extras. As a result, the structure of the building from which extras have been removed retains a degree of structural over-specification for a building that was designed and specified to the standard building specification, but for which no premium amenities have been included from the start. This means that the true baseline cost of a building that has been designed and specified for affordable housing, without any premium amenities, is lower than the adjusted base cost shown above. Thus, the adjusted base cost shown is an upper-bound or a conservative estimate of the affordable baseline. The post-hoc, completed design, specification adjustment is inherently limited and results should be treated with considerable caution, purpose-designed baseline schemes representing a far better basis to determining construction costs. However, some empirical insight can nonetheless be gained into the costs associated with building taller residential buildings. The empirical equivalent of a nearly zero extras specification was P014 with extras count of three flagged amenities having no extras cost because all three items were treated as standard specification for a building of this size and depth. The lowest adjusted 2026 cost was achieved on P014 at €1,557/m², 26% below the sample mean. Other factors such as the involvement of a large, well-established corporate developer, a competitive tender process, the urban site and that the building was five

storeys above ground contributed to this low cost. However, the most appropriate comparator for a design team seeking to establish a baseline cost for a standard-specification building would be P014.

The second is that the estimation method has been used to calculate the non-separately itemised extras and has therefore involved some degree of professional judgement. While every effort has been made to use the BoQ costs, where available, and comparable items from other projects in the sample, removals have also been estimated. As such these have greater uncertainty than the extracted removals. However, the total extras cost, as well as the split between extracted and estimated, have been reported for each project to give an indication of the level of estimation that has been undertaken.

Thirdly, some of the items classified under "extras" may be contested. An elevator in a 2 storey building may be seen as a premium extra, but for a 4 storey building it is a necessary accessibility feature. Similarly solar panels on the roof may be seen as desirable extras but with the EU's nearly Zero-Energy Building (nZEB) standards becoming law in 2019, it is likely that solar panels on the roof will be a required feature of all new builds in Paphos. The classification used in this study is that extras are items that do not affect the basic price of the apartment and whose absence would not prevent the building from meeting minimum building regulation and planning requirements for a standard residential apartment development in Paphos. Where classification is marginal, this is indicated in the project database.

Forth is, contingency allowances were excluded from BoQ totals prior to cost analysis. Where a BoQ included a contingency sum this would have been a standalone lump sum or percentage that would have been deleted from the bill totals prior to analysis. Contingency is a risk provision for potential future increases in cost and/or changes to scope that may or may not occur. To include contingency within the baseline cost of construction would overstate the cost of the components identified within the scope of the project. However the treatment of risk and uncertainty in the feasibility stages is addressed within the sensitivity analysis Section 3.5.3 that reflects the potential cost variation and impact on project viability.

The VAT is not included in the cost values used for the calculations of this study. This is due to the fact that under Article 11B of the VAT Law of Cyprus (Law 95(I)/2000, as amended by Law L.16(I)/2012) a domestic reverse charge mechanism is in place for construction services. Hence, contractors issue invoices to developers and construction services are paid for without any VAT included on the invoices, yet the developer self-accounts for the VAT as both output tax and input tax, when selling the property, making the tax neutral at the construction stage. Therefore, no adjustment has been made in order to remove the VAT from the cost values of the BoQs used for this study.

The VAT rate applicable to resale transactions differs according to the buyer. Qualifying owner-occupied primary residences pay 5% on the first €350,000 of value (with certain caps on covered

area and value, notably where permits were issued after 31 October 2023). All other transactions pay the standard rate of 19% (to investors, to foreign buyers etc). This is a major single cost factor to consider in the development appraisal and is one of the variables tested in the Phase 2 scenario analysis. In the VAT is also treated as a separate variable in the Phase 2 residual appraisal, at a 5% rate for affordable owner-occupier sales and at a 19% rate for market rate investor sales. The difference between these two rates (14%) is a key factor in the affordability–viability gap worked to in the Phase 2 analysis.

3.4.6 Temporal Adjustment: Inflation Standardisation

The material costs for 25 projects specified in the BoQs for the period from October 2019 to November 2025 were monitored. The costs for construction materials continued to rise during the period under review in Cyprus. Table 1 presents the CYSTAT Price Index of Construction Materials for the years 2019 to 2025. The year 2021 is used as the base year (2021 = 100). The annual averages fluctuated over the seven-year period recording 86.0 in 2019, 86.4 in 2020, 100.0 in 2021, 115.8 in 2022, 117.5 in 2023, 117.9 in 2024 and 118.8 in 2025. The overall increase for the seven year period is approximately 38%. The major increases occurred between the years 2019 to 2022.

Any cross-project cost comparison is meaningless unless firstly the costs have been adjusted for time. The two tables above show two project cost estimates. The first was compiled at the end of 2019 for a start early the following year. The second has been compiled five years later for a start five years later at a cost of €1,900 per m² for the basic core and shell. The actual useable resources probably be very similar. The main difference is the passing of time and the related input price inflation. One way of dealing with the former is to use a construction cost index (CCI) and adjust the various cost items to the same time as the other project. This is a common technique and one that is provided and referenced to by the RICS Building Cost Information Service (BCIS, 2023) as well as other sources of standard building cost information (Ashworth et al., 2013). The methodology is well outlined in Smith and Jaggar (2019).

The adjustment formula applied is:

Adjusted Cost (Jan 2026) = Original Cost × (Jan 2026 Index / BoQ Year Annual Average Index)

The January 2026 monthly index equal to 118.89 is used for the numerator. For the denominator, the annual average index is used of the year in which the BoQ was dated for the numerator of the Materials Inflation. The relevant time series are provided by CYSTAT. Data exist only from 2019 onwards, on the old 2015 = 100 base. For the years prior to 2019, values are back-calculated to the 2021 = 100 base using a linking coefficient for the year 2021. The annual average for 2021 on the 2015 base is approximately 130.2. The linking coefficient thus equals 100/130.2 = 0.768. This is the methodology followed by Eurostat for the chain-linking to the rebasing of price indices (Eurostat, 2024) and is fully described in the relevant projects' database (Sheet C-Cost of Materials Inflation). A full description of the complete CYSTAT Construction Materials Price Index series, methodology

for year to year linking of the Index and inflation adjustment factors for building construction projects are presented in Appendix D. This information, along with the C-Cost of Materials Inflation sheet in the Master workbook can be used to calculate the linking coefficients.

The real terms figures are shown in the final column of the A-Master Summary sheet entitled Adjusted Base Cost 2026 (€/m² GIA). This shows the adjusted baseline-standardised cost for the removals extras allowing for the removals to be constructed with the latest construction information available at January 2026 prices. These figures are the primary cost comparator used throughout the cost comparison analysis in Chapter 4.

Three limitations apply to this temporal adjustment. Firstly the CYSTAT index is an index of the prices of the construction materials themselves, and therefore does not measure labour cost inflation which may have developed differently over time, particularly in 2022-2023 at a time of acute skill shortages (European Commission, 2024). While a composite construction cost index does exist, it is not available at the level of disaggregation required here. As such, the material-only price adjustment provides a systematic but partial normalisation, and this is noted in the interpretation of findings.

Annual average indices are used for the denominator, which introduces some smoothing relative to the monthly numerator. For most of the sample period the CYSTAT publication does not provide monthly disaggregation, so annual averages are the most granular figures available for the denominator. This represents a pragmatic compromise between temporal precision and data availability.

The temporal adjustment captures input price inflation only. It does not capture non-price effects of market disruption such as supply chain substitutions, design changes, programme extensions or other adjustments beyond the original scope. The inflation-adjusted costs should therefore be interpreted as price-normalised figures rather than as predictions of what the same project would have cost had it been priced for delivery in a "normal" January 2026 market.

3.4.7 Contextual Variables

In addition to cost and area, several additional contextual variables were recorded for the descriptive cost analysis. These variables were not considered in the Phase 1 analytical process.

The developer scale is often divided into four categories: Micro (fewer than 5 units per year), Small (5-20 units per year), Medium (20-100 units per year) and Large (more than 100 units per year). This classification should be applied over the developer's normal output across all projects for that release, not the size of the sample project used in the test.

Three developer types are distinguished in this study: Private Individuals (commissioning a single project), SME Developers (small to medium-sized development firms), and Corporate Developers (large multi-location development groups).

What approach should be taken for the procurement of the Services? The options are: Competitive Tender (based on BoQ), Negotiated (based on BoQ), or Negotiated (on Special Terms).

These are the height of buildings metrics. They include the overall height to the highest part of the building, typical floor height (usually expressed as the slab to slab height) and the number of floors above the ground floor.

The Apartment mix measures the number of studios, one bedroom, two-bedroom, three bedroom and four-bedroom apartments.

The database contains also several other contextual variables that have the potential for use in future studies, such as possible cost determinants. These variables are described in Chapter 4, but they have not been applied as independent variables in this study due to the sample size. Twenty-five projects are perhaps too few for running multivariate regression analysis safely. The study has primarily focused on measurement and affordability-viability gap decompositions, and introducing cost drivers has not been attempted here. Further studies would benefit from a larger sample and possibly alternative methodological approaches. The variables are however included in the database for possible future use.

3.4.8 Secondary Data Sources

For the secondary data needed for the Phase 2 affordability assessment, market assessment and residual value judgment, seven different sources from institutional and regulatory bodies were utilized. These are the most reliable sources of such data in the local market.

The available data on income distribution relate to the annual Survey on Income and Living Conditions (EU-SILC) conducted by CYSTAT based on Eurostat methodology. The survey provides information on the income distribution by quintiles and deciles. The most recent issue available (2024 - income reference year 2023) reports that the national median equivalised disposable income for a single person is €20,667 compared to €19,247 in 2023. The threshold of poverty for a single person household is €12,400, while for a household with two adults and two children under 14 it is €26,039. It should be noted that the median equivalised disposable income includes social transfers and is the income left after taxes and social insurance contributions for low to middle income households who are generally considered to be below or near the tax threshold for income tax.

Since CYSTAT does not publish data from EU-SILC annual surveys at the district level, reference is made to data provided by the 2021 Population Census regarding the district-level employment profile of Paphos. The Paphos district covers 1,648 square kilometres and includes 101,900 residents, i.e. 11% of the country's population. The average household size in the district is 2.25 persons (the smallest across the country) and there are 44% of retired households and 26% single-person households. Tourism is a major activity in Paphos, accounting in particular for the bulk of employment in accommodation and food and beverage services, as well as in wholesale and retail trade. Average monthly wages in the accommodation and food and beverage services sector in

national terms are €1,583, and in retail trade they are €1,781. Thus, using the national average as a conservative "income anchor" for Paphos, housing is at least as unaffordable for the typical household in Paphos as it is for the national average using the median income as the basis for the income anchor.

The usual criteria for lending in the Cyprus market also include the net income of the applicant. In this study, the 30% Debt Service Threshold Income Indicator (DSTI) rule is adopted, as per the affordability threshold model. The national average median net monthly income for the country is used as the income indicator. According to the latest available data, the national average for median monthly net earnings for employees is €1,881 (CYSTAT, 2024). Assuming a 4.3% year on year increase this would be €1,962 or €23,544 per annum. This is the figure used as the national anchor for income in Scenario A. The net income figure used in the study is after a deduction for Social Insurance of 8.8% and General Health Services contribution of 2.65%. The use of a national average for income as opposed to district specific averages is a limitation of the imputation methodology used here. It does not allow for consideration of local factors that might affect affordability and tends to bias the results towards a property being unaffordable. This means that the imputation tends to overstate the purchasing power of a sales assistant with median earnings for 2023 in Paphos region of approximately €1,950 per month.

Data for land transactions were obtained from the Department of Lands and Surveys (DLS), Paphos District Office through the University's contacts. A total of 48,370 TITLE DEED OF LAND TRANSFER (ΤΙΤΛΟΣ ΟΙΚΙΑΝ) records and 13,226 CONTRACT OF SALE (ΣΥΜΦΩΝΙΑ ΠΩΛΗΣΗΣ) records were extracted from the DLS register over the period 2008-2024. These records indicate the point at which the transaction has completed legally and the buyer has received ownership to the land. Alternatively, some records indicate the point at which the Contract of Sale has been deposited with the DLS but the title deeds have not been issued, such as off-plan/under construction transactions, issues with title deeds and property transfers arising from antiparochi (consideration) agreements whereby a landowner is granted land in return for the construction of a new dwelling or the payment of a sum of money. In total 61,596 land transaction records have been recorded in Paphos and these have been used to inform the land cost parameters applied in the residual approach (Section 3.5.1). Land transactions have been classified into building plots of land (ΟΙΚΟΠΕΔΟ) on which a building could potentially be constructed, and agricultural land (ΧΩΡΑΦΙ). ΧΩΡΑΦΙ (field) refers to land that has not been subdivided, and can therefore be considered to be either agricultural land or undeveloped land (including within residential parcels of land). This is distinct from ΟΙΚΟΠΕΔΟ (building plot) in that it is not yet subdivided. The dataset was filtered for Paphos District and for the 2019-2024 time period. There were a few valid transactions found and identified as building plots (or plots of land) as opposed to fields. Town and village names were grouped into the following categories for the study: Paphos, Geroskipou, Pegeia/Coral Bay, Coastal Area (Kissonerga, Mouttalos, Chloraka, Lemba), Emba/Tala and Peri-

Urban. The average declared-to-accepted price ratio for all transactions recorded in the database is 0.84. This is in line with other findings in Cyprus that declare prices are less than market values, mainly due to the transfer fee minimisation effect (Pashardes and Savva, 2009). The term "declared price" is used to refer to the price as stated in the Contract of Sale between the seller and the buyer. This is different from the "accepted price" which is the price used by DLS Office for transfer fees and stamp duty payments, and is the price used in this study for Land Price values.

Data for residential property prices was obtained from the Central Bank of Cyprus Residential Property Price Index (CBC 2024, 2025) – a hedonic price index by district and type of property. The property information firm PwC (2025) provided additional information on transactions, average prices and the percentage of foreign buyers by district. The DLS dataset (Data_Apts sheet of the land analysis workbook) was used to obtain the average transaction price per square metre by zone and year in order to establish a GDV benchmark for the Phase 1 sample sub-markets where the test projects will be located.

The data of the construction cost index was taken from the official source of the construction cost materials (the data of the construction cost index of the CYSTAT. Price Index of Construction Materials), CYSTAT website, annual publication, www.cystat.mof.gov.cy (CYSTAT, 2025;

CYSTAT provides data for building permits through its CYSTAT Building Permits series (CYSTAT, 2024a). Declared permit costs are a very poor proxy to real costs and are used for volume and trend purposes only. As discussed in more detail in Section 4.2.3 of the Phase 1 analysis, declared permit costs are approximately 75-100% understated.

The affordability criteria used in this Report reflect the complex assessment criteria that lenders currently use to assess a borrower’s ability to make mortgage repayments. This goes beyond income and debt-service requirements and incorporates a number of additional factors, including collateral value, overall indebtedness, credit history and short and medium-term prospects. To determine the lending criteria used by the three largest retail mortgage lenders active in Cyprus, the mortgage products of Bank of Cyprus, Eurobank (formerly known as Hellenic Bank following the announcement of merger to be effective on 1 September 2025) and Alpha Bank Cyprus were studied in detail through their rate sheets and lending policy manuals available to the public. Information was also obtained on variable and fixed interest rates, maximum loan-to-value ratios, maximum loan terms and debt-service-to-income limits where applicable. In addition, the macroprudential data provided in the Central Bank of Cyprus Financial Stability Report (CBFSAIR), and the results of the Central Bank of Cyprus Lending Survey (CBS LS), both 2024, were sourced. An appropriate variable mortgage rate at which to calculate the affordability threshold is taken as the mid-point of current market rates, amounting to approximately 3.7%. Variable-rate residential mortgages offered by lenders in Cyprus are based on EURIBOR 3-month plus a bank margin. According to ECB Statistical Data Warehouse, EURIBOR 3 month (3M) is currently 2,12%. This translates to effective variable interest rates on mortgages 3,6% – 4,1% (after bank’s premium of 1,5 – 2,0%). For the sensitivity

analysis, a fixed interest rate is used of 3,10% (Eurobank fixed interest rate for 5-year mortgage product).

The soft cost data were garnered from a variety of triangulating sources, including official government and institutional sources, academic benchmark information and industry based market data from practising property developers. Consulting with active residential builders in Paphos, it emerged that the actual soft costs were below the usual quoted range of 6% to 10% plus loan interest cited on various property information websites, particularly for luxury specification projects offered on the international buyer market. Statutory costs referred to in Table 3.1 include official government fees and charges accessed via the internet, plus fees captured in the Ippodamos digital permitting system which went live in July 2024, and those charged by relevant bodies such as the EOA Paphos (formerly the Paphos Sewerage Board), and the Electricity Authority of Cyprus (EAC). Consultation with developers over their marketing and sales costs revealed figures that conformed to those normally reported in development appraisal texts (Isaac and O'Leary, 2012; Havard, 2008), and these costs are summarised in Table 3.1.

Benchmarking data was sourced from published reports (KPMG Malta, 2024) and aggregate composite or benchmarking data extracted from very large databases such as Eurostat (2024) relating to the Mediterranean mainland markets of Greece, Spain and Italy.

Also referred to in the report are statistics provided by published reports and large databases.

3.4.9 Data Validation

The primary cost data have been validated over four iterations.

Using information gathered from the cross-source triangulation of the six projects where both the developers had a role to monitor the construction account, costs from the Bills (Bill 13 and Bill 14) were compared against the QS firms' independent assessments. Analysis of any significant variances identified the main causes to be differences in treatment of discount, preliminaries proportion and categorisation between the two Bills. Once these were understood and resolved, a consistent approach was achieved.

In addition to verifying that elemental cost percentages fell within the "rough order of magnitude" range, a second comparison was made across projects to identify percentage variations for each elemental cost category against the rest of the sample. Using the elemental cost per m² for each bill, a comparison of the mean against individual results identified some bills as statistical outliers, i.e. more than two standard deviations from the mean. Each of these outliers was reviewed in more detail to establish whether or not the exception to the "mean" was due to a genuine market condition – for example unusually high quality materials being specified.

Thirdly, the information gathered was benchmarked against various building cost indices that are already available. An average cost per square metre was also established and tracked against the

annual movement of the relevant CYSTAT construction materials price index as well as the KPMG Malta construction cost range (2024) for a Mediterranean island market.

Internal consistency checks: for each project, the sum of the Bills 1-14 was checked against the recorded grand total; the total GIA for each project was checked against the sum of the relevant components of IPMS; and the adjusted base cost for each project was checked against the grand total of the Bill less the reported extras cost.

3.5 Analytical Methods

This section sets out three individual analytical methodologies used within the Study; the residual valuation method, sensitivity analysis, and the affordability threshold methodology. In addition, this section sets out reasons why a discounted cash flow analysis has not been undertaken. The three methodologies are to be used in conjunction with the dual-residual methodology set out in Section 3.2.3 in order to establish an affordability-viability gap measurement that emerges as the primary empirical finding of the Study.

3.5.1 Residual Valuation Model - Parameter Specification

The residual valuation model was applied to three development scenarios relevant to the three main market segments in Paphos. These scenarios were then "calibrated" to the relevant parameters for each segment. The construction cost was taken from the Phase 1 analysis. The balance of parameters were derived from secondary data sources referred to in Section 3.4.8. Table 3.1 outlines the full cost stack for each of the development scenarios referenced in the report, along with relevant justification for each parameter.

Table 3.1: Residual Valuation - Development Cost Stack

Parameter	A: Urban Infill	B: Coastal-Urban	C: Premium Coastal
Construction Cost (€/m² GIA)	*€1,998*	*€2,179*	*€2,179*
Land Cost (€/m² GIA)	*€347*	*€376*	*€702*
Soft Costs			
Architectural (3.0%)	€59.94	€65.37	€65.37
Structural Engineering (1.0%)	€19.98	€21.79	€21.79
MEP Engineering (1.0%)	€19.98	€21.79	€21.79
Quantity Surveying (1.0%)	€19.98	€21.79	€21.79
Statutory & Permits (€/m²)	*€35*	*€35*	*€35*
Total Soft Costs	**€155**	**€166**	**€166**
(% of Construction Cost)	*7.75%*	*7.61%*	*7.61%*
Total Development Cost	**€2,500**	**€2,721**	**€3,047**
Developer Profit (17.5% of Cost)	€437	€476	€533
Min. GDV Required (€/m² GIA)	**€2,937**	**€3,197**	**€3,580**
VAT Scenario: 5% (Owner-Occupied)	**€3,084**	**€3,357**	**€3,759**
VAT Scenario: 19% (Investor / Foreign Buyer)	**€3,495**	**€3,804**	**€4,260**

Scenario A - "Urban Infill" is a standard "off the shelf" apartment building in an urban context. The land cost parameter is based on average of plot transaction prices recorded with the DLS over the last 5 years (2019-2024) for Urban Paphos. The average plot price for Urban Paphos was €347/m² GIA based on 477 transactions in total. Note that no antiparochi schemes or zero consideration Community Option Schemes were included in the price analysis. The building coefficient (BC) for the Paphos Local Plan zone parameters for the predominant residential zones in the Urban Centre are; BC 1.40 (Kα3), BC 1.20 (Kα4) and BC 1.00 (Kα5). The median BC is 1.30 with a range of 1.00-1.60. The construction cost input for Urban projects is based on Phase 1 sample mean of €1,998/m² GIA. The total development cost including all soft costs is €2,500/m² GIA. Hence the minimum required Good Development Value (GDV) including developer profit is €2,937/m² GIA.

Scenario B (Coastal-Urban) is mid-upper in specification. Land cost is determined by reference to the cost of plots that have recently sold in Kato Paphos (61 land transaction records) and is enhanced by the high building coefficient (3.5:1) for the zones Kα4–Kα5/Eβ5. This results in a land cost of €376/m² GIA. The cost of construction is taken to be €2,179/m² GIA. The minimum required Gross Development Value (GDV) is therefore €3,197/m² GIA.

This scenario illustrates a premium specification Development (Scenario C – Premium Coastal). Land cost is derived from 343 plot transactions in the Premium Coastal zone, averaging €702/m² GIA. The applicable Building Coefficient (BC) is 0.55. The Construction Cost is €2,179/m² averaged GIA for the homes and therefore the Total Development Cost for the development is €3,047/m². This means that there is a minimum GDV required of €3,580/m².

The soft cost values used for the scenarios valuation are outlined below. These values were obtained from the research documented in Section 3.4.8 and are the central estimates for the full soft cost schedule outlined in Table 3.1.

The total professional fees of 7.75% of hard construction cost (centrally estimated), comprise architectural fees of 3.0%, structural engineering fees of 1.0% and services of the MEP engineer at 1.0%. EPC/nZEB certification is estimated at €350 per unit. Quantity surveying fees are estimated at 1.0% of the construction cost of the project. With a typical 20-unit urban centre development this would leave a total professional fee allowance of approximately 7.75% of hard construction cost. This is towards the lower end of the "normal" professional fees range reported by Isaac and O'Leary (2012) across Europe of 8–12%. However, professional services are often procured on a relationship basis in the Cypriot residential development market and lower fees are negotiated.

The margin over cost selected for the base case was 17.5 per cent of total development cost. The same overall hurdle rate range of 15–20 per cent was identified by three sources of information relating to the respective hurdles for residential development viability in Europe. For the market-rate residential case in the UK, Isaac & O'Leary (2012) identified the hurdle rate to be used in residential development appraisals as being 15–20 per cent in support of the development application. Crosby

& Henneberry (2016) found that typical target return sought by developers as indicated in residential development viability assessments, in the UK, remained at 15–20 per cent irrespective of market conditions. The exceptional circumstances of development potential on thin islands such as those off Paphos' Mediterranean coast justify the use of the high end of the range, 17.5 per cent, rather than an average figure. The findings are explored at both 15 and 20 per cent in the sensitivity analysis.

The land values used in the analysis were extracted from the declared transaction prices registered with the DLS. The declared-to-accepted price ratio for the filtered land transactions used in the analysis was 0.83 and is deemed to be downward biased (Pashardes and Savva, 2009). As such, the median values for the land in the residual model are likely to be a conservative lower-bound estimate. All Antiparochi transactions (54 records: 39 explicit and 18 zero-consideration unit COS) have been removed from the valid analysis set. The imputed land value for these transactions was found to be around 78% above the cash transaction median and supports the negative residual finding. Transactions that were classified as Field (ΧΩΡΑΦΙ) have been separated from those transactions classified as building plots (ΟΙΚΟΠΕΔΟ). This is due to the fact that fields that are to be developed typically require a series of contributions such as a contribution for roads, contribution for green areas and contributions for social facilities etc. before a net developable area is achieved. The prices of the building plot transactions have been used for the purposes of the residual model. In addition to the principal results outlined above, sensitivity analyses are presented, in which the land cost is varied by ±20% and ±50%.

The residual value appraisal does not include VAT on construction costs but permits a separate appraisal at the residual value of the sale price plus an appropriate rate of VAT. For owner occupied residences, the rate would be 5% in accordance with The Value Added Tax Law of 2000, Law 95(I)/2000, as amended, provided that the residence is priced at €350,000 or less and has a covered area not exceeding 130m² for permit applications submitted on or after 31 October 2023. The applicable rate for resale to third parties and foreign buyers is 19%. This difference in VAT rates is one of the largest of the structural costs incorporated into the Paphos development appraisal. The difference is also tested in the scenario analyses.

Table 3.2: Valuation Assumptions Register

Parameter	Base-Case Value / Range	Rationale	Sensitivity-tested?
3.5.1.1 Construction Cost Basis	€2,023–€2,179/m² GIA (A: Urban infill / B: Coastal-urban / C: Premium coastal)	Observed Paphos market cost envelope; Q1 for affordable-typology scenario, mean for central case. Excludes land, soft costs, finance, profit and VAT.	Yes - OAT ±10% / ±20% / ±30% in Table 3.4.
3.5.1.2 Land Cost	€347–€702/m² GIA (village-specific; urban €347 / coastal-urban €376 / premium coastal €702)	Observed arm's-length plot prices translated to finished-floor unit; foreign-buyer exposure and dual-market premium partly reflected in coastal tier.	Yes – OAT -20% / +20% / +50% in Table 3.4; village-level in Table 4.10.
3.5.1.3 Professional Fees	6.0% of construction cost (Architectural 3.0% + Structural 1.0% + MEP 1.0% + QS 1.0%)	Lower bound of standard professional services; excludes project management and legal (treated under contingency).	Embedded in soft costs sensitivity (aggregated).

3.5.1.4 VAT	19% standard / 5% reduced (owner-occupier primary residence, floor area ≤130 m², value ≤€350k,	Dual-market exposure: 19% for foreign buyers / investors / second homes (majority of Paphos coastal); 5% only for qualifying primary residences.	Yes - scenario switch 19%↔5% in Table 3.4 Panel B.
3.5.1.5 Developer Profit	17.5% of total development cost (construction + land + soft)	Midpoint of typical SME target margin in a shallow, low-turnover market; reflects illiquidity risk premium vs larger Nicosia/Limassol markets.	Implicitly tested via GDV sensitivity (±10%/±20%).
3.5.1.6 GDV	€2,200 / €2,800 / €3,500 per m² GIA (A/B/C typologies respectively) market-observed sale prices	Median sale €/m² by zone; excludes sub-40 m² studios and sub-€50k land-only parcels to reduce noise.	Yes — OAT ±10%/±20% in Table 3.4.
3.5.1.7 Affordability Thresholds	Stone 30% of gross household income (Scenario A: single earner; B: 1.5-earner; C: dual-earner)	Stone (1993) budget-standard threshold;	Yes — rate × income matrix Table 4.8; quintile breakdown Table 4.6.

3.5.2 Exclusion of Discounted Cash Flow Analysis

The alternative DCF analysis was considered but not pursued. The main study objective was to measure and decompose affordability-viability gaps for 25 projects rather than to forecast and compare expected real returns over time for individual projects. DCF analysis requires specific assumptions regarding construction phasing, sales rates and discount rates which were not available for all of the projects included in the sample.

French and Gabrielli (2004) comment that in thin markets such as Australia the estimate of the discount rate is likely to have to be obtained from industry practitioners rather than from market information, entailing an appreciable degree of uncertainty in itself unrelated to the precision of the measure of the "gap". The residual model provides a simple, transparent, comparable yardstick which can be applied both to small projects of different risk and to a range of proposals of differing sizes, geography and complexity.

The static temporal limitations of the static residual model are discussed in the deterministic sensitivity analysis Section 3.5.3.

3.5.3 Sensitivity Analysis

Given the uncertainties relating to the development feasibility models, a deterministic sensitivity analysis was undertaken to test the results' sensitivity to variations in the critical input variables. The results were obtained using a one-at-a-time (OAT) method and a limited number of combinations to reflect realistic correlations between some of the variables rather than all possible combinations (French, 2001; Hoesli et al., 2006).

In order to test the sensitivity of the minimum required GDV, four sensitivities have been tested for each of the variables GDV, hard construction cost, land cost and finance cost. In addition, three combined sensitivities have been tested: a most optimistic scenario, where the GDV is increased by 10% and all other costs remain as base case; a most pessimistic scenario, where the GDV is decreased by 10% and the hard cost increased by 20%; and a policy scenario, where the cost of the land is decreased by 20% and the VAT is decreased from 19% to 5%. The sensitivity analysis illustrates the

minimum required GDV for each flex under all three combined sensitivities, against the base case calculated in Table 3.1.

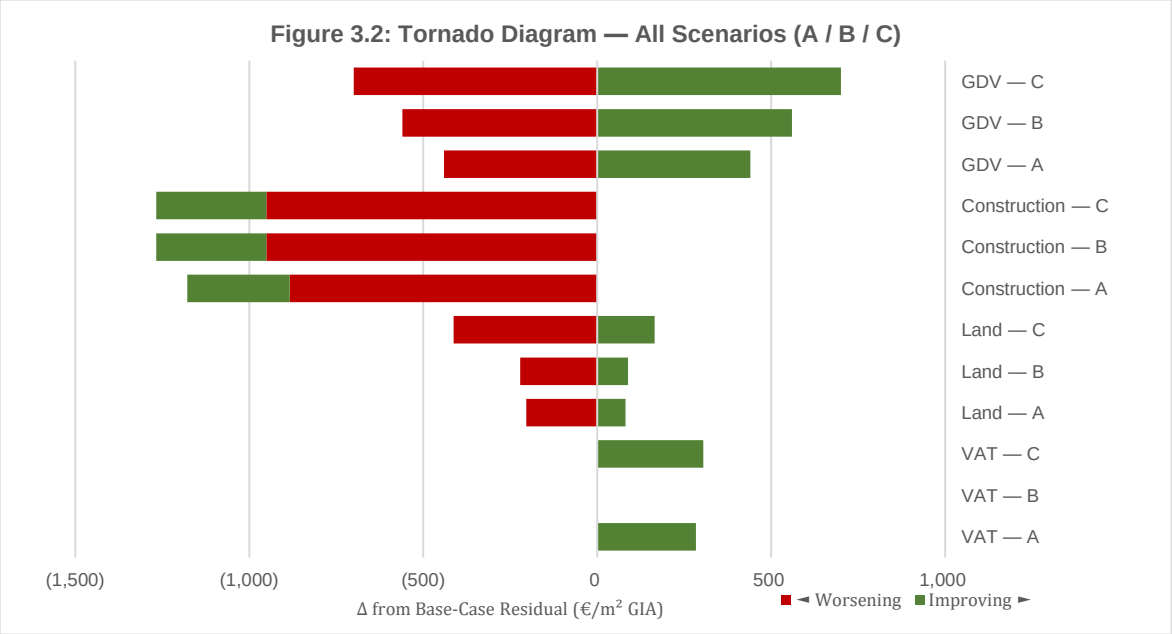

Figure 3.1: Sample Composition Summary

3.5.4 Affordability Threshold Calculation

An affordability threshold is important to establish the maximum housing price that a household considers itself able to afford. This study employs the residual income approach (Stone, 1993; 2006) to establish an affordability threshold using relevant local data including income levels, tax rates and mortgage information. A median household income for Paphos is used as the basis for the calculations. There is no Cypriot household budget standard available (unlike the UK's Family Budget Unit or the AHURI household budget standards developed in Australia) and therefore a simplified 30% of net income ratio (Burke et al. 2014) is used.

The calculation proceeds in seven steps.

Step 1 - Household income. The income anchor on which the affordability threshold is based is the income determined by the CYSTAT, which is the median gross monthly earnings for the year in question increased by 4.3% to reflect the annual increase. This results in an income anchor of €1,881 increased to €1,962 per month or €23,544 per annum for the national figure used in the study (as opposed to a district adjusted figure). This study uses gross monthly earnings rather than the equivalised disposable income as derived from the EU-SILC data for 2024, which is €20,667 nationally. The equivalised disposable income as derived from the EU-SILC already includes the effect of social insurance and general health service (GHS) deductions, and the tax- and deduction-calculation used in the study would therefore double count these contributions if applied to the EU-SILC income. The use of gross monthly earnings means that net income can be calculated through explicit and auditable deductions to the gross income.

Three different scenarios have been developed for three different household compositions which represent gross and net income for a household. The three different household compositions are described in Table 3.3 and are modelled as Scenario A, single earner on median, Scenario B, 1.5 earners on medians and Scenario C, two full-time earners on medians. The gross annual household income has been converted to net annual income. The net income calculation includes the Social Insurance contributions (8.8%) and General Healthcare System (GHS) contributions (2.65%) of the total rate of 17.6% which is the employee's portion. The net income calculation also includes the income tax, this only applies in the third scenario where the gross annual household income is just above the personal allowance threshold of €22,000 in 2026 (reform rates applied). The first two scenarios are below the personal allowance threshold (2026, reform rates applied).

Table 3.3: Household Income Scenarios — Gross to Net Calculation

	Scenario A	**Scenario B**	**Scenario C**
	Single Earner	*1.5 Earner*	*Dual Earner*
Gross Annual Earnings	€23,544	€35,316	€47,088
Deductions:			
Social Insurance (8.8%)	(€2,072)	(€3,108)	(€4,144)
GHS Contribution (2.65%)	(€624)	(€936)	(€1,248)
Income Tax	€0	€0	€0
Total Deductions	**(€2,696)**	**(€4,044)**	**(€5,392)**
Net Annual Income	**€20,848**	**€31,272**	**€41,696**
Net Monthly Income	**€1,737**	**€2,606**	**€3,475**
Effective Deduction Rate	11.5%	11.5%	11.5%

Step 2 - Maximum housing expenditure. 30% of net annual household income, yielding €6,254 (A), €9,382 (B), and €12,509 (C) per annum. The use of net income ensures social insurance and healthcare deductions are properly accounted for. The use of net rather than gross income is consistent with Cyprus banking practice, where DSTI limits are typically assessed against net income (Bank of Cyprus, 2026; Eurobank, 2026; Alpha Bank, 2026).

Step 3 - Maximum monthly housing expenditure. Step 2 divided by 12, results in €521 (A), €782 (B), €1,042 (C), respectively.

Step 4 - Non-mortgage housing costs. Estimated at €120.83 per month (€1,450 per annum), comprising: municipal charges and refuse collection approximately €25 per month, building insurance approximately €15 per month, communal maintenance fees (common areas, elevator, pool where present, gardens) approximately €45 per month and sewerage charges approximately €11 per

month. These estimates are based on prevailing rates for new-build apartment developments in Paphos, obtained from developer sales documentation and communal management company fee schedules.

Step 5 – Maximum monthly debt-servicing. The non-mortgage cost is deducted to derive the net amount available for mortgage servicing: €400 (A), €661 (B), €922 (C) per month, respectively.

Step 6 - Maximum loan principal. Calculated using the standard annuity present value formula:

Loan = PMT × [(1 − (1 + r)^−n) / r]

where PMT is the net monthly amount from Step 5, r is the monthly interest rate (annual rate / 12), and n is the loan term in months. Applying the base-case parameters of 3.70% annual interest rate (central estimate based on EURIBOR 3M of 2.12% plus typical bank premium of 1.5-2.0%) and 25-year term (300 months), the maximum loan principals are: €78,287 (A), €129,245 (B), and €180,202 (C), respectively.

Step 7- Maximum affordable purchase price. The loan principal is grossed up by the loan-to-value ratio of 80%, the Central Bank of Cyprus macroprudential limit for primary residence mortgages (i.e., purchase price = loan ÷ 0.80, reflecting a 20% deposit requirement). The resulting maximum affordable purchase prices are: €97,859 (A), €161,556 (B), and €225,252 (C), respectively.

These purchase prices are then converted to €/m² GIA to enable direct comparison with the construction cost benchmark from Phase 1 and the minimum viable sale price from the residual appraisal. Because buyers experience apartment size in NIA terms while developers price and build in GIA terms, the conversion applies a net-to-gross ratio of 0.87 rounded up from sample mean of 0.868 (i.e., GIA = NIA ÷ 0.87), reflecting the common area allowance for circulation, stairwells and shared services typical of Paphos apartment blocks.

Two NIA assumptions are tested, a LOW scenario representing compact unit sizes typical of affordable and investor-oriented schemes, and a HIGH scenario representing more generous layouts, across four-unit types. Table 3.4 presents the full results.

Table 3.4: Affordable Price per m² GIA by Unit Type and Household Scenario

Unit Type	NIA (m²)	GIA (m²)	Scenario A	Scenario B	Scenario C
MAX AFFORDABLE PURCHASE PRICE	—	—	€97,859	€161,556	€225,252
LOW NIA Scenario	*GIA = NIA ÷ 0.87*				
Studio	35	40	€2,427	€4,007	€5,588
1-Bed	50	58	€1,699	€2,805	€3,911

2-Bed	75	86	€1,133	€1,870	€2,608
3-Bed	95	109	€894	€1,476	€2,059
HIGH NIA Scenario	*GIA = NIA ÷ 0.87*				
Studio	45	52	€1,888	€3,117	€4,346
1-Bed	55	63	€1,545	€2,550	€3,556
2-Bed	80	92	€1,062	€1,753	€2,445
3-Bed	100	115	€850	€1,403	€1,956
Colour coding per Table 3.1 Min. GDV range (€3,084–€4,260/m² GIA incl. VAT). Green = covers all development scenarios; Amber = covers lowest-cost scenario only; Red = below all development cost floors.					

For an affordable price, the highest and lowest price ceilings for a 2-bedroom apartment are €1,870/m² GIA for 75 m² NIA (LOW) and €1,753/m² GIA for 80 m² NIA (HIGH). For the median-income Scenario B (2-bedroom apartment for a 1.5-earner household), the price ceilings of €1,870/m² GIA (75 m² NIA, LOW) and €1,753/m² GIA (80 m² NIA, HIGH) sit well below the development cost floor. For single-earner Scenario A, the affordable price ceilings of €1,133/m² GIA (75 m² NIA, LOW) and €1,062/m² GIA (80 m² NIA, HIGH) are below the construction cost alone, before land, soft costs and developer profit are added. In contrast, the price ceilings for dual-earner Scenario C (2-bedroom apartment for a 2-earner household) are very close to the total development cost thresholds for the residual value appraisal approach outlined in Table 3.1.

Paphos, a tourism-dependent area, faces the challenge of income seasonality due to its dependency on tourism, and this problem is identified in the paper. Banks typically assess a borrower's eligibility for a mortgage using criteria such as stable and consistent annual income; therefore, actual mortgage affordability for tourism sector workers may be more restricted than it appears from simple calculations.

3.6 Ethical Considerations

The research protocol was submitted to and approved by the Neapolis University Research Ethics Committee. Due consideration was also given within the ethical review process to the treatment of commercially sensitive information that will be utilised within the study, in order to guarantee that no material competitive disadvantage is placed on the individual firms under analysis.

All QS firms and developers involved in the study were provided with full details of the research including the non-disclosure agreement, and briefed on the intended uses of the data they generated. They were reassured that all parties would be anonymous in the study, and as a result no firm or project name would appear in the final written dissertation. They were given the option to withdraw from the study at any point prior to the point of data aggregation.

To address the confidentiality and anonymity issues, all project-related data has been assigned an alphanumeric code (e.g. P001 to P025) and the geographic information has not been provided beyond "Urban", "Urban-Coastal", "Coastal" and "Rural" within the Paphos district. For the purpose of this research all key figures have been presented in total form and not as detailed project costs breakdown.

Four sources of data have been referenced throughout the dissertation, hereafter referred to as QS Firm A, QS Firm B, Developer A and Developer B. The information obtained from these sources has been restricted and their identities have not been revealed and no further information has been extracted from them.

In addition to institutional data storage, raw data files will be archived on a password protected laptop back-up drive and on the university back-up store; only the principal investigator and primary supervisor shall have access to these archives.

3.7 Research Limitations

3.7.1 Sample Limitations

Although 25 projects represents a substantial portion of the market (approximately 25-40% of qualifying residential apartment projects, per Section 3.3.4), it does not constitute a census. As a result, there is some risk that the results could be affected by the projects that are not included in the study, which may differ in important ways from those that have been included. However, the risk of material error is likely to be reduced by the range of mitigation strategies outlined in Section 3.3.4, including the use of multi-source data and coverage of a broad range of QS firms.

The sample has a bias towards later years with only 13 of the 25 projects within the 2020-2022 period. Whilst the sample has been inflation adjusted this should normalise costs on a like for like basis. However, it is likely that factors other than simple material cost inflation have affected the costs of the earlier period. Unexpected longer-term consequences of supply chain disruptions encountered in the earlier period may have led to design and specification substitutions that have been locked into the building's design.

The study focuses on the Paphos district, in particular on potentially developable lands close to urban areas. The approach and analytical methodology can be applied in other constrained island secondary cities; however, the specific costs estimated for Paphos need to be recalculated for other study areas.

3.7.2 Methodological Limitations

While some residual error may remain due to the baseline standardisation process (Section 3.4.5), the results provided here should give a reasonably accurate comparison between the calculated and BoQ-extracted costs. Specifically, the structural over-specification of the adjusted base cost includes estimated extras that are likely to be higher in fact than those contained in these projections. In some cases certain decisions have had to be made as to what to include within the extras category. As such, users should treat the resulting adjusted base cost as a conservative upper-bound estimate of the true baseline construction cost of standard- specification residential construction in Paphos.

The residual valuation model treats development as occurring instantly, abstracting from the time profile of cash flows. The justification for this static rather than dynamic approach is set out in Section 3.5.2; this is a recognised limitation of cross-sectional cost benchmarking studies (Wyatt,

2013; French, 2020) and is mitigated through the deterministic sensitivity analysis described in Section 3.5.3.

This analysis assesses the consequences of a range of increased deterministic requirements within certain limits. The sensitivity testing of specific parameters as opposed to a simultaneous change in the joint probability distribution of several variables is also reviewed. Monte Carlo analysis was not considered due to the lack of sufficient comparable data from operational projects in the Paphos sub-market to create reasonable distributions for critical project input variables.

Elements relating to the project context (developer scale, procurement method, development size etc) are captured but not currently used as explanatory variables in the analysis. Due to the small sample of 25 projects the risk of overfitting precludes the use of multivariate regression modelling. Rather than attempt to estimate the additional gap associated with poorly performing components, the focus has been placed on measuring the existing performance gap. However, the context variables have been included in the database and can be used in future research once a larger sample is available.

3.7.3 Positionality and Reflexivity

The researcher is a practitioner within this market, advising real estate agencies and consulting on real estate costs. Prior professional involvement with property developers and consulting firms participating in the study raises positionality considerations. Three strategies were employed to mitigate potential bias. First, the cost analysis was primarily quantitative, which limited the scope for interpretive bias; the standardised analytical approach ensured no project received differential treatment. Second, the methodology was documented transparently to allow external scrutiny of the cost analysis. Third, systematic peer debriefing was conducted with the dissertation supervisor, in which findings were challenged, supported, or revised in response to unexpected results.

CHAPTER 4: EMPIRICAL ANALYSIS

The chapter reports the empirical results from the study in two related sections of text. Sections 4.1–4.6 (pp 95–105) report the Phase 1 construction cost analysis of the floor cost for new housing, including an elemental breakdown of the average cost per new house and an analysis of the variability observed among developers both within the sample and over time. The fourth aspect of the cost considered is the characteristics of the specified stock of housing being delivered to the market and the associated costs. Sections 4.7–4.9 (pp 106–116) report the Phase 2 affordability–viability analysis. First, the total development cost stack is constructed, followed by an establishment of the affordability threshold for the sample of developers. The affordability gap is then decomposed and its sensitivity to a series of key variables explored including: land cost; plot area; average floor area per new dwelling; and the price of the land acquired. Finally, Section 4.10 (pp 117–8) summarises the findings of the chapter and sets the scene for the discussion in Chapter 5.

All costs are expressed in Euros per square metre of Gross Internal Area (€/m² GIA). The costs are quoted as of the January 2026 dates of collection and are either indexed to the CYSTAT Construction Materials Price Index on a real terms basis (base year 2021 = 100) or stated as nominal values and clearly labelled accordingly. All the data used to produce the tables and charts has been accurately stored in the file titled "Master Dissertation Analysis Workbook" and the relevant sheet names have been provided to ensure verification of the used data.

4.1 Sample Description and Composition

4.1.1 Overall Sample Parameters

The sample consists of 25 residential apartment developments (348 apartments; 29376m² GIA; €59,200,000 Grand Total for all bills (14 in total) across the sample). The smallest project in the sample was P023 with 4 apartments and 449m² GIA for a Grand Total of €890,000 for all bills. The largest was P012 with 36 apartments and 3,068.8m² GIA with a Grand Total of approximately €6,316,797 for all bills. On average the sampled projects have 13.9 apartments, 1175m² GIA and a construction cost of €2,370,000. Bills were sampled from October 2019 to November 2025, and so cover all recent building activity within Paphos, including the medium-density residential type (from the smallest private enterprise development to the largest corporate projects currently under construction in the District).

4.1.2 Compositional Diversity

To avoid any skewness arising from the different procurement practices, purchasing power and preferences of different organisational or loci categories, the sample was set up to include all types of residential construction within the study area, Paphos. The sample therefore captures all variation across five different dimensions: developer type, developer scale, location, procurement route and apartment count band. The literature highlights these dimensions as key potential cost drivers (Ball, 2003; Somerville, 2001; Watermeyer, 2012). By including all variation across all of these dimensions at once, the sample enables the variance required for a cross-sectional regression analysis in Section

4.4. Table 4.1 summarises the composition of the sample and details of the individual projects are presented in Appendix B.

Table 4.1: Sample Composition Summary

Dimension / Category	Count (n)	Percentage
Developer Type		
Corporate Developer	11	44%
SME Developer	10	40%
Private Individual	4	16%
Developer Scale		
Micro (<5 units/yr)	4	16%
Small (5–20 units/yr)	4	16%
Medium (20–100 units/yr)	6	24%
Large (>100 units/yr)	11	44%
Location		
Urban	14	56%
Urban-Coastal / Coastal	7	28%
Rural	3	12%
Paphos (General)	1	4%
Procurement Route		
Competitive Tender (BoQ)	19	76%
Negotiated (BoQ)	5	20%
Negotiated (Special Terms)	1	4%
Apartment Count Band		
Small (4–8 units)	9	36%
Medium (9–16 units)	10	40%
Large (17–36 units)	6	24%
TOTAL PROJECTS	**25**	

The sample of projects, as of BoQ date, consists of three projects from late 2019, one from 2020, two from 2021, two from 2022, four from 2023, five from 2024 and eight from 2025. This spread of project dates is important in the inflation adjustment method employed (Section 3.4.6). The data supports the view that, when appropriately adjusted for inflation, the benchmark does not reflect the sharp cost increases of 2021-2022 but instead a stabilising trend in construction costs.

Out of the 25 projects analysed, 11 (44%) were carried out by corporate developers who build more than 100 units per year. Ten (40%) were built by Small and Medium Enterprises (SMEs) producing 5-100 units per year. The remaining four (16%) were carried out by private individuals. The developer scale classification used in this research distinguishes four groups: Micro (fewer than 5 units per year), Small (5-20 units per year), Medium (20-100 units per year), and Large (more than 100 units per year). Using such classification helps the research to avoid any possible biases that may stem from the cost benchmarking process which may be influenced by the buying practices,

purchasing power or specifications of different organisations. The main objective here is to test if the predicted scale effects by Ball (2003) and Somerville (2001) exist in the Paphos real estate market.

The projects included in the study are located in various locations across the Paphos district. Of the twenty-five projects included in the analysis, fourteen (56%) are located within the urban centre of Paphos. Seven (28%) of the projects are based in locations identified within the database as urban-coastal or coastal. A further three (12%) are based in the rural part of the district, with the remaining project having been classified within the general Paphos classification. This distribution reflects the pattern of apartment construction within the district and allows for a separate identification of any cost premia influenced by specific location factors.

Of the 25 projects identified, 19 (76%) were sourced through competitive tendering with a priced bill of quantities (BoQ), five (20%) by negotiated contracts but with a priced BoQ, and one (4%) on special negotiated terms. As the majority of projects have been sourced using the most common procurement route, it is considered that the cost data has been "market tested" rather than budget estimates or internal transfer prices. The inclusion of negotiated contracts within the cost data analysis allows for an assessment of the relative costs when different procurement routes have been used.

The sample comprises 9 small projects (4-8 units), 10 medium projects (9-16 units) and 6 large projects (17-36 units). The average GIA for small, medium and large projects in the sample is 629m², 1,063m² and 2,228m² respectively. The sample was deliberately constructed to span the full range of project sizes rather than concentrating on a narrow band.

4.2 The Construction Cost Floor

4.2.1 Progressive Normalisation: From Raw Cost to Structural Floor

Using a three-stage normalisation process, Section 3.4 isolates the cost floor for a standardised building structure from the impacts of variation in building specifications and time. A three-stage process is used to disentangle raw construction cost variation and successively strip out the effects to reveal a normalised benchmark value of interest. An interesting pattern in the variation of costs across the Paphos real estate market is revealed by the way the cost distribution is successively constrained.

Stage 1: Cost per square metre based on Unadjusted Total Cost - The Grand Total for all 14 tenders divided by the GIA averages €2,056/m² (median €2,081, std dev €309, CV 15.0%). The lowest cost is €1,390/m² for P004, the small SME scheme of 12 units, tendered in late 2019 on pre-inflation prices. The highest cost is €2,650/m² for P019, the six unit private coastal residence with high specification. The CV of 15.0% reflects a number of factors including the variability in cost between different configurations of different specifications, in addition to monthly price fluctuations and other project specific factors.

Stage 2: After "extras stripping", the mean falls to €1,971/m² (median €2,044). The drop provides a reasonable estimate for the aggregate specification premium due to non-standard amenities of €85/m² (or 4.3%). However, the CV has fallen only modestly from 15.0% to 13.8%. This may indicate that costs due to amenities are distributed fairly uniformly across the sample rather than there being a small number of high-specification instances. This is in line with findings on the prevalence of amenities set out in Section 4.5, where items such as a communal pool (60%), solar photovoltaics (80%) and roof garden (52%) have become quasi-standard market expectations in terms of the base cost of a Paphos apartment rather than premium add-ons.

Stage 3: The inflation adjusted, extras free and normalised cost, on a specification standardised basis, is adjusted for time to CYSTAT Construction Materials Price Index January 2026 prices. Based on the fully normalised methodology the average Fully Normalised cost is €2,107/m² GIA (median €2,086, std dev €216, CV 10.3%). The IQR has decreased to €255/m² (IQR1 €1,998, IQR3 €2,253).

The drop in CV from 15.0% (raw) to 13.8% (specification adjusted) to 10.3% (fully adjusted) is also illustrated. The variation of 1.2% (of average cost) due to specification differences and 3.5% (of average cost) due to time remains after all other variables have been addressed. These include site factors, aspects of building form, construction processes, subcontracttors' tendering strategies affected by current market conditions and random variation. The data, which consists of 25 projects developed over a six year period on four different sites, using three methods of procurement and developed by three different types of developers, shows an impressive consistency of cost around the structural floor.

Further, the degree of convergence observed supports an expectation from the island economy literature that even small variations in a set of variables influencing total production costs for a given economic activity will be reflected in similar patterns of potential change for small island markets. As noted by Briguglio (1995; 2022), Armstrong and Read (2002) suggest that small island markets are expected to exhibit structural convergence in production costs for small to medium sized construction projects. The cost floor for individual tendered projects in Paphos, as indicated by the 10.3% CV, is real and not simply a result of an unrepresentative sample. This finding is consistent with the observations of Ball (2003) on the structures of the construction industry in a number of countries around the world. He identifies a number of structural parameters that impact cost performance including material import costs, labour availability etc. These, and a variety of regulatory requirements, place similar constraints on all construction market participants.

The cost range for the construction of Residential buildings in Paphos is fairly boxed in within a so-called "cost corridor" of approximately €255/m² for the cost to the Developer of the finished building shell. This allows for some variation in cost mostly based on the nature of the site, the height of the building and the pressure on cost that the Developer is able to bring to the construction tender. The table below gives an estimate of the average construction cost for interior finishing of the medium-density residential product, based on a January 2026 construction price basis.

On average the Net Building Works come out at €1,194/m² for the Bills 1-13 only (CV 12.4%). This compares to a higher CV for the Bill 14 competitively tendered measured works which can vary greatly depending on the specialist sub-contractor pricing and the proportion of contractual works included within the specialist trade scope of works. Section 4.3 below details these figures and notes that based on the provisionally estimated sub-contract costs the Paphos cost stack is approximately 59% Bills 1-13 and 41% Bill 14.

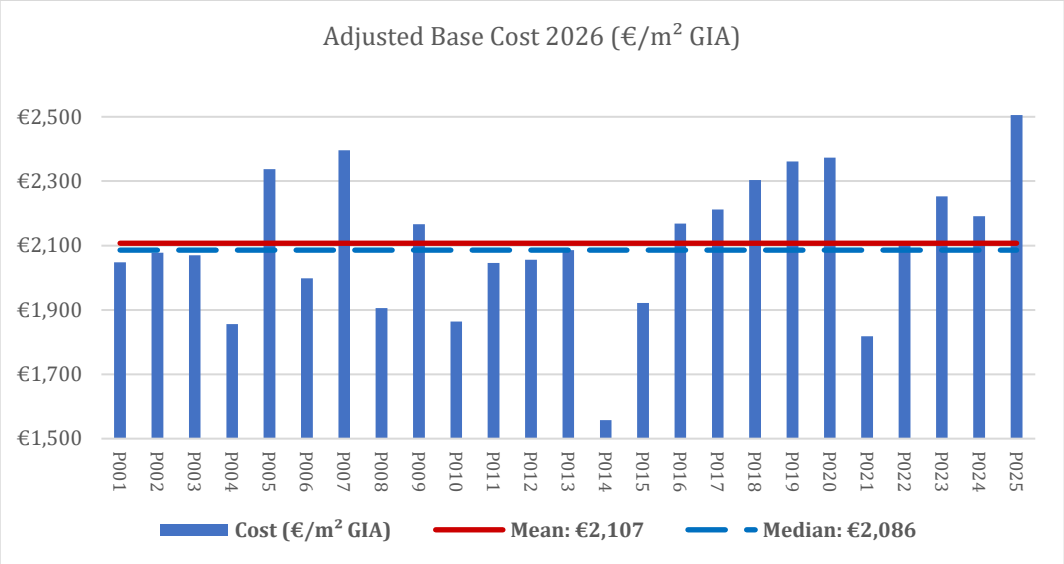

Figure 4.1: Bar chart of Adjusted Base Cost 2026 (€/m² GIA) for all 25 projects, sorted ascending.

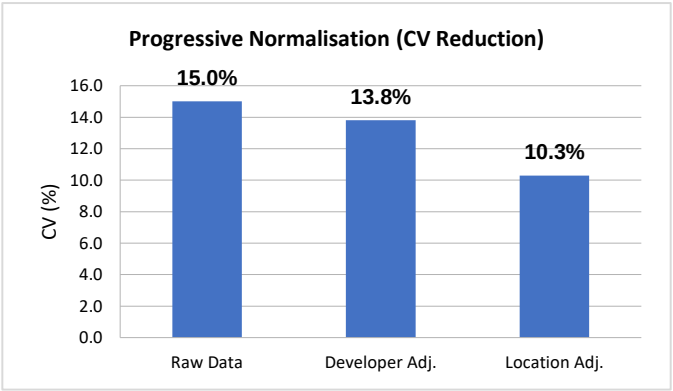

Figure 4.2: Progressive normalisation reduces dispersion from CV=15.0% to 10.3%.

4.2.2 Interpretive Qualifications

The €2,107 per square metre construction cost includes the 14 separate invoices for the core construction work and specialist sub-contracts, and allows for an assessment of the feasibility of the project in terms of common areas that cannot be sold as residential space. The cost per sellable square metre of floor space is €2,427 per square metre NIA based on the sample mean NIA/GIA ratio of 0.868. Apartments are typically marketed by reference to NIA at the point of sale, which is why the NIA-equivalent figure is reported alongside the GIA-based construction cost. These construction figures are hard construction costs at the point of contract entry and do not include land costs, professional fees, Statutory Charges, VAT, development finance costs, sales and marketing costs or developer profit. All of these soft costs and developer profit are shown in Section 4.7.

4.2.3 The Measurement Gap: Empirical Costs versus Official Data

The fully normalised Phase 1 cost averages €2,107/m² GIA, hereafter referred to as approximately €2,100/sqm. Official data on the average declared construction cost from the issues of the CYSTAT Building Permits series for residential permits in Paphos ranges between €1,000-€1,200/sqm (CYSTAT, 2024a). The serious measurement gap revealed by the data analysed in this report, means official data used by local authorities and by international organisations and research centres, such as the IMF (2023; 2024), European Commission (2023) and OECD (2024) is approximately 75-100% lower than the real construction cost.

Cyprus is a thin housing market and this is clearly reflected in the overall housing market official monitoring methodologies proposed by Apostolidis et al. (2023) using apartment transaction data. It is also a well known practitioners' fact that the declared permit cost for residential construction projects in Cyprus understates actual construction costs since this declared cost is used as a basis for the calculation of the statutory fees. This structural bias in declared costs has never been quantified and measured, and in this paper it is measured for the first time from a project level cost perspective using the details of the quantities contained in the bills for the priced tenders for the 25 projects analyzed in this paper. These project-level residential construction cost details represent the first published database of this type.

The findings of the present study have important policy implications. The affordability-viability gap identified in the present study is significantly larger than any study conducted to date using the declared CYSTAT construction costs. This affordability-viability gap is one of the most significant findings of the present study and forms one of the key contributions to the field of housing policy analysis. Significantly, the declared construction cost figure of approximately €945/m² used in housing policy analysis substantially understates the actual construction floor. This basic cost figure is utilised by all government ministries and also by the IMF and the European Commission in assessing and commenting on housing affordability in Cyprus. The true cost of construction as highlighted in Section 4.8 is effectively twice that figure.

4.3 Elemental Cost Composition

4.3.1 The Two-Thirds Concentration: Concrete and Bill 14

A comment is made that the construction cost is skewed heavily to the right within the 14 bill format. Provisional and PC Sums including nominated sub-contractor works and material allowances were found to be on average 40.9% of the total construction cost with the median at 40.6%. The highest individual average percentage of total cost was found to be the Concrete Works bill at 21.5% with 36.0% of the Bills 1–13 total. Bill 14 and the Concrete Works bill averaged 62.4% of total cost leaving the remaining twelve bills to average 37.6%.

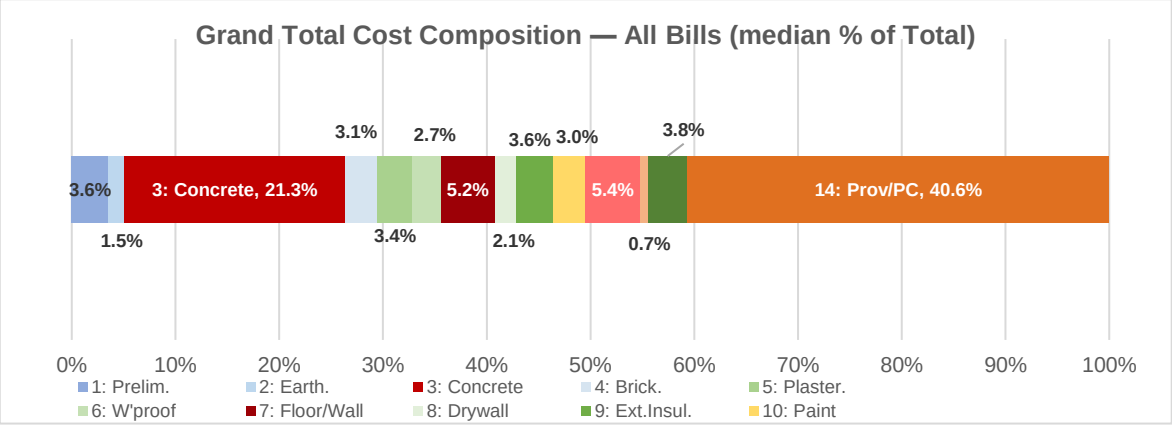

Figure 4.3: Grand Total decomposition for all 25 projects showing the Bills 1-13 / Bill 14 split.

This section describes the implications of the concentration feature shown in Figure 4.3 for the affordability analysis and discusses them in the light of the literature presented in Chapter 2.

Another aspect that was considered, albeit of secondary importance, was the import dependency of the cost stack relating to the Bill 14 costs. Around 40.9% of said cost stack may be vulnerable to what Briguglio (1995, 2022) refers to as the "island import premium". Section 4.3.2 highlights the sub-contract packages which make up the bulk of the Bill 14 related costs. These are mechanical and electrical services including HVAC, power, lighting, plumbing, fire protection, data and security infrastructure and elevator services as well as the aluminium glazing packages. All of the aforementioned packages are either fully imported into Cyprus, or made up of imported components and products for which there are no local alternatives. The cost of said materials and systems includes the landed cost, i.e. the price of the materials purchased plus all relevant freight and insurance charges plus the intermediary margins paid to those involved in sourcing the imports. These margins are estimated to be around 20-40% higher than comparable mainland European prices, according to Moullier (2009, 2015), particularly in relation to small island economies such as Cyprus. More than two-fifths of every euro invested in Paphos apartments goes to imports outside the local construction market. Exchange rates, global supply chains, and trade logistics play a role in the cost of every new apartment being built on the island.

The total-cost share of the structural system in housing construction in Paphos is found to be 21.5%. The method of in-situ reinforced concrete frame construction is a universal approach in residential construction in Paphos due to three principal factors: (i) the seismic design provisions of Eurocode 8 applicable to Cyprus, (ii) the favourable local climate conditions which allow for the use of thermal mass construction with concrete, and (iii) the local skills base that is accustomed to cast-in-situ reinforced concrete framing. The cost of concrete is further increased due to the import dependence of two essential elements, namely steel reinforcement bars which comprise approximately 30–35% of the cost of concrete, whilst cement supplied by Vassiliko Cement Works, the only integrated cement factory currently in operation in Cyprus, has indirect imports are also relevant due to the importation of fuel (pet coke and coal) and supplementary cementitious materials. Seismic design

provision increases the cost of reinforced concrete elements by 10–15% compared to non-seismic constructions, incorporating additional elements in the structural system and increasing the dimensions of typical columns and beams sections, additionally increasing reinforcement ratios, ductility detailing and capacity design requirements. This corresponds to an increase of the cost of the structural system from 13.5% of total cost (or 36% of Bills 1–13) to 21.5% of total cost. A seismic premium is also an irreducible cost floor.

The policy also sets out boundaries for cost-side policies. While some might argue that all bills have a role to play to achieve an affordable home, just 37.6% of the total cost of the homes remains to be spent. The largest component of these remaining costs is the External Works (Bill 11) at 5.4% of the total cost or €154 per square metre. Floor/Wall Coverings (Bill 7) and Builders Works for Services (Bill 13) are the next largest at 5.2% and 3.9% respectively. Preliminary Works (Bill 1) is then 3.6% with External Insulation (Bill 9) and Plastering (Bill 5) at 3.4%. The other bills are of lesser value. Indeed, by targeting the finishes, painting, landscaping or drainage, a marginal gain may be possible but that is all. An unrealistic reduction of 20% in every bill (save for the concrete bills) would yield a saving of no more than €154 per square metre or 7.3% of the total cost of the homes. Further savings of €85/m² (4.1%) could be achieved under Bill 14 for a 10% reduction in sub-contract procurement and of €45/m² (2.2%) for a 10% reduction in concrete costs through rebar bulk purchasing. Savings achievable in the future would be dictated by the fixed construction design and technology, the supply chain for construction materials and the relevant construction legislation, and hence would need to be addressed through an appropriate and effective construction costs policy. The latter were determined for the Paphos construction market.

Bill 14 Decomposition: The M&E Dominance

While each trade package under Bill 14 has a specific focus it also contains a cluster of associated elements. Measured against a 85% subcontract content against 15% Prime Cost or PC Sums (with 3% coordination fees), 85:15 becomes the new benchmark. Importantly this ratio is largely being driven by specialist sub-contractor pricing within a thin, oligopolistic marketplace. This market condition is not conducive to meaningful value engineering against measurable quantities.

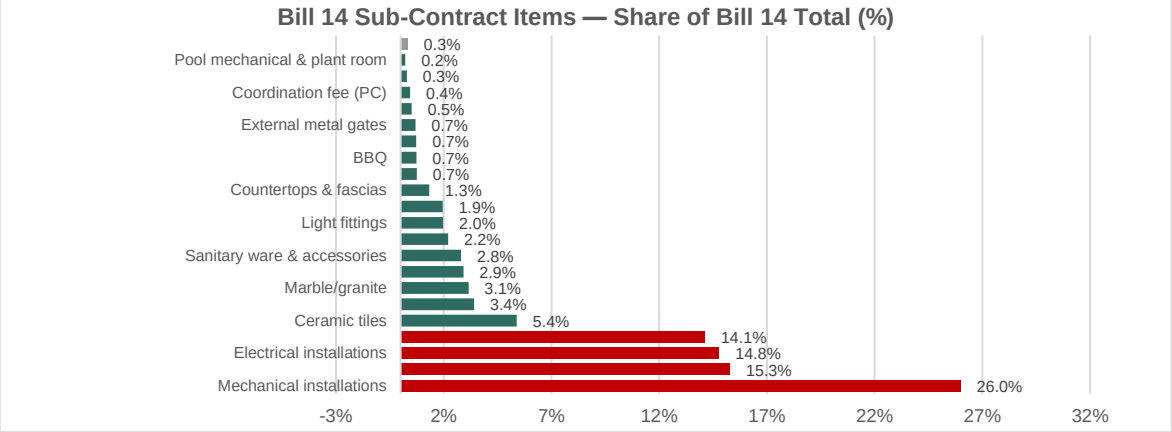

Figure 4.4: Total expenditure by Bill 14 sub-contract item across all 25 projects.

The five largest sub-contract packages are:

Mechanical and Electrical (M&E) trades account for 26.0% of the cost of the mechanical specialist sub-contracts and 14.8% of the electrical specialist sub-contracts. Taken together the two M&E trades account for 40.8% of the total specialist sub-contracts cost within the scope of Bill 14. Given that M&E systems are the sub-contract category most heavily affected by the upward pressure of regulatory uplift, this is a significant finding. Considerations around energy performance, fire safety and other building services requirements have impacted on the construction cost to integrate these systems into the building fabric. The 40.8% of the specialist cost stack influenced by cost increases due to regulatorily determined cost factors, and the trend in the cost floor due to increasing costs, will have important implications for policy makers.

Of the Bill 14 requirements, Aluminium windows and balustrades represent 15.3%. The aluminium sub-contract is very specification sensitive. Between standard thermal-break profiles and premium European systems there can be a cost differential of 40–60% and it is in the aluminium trade that the foreign buyer specification premium will get translated into Bill 14 costs.

The percentage of carpentry (fitted joinery including kitchen cabinets, wardrobes, vanity units, interior doors) is 14.1% of the Bill 14 items. The percentage for the coordination fees for sub-contracts is 2.9%. This is the main contractor's markup for managing the specialist trades.

The largest single component within the PC Sums for the floor and wall finishes to the facing of countersinks etc in wet areas is ceramic tiles at 5.4%. Marble / granite is second at 3.1%. Together the stone and ceramic finishes account for c. 8% of Bill 14 and account for approximately 59% of the floor and wall finishes PC Sums. These items are the most directly controllable from the client's perspective and represent the greatest opportunity to reduce costs. For example, substituting premium imported marble with a standard grade of ceramic tile could reduce the combined costs for the floor and wall finishes by 40 – 60%. The other major groups of controllable specification items account for a very small fraction of the overall cost of the project and have little impact upon the cost floor. Their value is in identifying a difference between a standard and premium building specification, not in determining the viability of a development.

4.3.2 The Building Envelope Cluster

Envelope building components make up 22.1% of the combined Bills 1-13. The Brickworks (Bill 4) represent 5.5%, the Plastering (Bill 5) 5.9%, Waterproofing and Insulation (Bill 6) 4.7%, and External Insulation (Bill 9) 6.0%. The combined insulation components form 10.7% of Bills 1-13. The insulation requirements for Near Zero Energy Building (NZEB) as required by the EU Energy Performance of Buildings Directive demand significant thicknesses of insulation particularly to achieve the U-values of $\leq$0.40 W/m²K for walls, $\leq$0.35 W/m²K for roofs and $\leq$0.45 W/m²K for floors. According to European Commission (2023) the cost of NZEB is estimated to increase the construction cost by 3-5% which clearly conflicts with the concept of housing affordability. In the

Paphos case the lifecycle benefits of improved thermal resistance to the building and environment, i.e. lower cooling costs which account for 40-50% of residential energy consumption in the Mediterranean, are economically invisible to the potential purchaser of a building at the point of sale.

4.3.3 Bill 14 Share Variation and Structural Consistency

The percentage of the Grand Total that relates to Bill 14 varied from 23.7% (P003) to 50.0% (P021) with an average of 41.8%. This percentage is distributed fairly consistently across the different types of developers with the average percentage of Bill 14 for corporate developers being 41.9%, SME 41.7% and private individuals 39.0%. This indicates that the share of Bill 14 is a standard element of the construction practice in Paphos related to the practice of the building services and specialist trades and not a function of the ambitions of individual developers. As a result, the maximum that can be achieved by reducing the construction cost of a new house or apartment through optimisation of Bills 1 to 13 is a reduction of 59% with the remainder of the cost to be addressed through the specialist sub-contract packages covered by Bill 14. Addressing Bill 14 requires a discipline in the correct specification of the individual trades as well as adopting a systematic process of value engineering the main trade contracts. Industry wide cooperation to achieve construction cost through collective procurement for as many developers as possible would also achieve the aim of reducing the construction cost and achieving best practice.

4.4 Cross-Sectional Cost Variation

This section examines the systematic variation in the inflation-adjusted, specification-standardised cost (€/m² GIA, January 2026 prices) across five contextual dimensions. The analysis employs both descriptive cross-tabulation and regression analysis to distinguish between dimensions that exhibit genuine cost effects and those where apparent variation reflects sample composition rather than structural cost drivers.

4.4.1 Developer Type and Organisational Scale

The three developer types have a clear but moderate cost profile. The mean adjusted cost per square meter for the Corporate and SME developers was €2,077 (€2,108) and €2,093 (€2,052) respectively. This is significantly greater than the cost per square meter for the private individual at €2.225 (€2.235). Although there is only a small difference between the cost of the Corporate and SME developer, this is in a thin market and most would expect the Corporate developer to have the advantage of being the lower cost of the two. In bigger markets as described by Ball (2003) the Corporate developer is able to take advantage of a number of costs savings, most notably the ability to purchase in bulk, the overheads that can be amortised over a larger number of units and the procurement skills that are needed in a competitive market. All of these factors appear to be negligible in the Paphos market.

Private individual premium assumed is 7.1%. This reflects a number of organisational disadvantages including smaller project sizes on average (7 per project compared to 15 for corporates) and an inability to spread procurement capacity across multiple projects. While bulk contracts have been

negotiated, three of the four private projects to date have been completed under a negotiated contract rather than an invitation to tender. Furthermore, there is some self-selection bias around the type of project an individual would develop for, and a key consideration in this regard is the potential to add value and customisation that tends to translate to higher construction costs.

Large developers (more than 100 units per year) averaged €2,077 per m², compared to €2,077/m² (more than 100 units per year, n=11). Medium (20-100 units per year, n=6) averaged €2,120/m², Small (5-20 units per year, n=4) averaged €2,053/m² and the lowest Micro (fewer than 5 units per year, n=4) operated at the highest cost of €2,225/m². While Small developers are only marginally below the Medium category this is contrary to initial expectations and perhaps a function of the sample size. What is however a clear trend is that the lowest operators (Micro & private) do suffer a cost disadvantage of approximately 7%.

In relation to Ball's (2003) efficiency threshold, even the largest developers in this sample do not specialise in more than half the market and average production across all districts of approximately 150-200 units per year. Thus, their cost disadvantage is marginal rather than substantial when compared to their smaller and medium enterprise competitors.

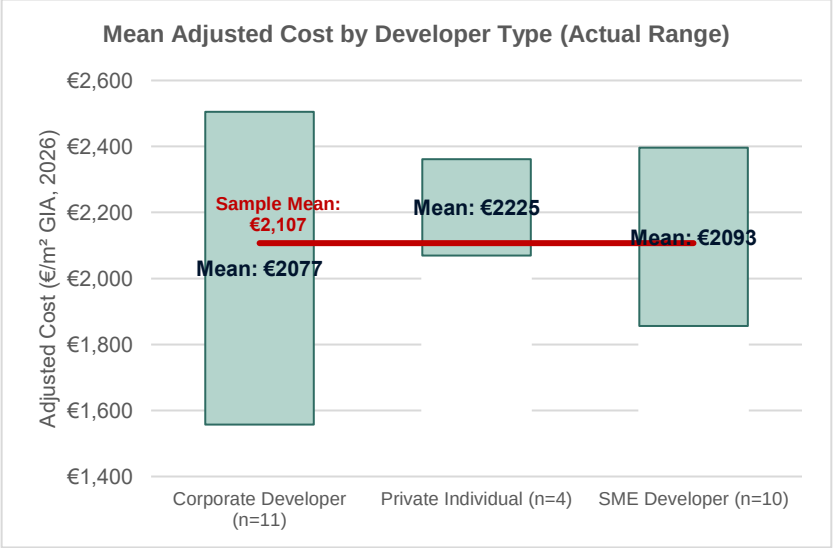

Figure 4.5: Mean adjusted cost by developer type with error bars (±1 SD).

4.4.2 Location

The 14 Urban projects have the lowest opportunity cost averaging €2,023/m². The 7 Urban-coastal projects have an average opportunity cost of €2,209/m², representing a 9.2% premium relative to the Urban projects. The 3 Rural projects have an average opportunity cost of €2,172/m², representing a 7.4% premium.

The urban–coastal premium is unlikely to be entirely captured by the "extras–stripping normalisation". While this component captures greater external works required to address site specific requirements of a coastal site, it also captures more superior base construction qualities required to command a price in the foreign buyer market segment that drives demand for new

construction on the island's coastal regions (Beyer and Biljanovska, 2023). In turn, the urban–coastal premium might also capture environmental site-specific compliance costs required to be incorporated into the price of construction. That the urban–rural premium also captures higher logistics costs associated with higher transportation materials and labour to more remote rural sites is a further manifestation of the well-documented transport-cost vulnerability of small island economies (UNCTAD, 2022).

The urban baseline used for policy purposes for this study is set at €2,023/m² the most favourable structural cost position available within the district. This is much higher than the sample mean of €2,107/m². Affordable housing developments would be sited within the city and the urban baseline should be used as a guide for developing design and structural cost strategies for these types of projects.

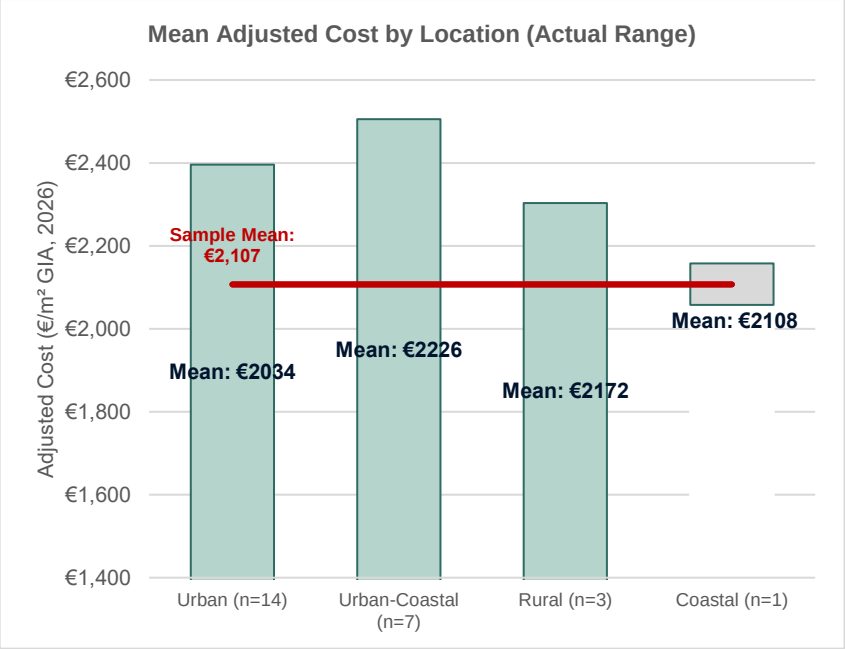

Figure 4.6: Cost by location classification.

4.4.3 Building Height

The systematic effect of the contextual variables examined showed the height of a building to be the greatest predictor of unit cost. The average of the five 3-storey buildings (n=5) was €2,192/m², the ten 4-storey buildings (n=10) averaged €2,191/m², the six 5-storey buildings (n=6) averaged €1,960/m² and the four 6-storey buildings (n=4) averaged €2,011/m². A regression was estimated for this variable and it explained some of the observed variation with an estimate of a −€87/m² drop in cost for every additional storey ($R^2 = 0.161$, $r = -0.40$). The group means show a notable step change between the 4- and 5-storey building costs, and are a more reliable guide for general planning purposes. The height of the building accounts for 16% of the variation in costs between projects. The costs associated with differing building specifications and project specific factors were far greater and less predictable.

The savings in the "savings mechanism" are also significant as the foundations, site preparation, early construction, lifts and roof together with the common façades, cores and balconies do not vary in proportion to the height of the building. Plans for three residences are considerably less expensive than those for six residences. For instance the saving is approximately €181/m² or 8.3% for increasing the number of floors from three to six. This translates into savings of €10,000 to €17,000 for each additional three residences thereby calculating out at a saving of €100 to €170 per m² of residence GIA (€900 to €1600 per residence of 92 m²).

The findings have important implications for housing policy. The density bonus is effective because it creates viability gain by lowering the cost per unit and by allowing the builder to construct additional units on the site. This latter "cost lever" within the current planning system has a magnitude of €87/m² (or - 4.2% of mean) per additional storey given that the density bonus would allow the builder to build a 6 storey building in lieu of the 3 storey building that was originally proposed. This gain is comparable in magnitude to the specification premium that developers obtain from including individual extras such as larger balconies, higher ceilings, greater floor area etc. This extra was estimated to be €85/m² on average for the 5.8 extras included in the sample. The finding is consistent with that of Calavita and Mallach (2010) who note that the effectiveness of density bonuses depends on the relationship between the GDV gained from additional units and the cost of the affordable provision. This is the first project-based evidence on the cost-side benefit from the Paphos data, which suggests that height uplift could reduce the denominator of the viability equation by circa. 3% per additional storey.

Figure 4.7: Building height vs. cost/m², with regression line.

4.4.4 Procurement Route

The Competitive Tender projects averaged €2,056/m² compared to €2,221/m² (8.0%) for the average of the five Negotiated BoQ projects. The single Negotiated Special Terms project averaged €2,505/m². The 8% advantage in the competitive tendering process translates into price only and the differential is only modest when set against the rest of the world. Ashworth et al. (2013) reported competitive tender discounts of between 5% and 15% over the long term during periods of normal tendering activity. In Paphos the market of contractors is thin and there is little room for competition with all contractors working at full stretch on most projects.

The level of discount offered to NS&I in tendering for the new nuclear power stations design and build contracts has been relatively modest. For the 25 projects for which tendering information is available, 22 have offered a discount off the Bills 1-13 tender price. The largest discount offered to NS&I on a single contract was 9.7 per cent and the average discount offered on the 25 projects was 2.5 per cent. The two largest discounts offered to NS&I of 8.9 per cent and 9.7 per cent were achieved in competitive tender. However, only a minority of discounts offered to NS&I have exceeded 4 per cent. This is in contrast to more competitive markets where contractors will go to great lengths to win a contract in order to increase their workload and margins.

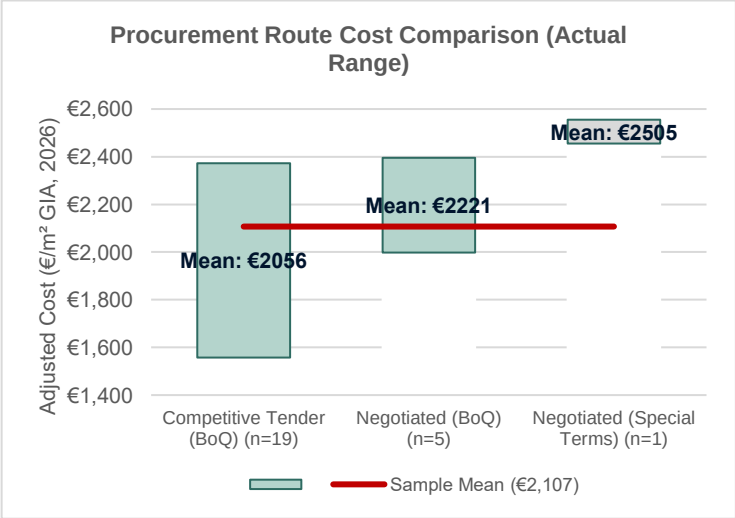

Figure 4.8: Procurement route cost comparison.

4.4.5 Scale Effects and Regression Analysis

The correlation between the number of apartments and the adjusted cost per m² for 2026 was very weak and not significant (Pearson $r = -0.115$, $p = 0.585$). The simple regression line had a very small positive slope of −€2.92/m² per additional apartment, which translates into a cost saving of less than €3/m² per apartment. Thus, within the typical Paphos range of 4 to 36 apartments, larger projects do not mean cheaper cost per m².

As discussed previously, neither project nor firm level scale effects were identified within the Paphos construction market. Analysis of the Paphos data, in relation to project scale, found that it is not in alignment with the findings of Somerville (2001) in relation to cost efficient project sizes in US

construction projects. Somerville (2001) found that the most cost efficient project size in the Paphos construction market would be in the region of 20-100 units. Additionally, Somerville (2001) established that there is a U shaped cost curve associated with construction project size, or in other words, very small projects can be very costly per unit of output and then as the size of the project increases, the cost per unit of output decreases to a point (the optimum) and then further increases in project size give rise to diseconomies of co-ordination. This finding is reinforced by the work of Ball (2003) who established that the optimal output for the largest firm in an market would be in the range of 100-500 units per annum. Discussion of the limited scale effects within the Paphos construction market were presented within the literature review and are not therefore replicated here. Essentially the limited number of contractors actively involved in the construction process in the Paphos region means that a small number of firms, sub-contractors and material suppliers are typically involved in the majority of projects at very similar price levels. The scale effect analysis presented within the findings on Bill 14, found that the scale savings in the portion of the construction project that can be optimized, which in this case constitutes less than 60% of the total project cost, was felt to be a less than optimal saving. However the key finding was that the same landed cost is transferred to import driven materials irrespective of the purchasing volume. Vulnerability's scale-cost curve for the Paphos market is flat, not U-shaped.

However, the question needs to be asked are these scale effects actually real or are they being masked by confounding variables. One way of addressing this is to conduct a three-variable multiple regression. This involves setting out three independent variables (apartment count, extras count and storeys above the ground floor) and taking the adjusted 2026 cost for the typical apartment as the dependent variable. The results of this exercise are shown in Table 28 below. The multiple regression explains 23.6% of the variation in the cost of the typical apartment with the remainder of 76.4% being explained by the site specific and contractor specific factors which cannot be teased out with the available data and sample size. The table shows that there are definitely scale effects in play. The model would suggest that an increase in apartment count of one would save approximately €6/m². Similarly there are scale savings of approximately €37/m² per additional storey. Most surprisingly the economic predictor of the cost of the typical apartment is the specification of the apartment itself. The table reveals that a project which includes 9 of the extras (high ceilings, balconies, roof terraces etc) would cost approximately €234/m² or 11% more than similar projects which incorporate only 3 of the extras. The cost of increasing the height of the typical 3 storey apartment to a 6 storey version would save approximately €5.3% or €111/m².

Looking at the bivariate correlation matrix (in A6_Correlations and B14_Correlations) shows that the variables most closely associated with the adjusted 2026 cost are: extras count (r = +0.367*) – moderate positive correlation; extras cost (r = +0.197*) – weak positive correlation; discount percentage (r = +0.262*) – weak positive correlation (this is counter-intuitive – i.e. as the cost of the project increases the discount awarded also increases); storeys above ground floor (r = -0.266*) –

weak negative correlation; apartment count (r = -0.115*) – negligible correlation; GIA (r = -0.009*) – negligible correlation; NIA (r = -0.073*) – negligible correlation. This confirms the earlier observation that the specification of the house is the main systematic driver of cost variation, with physical size having little to say on the matter.

Caution is required when presenting the results from the regression analyses, since the sample consists of 25 projects, which is small and yields only limited degrees of freedom for a multiple regression analysis (three independent variables). Therefore, the results from the multiple regression analysis serve only as an exploratory analysis and are meant to indicate the direction and the size of the relationships, rather than establishing causes. This needs to be an area of future research with a larger sample of projects.

4.5 Specification, Apartment Mix, and Area Efficiency

4.5.1 Amenity Prevalence and the Two-Tier Market

The ordinary amenities of the apartment projects under consideration consist of a limited number of items which are included in more than 50% of the projects, such as lifts, PV's, communal swimming pool, premium landscaping and roof gardens / penthouse terraces. Thus these ordinary amenities have become a standard requirement and the specification – standardised cost floor which eliminates their costs from the model is purely hypothetical and remote from being achieved, especially in the affordable segment of Paphos. The extra amenities on the other hand are limited and varied and do not include a large number of typical extras that are offered in most of the projects.

Out of the reviewed residential projects less than 50% offered premium amenities such as underfloor heating, HPL/premium cladding, bicycle parking or gym, BBQ facilities, private roof pools, water features and smart-home automation. While 40% of the projects offered underfloor heating and HPL/premium cladding, 44% provided spaces for bicycle parking or gym. Facilities for BBQs were offered by 24% of the reviewed projects. Roof pools were offered in 20% of the projects reviewed, water features in 12%. And while 8% offered smart-home automation and saunas/spas, there were no EV charging stations offered in the 25 projects reviewed. This is likely to change in the next few years as governments introduce regulations to make electric vehicles compulsory.

The cost of inclusion of amenities into the base floor plan configuration is equal to 4.3% of so-called "unadjusted total cost" averaging €85 per square metre. The premium for incorporation of different types of amenities into the floor plan shows marked variation and the highest premium per square metre is for all communal pool related amenities averaging €2,152 per square metre (5.5% above sample mean). Results also indicate that larger numbers of amenities above median values have higher premium per square metre than smaller numbers of amenities with the threshold for the sample as more than 5. The individual specification extra with highest average premium per project is underfloor heating at €2,185 per square metre (adjusted cost including associated structural and services costs) and this gives some indication of the additional costs that may be incurred where this

service strategy is specified. However, these costs are not captured fully by the extras-stripping methodology.

The positive correlation between the number of amenities and the adjusted cost (r = +0.367) suggests that there remains a strong link between the number of the features of a project even after all the extras have been identified and "stripped" out. This residual correlation supports the "cascade effect" referred to in Section 4.3.

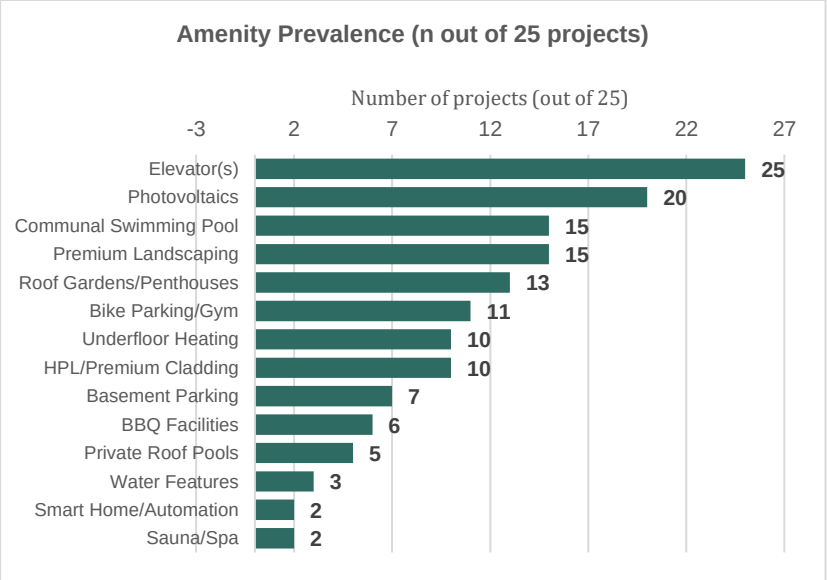

Figure 4.9: Amenity prevalence chart.

4.5.2 Apartment Mix and the 2-Bedroom Standard

The survey samples 348 individual apartments across studio, 1, 2, 3 and 4 bedroom types. Two-bedroom apartments represent nearly 50 per cent of product on offer, with the 1-bedroom close behind in terms of prevalence. Studios although a minority provide efficient spaces averaging 30–37 square metres. One, two, three and four-bedroom apartments averaged 35–79, 64–103, 98–141 and 148–183 square metres respectively.

The affordability analysis is based on a 2-bedroom apartment of 80 m² NIA (Net Internal Area). This choice strikes a balance between three different market pressures influencing apartment size in this market. Firstly, the minimum functional space for a 2-bedroom apartment with sufficient living space plus a kitchen and a bathroom is approximately 65-70 m². Secondly, the market consists of a mix of local families and foreign investors; both categories expect a minimum of 75-90 m² for a 2-bedroom apartment. Thirdly, developers are motivated to keep the floor area as small as possible, because while each square metre only incurs approximately €2,107 of additional construction cost, this translates very loosely into an increase in sale price per square metre. Based on a price per m² GIA of €2,107 (where GIA = 80/0.868 ≈ 92 m²), the construction cost of the base case 2-bedroom apartment would be approximately €194,000.

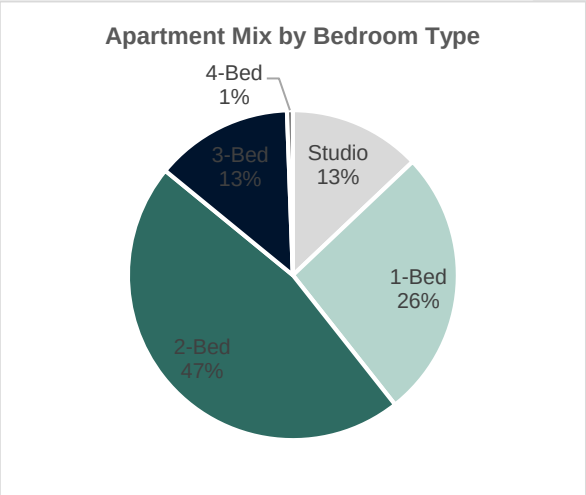

Figure 4.10: Apartment mix

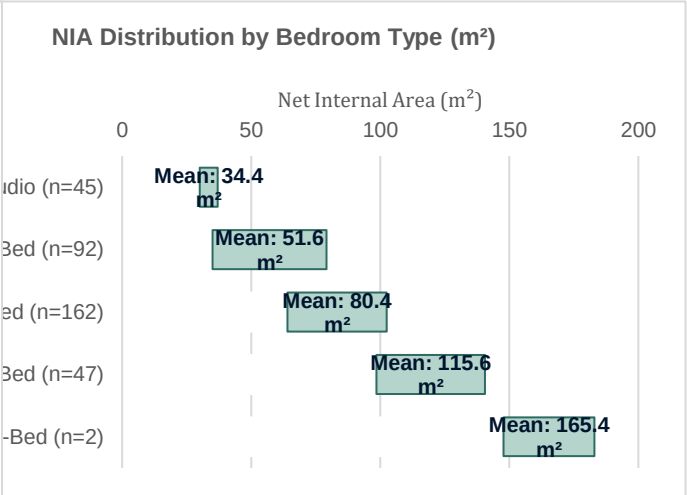

Figure 4.11: NIA distribution by bedroom type

4.5.3 Area Efficiency and the Covered Balcony Convention

The average ratio of NIA to GIA for the reports generated for the building was 0.868, equating to 86.8% sellable area and 13.2% common areas (all circulation zones including staircases, corridors, lobbies, plant rooms and refuse areas). The reports generated for the building ranged from 0.735 to 0.938. The single-core buildings with one staircase generally produced the highest ratio approaching 94%, whilst the dual-core buildings with complex plans produced the lowest ratio at 80-85%.

An important aspect of the design of the Paphos apartments is the provision of covered balcony space. On average this covered balcony space constitutes approximately 26-28% of the NIA of each apartment. In terms of the percentage of the Gross Internal Area (GIA) this would be approximately 25% which is the limit as set by planning legislation. Taking the three-bedroom 3-bathroom apartment as an example, the NIA is 120m². The covered balcony off the living room would be 31m² plus two further balconies off the two bedrooms of 10m² each. The balcony areas are constructed as reinforced concrete slabs either projecting out from the external apartment wall or supported from pillars cast from the floor slab below. The balconies are finished with balustrades, waterproofing and provisions for drainage. The cost of the construction of the balcony is approximately 60-70% of the equivalent floor area for sale. Therefore the cost of the 21m² of balcony space for the two-bedroom apartment would be approximately €27,000-€30,000.

The covered balcony provisions can also be a design lever in terms of affordability. By reducing the covered balcony from 26% of NIA to 15% of NIA, the constructed area per unit is reduced by approximately 9m² or €12,000 to €15,000 per unit. However this would make a very significant change to the character and product that is being offered on the market and is a parameter that should be considered as part of the overall design parameters when looking at a specification standardisation approach for an affordable scheme.

4.6 Temporal Dynamics

4.6.1 The Three-Phase Inflation Trajectory

CYSTAT published data on the Price Index of Construction Materials for the three phases of the monitoring period 2019-2026. The first phase of the monitoring period corresponds to the period 2019-2020. The Index shows a stable trend at the levels 86.0, 86.4 (base year 2021=100). The second phase of the monitoring period corresponds to the period 2021-2022. The Index shows a significant increase of the prices of construction materials. The highest value reached was 115.8 in 2022, showing an increase of 15.8% in a single year, due to the Pandemic, supply chain disruptions, the European energy crisis and the Russia- Ukraine conflict. The third phase of the monitoring period corresponds to the period 2023 to February 2026. The Index stabilises at the high levels reaching 117.5 in 2023, 118.5 in 2025 and 119.3 by March 2026. This means an increase of 1.5% over the three year period. In total the increase of the prices of construction materials from 2019 to 2026 is 38.7%.

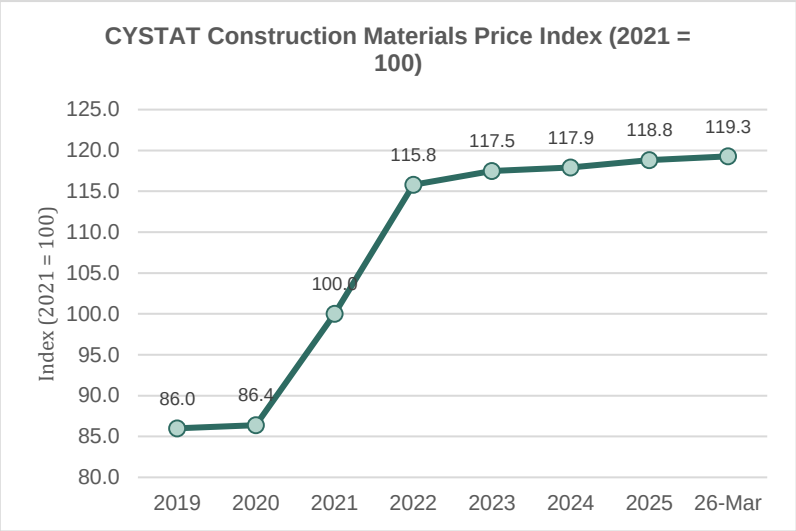

Figure 4.12: CYSTAT Price Index three-phase trajectory.

4.6.2 Nominal versus Real Cost Trends

In order to know the trends and evolutions of bathroom equipment and furniture prices, it is necessary to monitor the evolution of both nominal and inflation-adjusted prices on a year by year basis. Nominal prices have increased in all the monitored years. The total increase is equal to 26.3 % from €1,615 (2019 average of 3 quotes) to €2,040 (2025 average of 8 quotes). From an inflation-adjusted point of view, there is a decrease. The 2019 average in January 2026 is €2,233, while the 2025 average is €2,041. After allowing for recent materials price rises, the real total construction cost trend is revealed to be downwards, possibly level. This reflects improved efficiency, greater competition and tougher specification control on recent projects. However, the sample for 2019 is very small (n=3) and these findings should not be seen as predicting future trends.

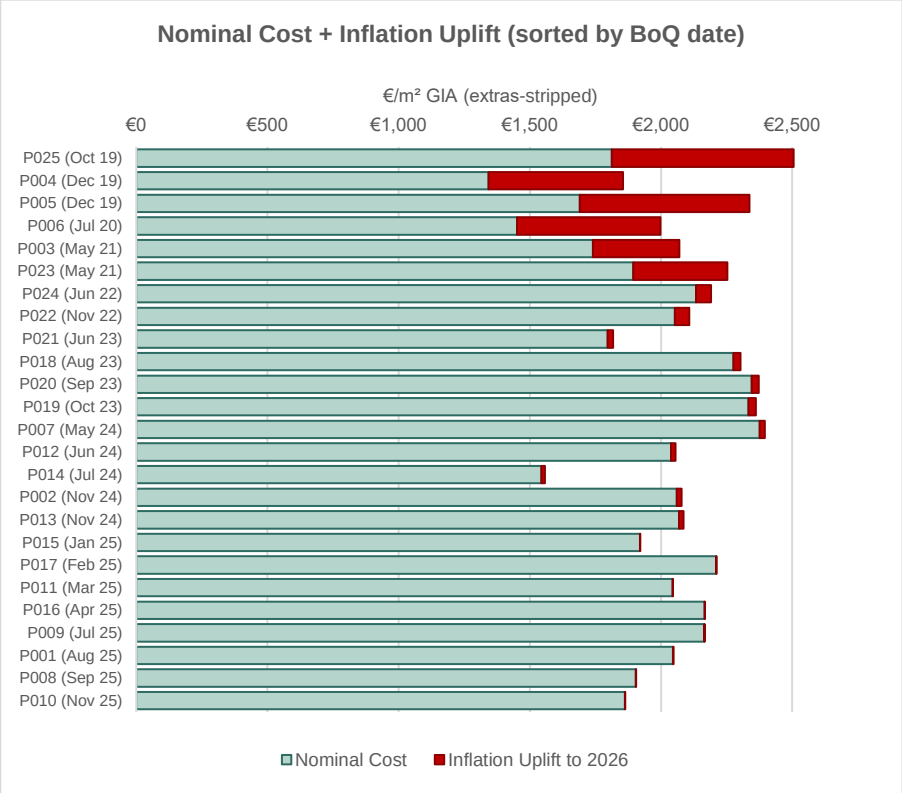

Figure 4.13: Inflation adjustment impact by project, showing uplift from nominal to adjusted

4.6.3 Implications of the Post-2022 Plateau

Considering the implications of the 2022 plateau. The sharp cost increases from 2021-2022 appear to have been a one-time level shift in materials costs (i.e., they have been tracking in a straight line up from 2021 and are currently at index level 119.3), and are no longer driving future inflation. For cost models for feasibility studies, these should be based on this new normal year of 2022 rather than ongoing increases. The "island premium" is higher than pre-2021 but it is also a constant wild card and therefore is no longer a source of risk for plans under development. The main consequence of the affordability analysis in the report is that the cost floor revealed by Phase 1 is not a cyclical peak but a permanent feature of the market.

4.7 The Total Development Cost Stack

The Phase 1 analysis established a hard construction cost floor for the development. This section calculates the total development cost that each scheme will need to realise from the resale price in order to deliver a viable development. The total development cost includes the Phase 2 analysis, the cost of the land, the soft development costs and the required developer profit. Three scenarios have been developed and analysed using a range of data relevant to three different market sectors currently operating in Paphos. The methodology, data and results are outlined in Section 3.5.1.

4.7.1 Land Acquisition Costs

The land cost parameters are based on 39,940 title deed transfers and 13,227 Contracts of Sale (COS) recorded at the Paphos District Land Registry Service (DLS) office between 2008 and 2024. After

applying several filters to the registers, a total of 8,945 valid arm's-length land transactions took place between 2019 and 2024. Transactions involving the sale of partial title deeds, or properties that had undergone restructuring or foreclosure, mortgage releases, existing building sales and antiparochi sales were all excluded from the sample. From the COS register, 39 documented antiparochi agreements and 13 zero-consideration unit transfers were also excluded from the analysis.

The study area is defined as a 10 minute drive radius, containing the seven villages shown in Figure 4.3. The study area is the potential development area for medium-density apartments within existing building plot configurations. The values for the existing building plots within the study area are summarised in Table 4.2.

Table 4.2 Building Plot Values by Catchment Village (2019–2024)

Village	n	Mean (€/m²)	Median (€/m²)	Q1 (€/m²)
Paphos	572	617	451	333
Geroskipou	192	367	241	214
Chloraka	55	428	279	197
Emba	139	370	212	196
Konia	113	401	232	221
Marathounda	16	164	121	117
Agia Marinouda	29	297	192	162
Catchment Wtd. Avg.	**1,116**	**497**	**343**	**270**

The sample is over represented by Paphos urban with 572 transactions accounting for 51% of the total sample size. The median price per plot for Paphos urban is €451/m² some €108 above the catchment weighted average price for the area of €343/m². The two options for a "peri-urban" land use, are offered at Geroskipou at €241/m² and Emba at €212/m². Although cheaper than Paphos urban in terms of land price per square metre, this advantage is slightly eroded by the lower building coefficients offered for the land over the square metre of buildable GIA.

Field land provides a parallel land supply, especially for larger site requirements. Average price per square metre for fields across the study area is €124, with the most expensive areas to develop being in Paphos at €248/m². The cheapest is in the Marathounda catchment at €7/m². Fields are generally a third of the value of the potential building plot but have a greater discount from the land area for the net developable area. All subdivisions under the Local Plan (LP §3.3.2–3.3.3) require a road contribution to the promoter of the scheme, this is currently around 10–15% of the catchment weighted average field price per square metre for the catchment. In addition the Local Plan allows for a green area / environmental deduction of the developable area, this varies from 0% to 15% and on average is around 10%. In addition the promoter is required to provide social facilities typically for large parcels of land of 2–3% of the site area. The total overall deduction from the promoter is limited to 40%. For example, a 2000 sq m field in Paphos District would be reduced to a 1750m² site after a road contribution of 12%. The total overall deductions would be 25%.

Plot prices more than doubled over the five year period studied. The catchment median price per square metre increased substantially over the study period, representing a median compound annual growth rate of approximately 10.0 per cent compared to growth in construction costs of 3–4 per cent and average wage growth of 4.3 per cent per annum. As such, the already problematic affordability–viability gap has increased significantly over the study period. Although the mean CAGR for all plots of 2.4 per cent looks modest, this disguises the large increase in value of individual plots within the study area that have driven a trend towards higher value plots.

The imputed land cost per square metre of buildable GIA is calculated using the median plot price per square metre divided by the appropriate building coefficient extracted from the relevant Section of the Paphos Local Plan. The results are depicted below.

Table 4.3: Imputed Land Cost per m² GIA by Catchment Village

Village	Median €/m² plot	BC range	€/m² GIA (low)	€/m² GIA (high)
Paphos	451	1.00–1.60	282	451
Geroskipou	241	0.60–0.90	267	401
Chloraka	279	0.60–0.80	349	466
Emba	212	0.60–0.80	265	353
Konia	232	0.60–0.80	290	387

However, a height-land paradox exists as in Paphos urban, the highest median plot price is €451/m² yet the lowest €/m² GIA at the high BC scenario is €282. This is because the Local Plan permissions for Paphos of 1.00–1.60: $\rho = 1.25$, fall within the Ka3–Ka5 land use zones. In contrast, at the lower median plot price of €279/m² in Chloraka, the resulting GIA has a €349–€466/m², while for Emba with the lowest plot price of €212/m², the resulting GIA is €265–€353/m². The inverse of what one would anticipate in terms of land affordability and the density of permissions exists. However, this has important implications for the policy analysis set out in Section 4.9.

This test applies affordable housing viability to observed land costs and building costs. Based on the catchment weighted average land cost of €342 per m² GIA, together with Phase 1 construction figures, soft and other construction costs of 7.5% , profit to the developer of 17.5% on building cost and zero finance cost, results indicate that residual land values are negative for all 6 scenarios tested. The breakeven point for Gross Development Value per m² GIA is €2,976 for the mean cost scenario (single earner, dual-earner affordable ceiling of €2,445 per m² GIA). This represents an increase of 22%. For the lowest cost (Q1) scenario of −€395 per m² GIA, breakeven point is 180% above the dual-earner affordable ceiling. Thus, based on current construction costs for residential building, affordable housing is unviable without the aid of subsidy. Sales from market-rate housing must exceed €3,000 per m² GIA for housing to be viable for development.

A caveat on land costs is that the quality of the information used is uncertain. The declared-to-accepted price ratio of the transactions included in this study averaged 0.83 (17% below transaction price), compared to 0.86 in 2019. In 47% of the 2023 transactions the declared price was below the

accepted price. As a result, the values used in the residual model are likely to be conservative lower-bound estimates of the actual land costs and potentially up to 15–20% higher than the values used in this study. Section 4.9 details the sensitivity analysis that examines the impact of varying the land cost by ±20% and ±50%.

4.7.2 Soft Costs

The soft cost schedule as detailed in Section 3.5.1 includes the professional services costs (central) expressed as a percentage of the construction cost for percentage-based items, and the statutory charges for planning and building permit fees.

For the residual model the soft cost allocation to residual profit includes only the basic professional services costs that rise in line with construction cost i.e. 7.5% of construction cost. Statutory charges and other GDV-linked marketing and sales costs are disregarded as being small. The marketing and advertising costs are treated as a deduction from revenue in the appraisal, as is standard practice (Isaac & O'Leary, 2012). The developer's finance costs have been treated in a relatively simplistic manner as it is considered that the majority of Paphos developers would expect to self finance a project from pre-sales and/or from their own equity.

4.7.3 The Three-Scenario Cost Stack

All development costs for the three cases are summarized in Table 4.4 for the relevant Q1 construction category in Paphos with the highest building coefficient (BC 1.60). The table distinguishes between Scenario A (best case urban, Q1, Paphos, construction costs in Q1, BC 1.60), Scenario B (standard urban case, average construction costs in Paphos, "median" BC 1.30) and Scenario C (peri-urban case of scenario Q3, area of Chloraka, average construction costs in Paphos, mid-range BC 0.70). As expected, land cost per m² GIA for the lower-density Scenario C is higher compared to the urban scenarios A and B.

Table 4.4: Development Cost Stack - Three Scenarios

	A: Urban Best-Case (Paphos)	**B: Urban Standard (Paphos)**	**C: Peri-Urban (Chloraka)**
Description	**Q1 cost, Paphos BC 1.60**	**Mean cost, Paphos BC 1.30**	**Q3 cost, Chloraka BC 0.70**
Construction cost (€/m² GIA)	1,998	2,107	2,253
Land cost (€/m² GIA)	282	347	399
Soft costs (7.5% of construction)	150	158	169
Total development cost	**2,430**	**2,612**	**2,821**
Developer profit (17.5% on cost)	425	457	494
Minimum GDV required (€/m² GIA)	**2,855**	**3,069**	**3,315**
Per 92 m² GIA unit	**€262,660**	**€282,348**	**€304,980**

Using the assumed costs outlined in Table 3.1 above the minimum viable sale price for a standard 2-bedroom apartment of 80 m² NIA (93 m² GIA) would be €263,000 under scenario A and €305,000 in the peri-urban case C. This means that in all circumstances a developer would not be able to deliver a standard specification apartment and make a minimum return on investment at a lower price. In reality the delivered price would be even higher allowing for items such as lift, security systems and other enhanced amenities, as well as a developers profit and the payment of a reasonable interest rate on development finance.

4.7.4 The Affordability-Viability Gap

The affordability threshold model, described in Section 3.5.4, produces the following maximum affordable purchase prices for the three household income scenarios.

Table 4.5: Affordability Threshold by Household Scenario

	A: Single earner	**B: 1.5 earner**	**C: Dual earner**
Gross annual income	€23,544	€35,316	€47,088
Less: SI (8.8%) + GHS (2.65%)	€2,696	€4,044	€5,392
Net annual income	**€20,848**	**€31,272**	**€41,696**
Max annual housing expenditure (30% of net)	€6,254	€9,382	€12,509
Max monthly housing expenditure	€521	€782	€1,042
Less: non-mortgage costs (€121/mo)	€121	€121	€121
Net monthly for mortgage servicing	**€400**	**€661**	**€922**
Max loan principal (3.70%, 25 yr)	€78,287	€129,245	€180,202
Max affordable purchase price (80% LTV)	**€97,859**	**€161,556**	**€225,252**

The central question of this study is whether the minimum viable sale price established in Table 4.4 is accessible to local households. Table 4.6 compares the development cost stack directly against these affordable purchase ceilings.

Table 4.6: The Affordability-Viability Gap

	Single earner (€97,859)	**1.5 earner (€161,556)**	**Dual earner (€225,252)**
Scenario A: Urban Best-Case			
Min viable price	€262,660	€262,660	€262,660
Gap (€)	€164,801	€101,104	€37,408
Gap as % of viable price	**62.7%**	**38.5%**	**14.2%**
Scenario B: Urban Standard			
Min viable price	€282,348	€282,348	€282,348
Gap (€)	€184,489	€121,000	€57,096
Gap as % of viable price	**65.3%**	**42.8%**	**20.2%**
Scenario C: Peri-Urban			
Min viable price	€304,980	€304,980	€304,980
Gap (€)	€207,121	€143,424	€79,728
Gap as % of viable price	**67.9%**	**47.0%**	**26.1%**

The outcome is uniformly negative for affordability. Even under the most optimistic assumptions – lowest urban construction cost, highest admissible density and highest dual-earner income – the lowest-cost viable apartment would cost at least €37,000 above the dual-earner affordability ceiling. In the scenario B (single-earner), the shortfall is yet more significant, amounting to €184,000 (65% of the minimum price for affordability) or 7 times the gross annual single-earner income.

For single-earner households the shortfall is far more severe. Across all three scenarios it ranges from €164,801 (Scenario A) to €207,121 (Scenario C), representing 63-68% of the minimum viable price and roughly 7-9 times the household's gross annual income.

In all three scenarios the minimum viable price for a typical 2-bedroom apartment (€262,660 - €304,980) lies well above the single-earner affordable ceiling of €97,859.

While public discussion of unaffordability in Cyprus often points to land speculation, developer profit margins, or excessive regulation, the empirical evidence here indicates that the dominant driver is the high cost of construction itself, reflecting the structural conditions of a seismic, import-dependent, small island economy.

There is a significant affordability gap between what owners would be willing to pay and the current price for both single and dual-earners. Under Scenario B, the dual-earner affordability gap of €57,096 (20.2%) could potentially be bridged by a combination of deposit subsidy, shared-equity arrangements, or supply-side cost reductions. Under Scenario A, the dual-earner gap is reduced to €37,408 (14.2%) – a sum that could be bridged through maximum-density urban zoning and competitive construction procurement, combined with modest demand-side support. This would make new-build homeownership accessible to the upper end of the dual-income middle class. For single-income households and the lower half of the income distribution such a gap is unbridgeable without continued large public investment.

4.8 The Affordability-Viability Gap Across the Income Distribution

The preceding section established that the minimum viable sale price of standard 2-bedroom apartment, exceeds the affordable purchase ceiling across all scenarios and household types. This section extends the analysis across the income distribution, situates the findings in international context and examines the deposit barrier as a separate dimension of exclusion.

4.8.1 The Gap Across the Income Distribution

In order to assess affordability, the quintile analysis applies the affordability threshold model to each quintile of the national earnings distribution. Three different benchmarks are used for this calculation: the Scenario A minimum viable urban best-case price per square metre of €263,000 used to compare affordability across quintiles; Scenario B's minimum viable urban standard price per square metre of €282,000; and the physical construction cost per square metre of €194,000 (mean construction cost per square metre of the flat × 92m² GIA). The latter is the lowest possible threshold below which no dwelling could actually be built.

Table 4.7: Affordability by Income Quintile (single-earner households)

Quintile	National income (€/yr)	Max affordable price (€)	Gap to €282,000	Gap (%)	Can afford bare cost?
Q1 (lowest 20%)	€8,800	€18,081	€264,267	93.6%	No
Q2	€14,500	€48,923	€233,425	82.7%	No
Q3 (median)	€23,544	€97,859	€184,489	65.3%	No
Q4	€28,500	€120,720	€161,628	57.2%	No
Q5 (highest 20%)	€44,000	€185,687	€96,661	34.2%	No

The cost of new-build apartments is unaffordable to the entire single-income distribution, including those on Q5 income (the highest 20%, €44,000 per year). At €282,000 the Scenario B viable price represents a €184,000 (65%) gap for a median-income household. For the highest quintile at €97,000 or 34%, the price is still far beyond their means. The affordability crisis is not marginal; it is a systemic problem which excludes the entire single-earner population from the new housing market.

For dual-earner households the affordability patterns take a dramatic turn. For the median-income couple, with a combined gross income of €47,088, under a 30% housing expenditure benchmark the maximum price they can afford is around €225,252, leaving a €57,096 gap (20.2%) below Scenario B's minimum viable price of €282,348. This gap would, however, be bridged under a more lenient 40% DSTI rule sometimes employed by Cypriot banks, raising the affordable price to approximately €310,000, just crossing the upper boundary of the viable price for the best-case urban scenarios. For the dual-earners at the 60th percentile, earning approximately €57,000 gross per earner, under the 30% rule the maximum price is €279,000, or €26,000 above Scenario B's price for upper-middle income dual-earners, and within the feasibility without subsidy range under the 40% rule. Thus, for the affordability-viability gap for dual-earners in this upper-middle income range is bridgeable, under the more generous DSTI rule.

4.8.2 Price-to-Income Ratios

The price-to-income ratio (PIR) is another affordability stress indicator. Based on Scenario B minimum viable sale price of €282,000 and national median annual gross income of €23,544, the PIR comes out at 12.0.

- Minimum viable PIR: 12.0×
- Scenario A (best-case) PIR: 11.2×
- Demographia "severely unaffordable" threshold: 5.1×

This places Paphos's PIR alongside London (12-13×) and Sydney (13-15×) per Demographia (2024). What is intriguing is that Paphos, being a secondary tourism city on a small EU island with a population of less than 100,000, offers a premium product; indeed it is arguably one of the highest quality destinations globally, yet it has an affordability stress and thus is included in the global housing affordability crisis, along with global major cities and tourist destinations. However, the affordability crisis in Paphos should not be misinterpreted. The island premium, due to the cost of

the land and the higher than average cost of labour and materials to produce the housing, plus the higher costs associated with a small market in an import dependent economy, with seismically active risks, is comparable only to the highest global cities with very different housing market dynamics.

4.8.3 The Deposit Barrier

Even households whose income would in principle support a mortgage well in excess of €300,000 may be deterred from purchasing by an additional barrier. However there is another affordability gap; whilst at 80% LTV Scenario B suggests a minimum viable price of €282,000, that equates to a required deposit of €56,500 or 2.4 years earning for a median-earning household, and assuming they continue to save at the same rate.

Even at 90% LTV (which none of the lenders currently offer) the required deposit would be €28,200 or 1.2 years gross income for the average salary in Paphos. The mortgage affordability constraint takes into account the mortgage amount allowed at different price levels, but this does not take into account the time and effort that would be required to save for the deposit. An alternative affordability of approximately €800 per month to rent a 2-bedroom apartment until the deposit is saved, is a separate affordability barrier that needs a separate set of policy solutions (deposit assistance schemes, shared equity, government backed mortgages that allow lower deposits).

4.9 Sensitivity Analysis and Policy Scenarios

In sections 4.5-4.8 a number of findings were derived under a set of assumptions regarding key parameters. This section tests the sensitivity of these findings by varying a number of different mortgage parameters, as well as construction and land cost, and also varying these together. The analysis then considers a number of combined policy scenarios in order to determine the minimum intervention required to address the current affordability gap.

4.9.1 Mortgage Parameter Sensitivity

Table 4.8: Affordable Purchase Price: Rate × Income Variation (1.5-earner household)

Rate \ Income Δ	−10%	−5%	Base	5%	10%
3.00%	€177,605	€189,241	€200,877	€212,514	€224,150
3.50%	€168,234	€179,257	€190,279	€201,302	€212,324
3.7% (base)	—	—	**€161,556**	—	—
4.00%	€159,561	€170,015	€180,469	€190,924	€201,378
4.50%	€151,524	€161,452	€171,380	€181,307	€191,235
5.00%	€144,070	€153,510	€162,949	€172,388	€181,828

Compared to the most positive assumption on trade-off (3.0% interest rate and +10% income), the affordable price remains at €224,000, €58,000 (21%) below the minimum viable price for the Scenario A. But it is still €38,000 below the dual-earner base-case. This means that increasing income is more important for housing affordability than splitting costs between two earners. At the most negative assumption on trade-off (5.0% interest rate and −10% income), affordability falls to €144,000, €138,000 (53%) below the Scenario B.

Extending the term from 25 years to 30 years increases the 1.5-earner affordable price from €186,000 to €207,000 - an increase of €21,000 or 11%. Increasing the deposit required to achieve an 80% LTV from 20% to 30% (of €133,000 house price) increases the maximum affordable price from €186,000 to €213,000. However the barrier to the deposit required increases to €64,000.

No adjustment to mortgage parameters will be sufficient to bridge the funding shortfall. In a table below, even a very large cut in interest rate, longer repayment period, higher household income and higher LTV are together insufficient to lift maximum affordable price above €195,000 for a 1.5-earners household. This is some €68,000 or 26% below the minimum Scenario A price for this household type, well outside its potential affordability range.

4.9.2 Construction Cost Sensitivity

The construction cost floor is the most structurally rigid input. Table 4.9 tests the gap at different points of the Phase 1 cost distribution, expressed as bare construction cost (92 m² GIA unit, zero land, zero soft costs, zero profit) against the three affordable ceilings.

Table 4.9: Bare Construction Cost vs Affordable Ceilings (92 m² GIA unit)

Construction cost	Bare unit cost	Gap to single earner (€98k)	Gap to 1.5 earner (€162k)	Gap to dual earner (€225k)
Min sample (€1,557/m²)	€143,244	+€45,385	−€18,312	−€82,008
Q1 (€1,998/m²)	€183,816	+€85,957	+€22,260	−€41,436
Mean (€2,107/m²)	€193,844	+€95,985	+€32,288	−€31,408
Q3 (€2,253/m²)	€207,276	+€109,417	+€45,720	−€17,976

For sample P014, the lowest cost per sqm was reported to be €1,557 by a large corporate developer responding to a competitive tender for an urban site. At this cost, the construction price per sqm of €143,000 for a 93 sqm house is €45,000 above the single-earner affordability ceiling. For dual-earners the cost is affordable at Q1 cost levels or less. For 1.5-earner households, affordability is achieved only at construction cost levels below the sample minimum of €1,557/m², which itself is an outlier and cannot be assumed to reflect typical market conditions.

The construction cost floor in Paphos means that even with land, soft costs and profit reduced to their minimum, new housing is unlikely to be affordable to single-income or 1.5-earner households. Land cost, other costs, and developer profit remain as variables tested in the following sections.

4.9.3 Land Cost Sensitivity

The two-way sensitivity matrix tests the viability gap across construction cost levels and catchment village land costs, using the dual-earner affordable GDV of €2,445/m² GIA as the revenue benchmark.

Table 4.10: Viability Gap by Construction Cost × Village Land Cost (€/m² GIA)

Constr. (€/m²)	Free land	Paphos (€282)	Geroskipou (€267)	Chloraka (€349)	Emba (€265)	Konia (€290)
1,200	+€945	+€663	+€677	+€595	+€680	+€655
1,500	+€570	+€288	+€302	+€220	+€305	+€280
1,800	+€195	−€87	−€73	−€155	−€70	−€95
2,107 (≈mean)	−€180	−€462	−€448	−€530	−€445	−€470

At the sample mean construction cost of €2,100/m², all municipalities register a deficit relative to the dual-earner affordable GDV, including the free-land scenario which still records a shortfall of −€180/m². For the current land cost, the required construction cost would be below €1,750/m², i.e. 17% below sample Q1, a level not observed in any of the projects in the database. The opposite holds true for the possible deficit at the construction costs: free land would be sufficient to reduce the deficit to −€180/m² at a construction cost of less than €1,950/m², i.e. marginally below Q1. This is quite rigid compared to Section 4.5.4 and contrasts with the inapplicability of land as a limiting factor.

4.9.4 Combined Policy Scenarios

These three scenarios are combined to test the sum effect on the minimum viable price for a Scenario B (urban standard) - set at €282,000.

Scenario P1 - Moderate Supply-Side Intervention. Large Open Plan Areas of Space (Free Land) saves €347/m² GIA or €32,000 per unit. Additionally, Land Cost reduces as Building Cost (BC) increases from 1.30 to 1.60 times per m² = €65/m² or €6,000 per unit. Competitive Tender for Fitout saves €109/m² GIA or €10,000 per unit. Total Savings c. €48,000. Revised Viable Price for the Development of this Option is therefore c. €234,000. This is €72,000 or 31% above the 1.5-Earners Ceiling Value of €162,000 for comparable space. Gap to dual-earner ceiling (€225,000): €9,000 (4%).

Scenario P2 - Aggressive supply-side package.

Same as P1, with additional cost savings from standardising specifications across the stock of approximately −€85 per m² (−€8,000 per unit). In addition, the model could be delivered on a non-profit basis, removing the 17.5% profit margin. Cumulative additional savings amount to approximately €94,000 per unit. The revised viable price for a standard 2-bedroom unit falls to approximately €188,000, leaving a €26,000 (14%) shortfall against the 1.5-earner ceiling but moving within reach for dual-earner households.

Scenario P3: Maximum intervention – All P2 measures + subsidised interest rate of 3% over a 30 year term. Maximum price for a 1.5 earner household is lifted from €162,000 to approximately €207,000 or even higher, meaning that while there is still a shortfall to the P2 viable price of approximately – €19,000 for single-income households at the 80th percentile and below, dual-earner households would be in surplus of approximately €60,000 or more relative to the viable price. As such, the same additional measures to increase demand from deposit subsidies to shared equity and rent-to-own would be required for single-income households at the 80th percentile and below.

4.9.5 Island Premium Estimation

Construction costs in Paphos are around 30-40% higher than the southern European mainland average. Reference is made to the comparable figures on the Mediterranean mainland as published by Eurostat 2024 for mainland Greece of €1,200-€1,500/m², Spain of €1,400-€1,700/m² and Italy of €1,500-€1,800/m². Comparative construction costs for Malta are reported to be around €1,800-€2,200/m² (KPMG Malta 2024). This supports the premise embedded within the vulnerability framework that an "island premium" exists and this is comparable to that of the nearest EU island, that of Malta. As per the vulnerability study, the increased costs associated with the materials import, relating to the freight on board (fob), insurance and port handling charges, are estimated at 20-30%. Reference is also made to the increased construction costs due to the thinness of the labour market, at around 5-10%, as well as the increased costs due to the concentration of contractors within the local markets, also estimated at around 5-10%. Moreover, it is noted that additional costs associated with design for seismic activity are minimal at 3-5%.

4.10 Chapter Summary

Five main findings emerge from the empirical analysis of the affordability-viability gap in Paphos and draw on these findings to inform a policy discussion in Chapter 5.

Based on empirical analysis the estimated construction cost floor for typical "standard specification" dwellings is €2,107 per m² GIA (IQR €1,998; €2,253; CV 10.3%). This is two times greater than the declared CYSTAT cost of the construction permit and therefore indicative of a 75-100% measurement error in current cost data which is grossly misused by all manner of institutions, using the figures to inform crucial decisions.

As previously mentioned, the construction cost stack is heavily skewed towards Bill 14 sub-contractor and concrete works. In summary, 40.9% of the construction cost stack is comprised of sub-contractor work and the concrete works category makes up an additional 21.5%. Taken together, the two categories account for 62.4% of the construction cost stack. Both categories are subject to the higher island import premium and the concrete works category has a strong correlation to seismic design. Both categories are generally fixed price and there is limited potential to reduce material cost.

There are no scale economies over the studied range of 4 to 36 residential units per site. The factor that is most effective at reducing cost per sqr metre is building height. Consequently, the most effective planning tool for unlocking cost reductions in housing development is the density bonus strategy.

Fourth, the affordability-viability gap is structural and severe. The gap for a 1.5-earner median household is €121,000, or 43% below the Scenario B minimum viable price. For a single-earner household the gap is €184,000, or 65% below the same minimum viable price. In other words, the bare construction cost (i.e. land value plus builders' profit are ignored) for an apartment is €96,000 above the single-earner affordable ceiling. The PIR for Paphos is 11.2–12.0×, similar to London and

Sydney, which have the worst affordability in the world. New-build apartment ownership is infeasible for the entire single-income distribution, and even for the top quintile there is a gap of 34%.

It cannot be solved by one or two factors, rather it needs a few variables to be optimised at the same time. The most aggressive realistic multi-lever scenario (free land + specification standardisation + density uplift + competitive procurement + non-profit delivery) would reduce the viable price to approx. €188,000, or €26,000 (14%) above the income of dual-earners without subsidy. However, it would be within reach of dual-earner households. For single-income households and for the lower half of the national income distribution, the affordability "crisis" is not a market failure that can be remedied and so continues to require sustained public investment in affordable housing supply. The economy is a small island economy that is highly dependent on imports. In terms of demand for housing, there are two types of household and both have exceptional needs. There are exceptional seismic risks that must be taken into account.

CHAPTER 5: DISCUSSION

This chapter uses the existing literature to interpret the findings from Chapter 4 in relation to the research questions set out at the beginning of the volume. The Paphos case study is used as a "test-bed" to shed new light on the complex causes of low housing affordability within both the affordability and the island economy literature streams. The chapter is organised around five inter-related themes that are developed using the affordability–viability gap model outlined in Section 2.6.

5.1 The Construction Cost Floor: Structural Rigidity in a Thin Island Market

The finding for Phase 1, of €2,107 per m² GIA (IQR €1,998; €2,253; CV 10.3%) was in line with predictions made by the island economy literature. Work by Briguglio (1995) set out the basis of the island economy literature and latterly Briguglio (2022) extended the findings to the built environment sector. The main point arising from this stream of literature is that small markets are characterised by what Briguglio (2022) referred to as structural convergence in terms of production costs amongst enterprises. Given the limited number of contractors, material suppliers and specialist sub-contractors that can participate in fragmented thin markets, all enterprises are subjected to the same costs. The finding for Phase 1 is particularly noteworthy in terms of the tightness of the CV across the 25 individual projects which were spread over a period of six years, four construction locations, three methods of procurement and three developer categories. This compares extremely favourably with the findings of Akintoye (2000) in terms of the CV for residential construction cost estimates in the UK. As noted by Ball (2003), this does not indicate greater accuracy in terms of cost estimation. In fact, according to Ball (2003), citing Schumpeter (1942), the cause of thinness in the built environment sector is the same set of parameters, namely the import prices of materials, availability of labour and the regulatory environment.

This paper reports on the first empirical decomposition of cost variation for a small market using a progressive normalisation approach. Analysis of the 25-project sample indicates that 1.2% of the 15.0% CV in raw costs is due to CV in specification and a further 3.5% is due to CV in price over time. In total, 10.3% of the CV in raw costs remains as an irreducible structural component. The results have important implications for housebuilders, consumers and planning authorities in small island markets. They indicate that whilst some cost savings can be achieved in residential construction by amenity stripping or by adopting a more uniform specification (results indicate a maximum saving of €85 per m² or 4.3% in this case study), the underlying fundamental cost floor facing the developer cannot be changed. This supports the observation of Barlow (1999) that whilst there are limits to innovative behaviour in housebuilding, the reason for higher house prices are the structural characteristics of the island construction market studied here.

The most important methodological finding concerns the magnitude of the gap between the actual price paid for a building incorporating land, and the declared costs of the land incorporated in the building as permit costs reported to CYSTAT. This finding will have repercussions for all institutions

that currently use the CYSTAT reported figures for the costs of building permits to assess costs and benefits of different policies. Such policies are currently assessed in IMF's Article IV reports (2023; 2024) and in the European Commission's Country Reports assessing the growth potential of member countries, including Cyprus, and their competitiveness in the Single Market. Furthermore, for countries with substantial housing policies, as is the case for Cyprus, OECD housing policy reviews compare the housing costs of these countries with those estimated for Cyprus. Strong evidence is found of under-declaration of transfer payments on the land as permit costs. The issue was first raised by Pashardes and Savva (2009) using a hedonic regression approach on house price data, but no estimate for the magnitude of the phenomenon was obtained from the available project cost data. The magnitude of the phenomenon turns out to be important, comparable to the costs of construction.

The theory is supported by the constituent elements of the cost floor. The two thirds of the cost floor, amounting to 40.9% and 21.5% respectively in sub-contractor works and in concrete works, are accounted for by the Bill 14 categories appropriate to the particular building type under consideration in a seismically active island location. The elements which exceed the import premium, M&E services, aluminium and specialist trades and fittings, are those building services that are most susceptible to cost cutting. This is consistent with the global findings in the McKinsey Global Institute's report on construction productivity by country by Barbosa et al. (2017), the two main barriers to reducing the construction cost as a per cent of Value of Work being the materials cost and the regulatory compliance, both of which are accentuated in an island location such as Paphos.

5.2 The Land-Density Paradox: Planning as the Missing Variable

In terms of findings from the zone-calibrated land analysis, these diverge from typical affordability findings and are particularly relevant to the land analysis component of the report. The findings highlight that the cost of land per square metre of buildable Gross Internal Area (GIA) is inversely related to the raw land price per square metre of plot area. The highest median plot price was found to be for Paphos urban at €451/m². The lowest land cost per m² GIA at Building Control Plan Depth 1.60 was found to be €282. This is due to the Paphos Local Plan allowing building coefficients of up to 1.60 in land use zones Kα3–Kα5. In contrast, the lowest plot price for Chloraka of €279/m² results in a higher land cost per m² GIA of €349–€466. The lowest plot price for Emba of €212/m² results in an even higher land cost per m² GIA of €265–€353. These are the peri-urban areas and are subject to much lower building coefficients of BC 0.60–0.80 in land use zones Kα7–Kα8.

The height-land paradox, i.e. that the most valuable land is the one that is allowed to build the tallest buildings, is mainly a function of planning policies and not of the market. The Paphos Local Plan grants building permissions for very tall buildings (≥3 floors, BC ≥ 0.90) in the areas with the highest land value and allows for the construction of only two-storey buildings (BC ≤ 0.80) in the areas with the lowest land value. Therefore, while the density bonus policies under the Paphos Local Plan have greater potential to decrease the construction costs (−€37/m² per additional storey, Section 4.4.3), they can only be applied in the areas where the land cost savings are the smallest. Consequently, the

standard prescription for housing affordability advanced by scholars (Calavita and Mallach, 2010, 2015; Crook et al., 2016) that refers to the use of "permitted density" to decrease housing construction costs is modified in the Paphos planning framework. "Permitted density" can be used in the Paphos planning framework only in the areas where it can achieve the smallest affordability savings.

The field subdivision deduction analysis adds another dimension. Fields are first analysed for undivided areas (ΧΩΡΑΦΙ). A first deduction of contribution to roads of 12% is made. This is then added to by a deduction for green space (up to 15% of net area for plots of 2,500 m² plus), or facilities for the social benefit (2–3% of net area for plots over 2,500m²). This results in a net developable area that can be built upon. As illustrated in the field deduction table above, a 5,000 m² field would result in a deduction of c. 12% or 0.24% of the field area (GIA) plus c. 10% of the field area (GIA) for the total deduction therefore would be c. 25% or approximately €1.25 per m² GIA after allowing for the resultant smaller area. This is cheaper than plots of the same area. However the cost does reflect the unrealised premium for subdivision and the cost involved to a landowner in waiting for often a long period (12–24 months) for planning permission to be granted and the DLS record updated. For public land the obvious solution would be to re-zone the land for development and then to subdivide the land with the zoning deductions paid for by the state coffers. The resulting plots could then be developed and sold at a price that is below the market value for the land as currently proposed to be subdivided.

The method for calculating density-uplift faces two challenges. Firstly, on the demand side, the increased buildable capacity of a plot from BC 0.80 to BC 1.60 will increase the residual value of the plot as more GIA can be extracted and sold. While some of this expected land-cost saving per m² GIA will be capitalised into a higher plot price, the landowner will retain this saving rather than passing it on to the developers of new residential units in the area. Phase 1 data indicates that land with urban BC 1.60 is valued at €451 per m² compared to Emba at €212 per m² with BC 0.60–0.80, a €239 per m² premium. This translates into a lower €/m² GIA land cost of development of €282 for urban BC 1.60 as opposed to €265–€353 for Emba at BC 0.80. This therefore whilst the coefficient of density does enable a net saving in terms of €/m² GIA that is meaningful albeit lower than the unadjusted arithmetic suggests, the saving is residual and can only be meaningfully realised where the market is unable to capitalise for the good. In terms of supply-side external costs, higher densities will clearly place greater pressure on local infrastructure, building design and urban environment. However, these costs can be quantified and planned for and are unlikely to outweigh the unadjusted land savings per unit of height. They are also unlikely to be dramatically greater than the average load placed on infrastructure in other jurisdictions within the EU, most of which operate within a development contribution regime. Moreover, measures of environmental impact per capita (water, energy, land) indicate that high- density apartments perform positively in a water- stressed Mediterranean environment, outperforming low- density sprawl. Design- quality issues can be addressed through good design codes, a lack of which currently exists in Paphos. It supports the

removal of arbitrary 2-storey restrictions in order to enable density provisions linked to good design codes. In order to deliver affordability through upzoning of land, a mechanism is required to capture the uplift in land value. This could be through public-land development, inclusionary covenants, fees-in-lieu and development contributions under the Streets and Buildings Regulation. It would require design codes to be in place as well as the ability of infrastructure to deal with higher densities. This is a considered policy measure and is at risk of being captured by freeholders if presented as a pure market measure. The main obstacle to affordability in Paphos is not the removal of height restrictions, but the existence of those restrictions itself.

5.3 The Structural Character of the Affordability-Viability Gap

The affordability-viability gap was positive for all scenarios and household types (Table 4.6). Based on the findings of the study, the minimum viable sale price for a 2-bedroom apartment was estimated to range between €263,000 for a standard 2-bedroom apartment in an urban setting (Scenario A) and €305,000 for a standard 2-bedroom apartment in a peri-urban setting (Scenario C). The maximum affordable price for purchase was estimated to range between €98,000 for a single-earner household and €225,000 for a dual-earner household. As such, the affordability-viability gap was found to range from €37,000 (14% of €263,000 for a dual-earner household under the best of scenarios) to €207,000 (68% of €305,000 for a single earner under the peri-urban scenario). As such, it is not a marginal issue that requires fine tuning, but a structural issue affecting the current Paphos housing market.

The findings in relation to the reasons provided by home seekers for not being able to purchase a home address the research question of RQ2. These findings support a key theoretical assertion of the affordability-viability gap model (Section 2.6.4). Previous research by authors such as Stone (2006) and Burke et al. (2014) have argued that where market supply costs are greater than the affordable price ceiling of the target homeownership population, the affordability "problem" is in fact a structural one, and one which is unlikely to be resolved by demand side approaches. The findings in relation to the affordability-viability gap in Paphos are particularly revealing and indicate that the affordability "problem" is not one of simply developer super-profits. The 17.5% profit margin on cost built into the residual model calculation for achieving viability is below the bottom end of the 15–20% that Isaac and O'Leary (2012) indicate is typical of UK development appraisal. Furthermore, this margin is below the level of profit that many developers would seek, at least in the more transparent and well developed housing market of the UK (Wyatt, 2013). However, in the thin and very thin, highly speculative housing market of Cyprus, the typical demand for return by developers may be as high as 20–25%. The basic construction cost of the zero profit apartment with zero land cost is €184,000 for 92 m² or €207,000 for 104 m², which is more than double the affordable ceiling for a single-earner household of €98,000. This excess would be €86,000 for the 92 m² apartment and €109,000 for the 104 m² apartment.

The paper is unable to provide a numerical answer to the question of whether the developer margin in Paphos is best explained as rational risk compensation or as evidence of limited competition. The

residual model specification treats the margin over the land cost price incorporated by the developer into the sale price of a completed development as given. The 17.5% used is towards the upper end of the 15–20% risk premium found to be built into residential land prices across Europe. Material-price exposure and uncertainty with respect to planning permissions over time are the two main variables for which the developer seeks to compensate in setting the margin over land cost. However, the developer also seeks to compensate for thin-market risks which, whilst potentially manageable, cannot be efficiently be hedged in a thin secondary market. It is not possible here to test whether observed margin distributions in Paphos are pushed above the 17.5% implied by the model, nor to seek an explanation for this in terms of risk and rent. However, both explanations are supported by the data and it is for the reader to decide whether the structural conditions for potential rent extraction exist in Paphos, namely thin-market risks and limited competition, together with entry barriers, minimum scales of operation, a small number of sophisticated banking organisations focused on the finance of residential land development since 2013, and relational capital invested with municipal planning authorities.

This implies that there is an additional rent premium above the 17.5% return to capital, that is driving down affordability–viability below what supply-side policy could achieve, and requires competition and transparency measures, as well as measures to reduce entry barriers, to deepen the finance markets and to improve margin disclosure on publicly subsidised schemes, addressing that part of the affordability–viability gap that risk-reducing reforms are unable to reduce. The first priority for future research is to seek to disentangle the rent premium from the risk premium in the specific Paphos context. The affordability threshold analysis in Section 4.6 shifts the focus to a household perspective on the affordability, or otherwise, of new housing supply. For a single-earner household on the median income (€23,544), the maximum affordable price is €97,859; for a 1.5-earner household (€35,316) it is €161,556; and for a dual-earner household (€47,088) it is €225,252. The price to income ratios across Paphos are therefore comparable to London at 12–13× and Sydney at 13–15× (Demographia, 2024), placing Paphos, (a secondary tourist town in a peripheral EU member state) amongst the world's most unaffordable owner occupied housing markets. Paphos is not another New York, but the affordability crisis faced by the city is as serious as that faced by larger economies with very different urban challenges and is potentially caused by the same set of factors including financialisation, restrictive supply and rapid population growth.

There is some evidence of the existence of the cash land finding problem at the market-level, as embodied in the prevalence of antiparochi arrangements in the Paphos real-estate market. Antiparochi arrangements involve land-owners being offered completed apartments on their land in exchange for the sale of the land. The arrangements facilitate development by solving the problem of the cash land finding, but they do not solve the problem. Furthermore, the arrangements only benefit land-owners and do not address the problem of the cash land finding for households without land, highlighting a deficiency in the market's viability. What the market has developed is a solution

to the finding problem, but it is a very particular solution that does not address the root cause of the problem.

Foreign demand for property in Cyprus, has a positive effect in filling a vacuum caused by the lack of domestic demand, supporting scale economies and high specification levels of the contractors, as well as the capacity and absorption rates of the PDS, in order to keep the sector operative. On the other hand, the same demand for property supports by high property prices, imposes huge pressure on prime land values and raises the levels of specifications of the developers above the affordability of average incomes.

Policies which decrease foreign demand for housing, shift the affordability gap from being unaffordable to others, to being unaffordable to the seller. However, there is a real cost to such measures, as they will reduce the production capacity and delivery ability of more affordable supply. This report does not attempt to weigh these costs and benefits, but it does consider how supply-side measures, public land, density and procurement reform could increase the "envelope" within which this trade-off is made. In contrast, demand-side measures simply shift the affordability gap within an existing envelope, and are easier to implement than the measures considered here.

5.4 Comparative Positioning: The Island Premium in EU Context

The island premium estimation section (4.9.5) estimates the premium for Paphos to be around 30-40% above the southern European mainland construction cost average. This can be further broken down to: cost of materials (freight, insurance and port handling charges) 20-30%; thin market 5-10%; concentrated market of contractors 5-10% and extra design costs to take into account seismic considerations and relevant regulations 3-5%. These disadvantages to the islands arise primarily through their trade openness and import dependency as depicted in the vulnerability-resilience framework of Briguglio (2022).

The closest comparator would be a small EU island country such as Malta whereby construction costs are circa €1,800-€2,200 per sq.m. pushing towards the upper end of current Paphos rates at circa €1,800 per sq.m. However there is a higher import content, a thinner pie of available contractors and more rigorous seismic loading criteria which though less onerous than those prevalent in Cyprus are none the less applicable and vigorously applied. There are a number of pressures and challenges that the planning authorities in Malta face on an ongoing basis. However in most areas of the island a high-density land use strategy has been maintained whereby the scale benefits of construction have been realised and the land cost per unit of buildable GIA is lower than currently prevalent in Cyprus. Geography can limit how dense a neighbourhood is but it is the planning system that is the real limit to density and at the root of the affordability problem.

The relevant cost benchmark for this project is Mainland Greece. Based on comparable projects of similar scope and scale, prices have ranged from €1,200 to €1,500/m². In Paphos prices have ranged

from €600 to €900/m² for similar construction works, indicating an overall island premium of 30-40%.

5.5 Implications for Policy Design

The empirical evidence generated in the paper has important policy implications for the future of housing in Paphos. The findings and analysis are also generalizable to other areas of tourism-driven tourism-reliant cities and small islands facing similar endogenous and exogenous constraints and problems. Implications for these areas are briefly discussed keeping in mind the caveat regarding generalizability.

Demand-side interventions are unlikely to achieve their objectives, indeed could potentially increase affordability problems. The sensitivity analysis in Section 4.9.1 illustrates that even assuming the most optimistic mortgage parameters (3% mortgage interest rate, 90% LVT) the 1.5-earners affordable ceiling would be €195,000, €68,000 (26%) below the Scenario A minimum viable price of €262,660 for a standard 2-bedroom apartment. In a supply-constrained environment such as Paphos, it is likely that such demand-side subsidies would be capitalised into house prices (Brackertz et al., 2015).

It is also worth briefly referring to capitalisation risk. The most notable demand-side measure, the 5% VAT on primary residences for habitual residents, targets the beneficiaries of the measure. For the VAT on primary residences for habitual residents to be effective, it needs to be passed on to the householders and recorded in the sale price of existing and new dwellings. Given the supply-constrained environment prevailing in Paphos, some part of the reduction in the VAT rate on primary residences may be in part capitalised into the sale price of housing stock and new dwellings. This does not mean that the legislator should revoke this measure, which targets the beneficial households, but it is unlikely that it can address affordability on its own. This measure needs to be combined with supply-side policies aiming at increasing dwellings supply and easing some of the supply constraints prevailing in Paphos. As for the tax incidence, it is well known that it is uncertain. However, available evidence suggest that the incidence of the targeted benefit in this case is unlikely to fall only on sellers. However, the government is targeting to benefit the households and the degree to which the savings will be saved by the beneficiaries as opposed to being capitalised into higher sale and purchase prices of housing stock and new dwellings, depends on the relative elasticity of supply as opposed to demand. Unfortunately, information on the aforementioned elasticities is not available.

A supply-side intervention tool could be public land mobilisation. If free land was available this would take €32,000 off Scenario B price per unit (€347 × 92 m²). If the resulting unit was acquired by a cooperative or public body and resold to a dual-earner household on a cost-recovery basis, a further €38,000 could be removed from the sale price relative to the dual-earner household median of €225,000. This would mean a sale price of approximately €188,000 and within the budget of 1.5-earner households (€162,000 ceiling) with some demand-side support. This leads to the height-land paradox treated in Section 5.2. Public land should not be sought in the lower-priced land of the peri-

urban zones (Kα4–Kα5), but in the high-density urban locations (Kα3), where higher building coefficients allow for higher structures that are cost-effective on a per buildable m² basis.

Planning reform is required in the lower-cost zones to enable higher density. Currently the Paphos Local Plan limits building height to two storeys in the peri-urban areas of Geroskipou, Emba and Chloraka where the land price per square metre is lowest. By enabling higher density in particular locations, densities could be raised from BC 0.60–0.80 to 3–4 storeys increasing the land area available per site by 40–60 per cent, which would bring the land cost per square metre down by 40–60 per cent resulting in lower costs per unit for developers who would be encouraged back into the market to serve the increased demand for housing on plots in these areas. This planning reform will have political and environmental sensitivities but the "Malta model" has already been successfully implemented in comparable environments and with the appropriate public consultation and debate can be implemented in Paphos.

Very low construction costs could be achieved through a structural not an incremental approach. One efficiency gain within the current construction model will only achieve very small savings of approximately 10.3% CV, but with a dilution of the elemental concentration in concrete. There are large savings available from a totally different approach to the construction process. McKinsey Global Institute (Barbosa et al., 2017) reported savings of 15–20% in mature markets from industrialised construction (pre-fabrication and modular construction). A cooperative approach to procurement (all developers ordering materials and shipping together to achieve a better import discount) would achieve immediate savings.

There is a measurement gap within institutions responsible for cost reporting in construction. There is an empirical evidence that the cost declaration at the time of the initial declaration of the construction permit is 75–100% below the actual costs registered by CYSTAT. What is required is an institutional reform in the real--estate sector that will oblige for actual-cost reporting from completed projects at the time of sign-off of the final building permit, and not at the time of initial declaration. This low- cost measure will provide the necessary empirical basis for sound analysis for the people involved in housing policy.

5.6 Limitations of the Discussion

Results are subject to the same limitations as outlined in Section 3.7. Although the village-level building coefficient proxy introduces some error into the land cost per m² GIA calculation this is regretted and will have to be alleviated by a GIS-based spatial join in future research. The static residual model will therefore only explain costs at a particular point in time and not the other variables that the developer would have to consider when deciding to invest such as cash flow, risk-adjusted return and sales absorption. Nevertheless, three scenarios are sufficient to highlight three different market segments within Paphos, and the results are robust across all the sensitivity tests that were run. The affordability-viability gap calculated from the quantitative and a wider sense of the market perspectives are consistent with the three scenarios results and in line with the wider market trends evident in the prevalence of the phenomenon of the antiparochi and the developers' margins.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 Summary of Findings

This dissertation aims at measuring and decomposing the affordability-viability gap as it arises in the Paphos residential real-estate market. Employing a dual residual approach the investigation juxtaposes supply-side construction costs against demand-side affordability thresholds. The ensuing study constitutes the first project level empirical cost database for residential construction in a small economy of a large EU island, thus providing a novel and vital analytical tool available for future reference to interested researchers, government officials and real-estate professionals.

For Research Question 1, the empirical cost floor for standard-specification medium-density apartment developments is determined to be €2,107/m² GIA (IQR €1,998-€2,253, CV 10.3%) at January 2026 values. This is derived from 25 priced Bills of Quantities for recently completed and on-going apartment projects in Paphos (2019-2025). The measurement gap between the empirical cost of the cost stack and the CYSTAT declared cost of the permit for the sample apartments is 75–100 %. The cost stack is found to be highly concentrated with Bill 14 sub-contractor works, (40.9%), and concrete works, (21.5%) together amounting to 62.4% of the total construction cost. All the costing factors include import costs to the island, and seismic design considerations.

The affordability-viability gap for a 1.5-earner median household is €121,000, or 43% of the Scenario B minimum viable price of €282,348. The price-to-income ratio for new-build apartments in Paphos is 11.2-12.0×, comparable to London and Sydney. The gap is large and robust to several important variables. Even at zero land cost and zero developer profit, the bare construction cost (approximately €193,844 for a 92m² unit) exceeds the single-earner affordable ceiling of €97,859 by approximately €96,000. Therefore, all of the single-income distribution is priced out of new-build apartment ownership in Paphos. Even the top quintile of income earners are priced out to the tune of 34%.

The island premium for land and development costs relative to the southern European mainland is estimated to be in the order of 30–40 per cent. Of this premium the import costs of materials for construction may account for approximately 20–30 per cent, thin labour and contractor markets and their concentration accounting for a further 5–10 per cent each. The premium to pay for land and development in the EU islands is not unique to Cyprus as evidenced by the Malta benchmark figures shown below. The planning system is identified as the main constraint to development in Cyprus. One of the main reasons for the additional land costs above those explained by geography is the spatial planning mismatch between the areas suitable for multi-storey development and those where the land is relatively affordable.

6.2 Contributions to Knowledge

This dissertation makes four main contributions to knowledge.

There is currently an absence of cost benchmarks for residential real estate construction costs in Cyprus and this article addresses that lacuna for the first time. By providing a unique, empirical cost benchmark derived from the detailed bills of quantities of completed residential real estate projects and "on the books" projects in construction, as distinct to declaratory permit prices and other aggregate indices which may or may not be appropriate, particularly in illiquid markets, the article informs and supports the debate on residential real estate construction costs. The breakdown of the total cost per square metre by elements and by the 14 categories of typical detailed bills of quantity provides a methodology that can be used to address a similar problem in other thin housing markets that currently lack an empirically-based construction cost benchmark. The total cost per square metre for the sample of projects on which the research is based is €2,107.

For the first time, this study provides a quantitative figure for the measurement gap between the real construction expenditure and the declared construction cost, as recorded in the Building Permits statistics (CYSTAT). The findings from this research indicate a measurement gap of 75–100 %. As a result, the findings of this research have significant implications for all analyses conducted using the official construction cost series and should guide future policy recommendations and reports, such as the IMF's Article IV Economic Developments and Prospects Report for Cyprus, the European Commission's Country Report on Cyprus and the OECD Housing Policy recommendations.

Extending the insights from the height-land paradox to the small island housing literature, the paradox is found to apply to the small island context. In particular, the analysis finds that the cost of land per square metre of buildable Gross Internal Area (GIA) declines as the price of the raw land increases, ceteris paribus, and that this relationship exists to the extent that the builder's achievable height or effective building coefficient (bz) varies across zoning categories. Implications for planning policy relate to the widely used device of the density bonus. While such bonuses appear to be a low-cost solution to addressing housing affordability, their impact on cost is found to depend on whether planners are prepared to allow higher density in those locations where higher height is currently precluded from the landscape in order to increase affordability.

In this study, the Briguglio (1995, 2022) vulnerability-resilience approach is applied to the housing construction sector. An empirical decomposition of the "island premium" for the Cypriot residential construction sector is presented. A similar empirical decomposition is not currently available within the Cypriot economic literature for residential construction.

The affordability-viability gap in a small island economy is not a problem that can be solved through demand-side measures. It is not a matter of a small increase in efficiency through supply-side measures. It is a problem which requires continued public investment in affordable housing supply and a package of measures, implemented simultaneously, to facilitate that supply.

6.3 Policy Recommendations

Based on the empirical evidence and theoretical analysis, the following policy recommendations are proposed, ordered by estimated impact and implementation feasibility:

Recommendation 1: Public Land Mobilisation. Publicly owned land should be brought into use for the construction of affordable housing. Potential sites for housing development are found in urban areas with land use coefficients ≥1.00 (Kα3–Kα5 zones). For the purpose of promoting housing development, such publicly owned land could be transferred to developers or housing cooperatives at zero cost or at a nominal ground rent subject to a covenant requiring the developer to sell the resulting housing at affordable resale prices for a minimum period of 15 years. As the height-land paradox shows, in areas of high density the highest return in terms of housing affordability per unit of public investment is derived from public land.

The above solution poses three problems. Firstly, publicly owned land in the areas Κa3–Kα5 is scattered in various locations (schools, police stations, military land, foresters' posts, etc.), in the ownership of various ministries and parastatal organizations and bodies, each with its own legislation, administrative frameworks and internal procedures. There is no central database with information regarding publicly owned developable land. Therefore, mobilization for the use of public land-disposal mechanisms is required, which in turn must be based on an inter-ministerial audit and transfer mechanism. Secondly, Cyprus lacks a planning-gain Section 106 agreement model that could serve as a reference for drafting affordability covenants and the relevant contractual provisions. These covenants would thus have to be implemented on an ad-hoc basis, ensuring their enforceability, mainly through the Ministry of Interior, with related costs of legal services and staff. Thirdly, the above assumption regarding the 15-year long term of the covenant period poses serious challenges regarding continued institutional efficacy and stability.

Recommendation 2: Planning Reform for Height in Peri-Urban Zones. In peri-urban areas the Paphos Local Plan should allow for the construction of 3-4 storey residential buildings under the ownership restrictions Kα7-Kα8 with relevant design criteria and criteria for the capacities of basic and local infrastructure. Given the above, the land cost per m² GIA of such areas will decrease by 40-60% and thus the sale price of standard specification apartments will be closer to the upper limit for dual-income households to purchase.

The reform is unlikely to be swift. The amendment of the Local Plan of Paphos is a rigorous statutory process which on average has taken 4-7 years. Moreover, any decision to allow higher building coefficients will require preliminary studies as to the necessary infrastructure to accommodate

increased demand for water supply, sewerage services and road networks. Who will pay for these studies? The cash-strapped municipalities?

However, the new planning director may also face challenges from owners of plots of land within the Paphos district boundaries who will oppose density uplift due to the fact that they bought into what they believed would be a low-rise environment, especially in peri-urban villages. Their anger will be particularly difficult to address when they find out that the person they wish to complain to is none other than the planning chief himself. This will be an added complication at a time when the Paphos district already has its own municipal government separate from the rest of the Paphos municipality. In addition, there are smaller communities within the district boundaries who will also expect to have a say in the planning process, through their respective communities' committees.

Recommendation 3: Cooperative Material Procurement. The Government should support the setting up of a construction materials procurement co-operative where builders would collectively place the orders and source the products at a lower cost per unit, with appropriate delivery arrangements put in place. This will help address the supplier market thinness issue without putting the developers under pressure to scale up production to levels they may not be able to cope with.

One key issue that needs to be explored, is how the potential Cooperative would be governed. This would need to be by a suitable host institution; ETEK, The Cyprus Land Development Corporation, or indeed a Special Purpose Vehicle created to host the scheme within the Ministry of Finance or Ministry of Interior. Each option has its own implications for the members, accountability and for potential state aid and classification under the EU Subsidy Law. In addition to these points, the future Cooperative would also need to address the problem of free riding, whereby third parties could benefit indirectly from the higher prices generated by the large orders from the members of the Cooperative. This would have to be managed through the Collective Agreement, setting out the rules of membership and pricing for houses that conform to the standardised model set out above, in a manner that is compliant with EU competition rules, particularly Article 101 TFEU which states that agreements between actual or potential competitors that relate to restricting, preventing or distorting competition, by controlling prices, outputs, markets or geographical territories, or by controlling technical development, is prohibited. Whilst such schemes involving buyers are not automatically excused from infringing Article 101 TFEU, there are recognized as having a potentially beneficial role to play in housing markets and specific rules and defences do apply. Of particular relevance would be the de minimis exception which applies where the agreements do not exceed 10% of relevant market and the efficiency defence which is potentially applicable if the agreements create efficiencies that outweigh the negative effects on competition.

Recommendation 4: Actual-Cost Reporting Reform. It is proposed that the declarations of intent contained in building permits applications should either be scrapped or supplemented by an requirement for a real costs report at the final building permit approval stage. Such a move would

allow policies to be based on a firm empirical foundation rather than having a measurement gap caused by the bias into the system to keep costs down.

Verification requirements for these costs should be established. The credible enforcement of actual-cost reporting implies sufficient audit capacity on the part of the building-permit authorities or the obligatory submission of VAT invoices and contractor accounts, both carrying substantial administrative costs. The reform would otherwise exchange declarative reporting at one stage for declarative reporting at another stage, lacking the ability to eliminate the influence of said reporting to any greater degree. While the reform does not remove the influence of said reporting, said influence can only be mitigated by aligning the various incentives that affect the declarants of real property, such as the transfer fee bases and immovable property tax rates, liability for capital gain upon resale, and VAT treatment of registration fees. Decoupling the transfer fee from the declared construction cost could be a natural step in such a scenario.

Recommendation 5: Integrated Policy Packages. No single measure is likely to be sufficient to bring the effective price of a standard 2-bedroom apartment within reach of a typical dual-earner, median-income household. Rather a number of supply-side levers including free land, density uplift, cooperative procurement and specification standardisation could be combined with some demand-side supports including deposit assistance, shared equity, and subsidised mortgage rates for first time buyers up to a certain income level. The combined scenario analysis in Section 4.9.4, presents the most aggressive multi-lever package, where the viable price is reduced to €188,000. This is fully affordable to dual-earner households without any subsidy, or at breaking point for 1.5-earner households. Single income households at or below the 80th percentile will require additional supports including social rental stock and/or rent-to-own-type products.

The challenges posed by the various strategies to be implemented require careful coordination, namely by Interior for public land, by Finance for fiscally neutral/VAT appropriate measures, and by Labour and Social Insurance for demand side policies. The Central Bank of Cyprus will have to calibrate interest rates for new mortgages as well as for macroprudential measures. Currently, there is no standing inter-ministerial body responsible for housing with the necessary authority and resources to monitor and coordinate a package of that sort. Furthermore, there are the constraints stemming from the Stability and Growth Pact and from the multi-annual fiscal framework set out by the Ministry of Finance, leaving very little room for enhanced public expenditure to boost demand.

6.4 Directions for Future Research

Several directions for future research arise from the limitations identified in Sections 3.7 and 5.6.

The existing approach uses a village-level building coefficient proxy, but it may be possible to move to a plot-level variable by performing a GIS-based spatial join (from DLS transactions to the relevant planning zone polygon) and then applying a hedonic decomposition to measure the capitalisation effect of planning gain.

Additionally, the "longitudinal" dimension of the database should be strengthened by including more projects (at least one new project per year), so that time trends on the cost floor under evaluation can be studied relative to the CYSTAT Construction Materials Price Index, in order to test whether this Index is a sufficient indicator of price developments.

Thirdly, stronger evidence could be provided by carrying out a comparative analysis for the three study islands (Malta, Crete and Balearic Islands) using the same methodology and approach to collect the same type of data, thus enabling cross-island comparisons and allowing Paphos or CYPRUS specific costs to be distinguished from those related to island development.

A developer decision-making study could complement the survey analysis by conducting semi-structured interviews with a selection of Paphos developers. The aim would be to gain some insight into how developers perceive the current viability challenge posed by the planning regime and how they are attempting to manage the negative aspects of the regime. It would also aim to investigate whether or not the developers are engaging in covert transfer of plots into antiparochi as well as whether or not they feel under pressure to accommodate specification creep. Additionally, it would investigate their views on the advisability of market timing and of targeting different categories of buyers in an attempt to enhance viability and whether such decisions serve to increase or decrease the degree of unofficial deregulation that currently exists within the planning regime in Paphos.

The fifth component would be a household panel study in Paphos of the housing experiences of a sample of young households over a 3-5 year period, with a view to collect demand-side evidence, on the impacts of price-affordability gaps on their housing experiences, such as whether or not households are forced to defer household formation decisions, to overcrowd, to out-migrate or resolve their needs informally in non-traditional forms of tenure.

6.5 Concluding Statement

The issue of affordability-viability in Paphos is not a transitory market issue. It is caused by a combination of four determinants which are: island related import costs, land use planning regulations, dual demand for housing and unequal income distribution. A multi-level approach is required, combining several levers simultaneously. No single intervention is sufficient on its own to close the gap; even a combination of free land and higher density, while substantial, will not fully overcome the affordability-viability gap in Paphos without additional measures. It will require a long term programme of public investment in affordable housing supply which will gradually bring down the price of housing to the buyer. This dissertation attempts to provide evidence, a benchmark for future projects, highlights a measurement gap and for the first time formally decomposes the island premium. Most importantly it attempts to provide a foundation for a strategy to tackle affordability-viability in housing.

APPENDICES

Appendix A - Non-disclosure agreement template

Sample provided in NDA_BoQ_Academic_Research.pdf

Appendix B - Full project-level data (anonymised)

Sourced from MASTER_Dissertation_Analysis_FINAL_7.xlsx, sheet A_Combined

Appendix C - Bill-level cost data for all 25 projects

Sourced from MASTER_Dissertation_Analysis_FINAL_7.xlsx, sheet B_Combined

Appendix D - CYSTAT Construction Materials Price Index and adjustment calculations

Sourced from CYSTAT Construction Materials Price Index public dataset; adjustment calculations in MASTER_Dissertation_Analysis_FINAL_7.xlsx

Appendix E - Land transaction data methodology and zone classification

Sourced from MASTER_Dissertation_Analysis_FINAL_7.xlsx, sheets C10_DataTrans and C11_DataCOS

Appendix F - Affordability threshold calculations

Sourced from MASTER_Dissertation_Analysis_FINAL_7.xlsx, sheets Table 3.4 and Table 4.5

Appendix G - Sensitivity analysis full results

Sourced from MASTER_Dissertation_Analysis_FINAL_7.xlsx, sheets Table 3.4 (OAT and combined scenarios) and Table 4.10 (village-level grid)

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