Electoral Formula and Fragmentation in Hong Kong

John M. Carey
Department of Government
Dartmouth College
Hanover, NH 03755

john.m.carey@dartmouth.edu
http://sites.dartmouth.edu/jcarey/

Abstract
The directly elected representatives to Hong Kong's Legislative Council are chosen by list proportional representation (PR) using the Hare Quota and Largest Remainders (HQLR) formula. This formula rewards political alliances of small-to-moderate size and discourages broader unions. Hong Kong's political leaders have responded to those incentives by fragmenting their electoral alliances rather than expanding them. The level of list fragmentation observed in Hong Kong is not inherent to PR elections. Alternative PR formulas would generate incentives to form broader, more encompassing alliances. Indeed, most countries that use PR employ such formulas, and the most commonly used PR formula would generate incentives opposite to HQLR's, rewarding broader electoral alliances rather than divisions.

DRAFT: June 9, 2016

Introduction
Hong Kong's political agenda has featured debates in recent years over how its top official, the chief executive, is elected (Langer 2007, Zhang 2010, Ip 2014, Young 2014). This paper reviews how the rules for electing Hong Kong's legislators have affected party system development and limited the effectiveness of the Legislative Council (LegCo). Building on existing scholarship on how votes are translated into LegCo representation, I examine how electoral rules shape the strategies pursued by Hong Kong party leaders. I also place Hong Kong elections in a broader comparative perspective, illustrating how LegCo electoral outcomes would differ under the proportional representation formula most commonly used in democracies around the world. And I show that even behavior that seems counterproductive, such as failing to form broad alliances, is a strategic response to Hong Kong's electoral rules rather than a symptom of political dysfunction.

Many observers have noted that Hong Kong elections are characterized by intense fragmentation of lists. Most notably Ma Ngoc and Choy Chi-keung, in a variety of investigations (discussed below), have emphasized that the formula for list proportional representation (PR) used in Hong Kong, known as Hare Quota with Largest Remainders (HQLR), encourages fragmentation. Rather than rewarding an electoral alliance for uniting as many votes as possible under one banner, HQLR punishes big winners and encourages political allies to divide. The effect of HQLR is to hinder the development of strong parties with encompassing platforms, limiting the LegCo's potential as a representative institution.

Most democracies that use list PR to elect their legislatures do not use HQLR, and the most commonly used PR formula rewards list size rather than punishing it. This paper demonstrates the extent to which an alternative PR formula would produce incentives to unite party lists, and contrasts these with the incentives to fragment present in Hong Kong. It also illustrates the opportunity costs Hong Kong politicians would confront, given the rules under which they compete, if they did *not* fragment their lists and instead pursued unified alliances.

The paper proceeds as follows. First, I compare the mechanics of the HQLR formula with the most commonly used PR formula worldwide, the D'Hondt divisors method. Next, I illustrate the phenomenon under consideration, the pattern of party and list fragmentation in LegCo elections under HQLR. Then I review the key institutional design decisions that produced the current electoral system, what prior scholarship has to say about the system, and what this paper adds. The next section introduces the idea of electoral efficiency and demonstrates that Hong Kong party leaders have responded to the incentives HQLR generates, but that the incentives under D'Hondt would be starkly different. The last section locates the case of Hong Kong in comparative perspective and considers the effects of electoral system design on democracy in the special administrative region.

PR Formulas
The two most common formulas for allocating seats in list PR systems are the HQLR and the D'Hondt methods. Despite their common purpose, the methods differ mechanically and in their effects on electoral outcomes.

HQLR: The basic principle here is to set a "retail price," in the currency of votes, at which seats in each electoral district may be "purchased" by lists. That price, or ***quota***, is determined by

dividing the total number of valid votes cast in a district by the DM.[1] After votes have been tallied, each list is awarded as many seats in the district as full quotas of votes it won. For each seat awarded in this manner, a quota of votes is subtracted from the list's district total. If not all seats in the district can be awarded on the basis of full quotas, any remaining seats are allocated, one per list, in descending order of the lists' remaining votes. These seats, therefore, are purchased for less than the retail price (or quota) for a seat. Lists that win seats on the basis of their remainders are, effectively, buying seats "wholesale," at reduced prices. Note that, under HQLR, it is virtually impossible for all seats in a district to be purchased at retail price, so the HQLR method almost guarantees that, within a given district, lists will pay different prices for seats they win.

D'Hondt: Under D'Hondt, all seats are awarded according to a uniform principle. Rather than set a price in votes for the purchase of seats, divisors methods use the tallies of votes across lists to establish a matrix of quotients pertaining to lists, then allocate seats in descending order of quotients until all the seats in a given district are awarded. A hypothetical example illustrates. Imagine a district in which four lists – A, B, C, and D – compete and 1,000 votes are cast. The votes are distributed across lists as illustrated in Table 3: 405, 325, 185 and 85, respectively. D'Hondt proceeds by calculating a matrix of quotients by dividing each list's tally by the sequence of integers 1, 2, 3, and so on. These quotients are shown in the successive rows of Table 3.

[Table 1]

Once the matrix is constructed, seats are awarded in the descending order of quotients. In this district, for example, if DM=6, then the distribution of seats under D'Hondt would be A(3), B(2), C(1), D(0). By contrast, under HQLR the seat distribution would be A(2) B(2), C(1), D(1), thus benefitting the smallest list and disadvantaging the largest relative to D'Hondt.

These two formulas are by far the two most commonly used among democracies that elect their legislative assemblies by list PR.[2] Forty-four democracies use D'Hondt, HQLR is second at thirty-six, and another fifteen countries use variants – either increasing the intervals between divisors (for example, Germany or New Zealand), or establishing a smaller quota (for example, South Africa), or combining different formulas for the allocation of seats in different tiers (for example, Belgium or Greece) (Colomer 2004; Nohlen 2005; Wikipedia 2015).

---

[1] The Hare quota is also known as the "simple" quota.

[2] Either a quotas-and-remainders approach or a divisors approach can be modified from its simplest variant in order to adjust the degree to which the formula rewards large versus small lists. The simplest quota-based formula, HQLR, is relatively friendly to small lists because the quota (retail price) it sets to purchase seats is high. Lists that win enough votes to purchase seats at retail pay a steep price for doing so, and in turn have their tallies diminished rapidly, meaning that lots of seats tend to be awarded by remainders, at discount prices, and to lists that did not necessarily secure any full quotas. By contrast, the simplest divisors formula, D'Hondt, is relatively friendly to large lists because, in constructing the matrix of quotients by which seats will be awarded, it erodes the tallies of large lists more gradually than do alternative sequences of divisors (for example, 1, 3, 5, …). Thus, the simplest variants in each family of formulas have _opposite_ effects.

LegCo fragmentation
Since the transfer of sovereignty from the United Kingdom back to Beijing in 1997, and the formation of a new LegCo under Hong Kong's Basic Law, the assembly has grown in size. Still, only half of its members are directly elected, whereas the other half are chosen by "functional constituencies," a corporatist system in which key decision-makers are chosen by commercial, professional, and civic groups whose voting weight does not correspond to their share of the population (Pepper 2000, Ip 2014). The sizes of these cohorts are shown in Table 2.

[Table 2]

The directly elected representatives are chosen by PR in five geographical districts. Table 3 shows the number of seats awarded in each geographical constituency in the HKSAR in each election since 1998.

[Table 3]

Within each district, parties, alliances, or even individual politicians can register to present a candidate list. Each voter casts a ballot for a most-preferred list.[3] After each list's votes are tallied, the HQLR formula is used to convert votes to a proportional share of seats within each district. Once each list's share of seats is determined, winning candidates are identified by their list positions. If a list wins one seat in the district, only its top candidate is elected; if it wins two seats, the top two are elected; and so forth.

Fragmentation in Hong Kong elections is driven by three related trends – the multiplication of political parties, splits within parties by which parties sometimes run multiple lists in the same district, and the proliferation of lists affiliated with the major political camps – pro-democratic and pro-Beijing – but under Nonpartisan labels. The combined effects of these phenomena are illustrated in Figure 1, which shows the vote share for lists within each camp and among non-aligned lists for each election since the current electoral rules have been in place.

[Figure 1]

The vote shares across the broad camps are fairly consistent, with the pro-democracy side winning majorities of the overall vote, albeit by declining margins above the pro-Beijing group over time. The fragmentation within camps, however, is striking, starting in 2000 among the pro-democrats and increasing thereafter on both sides. The splintering reflects an increasing fragmentation both among parties and within them. In the 2000 election, for the first time, the Democratic Party ran multiple lists in New Territories East (two lists) and West (three lists) districts. By 2004, the ADPL joined the Democrats, splitting lists in Kowloon West, and in that same election, six of the pro-democratic camp's 18 seats went to Nonpartisan lists that won a single seat each. By the 2012 election, the pro-Beijing DAB ran multiple lists in Hong Kong Island as well as New Territories East and West.[4]

---

[3] Voters cannot indicate any preference among the candidates on a list; thus lists are "closed."
[4] The Appendix shows vote shares and seats won for each party, and for non-partisan lists, for each election since 1998, and provides further information on data sources.

Engineering fragmentation and diagnosing the effect of HQLR
The selection of HQLR was part of a package of electoral reforms adopted by the government of the People's Republic of China in the late 1990s, when sovereignty over Hong Kong was transferred. In the late stages of British rule in Hong Kong, the colonial government conducted two elections in which some members of the LegCo were directly elected.[5] In 1991, those seats were elected by block vote in two-member districts; in 1995, they were elected by single-member district (SMD) plurality. Either method allows a camp that can command plurality support to capture a large winner's bonus, and Hong Kong's pro-democratic forces dominated both elections, winning 16 of the 18 directly elected seats in 1991 and 17 of 20 in 1995. These outcomes alarmed the officials in Beijing who were preparing for the reabsorption of Hong Kong and crafting the institutions that would define governance under "one country, two systems" (Lam 1995, Wong 1998, Ho 1999, Baum 2000, Pepper 2000).

Lau Siu-kai (1999) provides a detailed account of the deliberations of that era. From 1994 to 1996, Lau served as a convener first of the Electoral Affairs Study Subgroup for Hong Kong, then of the Subgroup on Electoral Methods for the First Legislature (SEMFL), both appointed by the National People's Congress in Beijing. He acknowledges how preventing the development of effective legislative parties was a central priority for Beijing:

> "The Communist regime … realized full well that the appearance of political parties was inevitable whenever there were elections, particularly popular elections. It nevertheless did not want to see the rise of anti-Communist political parties in Hong Kong. Nor could China tolerate the domination of the legislature by a powerful political party, which then could use the veto powers at the legislature's disposal to 'blackmail' the executive or to bring about stalemate between the executive and legislative branches… In devising the electoral arrangements for the first legislature of the HKSAR, therefore, China strove to impede the development of local political parties, particularly those with pro-democratic and anti-Communist inclinations." (Lau 1999:13-14).

Restricting the share of directly elected representatives and stacking the functional constituencies with representatives selected independently from parties promoted this agenda, but in Beijing's estimation, so did abandoning the majoritarian formulas that had been used under British sovereignty for the directly elected LegCo seats:

> "In view of the anti-Communist sentiments in Hong Kong and the instinctual tendency of a majority of the people to vote for politicians who stood for the interests of the man in the street, it was unavoidable that more than half of the seats would be won by the pro-democracy and pro-grass-roots politicians. Still, if a decent minority of directly elected politicians took a friendly stance toward China and a moderate position on socio-economic issues, the political clout of the majority could be blunted to a certain extent" (Lau 1999:15).

The Beijing government considered adopting either list PR or the single non-transferable vote (SNTV) system. The latter presents the greatest obstacles to political party development of any system used to elect national legislatures (Cox & Shugart 1996, Cox, Rosenbluth, and Thies 1999,

---

[5] The colonial-era LegCo was an advisory body and a majority of its members were either selected by functional constituencies or appointed by the governor.

Reynolds & