

HOUSING A NATION

HOLISTIC POLICIES FOR AFFORDABLE HOMES



SINGAPORE DEMOCRATIC PARTY

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HOUSING A NATION: HOLISTIC POLICIES FOR AFFORDABLE HOMES

SINGAPORE DEMOCRATIC PARTY

EXECUTIVE SUMMARY

Affordable housing is a huge concern among Singaporeans who are increasingly finding themselves priced out of public housing. To address this problem, the Singapore Democratic Party (SDP) has come with a new approach to increase the affordability of and access to public housing for all Singaporeans.

The policy ideas contained in this paper, *Housing a Nation: Holistic Policies for Affordable Homes* tackle the key issue of affordability by introducing an innovative new housing scheme — the Non-Open Market (NOM) Scheme — to our public housing system. This paper also introduces supplementary policies to support young families and foster inclusiveness within our public housing system.

Under the NOM system, prices of public housing will be lower because the cost of an HDB flat will only include the cost of construction and administration. NOM HDB flats will be built on land specially zoned for public housing and not contain a land cost component. This is unlike the current HDB practice of including the cost of land in public housing. As a result, the NOM scheme can offer public housing to Singaporeans according to prices listed below:

Flat-type	NOM Scheme Guide Price*
2-Room (99 years)**	\$70,000
3-Room (99 years)**	\$100,000
4-Room (99 years)	\$160,000
5-Room (99 years)	\$240,000
Studio (30 years)	\$40,000

* Prices will vary depending on location and other flat characteristics. The guide prices represent an average.

** Grants Available

For first-timer low-income households (with average gross monthly incomes of less than \$4,000) HDB's CPF Housing Grant scheme will be adapted and improved to provide grants for buying 2-room and 3-room flats.

The key features of the NOM system are as follows:

1. NOM flats may not be sold on the open market, but can be sold back to HDB at the purchase price less the consumed lease.
2. Owners of Open Market (OM) flats will have the option of converting to the NOM scheme, where the Government will return an amount based on the original purchase price from the HDB and the price of NOM flat of the same type.

3. The build-up of a buffer stock of HDB flats to enable Singaporeans to obtain their flats with minimal waiting times.

Housing a Nation: Holistic Policies for Affordable Homes also makes the following policy recommendations:

1. Implement the Young Families Priority Scheme (YFPS), a targeted priority scheme that grants balloting priority for first-timer families with children or couples who are expectant for Balance Flats or new Built-To-Order Flats in non-mature estates.
2. Increase the inclusiveness of public housing by enabling single parent families with children to own flats, and providing rental housing for low-income Singaporeans.
3. Enhance the Lease Buy-Back Scheme to more effectively assist needy senior citizens to have a secure retirement.

The NOM system will increase the affordability and access to public housing for all Singaporeans. While our suggestions for young families and Singaporeans with special needs will ensure our public housing system is inclusive. Collectively, these SDP policies can contribute towards resolving some of the major problems affecting public housing in Singapore today.

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SINGAPORE DEMOCRATIC PARTY

INTRODUCTION

Housing is a basic human need. Not only do people need roofs over their heads but they also need housing that is affordable. The SDP envisions a Singapore where all Singaporean households have the capacity to pay off their public housing loans within a reasonable period with non-onerous monthly instalments.

Housing and Development Board (HDB) prices in Singapore have escalated to severe levels leaving many Singaporeans, especially the younger ones, unable to afford their own homes. Those who are able to enter the housing market find themselves having to take loans with heavy repayment schemes that stretch for decades. Homeowners typically use most of their Central Provident Fund (CPF) savings to service their housing loans, leaving them with little to retire on.

In addition, public housing in Singapore needs to take into consideration the demographics of our population. We need to cater for an ageing population which will see the number of persons aged 65 years and above increase to about 19 percent of the population by 2030. Singapore also suffers from a dwindling Total Fertility Rate (TFR) of 0.78, the lowest in the world. Housing policy must take into consideration these demographic trends.

The SDP's housing plan is drawn up with the following objectives in mind:

1. To make HDB flats affordable,
2. To reduce waiting times for HDB flats,
3. To reduce the financial and logistical obstacles to young couples having children,
4. To plan ahead for a greying population, and
5. To transform our *rentier* economy based on an unsustainable housing market into one driven by productivity and innovation.

Public housing in Singapore – a brief history

In 1960, the Government established the HDB and within 35 years built 700,000 flats [1] on land that it had nationalised or acquired. After its inception, the HDB took over the management of the Singapore Improvement Trust (SIT), an agency set up by the British that built and rented low-cost apartments to the people. The SIT system continued until 1964 when it was replaced by HDB units that were sold to the public under a 99-year lease.

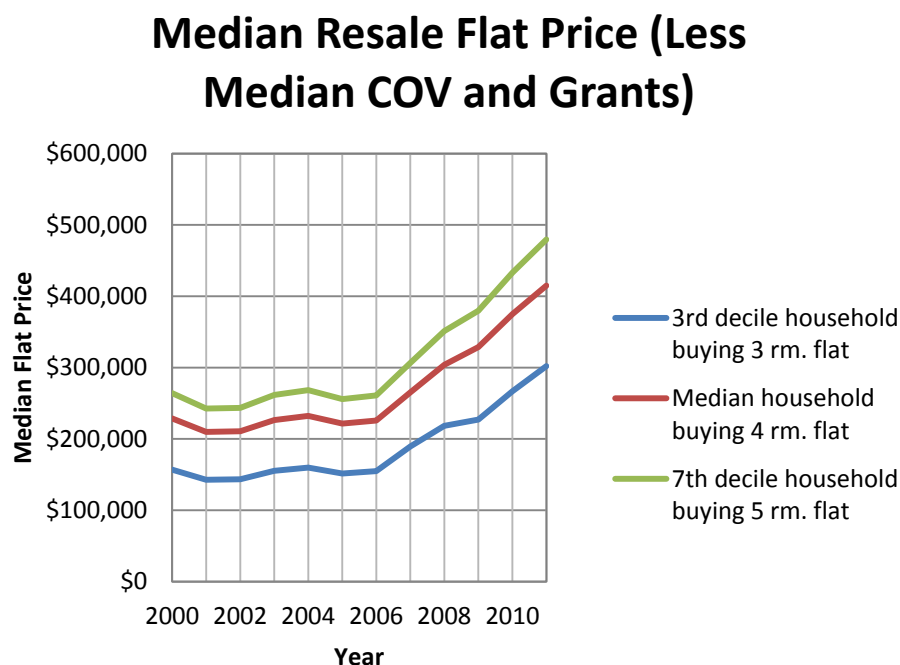
Few Singaporeans bought the flats built by the HDB at that time as they had little extra savings outside their CPF contributions. There were 52,408 applications for rental flats between 1960 and 1965, but only 2,967 applications for purchases [2], leaving many of the for-sale units vacant.

The Government then allowed CPF savings to be used to pay for the HDB loans. It introduced the CPF Housing Scheme in 1968 where loans could be taken from the HDB to make the initial down payments for the apartments with subsequent instalments serviced by monthly CPF contributions. (The scheme was later extended to purchases of private houses.) As a result, sales skyrocketed. In the first half of the 1970s while the number for rentals remained relatively unchanged at 57,034, applications for ownership reached 123,213 and

climbed steadily thereafter [2]. HDB chief executive Tan Guong Ching remarked, “*We made a conscious decision in 1964 to sell the flats so we began our home ownership scheme, not to any great success. When we made CPF available in 1968 home ownership really took off.*” [3].

Problems with the current housing system

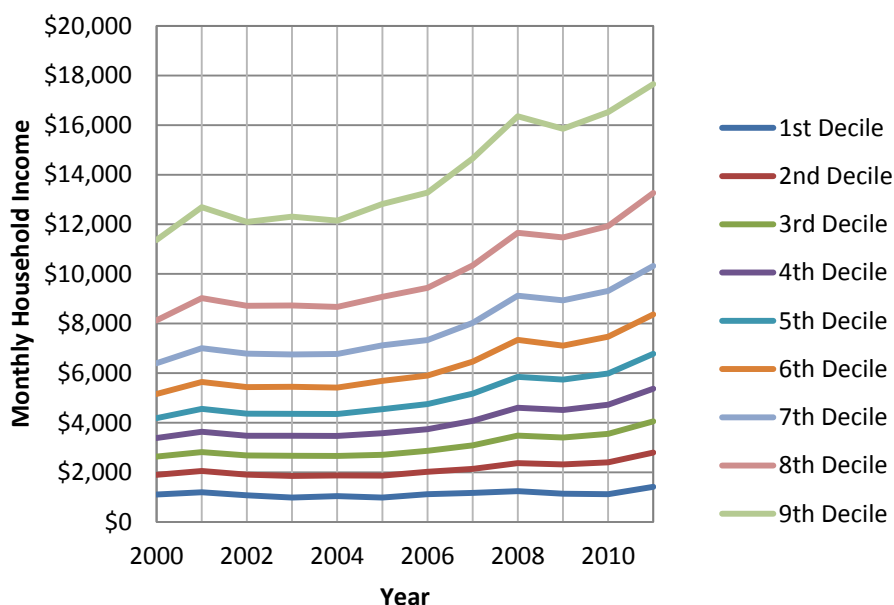
A major problem in Singapore is that Singaporeans are using more and more of their CPF savings to finance their HDB loans. In the face of escalating prices for public housing, Singaporeans are forced to draw on their retirement savings to finance their homes, leaving many “asset-rich” but cash-poor as retirement approaches. Prices have approximately doubled since 2006. This is illustrated in Figure 1 which graphs how the median resale flat price of 26 HDB estates in Singapore, less median cash-over-valuation (COV) and grants, has changed over the years. Given that the prices of new flats are pegged to the market value of property within the particular locale, the prices of new flats have soared as well.



Data Source: The HDB and Department of Statistics
Figure 1: Median resale flat price (less COV and grants)

While housing grants, which were enhanced in 2006 and 2009, have provided some help to Singaporean families, the general upward trend in the prices of HDB flats remains worrying given that incomes have failed to keep pace with housing prices (see Figure 2). This has hit low income households especially hard as their nominal incomes have stagnated.

Household Incomes Including Employer CPF Contributions (Excluding Retiree Households)

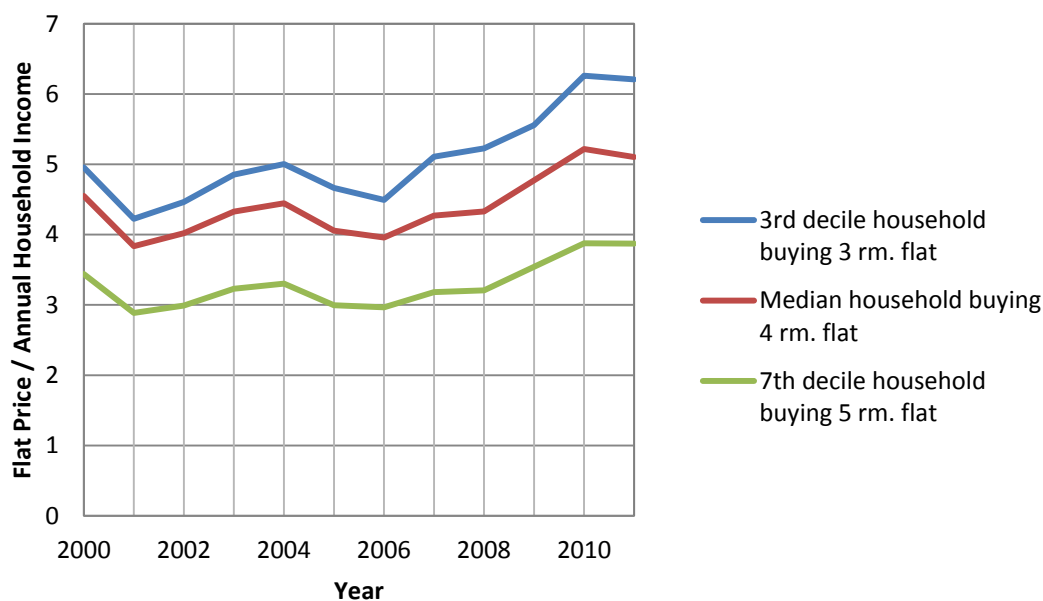


Data Source: Department of Statistics

Figure 2: Household incomes (including employer CPF contributions; excluding retiree households)

Consequently, the affordability of public housing, as measured by the ratio of annual income to cost (less grants), has fallen considerably across the board, even households on the upper-middle rungs of the income ladder are taking longer to pay off their housing loans (see Figure 3, which shows how long it would take to pay for a home using all of one's annual income).

