ADDRESSING SINGAPORE'S KEY PUBLIC HOUSING PROBLEMS:
Asset Protection, Affordability and Access

A citizen's nonpartisan policy proposal

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30 November 2019

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1. Background and introduction: Singapore has a stellar reputation in having achieved the most extensive, high quality and successful national housing program in the world. The proposals in this paper seek to address the key potential long-term crises in HDB-managed housing and to improve upon it. **There are two major problems facing HDB housing today:**

2. First, HDB flat owners have no security of tenure beyond 99 years, and the capital values of their flats will sharply diminish towards the end of the 99-year lease. As a result, their life savings will depreciate significantly as they age.

3. As things currently stand, the value of HDB owners' flats will become zero at the end of their 99-year lease, unless they are fortunate enough to qualify for Selective En bloc Redevelopment Scheme (SERS) midway. However, for the bottom 50% of income earners, the vast bulk of their net worth or life savings is in the value of their HDB flat. For most of them, when their flats go beyond the 40-50 year old mark, the value of HDB flats tends to decline rapidly, just when the owners need to capitalize on their flats 'values to fund their retirement the most. Neither the proposed Voluntary Early Redevelopment Scheme (VERS), the Short-lease Flexi-Flats nor the Lease Buyback Scheme (LBS) currently adequately addresses this problem.

4. Secondly, the current cost of HDB flats for first time buyers of BTO flats relative to their incomes is very high, with the result that it typically takes about 25 years for home buyers to pay off their housing loans. This effectively means that for the greater part of their working lives, many Singaporeans are channelling a significant part of their disposable incomes to paying off their HDB flats, leaving insufficient savings for retirement, medical expenses and education upgrading. The problem is exacerbated for the lower, irregular or uncertain incomes that makes home ownership difficult.

5. The challenge is to craft reform proposals which not only address the concerns identified above, but which are also <u>affordable, fiscally responsible and do not destabilize the existing housing market</u>. To this end, this paper proposes four major reforms to HDB managed housing that will address these problems and greatly improve the wellbeing of all Singapore citizens.

6. **<u>EXTENSION OF LEASE:</u> In order to preserve the value of older HDB flats, our <u>FIRST PROPOSAL is that the Government should do a one-time automatic top up of the leases of all HDB flats owned by Singapore citizens back to 99 years once a HDB flat is 50 years old</u>. This immediately addresses the problem of declining residual values of old HDB flats with short remaining leases. The lease top-up cost should be priced affordably at around 3% of the price of a new resale flat, with support for low income families to enable all citizens to afford it, much like current HDB upgrading schemes.**

7. **REPLACEMENT OF AGED FLATS:** The first proposal above brings with it a technical issue which needs to be solved: **All reinforced concrete flats need to be torn down and rebuilt on a 100-150 year horizon for structural safety reasons. Accordingly, our SECOND PROPOSAL is that the Government fund the rebuilding cost of all HDB flats every 100 years. The total bill for such a nation-wide exercise is estimated at $150 - 200 billion dollars over 100 years.** While the cost of this program is large over the long term, it is nevertheless eminently affordable and sustainable when amortized over 100 years.

8. **It is proposed that the Government fund this exercise by setting aside $1.5-2bn annually (a mere 0.3-0.4% of current GDP) into a sinking fund for this purpose. As with the current SERS, a fresh 99-year lease should be given to all HDB flat-owning citizens after rebuilding.**

9. **NEW PRICING POLICY OF NEW FLATS: The THIRD PROPOSAL is that all new BTO flats be sold at around construction cost of $150-200 per square foot. Such flats will not be eligible for sale in the resale market for the first 15 years to help effectively safeguard the price of current resale flats. One family can only own one such flat at a time. Flat owners older than age 65 should also be allowed the option to downgrade once to a smaller, low cost BTO flat to further boost retirement adequacy.**

10. **SOCIAL RENTAL HOUSING: The FOURTH PROPOSAL is that for citizens who still cannot afford home ownership, sufficient numbers of good quality, subsidized rental flats be maintained with a reasonable security of lease tenure. This is needed to ensure that housing is affordable to all, especially for the less well off in the gig economy with increasingly unstable employment.**

11. **Fiscal Implications: These reforms are eminently affordable and fiscally sustainable, and will leave substantial fiscal resources available for other important major budget items. The proposals will preserve the life savings of the population invested in HDB flats, especially the bottom 50% of income earners, thus reducing the need for what would otherwise be larger state retirement income support.**

12. **Long-term Positive Macroeconomic Impact:** At the macro level, these reforms will greatly help overall retirement adequacy, especially for our elderly poor (Section 3). It will boost domestic demand through lower "forced savings" and therefore greater consumption. There is also the fiscal boost of continuous rebuilding of the housing stock which will be renewed to best architectural standards every 100 years. Additionally, these proposals will also ensure all new flat buyers will be able to afford high quality flats that they can fully pay off in 10-15 years. This will release more savings for retirement and entrepreneurial activity which are currently locked up in housing while minimizing the negative impact on the values of resale flats. The proposed reforms are not expected to destabilize either the existing HDB resale market nor the private housing market.

13. **Social Well Being and Intergenerational Benefits:** At the level of social well-being, these reforms will not only ensure Singapore citizens the very significant security of being able to both afford and live in the flat they purchase until the end of life but will also enable them to preserve their flat's value as either an asset to

monetize in retirement or a bequest to the next generation. This further helps sustain the social networks needed for happy ageing in-situ as well as for long-term community building. The rental reforms will also address the basic housing needs of the less well-off in the uncertain labour markets of the future.

14. **Towards a Renewed Social Compact: The value proposition to these four major proposed HDB reforms, amounting to a new social compact, is that any citizen will be able to reasonably afford a flat that will preserve its value and be rebuilt to a high and safe standard across successive generations. All citizens will have access to affordable, high quality housing that suits them, be it ownership or rental. This will be a level of public housing achievement tied to citizens' rights that will be unparalleled anywhere in the world. It will give Singapore citizenship a substantial new value and meaning.**

15. In the face of growing retirement inadequacy with a rapidly ageing population, increasing uncertainty of employment as well as inherently expensive housing costs due to our limited land size, it is important for Singaporeans to capitalise on our fiscal, public land ownership and organisational strengths to reform current public housing policy to attain the full potential of public housing for the good of all citizens. The rebuilding, in 100 years, of all flats, neighbourhoods and HDB towns will constantly introduce new urban models that are climate adapted, energy efficient, information rich with built-in intelligence such that the Singapore population can "live, learn, work, play, farm and heal."

16. **THE STRUCTURE OF THIS PAPER**: Section 1 outlines the key problems facing public housing in HDB today and focuses on the dynamics of declining lease values over time and the severe adverse implications for life savings, especially for the bottom 50% of income earners.

17. Section 2 discusses problems of affordability of HDB flats for first time buyers and the poor as well as the likely growing numbers of citizens with uncertain incomes in the volatile and fragmented labour markets of the future.

18. Section 3 proposes a solution to the problem of sharply declining HDB flat values past year 50 of a flat's lease tenure in the form of an affordable lease extension process and suggests some approaches to the rationale of pricing such lease extensions. Ultimately, we propose simple guidelines to a subsidised system of such pricing to ensure universal affordability based on the premise that HDB leases are a unique public good in the first instance and should not be taken as a market driven asset. It also discusses the technical need for rebuilding HDB estates every 100 years to ensure structural integrity and usability and proposes that the Government pay for this eventual rebuilding from an eminently affordable annual 'sinking fund'.

19. Section 4 discusses the benefits and the broad positive macroeconomic impact of such measures on retirement adequacy, household savings, technological advancements and economic growth.

20. Section 5 argues the case for the fiscal sustainability of such measures while not crowding out other needed major budgetary spending.

21. Section 6 discusses the proposed solutions to the thorny dilemma of the need for affordable new BTO flats while at the same time maintaining the value of existing resale flats. It proposes all new BTOs be sold at around construction cost as well as the need for an adequate supply of good quality, HDB rental flats. It makes an important suggestion that such low-priced BTO flats be segmented from the resale market for the first 10-15 -years to preserve the current value of resale HDB flats It also argues that HDB flat owners at age 65 should be entitled to downgrade to a smaller low-cost BTO flat to help fund their retirement adequacy owing to rapid demographic ageing and growing longevity.

22. Section 7 concludes.

Section 1. Pressing Issues for HDB Reform

1.1. There are two major problems needing important reforms in HDB-managed public housing.

1.2. First, there is a potential long-term crisis facing all HDB flat owners, particularly lower income Singaporeans. They have no security of tenure beyond 99 years, and the capital values of their flats will sharply diminish towards the end of the 99-year lease. This adversely affects their life savings, a significant part of which has been invested in their flats and which will depreciate significantly. This problem will accelerate over time, particularly as the current stock of flats grow older.

1.3. Secondly, the current cost of HDB flats for first time buyers of BTO flats relative to their incomes is very high, with the result that it typically takes about 25-30 years for home buyers to pay off their housing loans. This effectively means that for the greater part of their working lives, many Singaporeans are channelling a significant part of their disposable incomes to paying off their HDB flats, leaving insufficient savings for retirement, medical expenses and education upgrading. This is in contrast to the first 20 years of HDB's history when loans could be paid off in 10-15 years. The problem is exacerbated for the lower income and those with irregular or uncertain incomes who may not even be able to afford homes.

1.4. The challenge is to craft reform proposals which not only properly address the concerns identified above but which are also affordable, fiscally responsible and do not destabilize the existing residential property market. There is good reason for confidence that the proposals articulated in this paper achieve all of these objectives.

1.5. We discuss each problem separately below.

1.6. Current HDB flats are "sold" on a 99-year lease. There is no assurance nor is there any obligation on the part of the Government to renew these leases upon the end of their tenure. In any event, the conditions for lease renewal post 99-years have, thus far, not been articulated by the Government.

1.7. Hence, as things presently stand, absent SERS which offers HDB owners an attractive, often above market compensation and a resettlement grant to buy a new HDB flat, the lease reverts to the HDB at the end of 99 years and the residual value of the HDB flat falls to zero.

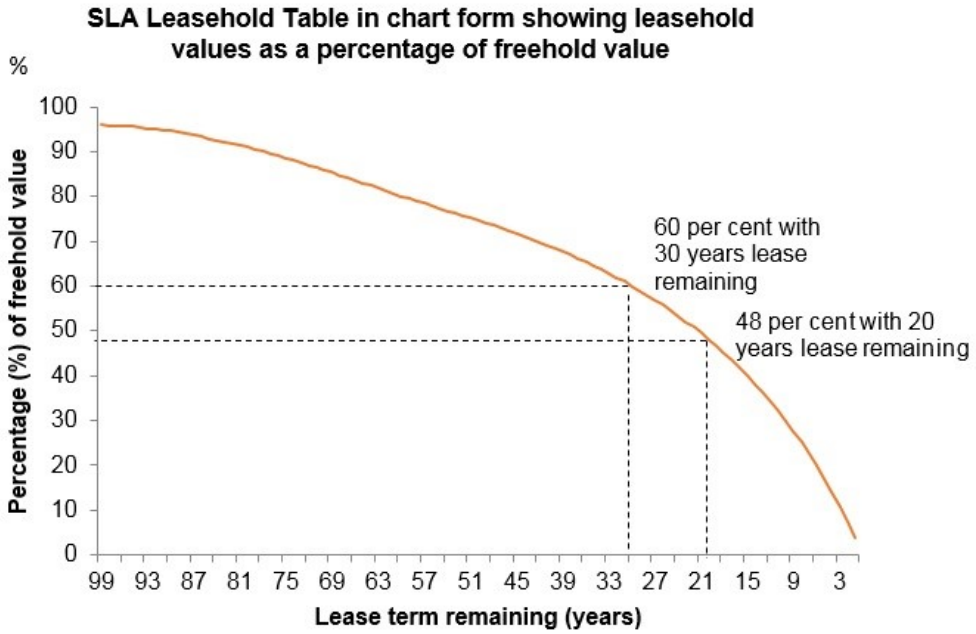
1.8. SERS does not adequately address the first problem identified. It is currently applied to less than 5% of HDB flats, leaving 95% of HDB owners still facing the problem of zero capital value at the end of their 99-year leases.

1.9. A new scheme called VERS (voluntary early redevelopment scheme) announced in August 2018 suggested that flats which are 70 years and older to be sold back to HDB enbloc at *prevailing market prices,* with the sales proceeds utilized to purchase a new HDB flat *at that point in time, and provided a undetermined majority voted for it*. Details of the scheme are still pending but, at first glance, compensation under VERS does not look as attractive as compared to SERS because the flats will be much older and, thus have a much smaller residual value. Market analysts expect the residual values of these aging flats to be closer to the

much lower resale prices of such older flats. 1/. This is confirmed by the analysis below.

1.10. The underlying value of older flats with remaining lease tenures of 50 years or less tends to follow the table used by SLA and HDB for valuing leaseholds called "Bala's Table" shown in the graph below. It is used as a guideline under the Lease Buyback Scheme (LBS) currently available to HDB owners (see Chart 1 below). Bala's Table shows that as HDB flats age and approach 70-80 years old, their values are likely to drop significantly to about 40-50% of the value of equivalent new flats. The table further shows that under current terms, the flat has no residual value at the end of the 99-year lease.

Chart 1: Underlying Trends in HDB Leasehold Values Over Time (Bala's Table)



Source: Christopher Gee, https://www.todayonline.com/commentary/why-hdb-owners-should-forget-about-getting-windfall-vers

1.11. Furthermore, Bala's Table also represents the most optimistic resale value of these flats without taking into account financing and physical constraints. It does not, for example, take into account the deterioration, usability, maintenance and financing restrictions of such old flats. There is, therefore, good reason to believe that the market values of these much older flats will in fact be lower than those suggested by Bala's Table.

1.12. To illustrate this point, bank loans are not available for purchasing flats with 30 or less years remaining, HDB loans are not available to purchase flats with 20 or less years remaining on the lease. Middle-aged buyers of old flats who are concerned about retirement adequacy may want to leave more CPF monies to accumulate and therefore set a lower budget for the purchase of old flats knowing that the old flats will depreciate towards zero value. This has a clear negative implication for the values of aging HDB flats. Flats with less than 60 years of remaining lease have limited resale value as the CPF and loan for the unit's subsequent buyer would be more restricted. In anticipation of such disadvantageous financing conditions and the consequently shrinking pool of resale buyers, markets are likely

to accelerate the natural price decline even further after a flat reaches 40-50 years of age.

1.13. VERS and the LBS, which at least guarantee the Government as purchaser of old flats, is of limited utility in preventing this substantial depreciation, and the resultant loss of savings, since Government compensation values for such short leases are based on the then prevailing resale market prices for such aged flats, possibly with a further discount for the time value of money. The cumulative effect is that -asset values of HDB flats will correspondingly have fallen by 30-40%, or even more, due to resale and other limitations by the time a flat reaches 70 years of age when it becomes eligible for VERS. Furthermore, VERS is envisaged to be voluntary and is subject to whether there is a majority of the owners who will vote for the program.

1.14. The LBS, in turn, enables some older HDB owners to sell the last 35 years of their leases to top up their CPF LIFE retirement plans and possibly obtain a cash payout with a small cash bonus 1/. However, as Bala's and similar tables show, the value of 40-50 year old HDB flats could have already fallen 15-20% when they are typically being considered for LBS and is likely to fall even more steeply after that. HDB flat owners 'net asset value available for retirement would have therefore diminished significantly right at the time they need to capitalize or liquidate the value of their remaining leases to fund their medical and retirement needs! LBS is also unpopular as it is designed to leave no bequest value after the owners pass away, something important to Asian families.

1.15. This prospect of rapidly declining values of HDB flats after 40-50 years, coupled with the uncertainty of lease renewal terms and conditions (if any), is causing the market value of older HDB flats to fall rapidly. HDB owners, thus, face the prospect of rapidly declining life savings, particularly as they and their flats advance in age.

1.16. The price fall most heavily impacts the life savings of bottom 50% of citizens as 7590% of their net worth is tied up in the value of their HDB flats 2/.

1.17. There is, therefore, both a significant price decline and consequently a savings crisis developing in the 50 year and older HDB leasehold market in Singapore. Chart 2 below is taken from the average transaction prices of 3-room flats around 50 years old in Blk 9 Lor 7 Toa Payoh compiled by property agent, Mr Timothy Quek.

1.18. From the transacted prices in Chart 2, one can see that after the hard truth of the net residual value of HDB flats was discussed in March 2017, the value of old HDB flats in Toa Payoh fell sharply. This shows quite clearly, albeit from a small sample, the potential for rapid significant decline in the price of old flats once buyers realise that, on current terms, these flats have zero value at the end of their 99 years lease.

1.19. Mr Quek further stated that in his opinion, in the coming years, "*those buyers above who paid more than $280,000 for these flats today will make a terrible loss," he said. "If you intend to sell your HDB flat, you should consider selling it soon before its lease declines further. The prices of HDB flats usually face a sharp decline when they are more than 40 years old when restrictions of using CPF and*

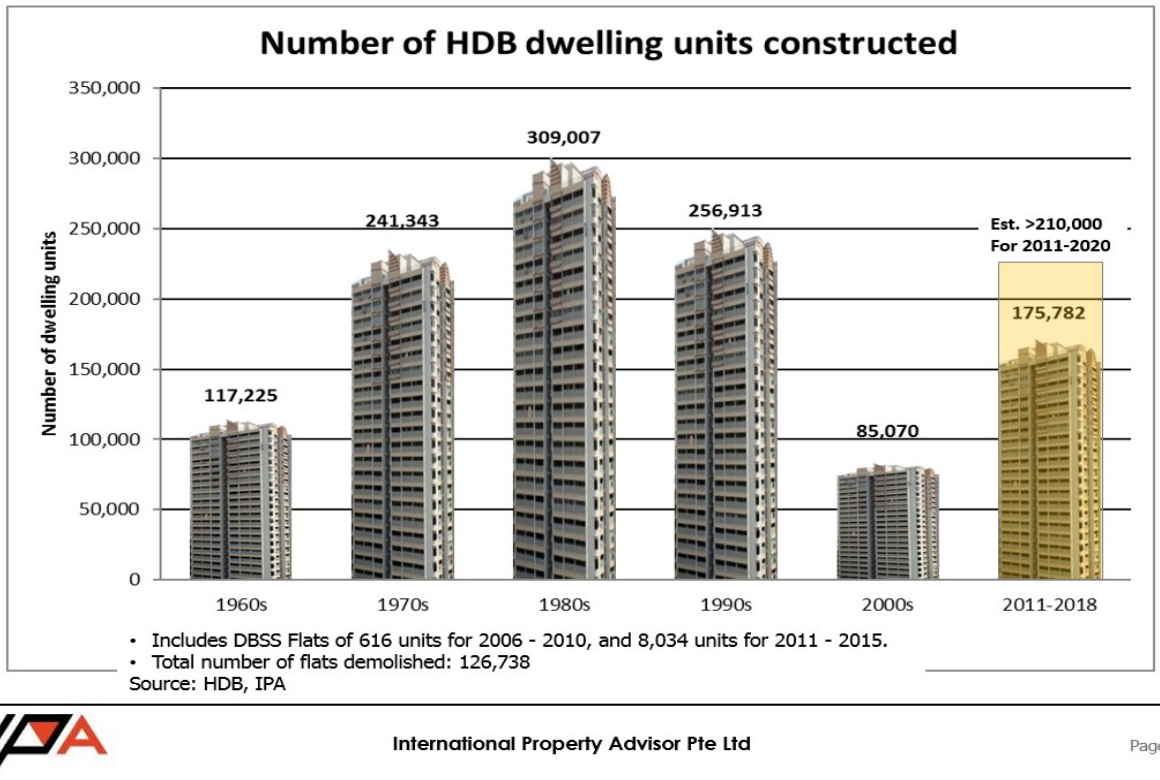
bank loan to finance their purchase kick in, thereby severely limiting the pool of ready buyers.". (Pl see https://www.theonlinecitizen.com/2018/11/03/property-agent-very-difficult-to-find-buyers-for-aging-hdb-flats-now/)

Chart 2 Trends in Transaction Prices of Older HDB Flats

1.20. Mr Quek also observed that only 4% of HDB flats have been redeveloped through SERS since 1995. That is, these old flats, typically at very good locations, were repurchased by HDB and the flat owners compensated and relocated. HDB then rebuilt new HDB flats in the same area for subsequent sale to the public.

1.22. But the vast majority of flats, Mr Quek noted, will be returned to HDB when their 99year leases run out without any compensation. "*As the leases run down, especially towards the tail-end, the flat prices will come down correspondingly*," he said. "*So, buyers need to do their due diligence and be realistic when buying flats with short leases*."

1.23. This is a real practical problem. There are currently more than 200,000 HDB flats which are more than 40 years old, all facing lease expiry in just over 50 years. The pipeline of such older flats will grow rapidly over the next decade. By the end of 2020 there will be more than 550,000 flats which are more than 30 years old (out of which more than 220,000 are over 40 years age) and which will face the same predicament over the subsequent 10-20 years. This forms nearly half of the total stock of 1,062,350 HDB flats that house around 80% of our resident population. (Pl see https://likedatosocanmeh.wordpress.com/2017/04/19/350000-or-480387-hdb-flatsolder-than-30-years/).



1.24. Again, the core challenge here is that the value of HDB flats form 75-90% of the net worth of the bottom half of Singapore citizens 2/. If the value decline of these old HDB flats is not addressed, the bulk of the life savings of 50% of Singaporeans will fall significantly as they age, exacerbating retirement adequacy and financial anxiety. There is the also the possible adverse perception of the Government having failed to live up to its promise of HDB flats being a reliable store of long term value to meet retirement needs and wealth transfer to the next generation. (Please see: https://www.theonlinecitizen.com/2019/03/20/heng-swee-keats-story-about-old-hdb-flatsshows-he-is-grasping-at-straws/).

Section 2. The Problem of Affordability of HDB flats

2.1 Affordability for new buyers

2.1.1 We discuss affordability of new BTO flats by reference to prices of new flats in a major integrated new town like Punggol or, more recently, Tengah. Currently, an outer-lying 3-room BTO flat (say in Punggol) costs around $215,000 while a 4-room flat costs around $325,000 (before grants). Couples buying such flats typically take the maximum loan tenure of 25 years to pay off these loans utilizing their CPF funds. Buyers using CPF funds to pay mortgages are paying interest expenses while forgoing CPF interest earnings that would contribute to their retirement. This means that for the greater part of their working lives, many Singaporeans are channelling the bulk of their savings to pay off their HDB flats, leaving insufficient savings for big ticket life-cycle financial items like retirement cashflow, education or emergency medical expenditures.
(Pl see https://www.srx.com.sg/hdb/bto)
Punggol BTO prices Sep19:
https://esales.hdb.gov.sg/bp25/launch/19sep/bto/19SEPBTO_page_2671/about0.html Tengah BTO prices May19:
https://esales.hdb.gov.sg/bp25/launch/19may/bto/19MAYBTO_page_4196/about0.

html Enhanced CPF grants assume $75000 for 3-room and $60000 for 4 room in non-matured

2.1.2 To lower mortgage repayment to a more reasonable and affordable 10-15 year horizon, the price of HDB flats need to be lowered to around $135,000 for a 3-room flat of 750 sqft and $180,000 for a 4-room flat of 1,000 sqft. This is based on the higher end of estimates of construction costs of $180 per square foot by leading property and quantity surveying firms such as Arcadis NV. These costs are not expected to rise by more than average wage or inflation rates due to improvements in technology (largely prefab and materials technology) as well as more cost effective design (more medium to low rise vs high rise buildings that can house the same numbers more convivially on similar land areas).

2.1.3 This lower, more affordable proposed BTO price is about 55-60% below current resale flat prices of around $350,000 for a 3-room and $470,000 for a 4-room flat in similar areas like Punggol. (Please see https://sg.finance.yahoo.com/news/could-tengah-reallynext-punggol-033800551.html)

2.1.4 An important policy question is whether such low proposed BTO prices will pull down current resale HDB prices, thereby adversely impacting the net worth of existing HDB owners. We believe this can be addressed. To preserve the values of existing HDB flats, we propose that the new low-cost BTO flats can only be resold to the HDB at cost for the first 15 years. We address this issue of preventing these policy reforms from destabilising HDB resale and private housing markets more comprehensively in Section 7 and in Annex 2.

2.2 Affordable public housing for bottom 30% of income earning households.

2.2.1 Low income families, particularly those in the bottom 3 deciles, may still be unable to afford the monthly mortgage payments of these lower priced BTO flats even over 15 years. Owing to the HDBs current policy bias for home ownership, there is an insufficient supply of decent sized, subsidised rental flats for poor families, which are also often badly overcrowded 6/. Ref SingStat Table 14A per household member per month $1583 incl full CPF and transfers

2.2.2 These problems will be exacerbated by current global trends. The evidence indicates that in the longer term, there is an increasing likelihood that there will be a structural shift away from permanent jobs to a series of uncertain payments via contract work or what is popularly referred to as the "*gig economy*". The realistic alternative for a growing number of low and inconsistent income-earning citizens might therefore be to increase the supply of decent, affordable rental public housing rather than encouraging ownership with long term mortgage commitments (and failure to earn CPF interests) that these citizens realistically are unlikely to be able to meet.

Section 3. Proposed Solutions to Security of Tenure and Depreciation of Life Savings Invested in HDB

3.1 **In order to preserve the value of older HDB flats, our first proposal is that the Government should allow a one-time automatic top up of the leases of all**

HDB flats owned by Singapore citizens back to 99 years once a HDB flat is 50 years old. This immediately addresses the problem of declining residual values of old HDB flats with short remaining leases.

3.2 The Singapore Land Authority (SLA) however, should retain land ownership and reserve the right to redevelop the flats at any time via the HDB should they wish to do so. However, in such cases, affected owners must be given a compensating flat of equivalent use value and location just like under the current SERS. The condition of quality equivalency is to safeguard the quality of housing provided to HDB owners so that living comfort is not compromised.

3.3 An affordable fee should be charged for the lease top up.

3.4 In this regard, we suggest that the base guideline fee for lease renewal be set at around 3% of the average market value of a new resale HDB flat for those who are able afford it (for a detailed discussion of the rationale see Annex 1). This works out to around $15,000 for an average 4-room flat priced at $470,000 and $10,000 for an average 3-room flat priced at $350,000. This lease renewal fee can be made payable over 10-15 years with no interest and, thus, made universally affordable like HDB upgrading.

3.5 However, smaller, nominal affordable fees as low as 10% of this guideline price can be charged for the lease renewal on a means tested basis to make it affordable for low income owners and retirees. Only citizens qualify for this subsidised lease renewal.

3.6 The first proposal above brings with it a technical issue which needs to be solved. All HDB blocks need to be torn down and rebuilt around every 100-150 years. Prof Tay Kheng Soon's research shows that reinforced concrete structures become structurally unsound over this longer time period 8/.

3.7 Thus, to enable HDB owners to have ownership rights beyond 99 years without incurring punitive rebuilding costs, our related second proposal is that the cost of tearing down and rebuilding these flats, once they reach 100 years, should be borne by the Government. **We accordingly propose that every HDB flat purchased by a citizen be guaranteed under a scheme in which the cost of rebuilding is borne by the State and a new flat with equivalent environmentally sustainable quality and comfort be returned to the owner every 100 years of the HDB flats' life. A fresh lease of 99 years should also be given to the existing owner upon completion of this necessary rebuilding, thereby ensuring continuity of housing provision as a social good**.

3.8 This would be equivalent of having all HDB flats effectively being guaranteed a SERS program near the end of their 99-year lease. Only Singapore citizens would be eligible for this effectively free rebuilding of old flats. We suggest that citizens bear the cost of housing during the rebuilding period, given the government will bear the cost of rebuilding. PRs would not be eligible and would have to fund the full reconstruction cost of the new flats unless they surrender the remaining lease of the flat to the HDB under existing lease buyback or under compulsory acquisition guidelines.

3.9 With these proposed policies on affordable 99-year lease top ups and effectively free rebuilding, all older HDB flats are likely to maintain value or see a rise in value depending on whether regular maintenance and upgrading managed to prevent excessive physical deterioration. Both the value and security of tenure of all HDB leases will thus be largely protected from ageing, i.e. HDB flats become a real store of value for retirement or bequest to successive generations. New entrants into the public housing system, and resale for downgrading during retirement or for asset division on death ensure HDB property ownership does not ossify and has sufficient turnover to enable social mobility.

3.10 Equally important, the net worth and life savings of the bottom 50% of income earners (whose 3- and 4-room flats form the bulk of their net worth) will be protected for the lifetime of the owners even before rebuilding, thus contributing significantly to their pension adequacy.

3.11 For those presently with old flats, their prices could also rise sustainably from their present values, resulting in a corresponding one-off significant restoration of wealth to such owners of HDB flats whose values have suffered time decay for the reasons discussed in Section 1. Readers may refer to Annex 3: Two Common HDB Human Stories.

Section 4. Benefits: Positive Macroeconomic Impact of the Proposals

4.1 This progressive wealth boost and continual rebuilding will also have significant positive macroeconomic effects. *First*, it will substantially enhance retirement adequacy, particularly for the bottom 50% of the population who need it the most. The significantly higher values of old flats will result in higher cash income or pay-outs through sales and downgrading or reverse mortgage schemes as the owners age.

4.2 *Secondly*, achieving a higher and more secure net financial worth across 80% of the citizen population with a more bankable HDB asset should result in greater consumption and investment by the general population. The constant rebuilding of the entire HDB stock over 100 years or less will also represent a constant significant fiscal expansion. Taken together, these should boost greater domestic demand, sustainable construction investment related activity and more buoyant GDP growth.

4.3 As effective owner of the underlying HDB land, valuations on governments books and hence national reserves will keep increasing when such rebuilding takes place with a small increase in plot ratios. Land values can also be enhanced by building large multifunction podiums beneath flats to increase land efficiency and provide nearby jobs. Hence as with land related projects like reclamation or SERS, part of the rebuilding cost can be designed as and considered “enhancement of state reserves” 9/.

4.4 However, it will still be incumbent on the Government and HDB to do periodic upgrading of older flats to put in new infrastructure such as wiring, plumbing, structural support and new rooms and lifts, as is currently done. As master planner, HDB would still retain the right and ability, as and when it chooses, to reconfigure public housing estates for the greater societal good, provided it gives

affected residents a SERS program as it does now for the small minority of flats. Nothing in our proposal is intended to impair this flexibility or responsibility.

4.5 Finally, the renewal of HDB towns every 100 years also presents a huge economic benefit. In the global quest to improve liveability and to attract talent, we need to maintain a leading position as a state-of-the-art smart city. Traditional methods of town planning with distinct zones for residential, commercial, educational and industrial activities are giving way to multi-purpose buildings and mixed developments within the same zone. The future is a mix of "live, learn, work, play, farm" and not "live here, learn there and work elsewhere".

4.6 We thus propose labelling the demolition and rebuilding of HDB towns as "Regen" strategy (short for regeneration and consistent with the terminology used in other countries). As a country, we will benefit from new asset-types and new technologies built into each Regen town. If we parcelled out the work across the 25 or so HDB towns, there will be a new Regen town project taking off every 4 years.

4.7 The lease/sale of non-residential spaces in Regen towns provides attractive revenue streams which will help significantly defray the rebuilding costs. Each Regen project, with mixed-use assets catering to "live, learn, work, play, farm" and incorporating the latest technologies will lead to higher asset utilization and improved land value. As a consequence, the value of Singapore's land reserves will grow when each Regen town is completed. Given our ageing population, we will also incorporate "heal" and "farm" into the urban regeneration plans.

4.8 The proposal is thus good for Singapore's macroeconomic strength. Even as we minimize the problem of retirement adequacy and the value of public housing for Singapore citizens, we also enhance the value of our national reserves.

4.9 At the same time, these proposals provide a way for upgrading and boosting productivity, innovative capacity and competitiveness by reconfiguring Singapore's urban infrastructure towards a smart country. Singapore could be the only country in the world capable of upgrading and integrating the latest Information Technology, schools, intelligent offices, factories and homes and transport systems over the course of each century.

4.10 One way of envisioning this is Prof Tay Kheng Soon's proposal to use this continuous rebuilding to transform Singapore into what he terms a "Tropical Renaissance City".

Section 5. Program Costs and Fiscal Sustainability

5.1 While the cost of this program will be large over the long term, we believe it is affordable and sustainable when amortized over 100 years, much the same way our similarly large 50-100 year investment to safeguard Singapore against climate change can be sustainably and responsibly financed.

5.2 The construction costs of a new flat are estimated to be around $180 a square foot. A standard 4-room 1,000 sqft flat would, thus, cost maximally $200,000 on average to demolish and rebuild. The current cost of replacing the entire stock of

around 1.1 million HDB flats over the next 90-100years (starting in 40-50 years with the oldest flats) is thus around $170-210 billion. [Note: more than three quarters of the total stock of flats are 4-room or smaller.]

5.3 Amortized over 100 years, this cost works out to an outlay, at present value, of around $1.5 -2 billion annually or around 0.3-0.4% of GDP today, allowing for a 2-3% inflation in construction costs. Additionally, being a massive long-term national program, there would necessarily be economies of scale with bulk buying, hedging forward contracts, etc.

5.4 This yearly average budgetary cost of around $1.5-2 billion can appropriately be set-aside as a "*sinking fund"* annual payment underwritten and spent by the Government to continually rebuild and regenerate all HDB flats under its custody every 100 years.

5.5 Building costs are also unlikely to rise too steeply given prefab construction technology innovation and a shift towards high-density-low-rise residences as opposed to the current low-density-high-rise HDB precinct design. Both utilize the same land area but the former is more convivial socially and environmentally. In fact, HDB construction costs have remained stable at around $150 per sqft over the last 10 years 10/. In the meantime, the long-term returns on investing the sinking fund before use by GIC, which makes a return of 3-4% above inflation, should ensure that the funding cost of this rebuilding program remains affordably low relative to the Government's overall annual budget.

5.6 In theory, there is no reason why this lease renewal and rebuilding cycle cannot go on perpetually every subsequent 100 years since the cost of rebuilding can be sustainably included in recurrent Government investment expenditures given its affordable yearly cost relative to the growth and size of the State's fiscal reserves and resources.

5.7 In this regard, it is well established by the IMF that we have a structural fiscal budget surplus of around 4-5% of GDP and that we will still grow our reserves significantly through such surpluses as well as the currently unused, reinvested net investment income worth 1.5-2.5% of GDP over the coming decades. Reserves are also likely to grow even further because of high household savings and net structural long-term balance of payments inflows which are expected to persist for at least the next decade or two 5/.

5.8 While the long term total cost of implementing our proposals is substantial, it is essential to keep in mind that spending around $1.5-2 billion annually or 0.3-0.4% of GDP of this ample fiscal headroom will not only help secure HDB owners net asset values for themselves and their children, but also result in the entire HDB housing stock being rebuilt to state-of-art housing design standards and quality every century. This would be a feat of public housing and renewal unparalleled anywhere in the world. The ratio of social benefit to fiscal costs would, thus, be extremely high.

5.9 Alternatively, the cost of this program may also be funded using a fraction of the funds from Government land sales which average around $7 billion or about 2% of annual GDP (reference Government Land Sales program from 2011-2018).

5.10 **Expenditure for this rebuilding program is thus, eminently affordable and should still leave considerable budgetary resources available to fund most other key long-term public expenditure needs like healthcare, an improved education system and better social security (See more detailed discussion in footnote 5).**

Section 6. Proposed Solution to Affordability of HDB flats

6.1 Affordability of new BTO flats

6.1.1 In the same fashion, the Government can comfortably afford to reduce the current price of BTO HDB flats so as to reduce the average loan payback period to an affordable 10-15 years from the current 25 years. This is because construction costs merely represent 50% or less of the total costs as the State already owns the land which was acquired at much lower historical, often compulsory acquisition prices which are sunk costs to the Government. Therefore, the current overall fiscal cost is minimal.

6.1.2 In order to keep low priced BTO prices from pulling down HDB resale prices, we propose that the HDB should extend the restrictions on market sale of BTO flats to 15 years 'minimum occupancy period (MOP) for first time buyers. Additionally, family units should only be allowed to own one low-priced BTO flat at any time. However, should they wish to upgrade to larger flats within the 10-15 year period, they should have the option to resell their flat to HDB at prevailing costs and purchase the larger desired low-priced BTO-flat from HDB. The maximum MOP for the upgrading buyer should be 10 years if they upgrade after 5 years after their initial BTO purchase.

6.1.3 Our proposal, therefore, preserves a 15-year illiquidity discount between BTO flats and equivalent older resale flats. Added to the current location choice premium and the immediacy of purchase premiums, a stable equilibrium 50-60% discount between new low-priced BTO flats and more expensive, older resale flats should be able to be preserved over the long term.

6.1.4 These price premiums protect the current owners of HDB resale flats from losing capital value and at the same time ensure that their children as well as new first time buyers can still afford much cheaper new BTO flats with a lower 10-15 year loan repayment period. In short, our proposal, while benefiting new BTO purchasers, is unlikely to destabilise the current HDB resale market.

6.1.5 Using our assumption of $150-200 per sqft building costs for example, a new 1,000 sqft 4-room BTO flat should only cost new buyers around $150,000-$200,000. A new 3-room BTO of 700 sqft should cost $110,000-$140,000 while a new 5-room BTO 1,300 sqft flat will cost around $210,000-$260,000. Some variation should be allowed for location differences. Since land value is no longer a factor in pricing, a simple markup formula can be adopted whereby outlying areas have zero markup, intermediate areas a moderate markup and good areas a higher markup and perhaps even also a longer lockup period before resale.

6.1.6 One huge benefit of these significantly lower BTO prices for new buyers will be the ability to save much more for retirement adequacy, education, healthcare or

capital that can be used for entrepreneurial activity, which is currently tied up in the costs of more expensive HDB flats. The benefit of owning BTO flats at construction costs should, in our view, also extend to singles and divorcees.

6.2 Downgrading eligibility after retirement - a final boost to retirement adequacy

6.2.1 In the above proposals, every citizen is only entitled to one HDB purchase of cost-priced BTO flats per family unit, which can be sold in the resale market only after a 10-15 year holding period.

6.2.2 However, we also propose that a flat owner after age 65 should be eligible to sell his flat and downgrade to buy a smaller flat sold by HDB at cost. This enables the flat owner to maximise the capital value of his flat for retirement purposes from age 65 till death. Such low cost BTO retirement flats can only be sold back to the HDB at "cost plus nominal economic growth minus depreciation" and cannot be sold by the owner in the resale market a second time no matter how long they live. The flat can then eventually be renovated by HDB and sold to other buyers.

6.2.3 HDB should further enhance this retirement-cash-out option by building many more low-cost studio flats for elderly couples or singles at cost. To make them more popular, these can be inserted in the spaces in existing estates in void decks or between blocks to enable ageing in situ so as not to disrupt social networks, preserve location familiarity and ensure the elderly are not isolated but supported by the rest of the community (please see research by Tay Kheng Soon, Singapore Version 2.0, Ageing In Place: https://youtu.be/JjlGE2VfA_I)

6.2.4 This downgrading eligibility to buy a smaller, low-cost flat at cost will help fund the retirement of a rapidly ageing population with increasing life expectancy that may, in future extend much longer than the current 85 years.

6.3. Proposed Solution to unaffordability of home ownership for the poor

6.3.1 In addition to the above proposals, HDB should ensure a sufficient stock of transparently means tested, affordable, good quality subsidized low rental flats for the bottom 30% of income earners with security of tenure.

6.3.2 In the increasingly unstable gig economy of the future with a much higher likelihood of technology-disrupted unemployment, it is unlikely that many of the bottom 30% of income earners will have sufficiently secure long-term employment to afford and service a mortgage even for 10 years. This proposal, therefore, provides a safety net for their housing needs, which is severely under-provided for, given the current sacred cow status of ownership in public housing.

Section 7. Conclusion

7.1 These four major proposals of: (1) affordable 99--year lease-top up after 50 years, (2) state funded rebuilding after 100 years, (3) BTO and retirement flat prices close to construction costs and (4) sufficient decent-sized and affordable rental flats, would collectively address the major problems of public housing by providing

security of tenure, stable asset values and retirement adequacy for the majority of our population.

7.2 At the same time, it will help sustain affordable, high quality housing for future generations of citizens and HDB owners. This would result in lower unnecessary investments in unproductive capital, leading to more buoyant growth from higher household consumption and both public and private investments. Importantly it will also provide a decent and affordable safety net of affordable rental housing for the poorer and less income-stable part of the population that is likely to structurally form a permanent feature of the future labour market.

7.3 Additionally, renewing the HDB housing stock every 100 years will ensure that the most modern and convivial design of integrated townships is available to Singapore citizens and existing HDB owners in perpetuity for generations to come. While the total cost is large, the annual cost is fiscally very affordable and would amount to a sustainable recurrent investment in the economic security, well-being and prosperity of our citizens unequalled anywhere else in the world.

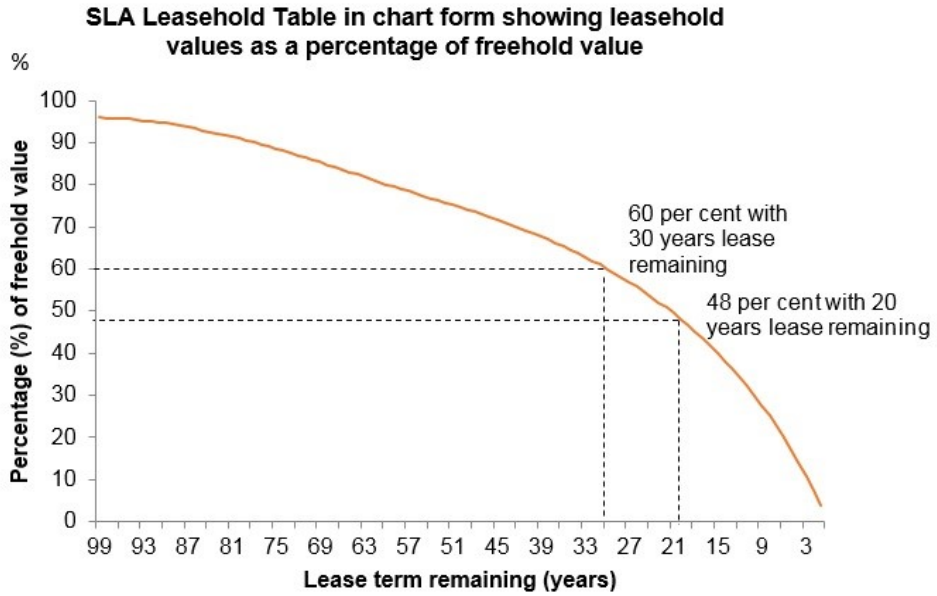
7.4 The combination of these enormous public housing benefits available only to citizens would provide Singaporeans with a more tangible basis to value their rights and privileges as citizens in a way no other country will be able to do.

7.5 As a nation, we can comfortably afford these reforms principally because, *first*, the Government owns the freehold rights to over 90% of land through past compulsory acquisition. *Secondly*, our large structural fiscal surpluses and strong reserve management capability makes these proposals eminently affordable and fiscally sustainable. Finally, HDB has developed the valuable capacity and capability to build, manage, retrofit and develop large, high quality integrated-facility towns for the bulk of our citizens.

7.6 In the face of growing retirement- inadequacy with a rapidly ageing population, increasing economic and employment uncertainty as well as inherently expensive housing due to our limited land size, it is time we capitalise on these fiscal, public land ownership and organizational -strengths to reform out-dated parts of public housing policy so that public housing may achieve its full potential for the common good. It would truly represent a new milestone in attaining prosperity and progress for our people. Singapore will be a pioneer that other nations emulate.

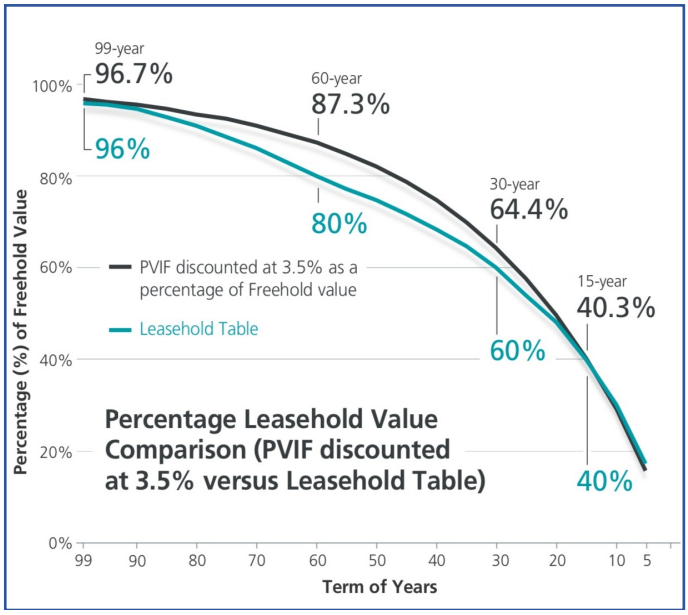
Annex 1: Leasehold Extension Pricing and Practice

In theory, a market based determination of the cost of topping up a 50 year old property back to 99 years based on current public sector practice can be inferred the "Bala's Table", which is used by the SLA and HDB to determine the pricing of a declining lease in a 99-year lease term property (chart form below).



Source: Christopher Gee, https://www.todayonline.com/commentary/why-hdb-owners-should-forget-about-getting-windfall-vers

It can be seen from the chart below that using this accepted methodology as a guide for calculating lease values over the term of a 99-year lease, the 99-year lease loses around 20% in value after 50-60 years. The implied "fair value" of a lease top up after 50 years is, thus, around 20% of the resale value of the flat (approximate figures are used to take into account the significant variation in using an appropriate discount rate of around 3.5%).



Source: Centre for Livable Cities, https://www.clc.gov.sg/docs/default-source/commentaries/balas-table.pdf

This forms a theoretical market-based starting point accepted by local authorities for lease valuation. However, various countries with major similar international property markets like London often charge a little less for lease renewal ranging from 12-13% of the then value of the property to extend a 60 year old lease by 90 years and around 15% for a similar extension to a 50 year old lease This offers a price of around 15% to extend the lease of a 50 year old property by 90 years as a lower alternative reasonable benchmark used in an established property market for setting base lease renewal prices.

Typical cost to extend lease on £200,000 flat by 90 years

LEASE LENGTH	EXTENSION COST	PROFESSIONAL FEES (1)	TOTAL	POTENTIAL ADDED VALUE (2)
95 years	£5,000	£2,500	£7,500	£5,000
85 years	£6,000	£2,500	£8,500	£10,000
79 years	£8,500	£2,500	£10,500	£16,000
70 years	£14,000	£2,500	£16,500	£26,000
60 years	£24,000	£2,500	£26,500	£38,000

Typical cost to add 90 years to a lease, cost based on Leasehold Advisory Service data. Costs are per flat and can vary dramatically. Based on a £200,000 flat (£200,000 is its value with 999 year lease) with £200 annual ground rent. 1) This includes the valuation fee and freeholder's legal costs. 2) Estimates by Kinleigh Folkard &

Singapore is not alone in grappling with this thorny issue of renewing state-owned leases. China has a 70-year leasehold system and is drafting laws to allow leases to be renewed unconditionally. Hong Kong has automatically extended leases on some old properties, subject to an annual rent. Both of these major Asian economies 'leasehold renewal processes and pricing are far more generous than our proposal or the UKs.
Please see: https://www.scmp.com/week-asia/politics/article/2160662/singapores-homeowners-have99-problems-and-their-lease-no-1

In short, the decision on leasehold renewal pricing is essentially a policy decision made for the greatest national benefit and while it should not be arbitrary or subject to populist pressures, should be made with the benefit of the welfare of the majority and economy foremost in mind rather than relying purely on market forces.

We, therefore, propose that for public housing in Singapore, 15% of the property value be used as a base 50year extension price, to be discounted first by dividing an average plot ratio of 2.5 and second a further 50% discount to take into account mortgage financing and enbloc sale restrictions and encumbrances. The guideline price of lease renewal of 15% should, thus, be divided by a cumulative factor of 5 to give a guideline lease renewal price of around 3% of the value of the HDB flat.

It should be kept in mind that this proposed price is only a rough guideline, which has a defensible market-based derivation and is in line with established international precedent.

As with social goods like education or healthcare, we believe it is incumbent on the Government to make the guideline price for lease renewal affordable to all citizens by further subsidies, as it currently does for upgrading. We, therefore, also recommend that this lease renewal price be repayable, interest free over 10-15 years and be further subsidised up to 90% on a means tested, case by case basis where necessary.

While acknowledging that public housing has become a de-facto store of life savings for much of our population, we also need to recognise that public housing in Singapore is fundamentally a social good and should not be determined, wholly or principally, on market asset pricing measures.

Annex 2: Analysis of Risks of Housing Market Destabilization

The risks of destabilizing impacts on existing home prices due to the recommended reforms could present themselves in one of the following ways:

HDB resale prices surge unsustainably, as the effective lease increases for existing flats and the guaranteed renewal and rebuilding regulations boost their market value.

Resale prices could fall significantly as much lower priced BTO flats pull down their values. Private housing prices could fall sharply as HDB property becomes much more affordable and attractive.

In general, we assess that the risks of an upside bubble in the form of a HDB resale price surge are low.

First, while there will be a one off jump in HDB resale prices effectively pricing in the prospect of fresh 99 year leases and guaranteed free rebuilding, this price jump will be capped by the limited total demand for HDB flats, which will likely be restricted largely to citizens as PRs will not be eligible for subsidized lease renewal or free rebuilding costs. If necessary, policy restrictions on PRs buying resale flats can be increased to further cap excessive increases in resale prices. Furthermore, the poorer physical condition of old flats would dampen both their resale and rental value, even after lease extension.

In addition, the long term fundamentals for HDB resale flat prices are soft given that the local citizen population is shrinking demographically and that over the long term (about 15 years later) a steady stream of many low-priced BTO flats will qualify for resale. Old flats will also suffer from a depreciation and ageing effect despite renewed leases and guaranteed rebuilding.

Overall, therefore, we do not expect a bubble to build up in HBD resale prices.

Similarly, the upside for private housing is limited both given current property market curbs and the competition from newly reformed and more attractive HDB resale flats. If necessary, private property market curbs can be tightened should there be a surge in private home prices.

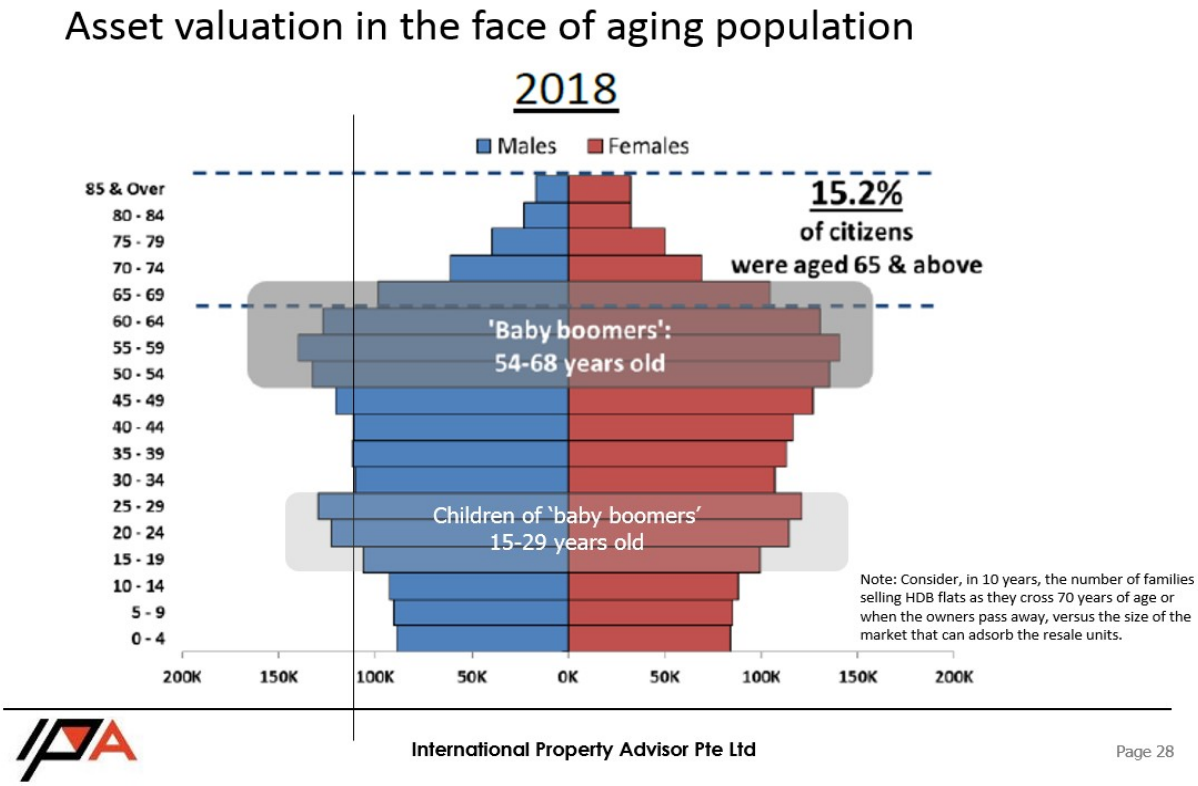
Turning then to downside property market risks, resale HDB prices should not fall sharply as the new cheaper BTO flats should be effectively segmented from the resale market by the new 15-year minimum lock in period, the lack of choice in location and the normal 2-3

year queue and construction lead time. If necessary, restrictions on PR ownership of resale flats can also be relaxed to shore up demand.

Private property downside risks can similarly be prevented, if necessary, by relaxation of current property cooling measures.

In conclusion, excessive increases or falls in both private and HDB resale prices are not expected to happen through a combination of market fundamentals and relaxation or tightening of available policy tools.

Over the much longer term (30-40 years) shrinking demographic replacement rates may put pressure on old flat prices as baby boomers are replaced by smaller cohorts, although this should be ameliorated by the corresponding demand from PRs and new citizens (chart below).



Annex 3: Two Common HDB Stories

CASE 1:

Mr Lim (67) and Mrs Lim (66) live in a 4-room flat in Hougang which is 35 years old, i.e. 64 years left on the lease.

Mr Lim is retired while Mrs Lim works in the security industry. Their HDB flat has been paid largely via Mrs Lim's CPF. Mr Lim has a few thousand dollars in his CPF.

They are concerned that their retirement savings might diminish along with the declining value for old flats. Since their son has gotten married and moved out, they can downsize to a 3-room flat which has a lower value (hence a smaller decline in future value).

The flat is worth $400,000 and the sales proceeds, net of fees and other expenses will be about $390,000.

The funds flow goes like this:
$170,000 of CPF money used for paying for the flat and interest expenses will be refunded to Mrs Lim's CPF Retirement Account. In addition, another $75,000 of unearned interest will be paid into CPF Retirement Account.

The remaining $390,000 - $170,000 - $75,000 = $145,000 cash proceeds will go to their bank accounts. Out of the $245,000 that went back to Mrs Lim's CPF Retirement Account, $110,000 was retained as the minimum sum for Full Retirement Sum (FRS) and CPF will pay out a refund of $245,000 - $110,000 = $135,000 to Mrs Lim.

So Mr and Mrs Lim has $145,000 + $135,000 = $280,000 of cash and Mrs Lim has a Full Retirement Sum which will pay her about $1200 per month until she 85 years old.

This sum of money is hardly sufficient for retirement as each of them have another 18-20 years (Life expectancy at age 65 is 19.1 years for males and 22.5 years for females). The cash is insufficient for the couple's living expenses of around $2000 per month as well as market rents of about $1700 for a 3-room flat if any bouts of illness strikes or if Mrs Lim loses her job or goes into retirement.

They thus want to use the $280,000 of cash and Mrs Lim can apply half of her CPF FRS (about $60,000) to buy a 3-room flat. Half of the FRS can be used, so the CPF Retirement Account is left with a Basic Retirement Sum (BRS) and that will pay out about $800 a month till Mrs Lim is 85. This is well below the $2000 needed for dignified retirement a couple.

So they will purchase a 3-room flat at about $320,000 (taking into account expenses required for relocation, legal, valuation and agents fees). At their age and income level, they are not eligible for loans.

Ownership of a 3-room flat comes with additional expenses such as S&CC, property tax, etc. This means that Mrs Lim has to continue working well beyond the retirement age. And neither of them can fall ill. Life is tough.

<u>If our proposals were enacted</u>, first the 4-room flat they own would hold its value even if it was much older. Second, Mr and Mrs Lim could now at 65 downsize to a 3-room BTO at cost of $130,000 instead of a resale 3-room at $320,000. This would give them a cash savings of $150,000 after buying their smaller retirement flat. They could then buy another CPF LIFE of $1200 per month, making their total retirement income $2,400 per month, significantly above the $2000 dignified retirement level. They would still have $30,000 cash in case of any unexpected medical expenses or emergencies. Not so tough now.

CASE 2:

Rafi (61) and his wife Siti (60) do not think they can retire.

11 years ago he purchased a 3-room flat in Block 61, Lorong 5 Toa Payoh for about $200,000. He took a 20-year loan of $120,000.

This block's lease started on 01Jun1967 and the flat is about 53 years old, with a remaining lease of 46 years and 7 months.

Rafi is a chauffeur and a part-time car jockey. Siti is a homemaker and earns some occasional income baking and selling cakes from home. Rafi's CPF Retirement Account has about $40,000 and Siti's has about $10,000.

In 4 years' time, when Rafi turns 65, he will be paid around $200 a month from his CPF Retirement Account until age 90. Siti will be able to receive about $50 a month from her CPF Retirement Account in 5 years 'time. These pay outs are barely enough for them. Rafi and Siti have a home loan with a monthly mortgage commitment of about $600 till year 2028 when Rafi turns 70 years old.

Both spend about $300 a month on their utilities, telephone bills and Service & Conservancy Charges. Food, transport and a bare minimum of day-to-day living will cost the couple another $600 a month.

They need about $1500 a month, including their mortgage payment.

And yet their home value keeps dropping. By the year 2028 when he has fully paid the home loan, the flat's value is likely to have dropped to less than $200,000. This is because the flat will be left with 37 years of lease at that time and whoever buys from him will have to use a large proportion of cash as they will face restrictions in financing their purchase with CPF money or bank loans.

What options do they have?

a. Sell the flat now ($220,000) and rent: sales proceeds minus $60,000 loan principle = $160,000 out of which $100,000 of CPF and accrued interest back to CPF. They will have $60,000 in cash and Rafi's Retirement Account will have $140,000 which will pay him about $700 a month after he turns 65.

b. Sell the flat later. They will continue to pay interest expenses for 9 more years, forego CPF interest and the value of the flat may decline $10,000 per year, shrinking their nest egg further.

c. Sell the flat and down-size to a 2-room flexi 40 years lease costing $60,000: they can use CPF but that means their cash of $60,000 and Rafi's Retirement Account of $80,000 will have to last them another 25 years.

d. Lease buy-back scheme: they can sell back 15 years of lease for (guessing) $50,000 but most of that will go into Rafi's Retirement Account and they will not have cash. After reaching 65, the monthly pay out to Rafi may be less than $500 a month.

<u>If our proposals were enacted</u>, Rafi will be less concerned about the declining value of his flat and he can then sell the flat and given the couple's retirement, opt to rent the low-cost flats from HDB using the proceeds from the sale. In another 5-10 years if he sells the flat he will have $80-100k in net savings which can get him an annuity of $1200 which is

closer to the $2000 poverty line for a couple. If they each receive $300 under the exiting silver support scheme for elderly poor their total income will be $1800, much closer to a dignified retirement adequacy for him and his wife than without our recommendations.

Annex 4: Transforming Singapore into a Tropical Renaissance City

The present challenge is to protect the declining asset value of existing HDB flat owners while at the same time to offer new BTO flats priced at $180 per sqft based only on construction cost. Taken together as described earlier, the two proposals render citizenship meaningfully tangible. While this is the immediate concern, it plays a catalytic role in eventually transforming the entire Island into an Intelligent City. Land economics and social equity creatively visioned can transform this Island City State into a front runner in the race towards eco-sustainability but it starts with seemingly tiny but vital steps that cumulatively, guided by vision, can be transformative.

The forgoing of land price of the new BTO flats can be compensated by additional commercial plot ratio. The State can thus recover land value from this. But the increase in plot ratio requires a new kind of design with housing above and a mix-use commercial podium below. This new model moreover also results in a huge increase in efficient use of land. The aggregated amount of useless fringe land normally to keep buildings apart is no longer required by a linear podium design. The aggregated useless land can now be returned to nature for parks and nature reserves.

Rebuilding of after 100years, of all flats, neighbourhoods and townships is necessary as this is the design life span of reinforced concrete structures. This new urban model visualised as a climate adapted and energy efficient system is to **live, learn, work, play, farm and heal** reducing the need to travel and be information rich therefore with built in intelligence. It has thus to be intentionally planned so that as people go about the routines of everyday life, going to school, to market, to shop, to work and to civic facilities etc, they naturally meet new people, are exposed to new ideas and information and experience new things, they thus gain knowledge experientially. This is the intelligent city to be aimed at even while addressing the vexing housing questions.

Thus we imagine a super-convenient way of life provided by a multi-level, mix-use podium that serves as main and secondary information arteries around which to live. This is the linear podium linked together becomes a neighbourhood, then more neighbourhoods eventually become a township and finally through elevated link-ways endowed with civic, educational and cultural facilities, the whole island becomes an intelligent island.

The continuous podium roof top is the linear community garden for the housing above and below, commercial facilities, work places, tertiary institutions, shopping malls, robotic production units, urban farms, schools, restaurants, food malls, community clinics, entertainment places etc. life is thus freed from congestion stress. Robotic taxis, buses and the MRT provide transport to more distant locations if needed otherwise everything is only a short distance away from where one lives. Pedestrian paths, tracks for bicycles and PMDs provide access to last mile destinations.

Like a three dimensional vertical and horizontal web akin to the neurons, axons and synapses of the brain that will ultimately link the entire island to transform the Metropolis imagined by Lee Kuan Yew to a whole new level as the World's first Tropical Renaissance City in which Machine intelligence is matched by the agency of Human intelligence.

The Greater Southern Waterfront (GSW) will be the locale to pioneer the new integrated urban model.

From the GSW, the HDB townships and neighbourhoods rebuilt piecemeal through SERS and VERS before the massive rebuilding of all flats as they approach their 100-year replacement age, the ideas developed in the GSW will then radiate outwards. The GSW will also become Asia's Campus City akin to 'Boston 'attracting the best and brightest to live and learn and thus forming lifelong friendships with our Singaporean students thereby naturally fostering a regional future together.

References

1. For details on LBS, SERS and VERS please see: https://www.hdb.gov.sg/cs/infoweb/residential/living-in-an-hdb-flat/for-our-seniors/leasebuyback-scheme https://blog.moneysmart.sg/property/sers-vers-hdb-en-bloc-sale-schemes/ and https://www.todayonline.com/commentary/why-hdb-owners-should-forget-aboutgetting-windfall-vers

2. While detailed official breakdowns of net worth by asset for different income percentiles are unavailable to the public, the fact that HDB flat values form 75-90% of the net worth of the bottom 50% of the population can be inferred from available wealth management studies. A 2019 Credit Suisse report shows that median net worth per Singaporean is about $100,000 USD (around $140,000 SGD). Adjusting this for net worth per adult the figure is closer to $200,000 SGD per adult and therefore $400,000 SGD per adult couple. The average price of a resale 3 room HDB flat is around $350,000 and a 4 room flat around $469,000 in the 2016-2018 period. It can therefore reasonably be inferred that for the bottom 50% of the population, the value of their HDB flat forms the bulk of their net worth. Please see: "The Global Wealth Report 2019, Credit Suisse Research Institute."

3. For current HDB BTO prices pl see: https://www.srx.com.sg/hdb/bto

4. For macroeconomic impacts and determinants of house process pl see : https://www.economicsonline.co.uk/Competitive_markets/The_housing_market.html

5. Fiscal sustainability

   The IMF estimates that we have a 4-5% of GDP structural budget surplus, of which around 2% is revenue from government land sales to the private sector which is renewed after the 30-99 year leases expire and which thus form recurrent sustainable revenues. Less conservative accounting (for e.g. amortizing investment properly) can yield another 0.5-1% of GDP).

   In addition we currently use only half of the net investment return contributions (NIRC) available from our reserves, leaving at least 2-3% of GDP currently reinvested in reserves It may not be rational to save as much as half our long term real investment returns on reserves for future generations who are likely to be much richer when we can use it be for budgetary spending over the next 10-20 years when the bulk of our retired baby boomers are living out their final years and we are thus likely to need it the most. Future NIRC is also likely to be higher than current as our reserves are growing rapidly from strong national savings and long term capital inflows, not just from investment income.

   We should, therefore, still have at least 6-7% of GDP left as a sustainable fiscal resource in the medium to long term, even after utilising only about half the remaining NIRC which should be sufficient to fund basic but increasing spending in healthcare, education and social security.

   The leasehold reform in the HDB sector set out in this paper, therefore, does not adversely impact our current operating budget surplus as it is essentially

redistributing the capital gains [which now reside in our reserves] into the value of old HDB estate back to HDB owners.
The total cost of rebuilding is also likely to stabilize and only grow modestly starting with the next 100 year rebuilding cycle as the citizen population stabilizes and the numbers of new flats similarly stabilize or shrink (though its composition may shift over time to larger flats as incomes rise) as the demographic profile combined with low citizen replacement rates suggest (See chart in Annex 2). Hence, it is unlikely that substantial new land acquisition will be needed for housing as it can come out of existing land banks. Hence, the lack of land to support these proposals is not likely to be a physical constraint.
Please see: https://www.edgeprop.sg/property-news/no-lack-space-10-million-population

6. On the issue of crowdedness, in rental housing, please see: https://www.ricemedia.co/current-affairs-features-jalan-kukoh-overcrowding-singaporerental-housing/

7. For a description of homelessness in Singapore please see : https://socialspacemag.org/going-public-homelessness-in-a-nation-of-homeowners/

8. Refer to Dr Rajesh Kumar “Designing Reinforced Concrete for Long Life Span” and Guy Kuelemans (UNSW) “The Problem with Reinforced Concrete”

9. Please see: https://www.todayonline.com/singapore/explainer-how-singapore-will-fund-its-s100billion-effort-mitigate-climate-change-effects

10. Estimates by Surbana, Jurong QS Division.