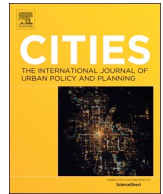




Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



Guest editorial/editorial

Introduction to SI: Homeownership and housing divide in China

The 2008 global financial and housing crisis has brought housing to the forefront of social and economic debates. Meanwhile, rising social inequality in the neoliberal era has caused escalating discontents from the public, which was epitomized by the global spread of the “Occupy” movement. With the rate of homeownership in the U.S. dropping to the lowest point since 1965 (63% in 2017) (US Census Bureau, 2018), the emergence of ‘generation rent’ (Richard, 2018) and the deteriorating housing prospects for low-income people in both developing and developed countries (Jacobs & Pawson, 2015), homeownership and housing inequality, a long-held central concern of social studies, has re-energized scholars and policy makers who are determined to understand “the housing question” in the new era. The ongoing Covid-19 pandemic further exacerbates the deep-seated housing inequalities and translates it into health disparities, in which renters and people enduring overcrowded housing conditions are hit hard. It is in this global context that this special issue focuses on homeownership and housing inequality in China, where profound social, economic and spatial transformations are taking place at unprecedented scales and speeds.

For decades, China was known for its socialist welfare-oriented housing system under which public rental housing was allocated among urban residents (In the countryside, there is a different housing system, where villagers built their own housing on collectively owned land). While China started to experiment with market economy in 1978, housing reform did not start until ten years later in 1988; yet real changes did not happen until after 1998 when the government announced the end of welfare housing provision (State Council, 1998). With privatization of existing public housing and massive provision of private housing mainly in the ownership sector, China has transformed itself from a country dominated by public renters to one of the countries with the highest rate of homeownership within a very short span of just two decades. Today China is a country of homeowners with more than 90% of households owning homes (87% in urban and 96% in rural China) (Clark, Huang, & Yi, 2019). At the same time, more than 20% Chinese households own multiple homes, higher than many developed nations (Huang et al., 2020). This achievement is particularly impressive and is in sharp contrast to the recent decline of homeownership rate in the U.S., Western Europe and other developed countries.

Meanwhile, China has experienced an unprecedented housing boom in recent decades. In the first decade of the 21st century, the number of housing units built in China was roughly twice the total stock of housing units currently in Spain or the UK, or about the same as Japan's current total stock (Economist Intelligence Unit, 2011). Judging from the rising average housing area, Chinese households enjoy much better and larger housing than before. Per capita residential floor space in Chinese cities increased from 4 m² in 1980s to 22 m² in 2000 and 40 m² in 2018 (NBS, 2018; Yi & Huang, 2014). While it is still far below the

level in the US, it is on par with many developed countries such as Japan and European countries. For the emerging middle class in China, it is fair to say that they have achieved the “Chinese Dream” of decent housing and homeownership. Yet, it remains largely unclear how China achieves such a high rate of homeownership apart from the privatization of public housing, in which ways the desire and pursue for homeownership contribute to the booming housing market, and what are their social and economic implications.

However, “a decent home for all” remains a distant reality in China, owing to the multi-dimensional inequalities behind the overall high rate of homeownership (Huang & Li, 2014; Wang & Murie, 2000). Millions of urban poor, young adults, and rural-urban migrants continue to be denied basic housing, and homeownership remains an unachievable dream. Many have to live in boxy rooms in crumble shacks, low-rises in dusty suburban villages, and tiny dark dorms in bomb shelters and basements under glossy apartment buildings (He et al., 2017; Huang & Yi, 2015; Ma & Xiang, 1998; Wang et al., 2010; Wu, 2002). Reminiscence of worker insects in a colony and mice in underground cellars, they are called “ant tribe” (*yizu*) and “mouse tribe” (*shuzu*), respectively. In particular, younger generations, who grow up in the reform era and do not have access to housing subsidies, face tremendous challenges to attain decent housing and achieve homeownership especially in large cities where housing has become prohibitively unaffordable. Intergenerational transfer has become indispensable for the lucky few young adults to achieve homeownership (Li & Yi, 2007a). Furthermore, with the persistence of the hukou (household registration) System, millions of migrants continue to be denied access to subsidized housing in most cities. Thus despite massive development of affordable housing by the government in recent years, migrants still have to resort to informal housing at marginalized locations, forming slum like settlements (Huang & Yi, 2015). Many cities even require local household registration for households to purchase housing or set strict housing purchase limit for migrants, which prevents better-off migrants to become homeowners (Jia et al., 2018). A great many of them thus have to gamble all their savings on extra-legal housing built on the collective land, known as small property right housing (He et al., 2019). For these disadvantaged groups, homeownership and even a decent rental home are beyond their reach. Meanwhile, the new *nouveaux riches*, who are typically multiple-homeowners, live in exclusive gated villa communities that are on a par with upscale gated communities in the West (Giroir, 2006; He, 2013; Huang, 2005; Pow, 2009; Wu, 2005). The rural-urban, intergenerational, and cross-region housing divide in China, alongside the social and economic divide, is becoming increasingly complex and alarmingly polarized (Huang & Jiang, 2009; Huang & Li, 2014; Logan et al., 1999; Sato, 2006), which challenges our perception and understanding of

<https://doi.org/10.1016/j.cities.2020.102967>

homeownership, housing inequality and its impacts beyond Chinese cities.

This special issue aims to better understand China's unprecedented achievement of a homeownership society and its impacts on the Chinese society, particularly homeowners' subjective wellbeing/happiness, as well as the growing housing divide and multi-dimensional inequalities. This special issue is of theoretical and empirical significance for three reasons. First, China's socialist history and recent transition towards a market economy create a unique context to study socioeconomic inequality and mobility in general, and homeownership and housing divide in particular. With rapid urbanization and massive migration, uneven regional development, and discriminative institutions such as the hukou system, housing divide and social inequality in China is multidimensional and complex. In addition to better understanding Chinese society, research on China potentially can shed important lights on recent housing problems in the West such as rising housing inequalities both within and between generations, and between different social groups, multiple homeownership and the social-cultural meaning of housing, as well as the lack of affordable housing and difficulty in achieving homeownership especially among young adults and (im)migrants (e.g. Clark, 2019; Forrest & Hirayama, 2015; Forrest & Yip, 2012; McKee, 2012; Richard, 2018). Thus this special issue can make significant theoretical contributions on housing and social inequalities, intergenerational transfer and inequality, social mobility, and the socioeconomic implication of housing and homeownership. In particular, China's achievement of a homeowner society in contrast to the decline of homeownership in other countries has important policy implications.

Secondly, this special issue offers an up-to-date study of homeownership in China at the national level, using a unique large scale national survey data. Despite rapid increase in homeownership in China, we know relatively little about this process. The relatively recentness of this change (in the last two decades) and the lack of good national level micro-data with detailed housing information are main reasons. There is a small but growing body of literature on housing in China. But existing studies on homeownership in China (e.g. Huang, 2004; Huang & Clark, 2002; Huang & Yi, 2010, 2011; Li, 2000; Li & Li, 2006; Li & Yi, 2007a, 2007b; Zhang, 2010) tend to use small scale surveys and conduct case studies of specific cities. Papers in this special issue all utilize the large scale national survey data conducted by China Household Finance Survey and Research Center at Southwestern University of Finance and Economics in 2011, 2013, 2015, and 2017. This unique survey collects rich housing, income, wealth and assets information in addition to conventional socioeconomic indicators. In particular, this survey collects housing information of not only the primary residence but also additional homes (up to six houses/apartments in total) the sampled households have, the latter of which is often missing in most surveys. Thus these surveys provide an unprecedented, valuable opportunity for scholars to study housing and homeownership, and socioeconomic wellbeing, inequality and mobility.

Finally, this proposed issue is truly multidisciplinary, contributed by both established researchers and emerging scholars from geography, urban planning, sociology, public policy, family studies, business, management and economics. Each paper is collaborative in nature. These papers offer a transdisciplinary understanding of homeownership in China that links to a number of compelling questions such as urbanization and rural-urban migration, urban inequality and social mobility. Most papers included in this special issue were initially presented at "A Decent Home for All: International Symposium on Housing in China" hosted in Chengdu in 2018, organized by guest editors. After several rounds of revisions and improvements, we are happy to see the special issue project that covers two board themes—homeownership and happiness, as well as housing inequality and divide, eventually comes to fruition, which hopefully will inspire studies on homeownership and housing inequalities in China and beyond.

1. Homeownership and happiness

The first group of papers addresses homeownership and its implications for subjective wellbeing and happiness (Cheng et al., Huang et al., Li and Fan, Zeng et al., Zheng et al., all in this issue). China is now a country of homeowners with one of the highest rates of homeownership (> 80% of all urban households) and multiple/second home ownership (> 20%) in the world. It is especially impressive that China has achieved this high rate within a short period of just three decades. There has been a decent body of literature devoted to understand homeownership in China (e.g. Huang, 2004; Huang & Clark, 2002; Huang & Yi, 2010, 2011; Li, 2000; Li & Li, 2006; Li & Yi, 2007a, 2007b; Zhang, 2010). Housing reform in China has been anchored on privatization of previously public rental housing through subsidized sales, commodification of the housing sector with massive provision of private housing, and promotion of homeownership, which have contributed to the rapid increase in homeownership in China (Huang & Li, 2014).

In addition to changes in the housing sector, profound changes in other economic and social arenas may have also contributed to the rise of homeownership. For example, in recent decades, China has experienced tremendous export growth, becoming the "factory of the world". The paper by Zeng et al. in this issue examines whether and how export expansion at the county level affect homeownership. They consider export expansion as an external shock to household behavior, and find it has a negative impact on homeownership and a positive effect on housing space per capita. Income inequality, the influx of migrants, and housing affordability are possible channels through which export expansion affects homeownership. In addition, these impacts are more significant among households with lower income, younger ages, employed status, and local *hukou*.

While we have a good understanding of homeownership in general, we are less clear about the driving forces, processes and outcomes of multiple home ownership in China. Resembling their counterparts in developed economies, the emerging middle class with higher household income and social status are purchasing additional homes to facilitate their recreation/leisure consumption, to gain privileged access to education and health services, to meet their needs of rising mobility and desire for better and larger housing, as well as to invest and accumulate wealth. In addition to these financial/material reasons, Huang, Yi and Clark (in this issue) argue that institutional and cultural forces are also important in explaining the unprecedentedly high rate of multiple home ownership in China. Institutionally, they argue that several housing programs and practices have encouraged multiple home ownership, which include heavy housing subsidies in the reform era (through both subsidized sale of housing and Housing Provident Fund, a mandatory housing saving account with employer matching and low interest mortgage), large scale housing demolition and resettlement and significantly improved compensations to displaced households, housing purchase regulations that favor households with urban registration, and the uneven distribution of superior educational resources and access policy that requires homeownership in the catchment zones. Culturally, the persistent patrilocal marriage tradition, and homeownership as a status symbol and citizenship to access superior public services have influenced many households with sons to purchase additional homes. The empirical analyses using 2015 CHFS provide strong evidences for the institutional and cultural perspective and demonstrate how various housing policies and culture in China have unintentionally contributed to multiple home ownership.

Li and Fan also focus on second/multiple homes, and attest to the importance of institutional constraints. They aim to understand the distribution and usage of second homes in China. According to their research, second homes are more common in large cities and in heavily urbanized areas, and they tend to be in relative proximity to primary homes. Unlike mature housing markets in Western countries where second homes are used primarily for leisure and income-generation,

second/multiple home in China are mostly vacant, followed by being rented out and occupied by relatives, with only small percentages used for weekday commuting and leisure. While there are differences between private and policy-related second homes, they argue that second homes' usage is influenced by the household's life cycle and institutional constraints more so than leisure pursuit. These two papers on second/multiple homes show that while China may have a similar phenomenon of second home ownership as in the West, its underlying dynamics are more complex and can be rather different, owing to the distinctive institutional settings, as well as social-cultural norms and values.

What does the high rate of homeownership mean to Chinese, especially their subjective wellbeing? Are homeowners happier? The paper by Zheng et al. attempts to answer this specific question, and not surprisingly it shows that homeownership has a positive impact on subjective well-being. Moreover, the results are robust to different specifications and unaffected by the financial constraints faced by new homeowners. This finding has implications for the policymaker to stimulate homeownership rate to promote subjective well-being.

Homeownership is also the most important means to accumulate wealth, especially in China where investment options are limited and the stock market has been extremely volatile and has had a poor performance (Carpenter et al., 2015; Zhang et al., 2011). Just like homeownership, housing wealth affect happiness, as the paper by Cheng et al. shows. They find that happiness increases with housing wealth, but with diminishing returns to owning a second and third house. Higher happiness is also more concentrated among people with larger housing wealth. In addition, housing wealth inequality affects happiness with more complexities. An increase in housing wealth inequality among individuals of similar backgrounds sends out a signal that people could also accumulate housing wealth and thus makes people happier up to a threshold. However, once housing wealth inequality passes that threshold, it lowers happiness, which is consistent with a jealousy or status effect. This research demonstrates the need to curtail extreme housing wealth inequality to promote subjective wellbeing.

2. Housing inequality and divide

The second group of papers in this issue examines various dimensions of housing inequality and divide in China. Despite decades of relative equality in the socialist era, China is becoming one of the countries with the highest social inequality. Housing inequality is the most visible and salient component of social inequality. In addition to spatial and social inequalities, housing inequality in China is also of deep institutional roots due to persisting socialist institutions and discriminatory housing policies and programs.

The paper by Wei et al. assesses the patterns of housing inequalities in both homeownership and housing area at a national level, and examines the mechanism for such patterns. It reveals considerable housing inequality between groups with different socio-economic and hukou statuses and identifies both individual- and city-level factors driving such patterns. For example, people with rural and migrant status are disadvantaged in both housing area and homeownership. Their paper also reveals that with the deepening of reforms, institutional factors inherited from the socialist era and burgeoning market mechanisms intertwined to intensify housing differentiation in transitional urban China.

The paper by Wang et al. focuses on one of the key dimensions of housing inequality: urban-rural inequality. Their research finds not only significant urban-rural housing wealth inequality, but also a higher housing wealth inequality in rural China than in urban China. They believe that the relatively higher marketization of housing in urban China helps urban households accelerate their wealth accumulation through higher capital gains, thus widen the household wealth gap between urban and rural areas.

Huang, He, Tang and Li focus on one particular vulnerable group: involuntarily relocated residents in Chinese cities. Due to urban

renewal and expansion, there has been a massive forced relocation and resettlement in Chinese cities. While forced relocation is conventionally associated with poor housing conditions and residential dissatisfaction, this research reveals the multifaceted nature of forced relocation and provides a more nuanced understanding of this process. They argue that forced relocation does not necessarily have a negative effect on residents' housing conditions and residential satisfaction, and it depends on residents' bargaining power for compensation and their housing strategies after relocation. The impact of forced relocation also varies over time and should be understood as a dynamic process with a time sequence. The results also indicate that housing conditions are important pathways through which compensation can have positive effects on residential satisfaction.

Hu et al. focus on another vulnerable group—the elderly—and study the role of housing wealth on their consumption behaviors. Using multiple years of CHFS, this paper reveals a large urban-rural and regional gap in housing consumption, housing wealth as well as in financial wealth, social security and non-housing consumption in China. They also find housing wealth exerts limited effects on the urban elderly households' consumption behaviors but has significant positive effects on the rural elderly households' consumption. In comparison, financial wealth and pension have significant impact on non-housing consumption, and may offset part of the consumption inequality generated from annual household income. In particular, an increasing pension contributes more to medical and health care consumption for the poor households, which demonstrates the need to enhance the social welfare system to take care of the most vulnerable elderly group.

Taken together, these nine papers present comprehensive, in-depth, up-to-date examinations of the dynamics, inequalities in and the effect of homeownership in China, and enable a better understanding of urban inequality and socioeconomic mobility in Chinese cities and beyond. Although this special issue focuses on China, it certainly contributes to the wider literature and appeals to international readership from at least two aspects. Departing from a recent history of massive privatization of public housing, the relatively high homeownership rate and the exacerbated housing inequality in China are highly relevant to a large number of post-socialist countries that share a similar trajectory of shifting housing tenure structure. The classic market transition debate (Bian & Logan, 1996; Nee, 1989; Szelenyi and Kostello, 1996) remains a useful conceptual prism to scrutinize the changing dynamics of housing inequality and differentiation in transitional economies in various contexts. Papers included in this special issue enrich this debate. In addition, addressing the pressing issue of housing inequality, especially the housing choices of the disadvantaged groups, e.g. migrants, dislocated residents and the elderly, this special issue connects the unequal housing outcomes with broader issues of urban livelihood, subjective wellbeing, residential satisfaction, and the welfare system, with which international readers will certainly find resonance.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