Changes of Home Affordability Over Time of Different Flat Sizes at Representative Income Levels

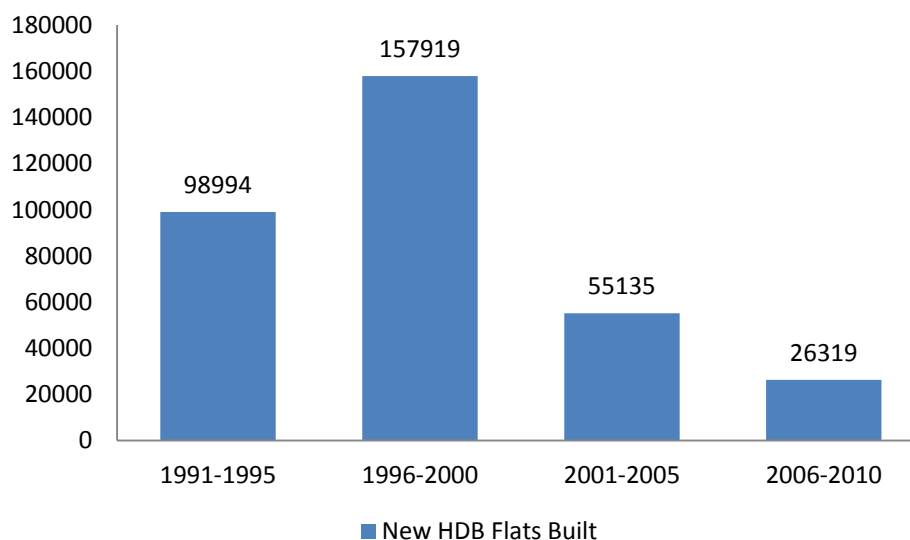


Data Source: Department of Statistics

Figure 3: Changes of home affordability over time of different flat sizes at representative income levels

Some might argue that the escalation of HDB prices is the free market of supply and demand at work. Nothing could be further from the truth. A closer look reveals that the state, which controls as much as 90 percent of the land, and acts as land owner, landlord, and developer. In the Government Land Sales (GLS) process, winning bids in tenders have to meet benchmark levels set by the authorities to be accepted. The HDB “purchases” land for less than this “controlled market rate” and includes this “cost” in the prices of new HDB flats. Because the HDB pays less for the land than a private developer, this is touted as a “subsidy” for HDB flat buyers. Every year, over and above the cost of building HDB flats and running the HDB, a few billion dollars in “land costs” are paid by HDB buyers to the Government. As a result, the sale of public housing, just like the sale of land for private residential use or commercial purposes, is a huge profit-generating enterprise. Indeed, Wong Pak Shong, a former top official of the Monetary Authority of Singapore, remarked that when it comes to the compulsory acquisition of land, the PAP Government “*is a terrific moneymaking machine*”.

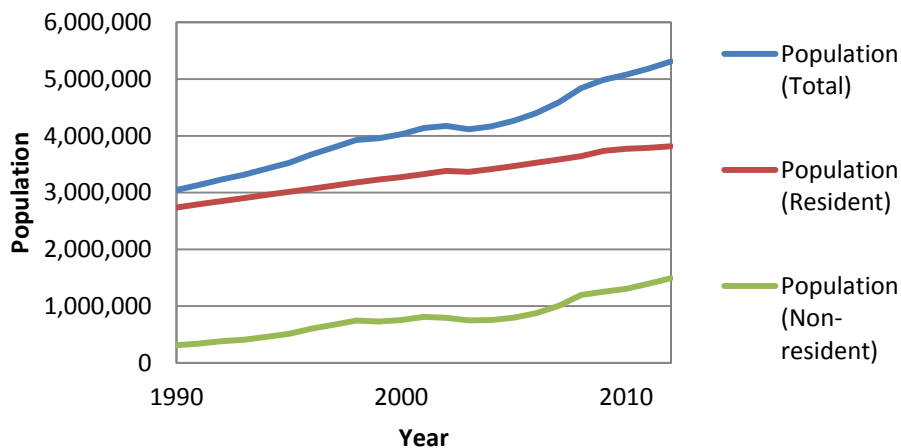
To further underscore how free-market demand and supply are not at work in public housing, note that the Government controls the amount of land released for HDB construction. It therefore also determines the number of flats to be built. The economic law stating that prices can be sustained at high levels with the restriction of supply is clearly not lost on the Government. Figure 4 below shows the number of new HDB flats built over the past 20 years. It can be seen that there has been a dramatic reduction in the number of new HDB flats released, necessarily increasing upward pressure on the prices of HDB flats in recent years. With the simultaneous upsurge in population (see Figure 5 below), it is no wonder that HDB flat prices have escalated.



Data Source: The HDB

Figure 4: Supply of new HDB flats between 1991 and 2010

Population of Singapore



Data Source: Department of Statistics

Figure 5: Population of Singapore from 1990 to 2012

Effects of high property prices

Many Singaporeans have been convinced by the PAP Government's framing of public housing as a sure-fire investment that generates wealth quickly. But this is true only if there are net gains from the sale of housing assets and the purchase of alternative housing. But high housing prices and rental rates mean that realising capital gains from selling one's home is unrealistic unless one owns more than one property or if one decides to leave the country.

Singaporeans must realise that in a country where 85 percent of the people live in HDB flats, the deleterious effects of spiralling prices and increasing unaffordability of HDB flats are significant and far-reaching. As noted at the beginning of this paper, we highlighted the fact that young couples are finding it increasingly difficult to purchase their first home and putting off marriage and starting a family. This has been a major factor responsible for the plummeting birth rates in recent years. The dire consequences of a low birth rate in conjunction with a rapidly aging population are all too well documented. The Government has tried for many years to persuade our younger generation to have more children but without success. Controlling excessive property speculation is, therefore, a necessary measure for increasing the TFR. It is also crucial for preventing, or at least cushioning, a property crash if/when the bubble bursts.

Prices cannot rise indefinitely. The property frenzy and the demographic trends of Singapore are textbook indicators of bubble formation. To clarify this statement, we touch briefly on the dynamics of housing bubbles¹. Housing booms are driven by the increased demand for housing associated with increasing numbers of individuals around the age of 40, where individuals' earning power is typically at its peak. Individuals between the ages of 30 to 50 are starting families or upgrading to larger homes to accommodate growing families. As the number of individuals in this demographic band increases, demand for housing increases, causing prices to rise. This in turn prompts investors and speculators to jump on the property bandwagon, reinforcing the boom and inflating an asset bubble. As the demographic profile shifts to one where the numbers of those around 40 decreases, the falling demand is unable to

¹ We discuss, at greater length, the formation of bubbles in Annex A, where we draw lessons from the United States and Japan to be applied to the local context.

sustain the high property prices, leading to a fall in prices that accelerates with panicked selling to limit losses on the part of investors. Japan is a classic example of such a boom and bust cycle where a boom in the late 1980s was followed by a combined collapse of the Tokyo stock and real estate market around 2003, wiping out tens of trillions in US dollars. Singapore is presently at a point demographically that is not dissimilar from Japan's in 1990², at the peak of its housing boom. We fear that further inflation of our housing bubble will lead to increasingly severe outcomes should it burst and collapse. The attendant socio-economic repercussions on the wider economy would not be mild, as the recent housing-led recessions in Japan and the USA indicate. We are especially concerned as in such crises, disproportionate suffering and hardship is experienced by those in the lower to middle income groups.

Most Singaporeans are paying off their mortgages over more than 20 years, and in many cases over as long as 30 years. By the time they reach retirement age, many Singaporeans will find themselves with little to retire on, having used the bulk of their CPF savings to service their housing loans. The social costs are tremendous. Not only do the large loans whittle away people's retirement savings, they also erode funds needed for healthcare needs and their children's education, leading to negative consequences for present productivity and future capabilities. Furthermore, with such long payment horizons, these problems can be further compounded if debt is passed on to the next generation.

In the face of these serious problems with real consequences on the lives of citizens, the PAP Government simply defines away the problem of unaffordability by assuming 30 year payment horizons which allow for "smaller debt servicing ratios" [5] [6]. Such word play is not helpful. Affordability means that one's earnings are enough for basic expenses which must include paying off a housing loan and putting aside an amount for retirement. If housing costs so much that little is left for retirement, clearly public housing is unaffordable.

Aside from the implications on retirement, unaffordable housing has other dire economic effects. At an individual level, huge mortgages discourage risk-taking and stifle entrepreneurship, which in turn reduces the innovation that is vital for long term economic growth. The growth of Small and Medium Enterprises (SMEs) is stunted by rentals which are a disproportionate fraction of the cost of doing business. Businesses are forced to either close down or pass the costs on to consumers. High property prices funnel money from productive sectors of the economy into the rent-seeking sector, creating and entrenching a *rentier* economy with its attendant problems – asset bubble creation, lack of regenerative dynamics, stagnant wages, structural unemployment, widening income inequality, etc. Furthermore, high housing costs are a huge financial millstone around the necks of many Singaporeans, and have become an obstacle to Singaporeans living a fulfilled life.

A new mind-set, a better life

In the face of these challenges, the SDP has drawn up a holistic plan which will provide affordable public housing for Singaporeans, without causing undue dislocation to the current property market. Our plan seeks to work towards creating a more secure economic base for Singaporeans by providing everyone a home at an affordable rate. We also propose measures to increase inclusiveness for public housing and discuss how our implementing our proposals will provide powerful support for national priorities such as population regeneration and economic dynamism, as well as, on the whole, improve the housing system's efficiency.

² See Figure A-1 and Figure A-3 in Annex A.

The reduction of HDB prices under the SDP's plan would allow Singaporeans greater capacity to pursue their aspirations in life and also enable them to begin accumulating adequate CPF savings for their retirement. Also, because the overwhelming majority of the population live in public housing, pricing public housing at affordable rates has a knock-on effect on private and commercial property prices. This discourages rent-seeking behaviour such as property speculation, reduces the cost of doing business, enables higher wages and greater investment in infrastructure and worker training. The prevalent mind-set that speculative capital gains through property is a sure-fire way to riches will, over time, change to one that views property, especially public housing, as a long-term consumer durable which meets a basic need. These changes will gradually shift our economy away from the *rentier* model into an economy that generates growth through increased productivity, innovation and the accrual of knowledge capital.

Despite having one of the highest per capita Gross Domestic Product in the world, in a 2009 UBS study [4], Singapore ranked only 43rd and 49th for domestic wages and purchasing power respectively, comparable to Kuala Lumpur, Warsaw and Bogota, but lagging behind the other Asian 'tigers'. Reducing mortgage liabilities will increase disposable incomes and improve the quality of life. Indeed, in many Western countries, a large proportion (up to 55 percent) of the population do not own their own homes, yet enjoy a quality and standard of living superior to Singaporeans'.

Making housing affordable for young people setting up home will help to reverse the trend of declining birth rates, and help parents invest more in their children's education, which in turn brings positive social and economic returns.

The lynchpin of this plan is to make HDB flats affordable, and in so doing free up money tied up in property that will foreseeably lead to greater investment in private enterprise and in the underdeveloped small-and-medium-enterprise sector which has hitherto been stymied by the heavy reliance on multi-national and government-linked corporations.

The SDP plan includes the build-up of a buffer stock of flats that will enable young Singaporeans to obtain their flats in a timely fashion as opposed to waiting between three to five years, in the prime of their lives, balloting for flats and waiting for them to be constructed.

In *toto*, these initiatives, along with others we will describe in this paper, will produce a public housing system that more effectively supports Singaporeans in the pursuit of their aspirations and the Singapore economy at large.

MAKING HDB FLATS AFFORDABLE: THE NON-OPEN MARKET SCHEME

To make HDB flats affordable, prices must be reduced. To do this, the SDP proposes the Non-Open Market (NOM) System. The lynchpin of this plan is a new class of HDB flats built on land zoned specially for public housing and sold under the principle of cost-recovery³. Under the NOM System, buyers will pay substantially lower prices (by as much as half of current prices) because the HDB will only recover the costs of construction and administration, and no more.

³ To institutionalize transparency and to keep the Government accountable, the detailed finances of HDB's home building function will be published regularly for public scrutiny.

As the name suggests, NOM flats may not be resold in the open property market. If NOM owners want to sell their flats, they will have to sell them back to the HDB at the purchase price⁴ less consumed lease. There will also be additional restrictions on renting out of these flats⁵. These provisions are geared towards keeping flat prices low as well as decoupling home ownership from speculation (thereby, preventing housing-price bubbles from developing).

In the NOM sector, Singaporeans are able to opt for lower prices if they do not seek speculative benefits. Existing HDB flats will be classified as “Open-Market” (OM) flats, where existing market privileges of open market resale and open market rental will be retained. This fundamental distinction between OM and NOM flats will reduce the prices of new flats without destabilizing the housing market. More discussion on this matter will follow after we outline further details of the SDP plan.

HDB flat prices and grants

The proposed pricing scheme is listed in Figure 6 below. It is based on the planning norm that Singaporeans should be able to pay off their housing loans over 9 to 15 years on monthly payments of about 20 percent of their gross income (that is, before CPF contributions). This pricing scheme is formulated with the recognition that income levels change with economic conditions. In order that people continue to be able to afford HDB flats during adverse economic conditions, the SDP proposes the following prices, which will be updated based on changes in income levels:

Flat-type	NOM Scheme Guide Price [*]
2-Room (99 years) ^{**}	\$70,000
3-Room (99 years) ^{**}	\$100,000
4-Room (99 years)	\$160,000
5-Room (99 years)	\$240,000
Studio (30 years)	\$40,000

^{*} Prices will vary depending on location and other flat characteristics. The guide prices represent an average.

^{**} Grants Available (See Figure 7 below)

Figure 6: HDB prices under the NOM scheme

The numbers in Figure 6 were arrived at based on our planning norm and squaring that with estimates of the cost of construction and administration, the goal being to work towards HDB becoming a zero-profit venture. It should be emphasized that those numbers are estimates that will be revised before implementation of the SDP plan with the availability of the detailed finances of the HDB.

As suggested by the term “guide price”, prices will vary depending on flat location and other

⁴ Details of how to implement this to account for future changes in price will be left to the public service.

⁵ The guiding principle behind rental restriction is that land zoned for public housing and sold at cost-recovery should be used for owner-occupied housing. Rental is used for income generation. As such, rental income will incur a large levy, and rental will be authorized only for valid reasons such as an overseas work posting. To reduce the enforcement burden, matching of tenants with available flats will be done through a HDB clearing house which will be paid by the tenants and will remit the rental proceeds less the levy to the flat owner. Levies will be used to fund the clearing house and the balance will be returned to the reserves.

flat characteristics. Presently, these price differences are computed for OM flats based on statistical models calibrated using the characteristics of neighbouring properties and transacted prices. The SDP recognizes that this may not be the best way to value differences in location and flat characteristics as the NOM context is substantially different from the OM setting. However, under present circumstances, we will adopt existing valuation methods while studying alternative ones. One of these is a bottom-up system, based on real demand signals, for allocating and pricing flats. This system is able to ensure the twin outcomes of affordable homes for the majority and price competition for highly sought after flat categories⁶. We present it in Annex C⁷ for further discussion.

As affordable as the prices for NOM flats are as shown in Figure 6, they may still be out of reach for low-income households. As such, the HDB's CPF Housing Grant scheme will be continued in the form of grants which will be tenable for applications for 2-room and 3-room flats for first time applicants with monthly household incomes not exceeding \$4,000. These discounts will be factored into the price if the flat is sold back to HDB. Figure 7 lists the grants for first timers in the various income groups, and Figure 8 diagrams the grants at each income level. This grant scheme corrects adverse incentives that suppress productivity in the economy and is a substantial improvement over the current one. This is discussed in Annex B.

Average Gross Monthly Household Income[*]	Grant Quantum
\$1,500	\$60,000
\$2,000	\$52,000
\$2,500	\$42,000
\$3,000	\$30,000
\$3,500	\$16,000
\$4,000	\$0

^{} With interpolation at intermediate levels*

Figure 7: Proposed grants for 2-room and 3-room flats for households with average gross monthly incomes not exceeding \$4,000

To clarify our grant scheme, consider the following examples: A household with a monthly income of \$1,750 will be eligible for a grant of \$56,000⁸, and a household with a monthly income of \$3,625 will be eligible for a grant of \$12,000⁹.

Figure 9 lists approximate payment horizons (amount of time expected for the loan to be fully repaid) for the various flat-types after grants under the assumptions of a 3 percent interest rate and monthly instalments of 20 percent gross income. Though there are affordable housing options for all, lower income Singaporeans may find that the more expensive public housing options can result in payment horizons that are longer than 15 years. To discourage the

⁶ Subsequently, we will recommend the buildup and maintenance of a buffer stock of HDB flats.

⁷ The method is based on the generalized Vickrey-Clarke-Groves mechanism which is very well-studied. Annex C contains technical details of how this mechanism is specialized to the public housing setting for the scrutiny of experts.

⁸ For a household income of \$1,750 = $\frac{1}{2} \times \$1,500 + \frac{1}{2} \times \$2,000$, the grant is $\frac{1}{2} \times \$60,000 + \frac{1}{2} \times \$52,000 = \$56,000$.

⁹ For a household income of \$3,625 = $\frac{3}{4} \times \$3,500 + \frac{1}{4} \times \$4,000$, the grant is $\frac{3}{4} \times \$16,000 + \frac{1}{4} \times \$0 = \$12,000$.

selection of such options, HDB Concessionary Loans will be capped at 3 years of gross income.

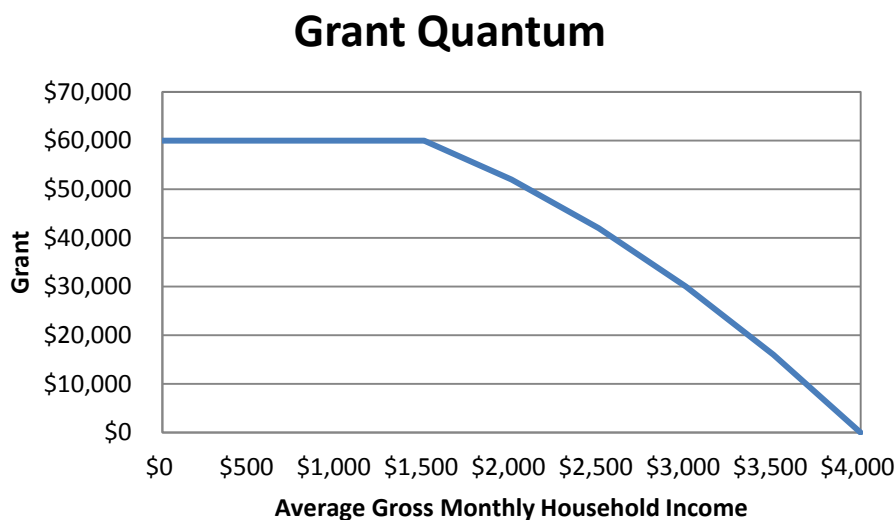


Figure 8: Proposed grants for 2-room and 3-room flats for households with average gross monthly incomes not exceeding \$4,000

Average Gross Monthly Household Income	Housing Option 1	Price After Grant	Payment Horizon (in years)	Housing Option 2	Price After Grant	Payment Horizon (in years)
\$1,000	2-Room	\$10,000	5			
\$1,500	2-Room	\$10,000	3.5	3-Room	\$40,000	14.5
\$2,000	2-Room	\$18,000	5	3-Room	\$48,000	12.5
\$2,500	2-Room	\$28,000	6	3-Room	\$58,000	12
\$3,000	2-Room	\$40,000	7	3-Room	\$70,000	12.5
\$3,500	2-Room	\$54,000	8	3-Room	\$84,000	12.5
\$4,000	2-Room	\$70,000	9	3-Room	\$100,000	13.5
\$4,500	3-Room	\$100,000	11.5	4-Room	\$160,000	20.5
\$5,000	3-Room	\$100,000	10.5	4-Room	\$160,000	18
\$6,000	3-Room	\$100,000	8.5	4-Room	\$160,000	14.5
\$7,000	4-Room	\$160,000	12	5-Room	\$240,000	19.5
\$8,000	4-Room	\$160,000	10.5	5-Room	\$240,000	16.5
\$9,000	4-Room	\$160,000	9	5-Room	\$240,000	14.5
\$10,000	4-Room	\$160,000	8	5-Room	\$240,000	12.5

Figure 9: Payment horizons for NOM flats (Rounded up to Next ½ Year)

The proposed scheme will mean that lower income groups are able to pay off their loans faster than other income groups. This is socially important and reasonable as lower income

workers have less job security and they spend a larger percentage of their household income on non-housing necessities. This plan enables them to use less than 20 percent of their monthly household income to pay their instalments by stretching out their payment horizons.

For families in the “sandwiched-class” who are not eligible to buy new HDB flats but cannot afford to buy private property large enough to raise a family, an upward revision of the income ceiling for buying HDB flats may be necessary. However, this is a matter that will be assessed closer to the implementation of the NOM scheme subject to prevailing needs.

Under the SDP's plan, all HDB dwellers will pay substantially reduced prices for public housing. This will reduce the fraction of Singaporeans' income tied up in property, allowing them to save for retirement, stimulate the economy through consumption or even build businesses.

Rationale behind the pricing of NOM flats

The Government should not profit from Singaporeans when it comes to public housing. Land belongs to the people and the Government is the steward of state land. Its ultimate objective is to ensure that land in Singapore is wisely used to ensure that all Singaporeans are provided homes at affordable rates.

At Singapore's current stage of development, public housing is a basic need; and a profit-seeking approach to public housing is unacceptable. As such HDB flat prices should only comprise of tangible costs that go into the building of the flats. Such costs would include labour costs (such as salaries/fees for construction workers, engineers, architect, administrators, lawyers, contractors, etc.) and material/equipment costs.

GeBIZ data¹⁰ reveals that firms bidding for “building works and contingency works” projects for typically ask for between \$75,000 per unit to \$170,000 per unit depending on land conditions. Given this information, one might ask why the typical HDB flat is priced at a large multiple of cost (including the running of the HDB). The answer is that the Government includes what it calls a “land cost” to close the gap between the “market price” and the cost price. As pointed out, land belongs to the people, not the Government. Hence, the Government has no moral right to charge Singaporeans for the land, and certainly not for a dubious purpose like “marking to market”.

By controlling the amount of land parcels released for HDB development, the Government restricts flat supply and hence raises prices¹¹. Further compounding the imbalance is the immigration-driven population surge of over a million foreigners over the past decade that has led to a spike in demand for public housing. The escalation of demand and suppression of supply has led to the surge in flat prices diagrammed in Figure 1, causing public housing to become increasingly unaffordable for Singaporeans. Eliminating the artificial “land cost” component from the flat prices eliminates Government profiteering through the HDB. Such a measure enables prices of flats to be reduced to our proposed guide prices (in Figure 6).

The economic rationale for lowering the prices of HDB flats is clear and compelling. The reduction of flat prices does not only make public housing affordable for the average Singaporean, it also frees up private capital that can stimulate consumption in the non-property sectors as well as increase the appetite for entrepreneurship, leading to a more

¹⁰ Accessed August 2012.

¹¹ Figure 4 shows the extent to which the supply of new HDB flats has been cut.

diverse and dynamic economy. At the individual and family levels, this means increased freedom and financial capacity to live one's life as one wishes instead of being enslaved to a lifetime of heavy mortgages.

The lease for NOM flats

The lease for NOM flats (listed in Figure 6) will be set at 99 years (except for studio apartments). However, homeowners will not have to surrender their NOM flats should they out-live their lease.

Buyback scheme for NOM flats

The owner of an OM flat will be able to, after the Minimum Occupancy Period (MOP), sell his flat at the OM market price whereas an owner of a NOM flat will have to sell his flat back to HDB at the current price of an equivalent new NOM flat (less grants) minus the value of the consumed lease. Computing the value of the consumed lease will be left to the HDB with the recognition that flats do not lose as much of their value over time when they are newer than when they are older.

The MOP for NOM flats will be 5 years (the same as OM flats).

Building a buffer stock

The SDP proposes that we return to a system where a buffer stock of HDB flats is maintained. This will mean that young people planning to get married and start a family will no longer suffer the inconvenience and uncertainty of booking a flat well in advance of a wedding.

We recognize the issues associated with a large stock of unoccupied flats. Oversupply will be avoided by commitment to a policy to keep the buffer stock at a pre-determined level. Should the stock be too high, no new flats will be built, and should the stock be too low, a suitable quantity of new flats will be built. This level will be determined by experts in the public service based on considerations such as population demographics.

We also recognize that under the current balloting system a buffer stock of flats can become difficult to deal with, from the perspective of prospective applicants, due to fragmentation of the stock into multiple flat types in multiple locations. This can be seen in the Sale of Balance Flats, where getting a flat one desires can be more challenging than obtaining one from BTO launches due to the smaller batch sizes. This is why we also propose to replace the existing balloting system.

Enhancing the current balloting system

We highlight two possibilities for a new system for applying for flats. Previously, we mentioned a bottom-up allocation and pricing system based on the well-studied Vickrey-Clarke-Groves mechanism¹². However, if pricing is to be done through statistical models calibrated by recent transactions of nearby property, as it is presently, a generalization of the current balloting system will suffice.

To ameliorate the problem of fragmentation mentioned at the end of the previous section and to improve the efficiency of the housing system as a whole, we propose a multi-round balloting system where applicants may make multiple selections as opposed to one, at

¹² This is elaborated upon, in detail, in Annex C.

present. Prospective homeowners may be in favour of various housing options in terms of flat-size and location. Thus, it makes sense for them to indicate a range of preferences instead of being forced to choose a single flat-type in a single location. Such a practice decreases the buyers' welfare as well as efficiency of the allocation process.

An applicant may indicate more than one precinct choice per balloting exercise in order of preference. (For instance: 1st Choice – 4 room flat at Bukit Batok Skyline, 2nd Choice – 5 room flat at Bukit Batok Skyline, 3rd Choice – 4 room flat at Clementi Ridges, ...) Computer balloting will be done for all the first choices, followed immediately by balloting for all the second choices for applicants unsuccessful in their first choice application, followed by balloting for all third choices, and so on. This combined balloting system will speed up the application process for unsuccessful applicants.

To reduce uncertainty on the part of applicants, they will be allowed to change the choices on their application over the entire application window and will be given visibility over the statistics of the balloting exercise¹³ over part of the application window¹⁴.

Conversion of OM to NOM flats

All Singaporean owners of OM flats will have the option of converting to the NOM scheme. Conversion will entail the reclassification of the relevant flat as a NOM flat and a payment into the owner's CPF and cash if enough of the purchase price of the OM flat was paid for in cash¹⁵. A period of one year from the launch of the NOM scheme will be given to homeowners to decide whether they would like to take up conversion.

The rationale behind allowing a conversion of an OM flat to the NOM scheme is that in the past, especially over the past decade, owners of OM flats, both completed and under construction, have overpaid for their flats bought directly from the HDB. As mentioned, the Government has included a “land cost” component in flat prices and the recent escalation of this component has driven up prices, especially since 2006 (see Figure 1).

The conversion from OM to NOM flats is not a means for homeowners to obtain capital gains in the property market, but rather for them to recoup their CPF funds unfairly paid to the Government. This will reduce their debt and free up cash for other needs.

The payment quantum will be based on the difference between the original purchase price from the HDB and the price of a NOM flat of the same type. This conversion scheme is fiscally responsible as the amount that was overpaid was paid into the reserves and, thus, no addition revenue will have to be raised to fund this scheme.

Owners of older flats may have original purchase prices less than the NOM flats. In such cases, they will not receive payments from the Government because they have not overpaid the HDB substantially, unlike those who bought flats in recent years. They can, however, sell their flats in the open market and apply for a flat under NOM scheme.

We propose that the conversion payment be computable as follows. Let R_1 be defined by

¹³ An example of such a statistic might be the number of applicants who placed “4 room flat at Bukit Batok Skyline” as their 2nd choice.

¹⁴ For example, if the application window is two weeks long, visibility over the statistics of the balloting exercise might be available until the second last day.

¹⁵ Those interested in saving for retirement can currently make transfers in cash or CPF OA monies to one's CPF SA, which has a higher minimum interest yield than the CPF OA.

$$R_1 = [\text{Original Purchase Price of OM flat}] - [\text{Purchase Price of a New NOM flat}]^{16}$$

and define the “soft cap threshold” as

$$R_2 = [\text{Capping Coefficient}]^{17} \times [\text{Purchase Price of a New NOM flat}]$$

If R_1 is less than R_2 , then the amount paid out is R_1 . Otherwise, the payment will be R_2 plus:

$$R_3 = [\text{Discount Factor}] \times (R_1 - R_2).$$

The reason for introducing a discount on the amount above the purchase price of a new NOM is that flats in good locations/higher elevation have much higher original purchase prices and to not discount the payment would be tantamount to giving such flat owners good locations/higher elevations for free, which would be unfair. This discount factor must be large enough to account for the value people generally place on location and elevation. Presently, 50 percent is proposed though details will be left to the public service. Worked examples are provided in the footnotes¹⁸.

Notably, the conversion scheme does not pay for interest payments on loans made by flat owners. This is because interest is an expense paid for consumption¹⁹. The Government is not obliged to pay for such an expense.

The advantage is that under the SDP's plan, HDB flat owners will have the added option of converting their OM flats to NOM ones or selling their flats in the open market and buying a new one under the NOM scheme.

Owners of flats that were bought on the resale market are not eligible for conversion as the Government is not obligated to pay for the profit of the sellers. They can, however, sell their flats on the open market and buy a new NOM flat.

New open market flats

The OM scheme will be continued. New OM flats will be built in separate estates and priced on the same basis as existing OM flats. Current conditions regulating HDB flats will continue to apply. However, these new flats will not be eligible for conversion.

We are confident that the NOM scheme will meet the needs of Singaporeans, but have concerns about the attractiveness of the new OM flats. Therefore, if there is under

¹⁶ Price refers to the purchase price of a new NOM flat at the launch of the NOM scheme. This term may be tweaked, if appropriate, to account for the hypothetical cost of a NOM flat in the year of purchase of the OM flat.

¹⁷ We propose a value of 85 percent so most flat buyers in non-mature estates will be reimbursed in full. This takes reference from the pricing of new 4 room flats under the BTO scheme in 2012.

¹⁸ **Example 1.** A 4-room flat on 12th floor in Seng Kang bought at \$300,000.
 $R_1 = \$300,000 - \$170,000 = \$130,000$; $R_2 = 85\% \times \$170,000 = \$144,500$.
 Since $R_1 < R_2$, the payout is $R_1 = \$130,000$.

Example 2. A 4-room flat on the 25th floor in Geylang bought at \$479,000.
 $R_1 = \$479,000 - \$170,000 = \$309,000$; $R_2 = 85\% \times \$170,000 = \$144,500$.
 Since $R_1 > R_2$, we compute R_3 to be $50\% \times (\$309,000 - \$144,500) = \$82,250$.
 The payout is $R_2 + R_3 = \$144,500 + \$82,250 = \$226,750$.

¹⁹ Interest is an expense paid to allow consumption, today, of what one would only be able to afford tomorrow.

subscription for the new OM flats, balance flats will be allocated as NOM flats.

In the application for flats, applicants will indicate whether they are applying under the OM scheme or under the NOM scheme²⁰. Applicants under the OM scheme may only apply for flats in OM estates. Applicants under the NOM scheme may apply for both flats in NOM estates and balance flats in the OM estates, but applicants under the OM scheme will have priority for selection in the new OM estates. If applicants for NOM flats are allocated flats in OM developments, they will pay the NOM price.

Preventing a sudden and severe price correction

Left alone, the current system not only makes the HDB flats unaffordable, it also allows the continued inflation of a housing bubble, threatening the national economy. With these serious problems, inaction is not an option, and the introduction of the NOM scheme will go a long way to disarming these threats.

The NOM scheme will make flats genuinely affordable for the people, and with the promise of more NOM flats being built over time, resale prices will stabilize and correct themselves. This is a necessary outcome, but it is important for the welfare of recent resale flat buyers that this market correction be gradual.

In the conceptualization of the NOM scheme, a major concern was to devise a scheme that would not cause a severe market correction which would leave recent buyers of resale flats, who have most of their housing loans unpaid, in negative equity with the attendant financial hardship. The NOM scheme was designed so as to avoid this undesirable outcome.

To show that the NOM scheme will not destabilize the public housing market, causing resale prices to plunge, we will consider demand side and supply side factors in the resale market following the introduction of the NOM scheme.

We will begin with demand factors. Currently, BTO flats already compete with resale flats. Resale flats are attractive by virtue of the shortness of the wait and the ability of buyers to choose from a large pool of varied resale flats. They are also sought by those who are unable to buy new BTO flats such as PRs and former private property owners. The same applies when NOM flats are considered. The demand for resale flats will continue to be supported by these important non-price considerations.

The supply side will be affected by the eventual availability of second-hand NOM flats and a buffer stock of NOM flats. However, second-hand NOM flats will not go on sale till at least about 10 years (construction plus MOP) after their introduction. A buffer stock will take even longer to build up due to the current backlog. The supply of NOM flats competing directly with resale flats, for buyers in the first category described above, will not be substantial for a long time and thus cannot generate much supply side impact. Furthermore, as highlighted previously, the conversion of OM flats to the NOM scheme by those who wish to cut their debt load will reduce the competition for buyers on the resale market for those who decide not to convert.

Considering the various factors, we conclude that the NOM scheme will not have an adverse impact on the market for resale flats. Barring any catastrophic external economic shock that

²⁰ As previously mentioned, to reduce uncertainty on the part of applicants, they will be given visibility over the number of applicants in each scheme.

would undermine Singapore's economy, any decrease in resale flat prices will necessarily be gradual, guarding against negative equity.

HELPING SINGAPOREANS TO START FAMILIES

One of our main objectives is to remove obstacles to Singaporeans starting families. With a record low Total Fertility Rate (TFR) of 0.78 births per female, the percentage of persons aged 65 years and older will reach 19 percent of the population by 2030 compared to 8.7 percent in 2008. This increased dependency will have serious economic repercussions. The problems associated with an aging population are serious and challenging, and it is clear that something needs to be done to ameliorate the low fertility rate.

The factors associated with the low birth rate in Singapore and having fewer children are many. One of the main reasons cited by young married Singaporeans against, or putting off, having children is housing. Human talent is our key resource and we must not let an inept housing policy hinder procreation.

The current difficulty in obtaining a flat exacerbates the problem. The time taken for a couple to acquire a flat can range from three to five years (or even longer) unless they decide to pay a premium to purchase a flat on the resale market. This time is essentially “lost life” for young Singaporeans in their prime. In economic terms, such a sacrifice in the name of “a leaner housing stock” is a trade-off not worth making. Furthermore, having already been forced to make that sacrifice, taking further account of other factors such as education, healthcare and the socio-political environment, couples think twice about whether they want to bring a child into the world. All this is especially problematic because we, as a nation, are in desperate need to have couples of child-bearing age procreate.

Also, as noted in the preceding sections, the prices of HDB flats have also escalated to the point where many younger Singaporeans cannot afford them. As a result, these couples end up having to stay with their parents and in-laws. The lack of privacy and the attendant space constraints in such an arrangement are further impediments that discourage them from having children or delay procreation.

Deferring starting a family can also have negative health effects on mother and child. The likelihood of health complications increases for mother and baby as a woman ages. Some of the most common complications include chromosomal abnormalities (e.g. Down’s syndrome), a higher rate of miscarriage and premature births. Older couples may also find it more difficult to become pregnant. At a national level, an entire generation forced into such a delay can be serious.

Broadly speaking, the environment that the PAP Government has allowed to develop is one where couples think twice about having children and are likely to delay child bearing. In the long term, SDP plan will remove the financial and logistical barriers to child bearing. However, in the interim we recommend strong temporary measures. To this end, we recapitulate a proposal we made in May 2012 [7].

The Young Families Priority Scheme (YFPS)

Presently, those applying to buy HDB flats for the first time are given priority over other applicants. These buyers, under the Build-To-Order (BTO) scheme, are then given a queue position – determined by a computer ballot – to book a flat. Under the SDP's proposal,

married couples who have children or are expectant and who are applying for balance flats or new flats in non-mature estates as first timers will be given absolute priority in the following order:

- Tier 1: Families who have two or more children under the age of 12
- Tier 2: Families with one child under the age of 12 and expectant couples
- Tier 3: Other Applicants

This means that buyers in Tiers 1 and 2 will be placed at the top of the queue for flat selection in the Sale of Balance Flats (SBF) exercise and BTO launches in non-mature estates.

The YFPS will ensure that couples who have children or are expectant will be able to obtain a home in the shortest time possible. Furthermore, there will also be a sizable, but not unreasonably large, incentive for Singaporean couples to join Tiers 1 and 2 as they would have a free pick of the available flats in the SBF and BTO launches in non-mature estates.

This scheme is easy to implement. In fact, the procedure can be administered immediately at the next HDB ballot launch.

The SDP recognises that there are other factors affecting the procreation issue in Singapore such as the price of HDB flats, the cost of living in Singapore, the education system and so on. These subjects will be tackled separately.

AN INCLUSIVE AND CARING HOUSING POLICY

Increasing inclusiveness

The SDP's housing policy ensures that singles and divorcees are not unfairly discriminated against. The present system severely disadvantages singles. While priority should be given to families with children or couples who are planning to have children, individuals who are not married should be able to ballot for their flats under Tier 3 with restrictions on the types of flats they are eligible for. Single-parent families with children under 12 are eligible for Tiers 1 and 2.

Moreover, to encourage marriage, the process of transitioning from a flat built for singles to a bigger flat built for a family will be just as easy as for a first-timer couple getting their flat. A pair of singles who collectively own one or two NOM flats will be able to make a joint application for a bigger NOM flat and sell their existing NOM flats back to the HDB within three months of collecting the keys to their new flat.

Housing lower income Singaporeans

Lower-income Singaporeans who do not have the means to pay for an NOM flat will have the option to rent from the HDB. The income ceiling for direct rental from HDB is pegged at a monthly household income of \$2,000 and \$1,000 for singles. Rental pricing will be done based on the same sound microeconomic principles outlined in Annex B.

Helping needy senior citizens

Under the current HDB Lease Buy Back (LBB) Scheme, elderly Singaporeans who are in need of an income can re-mortgage their flats to the HDB for a sum of money for a limited lease. While it is understandable that a government should not be offering pay outs at market

valuation, the LBB rates offered by the Government severely undervalue the lease they are buying back, disadvantaging these residents substantially [8].

Under the SDP's plan, senior citizens can convert their flats to the NOM scheme in return for an annuity to live on while preserving their equity in their flats. This annuity will be adjusted according to the prices of a basket of goods selected to represent a reasonable level of consumption for a dignified retirement. Such an inflation adjusted annuity will provide assurance that seniors are taken care of. It should be emphasized, however, that in the long term, the NOM scheme will greatly reduce the number of Singaporeans who do not have enough for retirement.

HARMONIZING PUBLIC HOUSING RULES WITH GOOD SENSE

Public housing and private property ownership

Currently, owners of HDB flats bought without housing grants may acquire private property in Singapore without having to dispose of their flats. We do not propose to make any changes to this. However, owners of NOM flats will not be allowed to concurrently own completed private property, meaning that they must dispose of the HDB flat within three months of the issue of the Temporary Occupation Permit for the private property²¹.

We propose to modify the rule where owners of private property in Singapore may not apply for HDB flats without first disposing of their private property. Owners of private property are not immune to economic dislocation and may encounter circumstances where they have to move to a less expensive home. It is unreasonable to expect them to seek expensive rental housing while waiting out a 30 month period before they can apply for new flats. They may apply for new NOM flats (subject to income requirements), but must dispose of their private property within three months of the flat becoming available for occupancy²².

Permanent Residents and subletting

Under the SDP plan, PRs will not be allowed to sublet flats as they are expected to be working in Singapore and only be away for short durations for work-related overseas trips or family vacations.

As the number of foreign nationals and PRs allowed into Singapore has had a demonstrably large impact on housing prices, the SDP will reduce significantly the number of immigrants by ensuring that only individuals with relevant and demanded skills will be allowed to work in Singapore. Also, the granting of Permanent Residency will be done in a more judicious manner. This topic will be examined in greater detail in a separate policy paper on population and immigration.

Capital gains on public housing

Restrictions should be placed on capital gains from PR-owned (open market) HDB flats. It is recommended that, an additional capital gains tax be levied on the portion of the sales proceeds in excess of the purchase price for existing OM flats. This measure greatly reduces the motivation for PRs to speculate on the Singapore public housing market.

Ownership of private property overseas

²¹ This period may be extended subject to a weekly levy.

²² This period may be extended subject to a weekly levy.

We propose to allow simultaneous ownership of HDB flats and overseas property. This is because the ownership of property overseas, even if just across the Causeway, has little impact on the local housing market. Furthermore, this obviates the need for an onerous enforcement effort²³.

CONCLUSION

The issue of housing affordability is not a new issue for Singaporeans. Over the past decade, misguided housing policies focusing on “leanness” rather than providing for the housing needs of Singaporeans has resulted in a shortage of HDB flats. The Government is currently scrambling to compensate for it and deal with the concomitant doubling of HDB flat prices over the past six years. The PAP Government has not been successful.

In this paper, the SDP has highlighted that the un-affordability of public housing, a major necessary expenditure for most Singaporeans, generates huge obstacles to individuals trying to live fulfilled lives. As a financial millstone around the necks of Singaporeans, it broadly reduces the appetite for entrepreneurship, thus sowing the seeds of wider economic troubles that may eventually threaten Singapore’s place in the larger world economy. To address these issues, the SDP has put forth a synergistic set of proposals designed not only to make public housing more affordable, but also to improve the overall functioning of the public housing system through timely availability and better utilization of applicant preferences in allocations.

The SDP’s recommendations address the widespread calls by Singaporeans for truly affordable housing. The Singapore government has been elected by the people of Singapore and it is only right that they heed the voices of the people and accept the recommendations herein.

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²³ An unenforced prohibition leads to a sort of “broken window effect” where the lack of enforcement emboldens people to break the law. This is socially undesirable.

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ANNEX A: ASSET BUBBLES

Lessons from the United States

As early as 2005, in the midst of America's biggest post-war housing boom, some economists and financial analysts were already sounding warning bells that a bubble was forming, and a bust imminent. The boom had been fuelled in the wake of the 2000 dotcom crash by a combination of funds shifting from equities to the property sector and the Federal Reserve's expansionary monetary policy, resulting in an ample supply of cheap money and easy credit.

The signs were there: between 2001 and 2003, the Federal Reserve cut interest rates 13 times; the amount of sub-prime loans increased from US\$332 billion in 2003 to US\$1.3 trillion in 2007, an increase of 292 percent; the total value of derivatives held by financial institutions ballooned even as total cash reserves shrank; and by the time the market peaked in 2006, some of the subprime loans were already going into default.

When credit dried up in 2007, it caused a downward spiral into a financial crisis the likes of which had not been seen since the Great Depression of the 1930s. The boom had turned into the biggest housing crash in the history of the United States (US).

The parallels of the US property bubble with our current housing market boom are eerie: property prices here have been on an upward trend since the 2008 financial crisis, largely fuelled and sustained by an economic rebound, influx of foreigners, massive inflow of liquidity, long loan tenures and low interest rates. The recent sale of a Housing Development Board (HDB) flat for \$1 million has raised eyebrows and generated much angst among young aspirants to property ownership.

The HDB Resale Price Index, a key indicator of public housing price trend, is now at a historical peak, and is showing no sign of abating despite a recent slew of cooling measures adopted by the government. To all appearances, a speculative bubble is forming. The prospect of a sharp correction, if not a major crash, looms for the property market.

What lessons can we draw from the historic housing crash in the US? First, housing, in particular public housing, should not be considered an investment good, an appreciable asset to be invested in to reap capital gains. Houses are, fundamentally, consumer durables. That is, they are goods that yield utility and depreciate slowly over time.

Second, the proponents of the Austrian School of economics hold that only savings-induced growth is sustainable, while a credit-induced growth will inevitably lead to a boom-and-bust cycle. That is why a housing boom contains the seeds of its own destruction: easy access to credit and speculative frenzy lead to over-pricing as buyers seek to maximise capital gains during the boom phase, and when credit freezes, a marked readjustment occurs with distressed selling amid falling equity and the accumulation of massive debt as the bubble bursts.

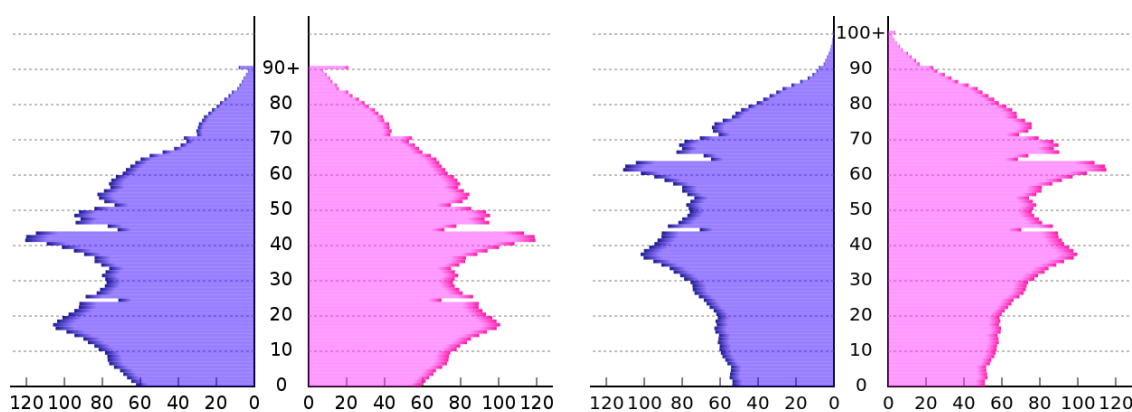
How property bubbles start – and burst

Financial bubbles have a set of fundamentals that drive the initial boom. During the dotcom bubble there were many new business models which were highly innovative and promised great returns. There were trailblazers like *Amazon.com* which revolutionized book selling, and *Yahoo!* which pioneered sponsored search advertising.

Unfortunately, the initial boom often leads to irrational exuberance which is accompanied by over-investment, culminating in a market collapse. This was what caused the bubble in the stock market, which drove the NASDAQ up to 5,132 points in January 2000 only to come crashing to 1,108 points in October 2002.

Similarly, there are fundamental drivers in the property market which often lead to boom and bust. The dominant sources of demand for housing are individuals between the ages of 30 and 50. Individuals in their 30's are starting their family and aspire to buy a house or looking to upgrade to a bigger house to accommodate their growing families. Individuals in their 40s are usually at the peak of their earning power and will look to upgrade to bigger and more luxurious housing or investing in additional residential property. As the numbers of such individuals rises, the property market booms. As the boom continues, investors and speculators will pump money into the market, reinforcing the boom and inflating an asset bubble.

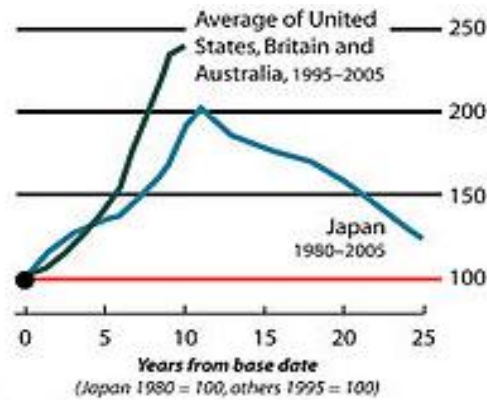
Demand for housing will fall when these groups of individuals age and their earning power reduces with retirement. A crash is to be expected unless the population reproduces sufficiently or is sufficiently supported by immigration to sustain the demand for housing. Japan over the recent decades is an excellent case study. Figure A-1 shows the population profiles of Japan in 1990 and 2010 respectively. It illustrates the how, from 1990 to 2010, the peak in Japan's population profile shifted from people in their 40's and to people in their 60's.



Source: Wikimedia commons

Figure A-1: Population demographics of Japan in 1990 and 2010

We acknowledge that comparing housing boom-bust cycles with demographic trends can be problematic as many other contributory factors exist such as excessively loose monetary policies, immigration policies, and the lack of restrictions on property speculation. Nevertheless, population demographics are an important indicator that policy policymakers cannot ignore. Figure A-2 shows how boom and bust played out in the property prices in Japan over the period from 1980 to 2005, neatly corresponding to what population trends would suggest. In 1989, choice properties in Japan commanded prices of US\$20,000 per square foot, but by 2003 prices for these same properties had slumped to less than one percent of the values at the peak of the boom. Tens of trillions (in US dollars) were wiped out with the combined collapse of the Tokyo stock and real estate markets.

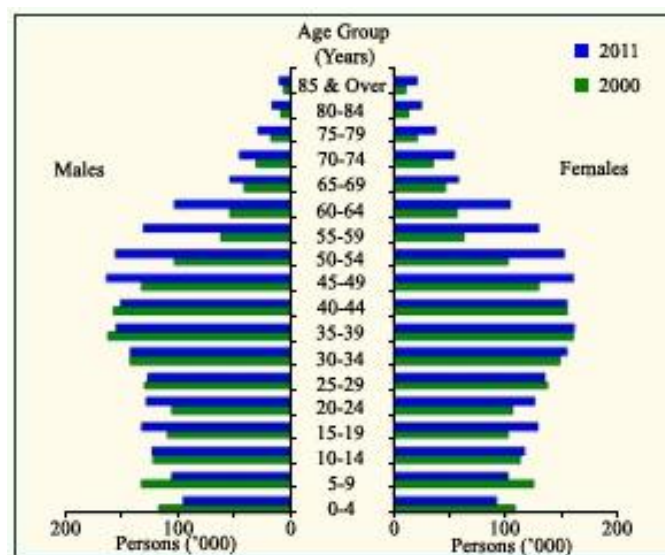


Source: *The Economist*, 16 June 2005

Figure A-2: Housing prices in Japan, US, Britain and Australia

Presently, China has a very similar population profile as the Japan of the 1990's. With no prospect to bolster the population with immigration, this portends serious consequences for the Chinese housing market. This prompted Kiyohiko Nishimura, the Bank of Japan's deputy-governor and an expert on asset booms, to warn of China "*entering the danger zone*" demographically.

Singapore's population profile is similar to that of 1990's Japan (see Figure A-3 below). We will face a similar cycle in our property market unless our policymakers are willing to take unpopular measures to curb excessive speculation. We must also take steps to bolster the number in the 0-10 age group through increasing fertility.



Source: Department of Statistics

Figure A-3: Demographics of the Singapore population

The PAP Government's policy of increasing the number of individuals in their 30s through immigration will increase the size of this age group and add to the demand for housing in the present (further adding to the boom). However, it simply kicks the can down the road and leaves an even bigger problem for the next generation and is not a long term solution.

ANNEX B: HOUSING GRANTS AND INCENTIVES FOR PRODUCTIVITY

We proposed a set of grants to assist lower income households in paying for HDB flats. The visible difference between our proposal (see Figure B-1) and the current scheme (see Figure B-2) is that there are no more sharp drops in grant quanta at certain thresholds. This is because such drops induce disincentives for lower income workers to take on higher value work for fear of a sharp drop in their grant-discounts.

To address that problem, the proposed grants will be interpolated for intermediate levels between the tabulated quantities to remove the huge “threshold disincentives” for lower income workers to take on higher value work. However, even with interpolated grants, if the rate of decrease in the housing grant, with respect to household income, is too rapid, then similar, but less severe, negative incentives exist. Since each grant dollar in housing grant money is valued more by a household with lower income than by one with a higher income, it is necessary that the rate of decrease in the housing grant be lower at lower levels of income to reduce the chances of incentive bottlenecks for moving up the value chain.

While the incentive problems mentioned above disappear after one has booked a flat, not all low income workers may buy flats. Those that rent face similar adverse incentives on a monthly basis. As such these principles should also be applied to reform the rates for subsidized rental²⁴. A recent article titled “\$50 raise? No, thanks” (The New Paper, 2 July 2012) highlighted a specific case where a low-wage earner turned down a pay increase as it would have put her in a higher income bracket, which would have led to a net loss after accounting for the increase in rent. This goes to show that these incentive issues are real and should be properly addressed.

These modifications make the grant system sound in a microeconomic sense and will be beneficial to the economy at large as it will not discourage higher productivity as current systems do (e.g.: housing grants and rental rates).

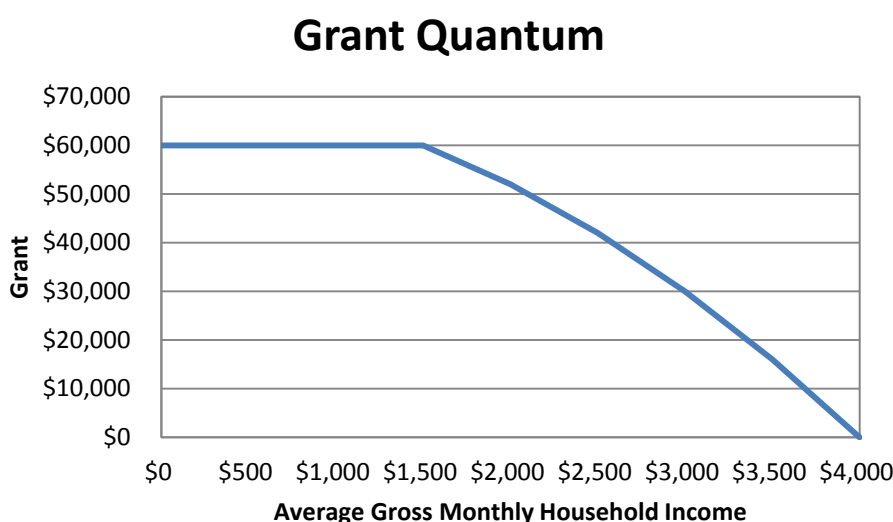


Figure B-1: Proposed grants for 2-Room and 3-Room Flats for households with average gross monthly incomes up to \$4,000

²⁴ See <http://www.hdb.gov.sg/fi10/fi10323p.nsf/w/RentDirectHDBRentDeposit?OpenDocument> for HDB's rates.

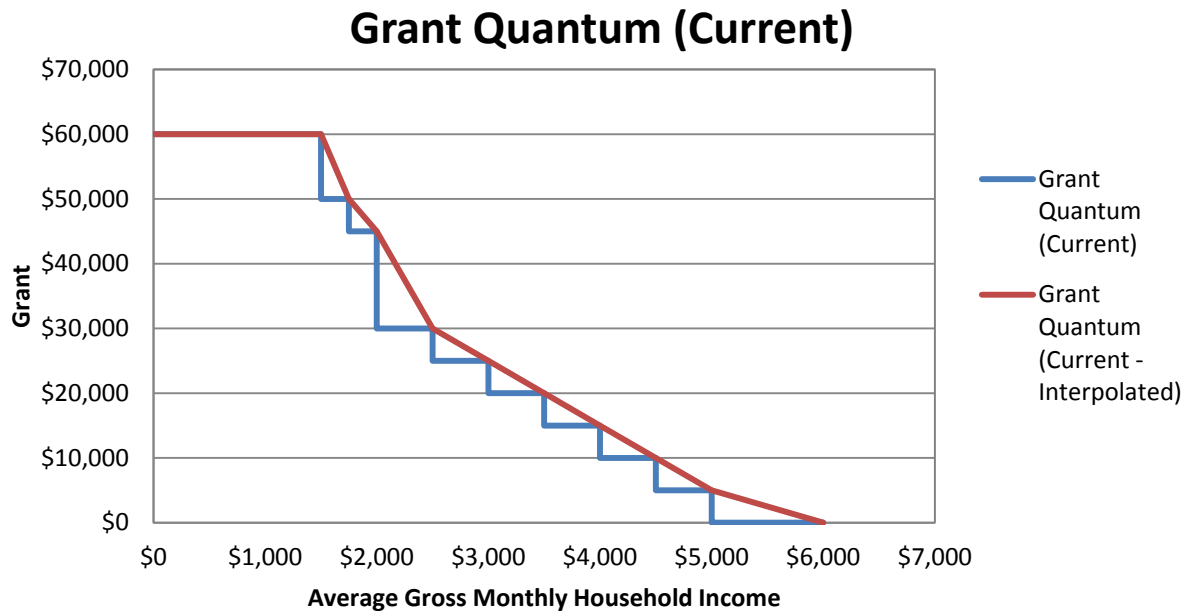


Figure B-2: Current grants

ANNEX C: A FLAT APPLICATION/ALLOCATION SYSTEM THAT BLENDS AFFORDABILITY WITH EFFICIENCY AND MICROECONOMIC SOUNDNESS

In this annex, we propose an allocation system for HDB flats that is based on the well-studied generalized Vickrey-Clarke-Groves (VCG) mechanism which extends Nobel Prize winning theory. Throughout this annex, it will be assumed that the ratio of home seekers to the number of available flats is not too high, or more ideally, that there already exists a buffer stock. Such conditions will ensure desirable outcomes when this allocation system is used. In the absence of a buffer stock, balloting for participation can be used to generate such conditions, which is similar to the existing ballot for the right to choose first albeit more sound from the perspective of fairness and efficiency.

This allocation system enables applicants to select as many categories of flats that they are interested in and also requires that they indicate if they are willing to pay a premium, that will not be returned in resale to the HDB, for any of the flat categories they are interested in (and if so, how much). Rationalizing these preferences over the entire set of applicants results in the twin outcomes of affordable homes for the less choosy and price competition (as presently exists) for flat categories which are in high demand.

Under this system, and under the above assumptions, it is highly likely that many applicants are allocated flats in categories they find desirable without paying any premiums even if they specify that they would be willing to do so. (In this system, the willingness to pay a premium acts as a signal of preference.) This system, like other VCG mechanisms has the characteristic that it incentivizes applicants to reveal valuations truthfully because its pricing rules do not take advantage of this information to extract revenue, but rather use it to generate efficient outcomes. VCG mechanisms “poor” revenue properties make it unpopular for revenue generating auctions, but make it very suitable for allocating public housing where affordability is an important goal.

Subsequently, details of the system will be described in detail, including a discussion of general criticisms of VCG Processes and how they are dealt with in this particular system. This annex will necessarily be technical for the purpose of expert scrutiny.

The need for a system that is more than a random ballot

A VCG mechanism is fundamentally an auction. We have avoided using the term until now because of the negative connotations associated with auctions in Singapore. The Certificate of Entitlement (COE) auctions for the license for vehicles to be on the road are essentially disconnected single product type VCG auctions with no provision for substitution²⁵. The fact that demand far outstrips supply in the COE auctions results in high prices.

In this setting, a buffer stock/a reasonable ratio of supply to demand relieves demand pressure on the whole, leaving high demand only for highly desirable flat categories. The ability of the VCG process to “automatically substitute between flat categories” and “look for a better deal” improves outcomes for flat applicants relative to the outcomes in the COE auctions.

Still, one may question the need for an application system that is essentially an auction. The SDP believes that, on the whole, prices of HDB flats should be pegged to income levels to ensure affordability. However, we also recognize that HDB flats are not all the same and

²⁵ The possibility of substitution to products for which one is “able to get a better deal” (more consumer surplus) means that substitution helps reduce prices. This may be interpreted as supply-side competition.

locations are not all equal. A flat generates value for its owner by virtue of its size and other characteristics such as location and elevation. Furthermore, the value generated by a flat can be highly particular to its owner due to factors like proximity to friends and family. Therefore, if there is high competition for a particular flat category due to large numbers of applicants preferring that flat category over the others, it is only fair that those applicants compete, and their ability to pay is the simplest and fairest criterion to use. The premium over a baseline price for the flat category (set based on the guide prices) will not be returned in resale, and this characteristic puts a brake on irrational exuberance. With a buffer stock, applicants who are less able to pay are not excluded and will, in fact, be able to get flats at the baseline price.

The SDP believes that real supply and demand signals are the best basis for pricing value derived from a flat. Baseline prices will be the same for all flats of the same size, so factors other than size (e.g.: location and elevation) will be priced by supply and demand.

In this setting, “supply-side competition” due to the buffer stock keeps prices low. In particular, the price of an allocated flat would be the lowest price that the relevant applicant could have stated as his valuation (baseline price plus maximum premium) and still have been allocated the flat. (A close, but unfortunate, analogy is the flood of foreign professionals, with entry-level skills and qualifications, into the Singapore labour market, depressing wages.)

A true free market for pricing and allocation is superior to allocation by random ballot and fiat prices that are based on “scouting around the neighbourhood”. Current valuation methods lead to positive coupling of the prices of new flats and the prices of resale flats. That is to say, when the prices of resale flats rise, the prices of new flats rise; and when the prices of new flats rise, the prices of resale flats rise. This leads to a multiplier effect that makes the “scouting around the neighbourhood” approach unreliable.

The SDP is cognizant that prices can be manipulated by controlling supply, thus we reiterate that such a system will only be used when supply does not outstrip demand by too much. One way for this to be done is by restricting the set of participating applicants by ballot.

The behaviour of a system is best described by its outcomes in the circumstances in which it will operate. In the simple case where there is only one flat category and 100 flats on offer, the price of allocated flats turns out to be the 101-st highest valuation stated, or the baseline price in the event that there are 100 or fewer applicants. It should be noted that these are free market prices. While the details become slightly more complicated with multiple flat categories and applicant groups, the qualitative aspects remain largely the same if not more attractive for flat applicants due to demand substitution. In the next section, a close analogy to the VCG process is given, which will underscore how it is a reasonable method to use for allocating and pricing HDB flats.

A deal shopping analogy and a comparison with the Certificate of Entitlement (COE) bidding system

Consider the following scenario which is a close analogy to the VCG process. You are entering a market seeking good quality sausages for a small BBQ. You only need one pack. In this market are sold are many types of sausages such as bratwurst, curry sausage and cheese sausage. There are various brands, and the various products may contain slightly more or slightly fewer sausages.

You have some willingness to pay for each different product because each is different. What you are looking for is the “best deal” which means that after comparing your willingness to pay (a measure of benefit) with the price you have to pay over the various products, the “best deal” gives the biggest excess benefit over cost is the best deal. To determine the cost you would pay, you shop around.

It happens that all the other prospective buyers are already there. Once everybody makes their pick, subject to availability, everyone buys. However, this market is run by independent vendors who will sell at the sticker price if there is enough stock but will allocate by price if there is not enough stock.

The VCG mechanism is designed precisely to help pick the good that gets you the best deal. But before describing how, let us digress to talk about bidding for COEs. In that auction, each allocated bidder can be considered to have deprived the first among unallocated bidders of a COE. One can imagine any of the winning bidders entering the auction in a state where that first among unallocated bidders was originally the last among allocated bidders and engaging in a bidding war with that bidder. For clarity, denote the bidder who, in the end is the last among allocated bidders, bidder U, and the “entering” winning bidder, bidder A. Bidders U and A each have a maximum willingness to pay which LTA calls their “reserve prices”. Bidder A and U bid up the price of a COE up to a point when it just exceeds bidder U’s “reserve price”. At this point, bidder U concedes and the prevailing price is now the reserve price of bidder U.

A market where only one product was available would be identical with the COE bidding situation. However, this market has a large number of products and you can shop around. Imagine going to each of the many stores to enquire about prices. If there is enough stock, the price is the sticker price. If there is not enough stock, you engage in a similar bidding competition with the last customer who would get an item. The distinction is that, when the price gets high enough, that other customer would conclude that he/she might get a better deal elsewhere and give up the item to you. Because of this, prices are not forced all the way up to the “reserve price” of the customer who would walk away if you decide to buy that product. After shopping around and determining the prices you’d have to pay, you make your choice based on the best deal you might find. It is this “shopping around” element behind the VCG process which makes it very different from COE auction.

On a similar note, acquiring a COE is like buying a product from a monopoly firm. The aforementioned differentiated market for sausages entails supply side competition. The ability to substitute keeps prices reasonable. A further restriction on the number of people entering the sausage market keeps things affordable too. Thus, in a housing market where demand exceeds supply, one can ensure a modest demand excess by balloting for participation.

Pre-emptively responding to criticisms

It would be useful to respond pre-emptively to general criticisms of VCG-based mechanisms that are well known. A comprehensive list of criticisms of the VCG Process was published by Michael H. Rothkopf in a 2007 article titled *Thirteen Reasons Why the Vickrey-Clarke-Groves Process Is Not Practical* in the prestigious journal *Operations Research* (Volume 55, Issue 2, pp. 191–197). Our responses to them will be framed, and rightly so, in the specific context of allocating and pricing public housing, and it will be argued that weaknesses of VCG-based mechanisms (in particular, lower revenues) turn out to either be unimportant or

even strengths in the public housing setting.

1. **Revenue Deficiency and “Weak Equilibria”.** This issue essentially boils down to possible reductions in revenue due to the surrender of the "surplus of trade" to applicants as consumer surplus, and the unwillingness of applicants to state preferences for flats which have a low chance of making an (if the work of stating these is costly). However, this turns out to be a strength as affordability is one of the main objectives of a public housing system. Also, as a point of clarification, stating preferences is not too costly at all in our setting, but the amount of effort required can be further reduced by supporting applicants with a suitable language for expressing their preferences (e.g.: Expressions like “each additional floor in elevation is worth \$x more to me” can be expressed graphically and inquitively.).
2. **“Bid Preparation and Bid Communication Costs”.** This criticism does not apply in our setting, as it arises in tenders for complex projects. In such tenders, potential suppliers would not be willing to enter a procurement auction if there is considerable work to be done in preparing their bids and they do not think they have a good chance of winning.
3. **Winner Determination Effort.** Often, the winner determination problem in VCG processes will be NP-hard (or, in layman's terms, will require a very high amount of computational effort that may entail long solution times even on present day computers). However, this problem is solved in our setting, and a proof will be given.
4. **Budget Constraints.** The crux of this matter is that someone may value a flat in some category at some high amount, but would not be able to get a loan if he indeed was charged that price, which belies the claim of efficiency. However, in the public housing setting where baseline prices are around cost, loans are obtainable, thus the issue of budget constraints binding becomes irrelevant. It might be an issue for properties costing over a million dollars. But this is hardly the case here
5. **Information Revelation.** This criticism also does not apply in our setting, arising instead in procurement auctions. Firms in a procurement auction are typically unwilling to reveal their costs to their clients as this information may be used against them in subsequent transactions. Government commitment to setting baseline prices for public housing on a cost recovery basis should provide assurance that it is alright to reveal true individual valuations.
6. **Cheating on the Part of the Bid-taker and Bidders.** Various kinds of cheating are possible in the auction setting: (i) false bids by the bid taker, (ii) conspiracies by competing bidders, (iii) conspiracies in two-sided markets between bidders offering to sell and those offering to buy, and (iv) the use of false-name bids by single bidders. However, (i) is not applicable as government cheating would be too scandalous and there are certainly easier ways to obtain higher revenue like restricting supply, (ii) if applicants for flats were able to “conspire to reduce prices” the revenue consequences would be acceptable and the lessons learnt from such grassroots coordination would be useful, resale regulations would obviate this concern of (iii), and (iv) is based on a highly contrived example in an auction for bundles of items without proper baseline prices and it does not apply to the public housing setting.

7. **Sequences of Auctions.** Sequences of “truthful auctions” may not be “truthful” even if individual ones are. The effect of this is that applicants may state lower valuations if they assess that there might be lower competition in a later application round. This criticism is valid, but its negative effects are negligible as raising revenue from the sale of public housing is not a major concern. To make an academic point, loosely speaking, we might look at value as including a component measuring the value of getting a flat earlier. However, it is not clear that looking at the sequence of runs of the allocation mechanism with this in mind produces an overall truthful outcome.

We emphasize that the criticisms of the article are valid in general revenue seeking settings (especially in combinatorial auctions). However, we have argued that the VCG process and in particular our application of it is uniquely suited to the allocation and pricing of public housing.

The application process

As previously mentioned, the allocation system allows applicants to select as many categories of flats that they are interested in and also requires that they indicate if they are willing to pay a premium, that will not be returned in resale to the HDB, for any of the flat categories they are interested in (and if so, how much). Using established optimization tools and the VCG process, it will perform the combined allocation and pricing of flats. The resulting allocation will be economically efficient allocation with truly demand-based (non-fiat) market prices. As previously mentioned, however, that to ensure low prices that are not inflated by excess demand, this system is most effective with a buffer stock of available flats. With a buffer stock in place, the system achieves the twin outcomes of affordable housing for many (without the need for a premium), with efficient market allocation for the flat categories where pricing at cost would produce a random lottery.

Applicants using the system will be faced with a menu of available flat categories such as

“4 room flat; Punggol Opal; Punggol Central; Blocks 256A to 256D; Floors 14 to 16.”

Typically, applicants will be amenable to one or more flat categories based on their personal needs and they will be able to indicate interest in more than one, thus providing the HDB with more information to perform allocation. For each category, the HDB will provide the number of flats available and a baseline price (based on the planning norm of 20 percent gross monthly salary paid monthly over 9 to 15 years). Applicants will indicate the maximum price they are willing to pay for each category they are interested in (their valuation) and the system will generate an economically efficient allocation of flats, on the assumption that the information provided by applicants on their willingness to pay is truthful. (Later, it will be shown that each applicant is better off providing truthful information, regardless of whether others do.) If allocated a flat, an applicant will pay no more than the corresponding figure he declared in his application.

To facilitate the application process, an “expressive language for preferences” will be used. For instance, instead of stating valuations for each set for flat categories in the same development of the same size, applicants may simply check off the floors they are interested in and use a graphical tool to shape how their valuations vary with elevation (a “linear function” for instance).

During the application process, applicants will be able to monitor the applications for each flat category: the number of applications, the number of allocations, the distribution of bids

and the prevailing prices. This information will be updated regularly (a few times a day).

The application process will go on for about two weeks (beginning mid-week, for practical reasons). Over the two weeks, applicants will be able to freely revise the categories they are interested in as well as the amounts they indicate they are willing to pay. This may be termed a “learning phase” where applicants learn about their own preferences. The rationale for this is that it is the practical reality that people may not have full clarity, upfront, on the real value of a flat to them until they see actual prices and demand. This provides a reasonable length of time for effective learning to take place. The last two days of the two weeks will be a blackout period, where applicants will be able to revise their application but will receive no information on allocations and prices. This ameliorates the problem of “auction sniping” (although the benefits of such a practice are largely eliminated by the “truthfulness” characteristic of the mechanism) and reduces load on the IT system towards the end of the period for application revision.

In the next two sections, the theory underlying the mechanism will be described. These sections will be highly technical to allow for rigorous scrutiny.

The theory

The objective of the VCG-mechanism is to generate an efficient allocation. In economic terms, it means that society as a whole is most well off in terms of the sum of value individuals get out of their allocations. To do this given accurate information one may solve an optimization problem maximizing the value of an allocation subject to the various constraints. However the difficulty is getting that accurate information.

The fact is, people are not truthful when providing incorrect information furthers their interests. The easiest case in point is the “first-price auction”, where the top bidder takes the item and pays his bid. There is no incentive for the top bidder to bid his true value as that reduces his economic surplus, the difference between his valuation for the good and the price he pays, to zero. Instead, he will bid just above the second highest bidder or make an estimate of the bid of the second highest bidder and bid in that neighbourhood. The consequences of non-truthfulness can be severe, such as the observed instability in sponsored search auctions that occurred due to the dynamics of non-truthful bidding. Suffice to say, without accurate information one cannot make an efficient allocation. The simplest “truthful” auction is the “second-price auction”, a variant of the VCG mechanism, the top bidder gets the item and pays the second highest bid. It takes a simple mental exercise to verify that there is no incentive to pretend to value the item more (and risk negative surplus) or to value the item less (and risk no surplus). However, the problem facing the auctioneer in the second-price auction is that he is sacrificing revenue to get truthfulness. While this is a problem in the profit-maximizing sector, it is a strength where the objective is to make housing affordable (and to also recover costs).

We will first touch on the allocation problem and then later on how truthful information can be elicited from each applicant regardless of whether or not other applicants are truthful. As mentioned, the objective is to maximize allocative efficiency as quantified by the total value of the allocation (unallocated flats are valued at their baseline price). This is the associated optimization problem:

$$\begin{aligned}
& \max_x \quad \sum_{i \in A} \sum_{j \in C} v_{i,j} x_{i,j} \\
& \text{s.t.} \quad \sum_{j \in C} x_{i,j} \leq 1 \quad \forall i \in A \setminus \{HDB\} \quad (\text{at most 1 flat per applicant}) \\
& \quad \sum_{i \in A} x_{i,j} \leq n_j \quad \forall j \in C \quad (\text{flat availability by category}) \\
& \quad \sum_{i \in A_g} x_{i,j} \leq q_{g,j} \quad \forall g \in G, \forall j \in C \quad (\text{group-based quotas}) \\
& \quad x_{i,j} \geq 0 \text{ (integer)} \quad \forall i \in A, \forall j \in C \quad (\text{integer allocations})
\end{aligned}$$

In the optimization problem above, A denotes the set of applicants (including the HDB), C denotes the set of flat categories, G denotes the set of applicant groups for which quotas exist, A_g is the set of applicants in group g (the HDB does not belong to any, obviously, and each applicant can belong to at most one group), $v_{i,j}$ is the valuation/bid of applicant i for a flat in category j (the HDB's valuations are the baseline prices), and $x_{i,j}$ is the number of flats in category j allocated to applicant i . Naturally, if an applicant does to state a preference for a flat category, that associated valuation will be zero.

In the (generalized) VCG mechanism, of which the second price auction is a special case, the pricing rule is what is used to incentivize truthful responses. Let z denote the value of the optimal solution to the above problem and let z_{-i} be the value of the optimal solution if applicant i were removed. It holds that $z \geq z_{-i}$ since in the latter case there are fewer allocations to choose from. They are equal when (but not only when) i is not allocated anything. For notational convenience, let $y_i := \sum_{j \in C} v_{i,j} x_{i,j}$, the (claimed) value of the allocation to applicant i . Also, let $\bar{y}_i := \sum_{j \in C} \bar{v}_{i,j} x_{i,j}$, the actual value of the allocation to applicant i (where the $\bar{v}_{i,j}$'s denote the true valuations). In this mechanism, the price paid by applicant i for his allocation is $p_i := y_i - (z - z_{-i})$. One can easily verify that this is independent of the stated valuations of i , so i cannot affect his payment p_i .

It is easy to see that an unallocated applicant pays nothing because the value of the allocation to him is zero and $z - z_{-i}$ is also zero. Also, all applicants pay at most their bid (usually less, especially when there is sufficient supply), this follows because $z - z_{-i}$ is non-negative. These properties assure one that the mechanism is reasonable. Let us now talk about how the mechanism makes truthfulness the best policy for an applicant whether or not others are truthful.

What applicant i seeks to maximize is his consumer surplus $\bar{y}_i - p_i := (\bar{y}_i - y_i) + (z - z_{-i})$. First, note that under truthfulness, the first two terms cancel and his stated valuations only affect z , which is the optimal value of the allocation under truthful valuations. We will now discuss the various scenarios where he may be untruthful. That is, if he states a different valuation in one or more flat categories. Consider two cases: (i) if the allocation does not change, the y_i and z terms would both increase by the same amount and there is no benefit to be had; (ii) if the allocation changes, the value of that new allocation (without misrepresentation) would have originally been less than or equal to z , so by applying the same argument as in (i), it is clear that misrepresentation does not change the surplus

associated with the new allocation, so there is no benefit to be had and possibly loss. This means that his best course of action for all applicants is to bid truthfully regardless of what other applicants do.

Thus, we may say that the mechanism “maximizes consumer surplus subject to maximizing efficiency”. From a different perspective, it might be said that this mechanism is tilted in favour of applicants due to the payment rule and but just due to the pursuit of allocative efficiency. Having dealt with the economic aspects, we will proceed to touch on the computational aspects, vital to enabling a responsive applicant experience.

Computational practicality

The scientists and engineers among us, especially those with a background in optimization theory, may question whether the above allocation and pricing can be efficiently computed. This is because the allocation problem falls into the category of large combinatorial optimization problems, and these are notorious for requiring sizable computational resources and a long time to solve. We will appeal to the theory of integer optimization to explain why the underlying optimization problems of the allocation system are computationally tractable. In brief, it can be shown that the coefficient matrix associated with the aforementioned optimization problem is “totally unimodular”, meaning it can be solved as a linear optimization problem for which efficient algorithms are available. The structure of the coefficient matrix is

$$\begin{bmatrix} I & I & \dots & I \\ M & 0 & \dots & 0 \\ 0 & M & \ddots & \vdots \\ \vdots & \ddots & \ddots & 0 \\ 0 & \dots & 0 & M \end{bmatrix}$$

where I is the identity matrix and M is a matrix of ones and zeros with at most a single one in each column.

A characterization of total unimodularity due to Ghouila and Hour²⁶ can be used to verify that the matrix is totally unimodular. In particular, by assigning a weight of 1 to all rows associated with the identity matrix and assigning a weight of -1 to the other rows, a weighted sum of any sub-set of the rows of the coefficient matrix will result in vector that has only 1's, 0's or -1's. (It is thus important that each applicant falls into at most one group.) This means that the optimization problem for allocation (and pricing) can be solved efficiently.

On the matter of pricing, while the solution of the allocation problem has to be done first, the sub-problems for pricing (solving the allocation problem omitting a single applicant each time) may be solved in parallel as they have no interdependency. Furthermore, the number of pricing sub-problems may be reduced to at most the number of applicant groups times the number of flat categories as the price charged for a flat in a given category is the same for applicants in the same applicant group.

²⁶ See, for instance, Theorem 19.3 on page 269 in *Theory of Linear and Integer Programming* by Alexander Schrijver (Wiley, 2000).