- Bian, Y., & Logan, J. R. (1996). Market transition and the persistence of power: The changing stratification system in urban China. *American Sociological Review*, 61(5), 739–758.
- Carpenter, J. N., Lu, F., & Whitelaw, R. F. (2015). *The real value of China's stock market* (no. w20957). National Bureau of Economic Research.
- Clark, W. A. (2019). Millennials in the housing market: The transition to ownership in challenging contexts. *Housing, Theory and Society*, 36(2), 206–227.
- Clark, W. A., Huang, Y., & Yi, D. (2019). Can millennials access homeownership in urban China? *Journal of Housing and the Built Environment*, 1–19.
- Economist Intelligence Unit, E (2011). *Building Rome in a day: The sustainability of China's housing boom*.

- Forrest, R., & Hirayama, Y. (2015). The financialization of the social project: Embedded liberalism, neoliberalism and homeownership. *Urban Studies*, 52(2), 233–244.
- Forrest, R., & Yip, N. M. (Eds.). (2012). *Young people and housing: Transitions, trajectories and generational fractures*. Routledge.
- Giroir, G. (2006). The Fontainebleau villas (Shanghai), as globalized golden ghetto in a Chinese garden. In F. Wu (Ed.). *Globalization and the Chinese city*. London/New York: Routledge Curzon.
- He, S. (2013). Evolving enclave urbanism in China and its socio-spatial implications: The case of Guangzhou. *Social & Cultural Geography*, 14(3), 243–275.
- He, S., Liu, L., Yang, G., & Wang, F. (2017). Housing differentiation and housing poverty in Chinese low-income urban neighborhoods under the confluence of State-market forces. *Urban Geography*, 38(5), 729–751.
- He, S., Wang, D., Webster, C., & Chau, K. W. (2019). Property rights with price tags? Pricing uncertainties in the production, transaction and consumption of China's small property right housing. *Land Use Policy*, 81, 424–433.
- Huang, Y. (2005). From work-unit compounds to gated communities: Housing inequality and residential segregation in transitional Beijing. In L. J. C. Ma, & F. Wu (Eds.). *Restructuring the Chinese city: Changing society, economy and space*. London and New York: Routledge.
- Huang, Y., & Clark, W. A. (2002). Housing tenure choice in transitional urban China: A multilevel analysis. *Urban Studies*, 39, 7–32.
- Huang, Y., & Jiang, L. (2009). Housing inequality in transitional Beijing. *International Journal of Urban and Regional Research*, 33, 936–956.
- Huang, Y., & Li, S. M. (Eds.). (2014). *Housing inequality in Chinese cities*. Routledge.
- Huang, Y., & Yi, C. (2010). Consumption and tenure choice of multiple homes in transitional urban China. *European Journal of Housing Policy*, 10, 105–131.
- Huang, Y., & Yi, C. (2011). Second home ownership in transitional urban China. *Housing Studies*, 26, 423–447.
- Huang, Y., & Yi, C. (2015). Invisible migrant enclaves in Chinese cities: Underground living in Beijing, China. *Urban Studies*, 52(15), 2948–2973.
- Huang, Y., Yi, D., & Clark, W. A. (2020). Multiple home ownership in Chinese cities: An institutional and cultural perspective. *Cities*, 97, 102518.
- Huang, Y. (2004). The road to homeownership: A longitudinal analysis of tenure transition in urban China (1949–1994). *International Journal of Urban and Regional Research*, 28(4), 774–795.
- Jacobs, K., & Pawson, H. (2015). Introduction to the special edition: “The politics of housing policy”. *Housing Studies*, 30(5), 651–655.
- Jia, S., Wang, Y., & Fan, G. Z. (2018). Home-purchase limits and housing prices: Evidence from China. *The Journal of Real Estate Finance and Economics*, 56(3), 386–409.
- Li, S.-M. (2000). The housing market and tenure decisions in Chinese cities: A multivariate analysis of the case of Guangzhou. *Housing Studies*, 15, 213–236.
- Li, S.-M., & Li, L. (2006). Life course and housing tenure change in urban China: A study of Guangzhou. *Housing Studies*, 21, 653–670.
- Li, S.-M., & Yi, Z. (2007a). Financing home purchase in China, with special reference to Guangzhou. *Housing Studies*, 22, 409–425.
- Li, S.-M., & Yi, Z. (2007b). The road to homeownership under market transition Beijing, 1980–2001. *Urban Affairs Review*, 42, 342–368.
- Logan, J. R., Bian, Y., & Bian, F. (1999). Housing inequality in urban China in the 1990s. *International Journal of Urban and Regional Research*, 23, 7–25.
- Ma, L. J., & Xiang, B. (1998). Native place, migration and the emergence of peasant enclaves in Beijing. *China Quarterly-London*, 546–581.
- McKee, K. (2012). Young people, homeownership and future welfare. *Housing Studies*, 27, 853–862.
- National Bureau of Statistics (2018). *Statistics yearbook*. Beijing: China Statistics Press.
- Nee, V. (1989). A theory of market transition: From redistribution to markets in state socialism. *American Sociological Review*, 54(5), 663–681.
- Pow, C.-P. (2009). *Gated communities in China: The politics of the good life*. London and New York: Routledge.
- Richard, R. (2018). ‘Generation Rent’ and intergenerational relations in the era of housing financialisation. *Critical Housing Analysis*, 5(2), 14.
- Sato, H. (2006). Housing inequality and housing poverty in urban China in the late 1990s. *China Economic Review*, 17, 37–50.
- State Council (1998). *Guowuyuan Guanyu Jingyibu Shenhua Chengzhen Zhufang Zhidu Gaige Jiakuai Zhufang Jianshe De Tongzhi (A Notification From the State Council on Further Deepening the Reform of Urban Housing System and Accelerating Housing Construction)*. (Beijing).
- Szelenyi, I., & Kostello, E. (1996). The market transition debate: Toward a synthesis? *American Journal of Sociology*, 101(4), 1082–1096.
- U.S. Census Bureau (2018). Homeownership remains below 2006 levels for all age groups. accessed at <https://www.census.gov/library/stories/2018/08/homeownership-by-age.html>.
- Wang, Y. P., & Murie, A. (2000). Social and spatial implications of housing reform in China. *International Journal of Urban and Regional Research*, 24, 397–417.
- Wang, Y. P., Wang, Y., & Wu, J. (2010). Housing migrant workers in rapidly urbanizing regions: A study of the Chinese model in Shenzhen. *Housing Studies*, 25, 83–100.
- Wu, F. (2005). Rediscovering the “gate” under market transition: From work-unit compounds to commodity housing enclaves. *Housing Studies*, 20, 235–254.
- Wu, W. (2002). Migrant housing in urban China choices and constraints. *Urban Affairs Review*, 38, 90–119.
- Yi, C., & Huang, Y. (2014). Housing consumption and housing inequality in Chinese cities during the first decade of the twenty-first century. *Housing Studies*, 29(2), 291–311.
- Zhang, C. S., Zhang, D. Y., & Breece, J. (2011). Financial crisis, monetary policy, and stock market volatility in China. *Annals of Economics and Finance*, 12(2), 371–388.
- Zhang, L. (2010). *In search of paradise: Middle-class living in a Chinese metropolis*. Ithaca, NY: Cornell University Press.

Youqin Huang^{a,*}, Shenjing He^b, Li Gan^{c,d,e}

^a Department of Geography and Planning, University at Albany, State University of New York, United States of America

^b Department of Urban Planning & Design, University of Hong Kong, Hong Kong, China

^c Department of Economics, Texas A&M University, United States of America

^d Research Institute of Economics and Management, Southwestern University of Finance and Economics (SWUFE), China

^e China Household Finance Survey (CHFS) and Research Center, SWUFE, China

E-mail addresses: yhuang@albany.edu (Y. Huang), sjhe@hku.hk (S. He), gan@chfs.cn (L. Gan).

* Corresponding author.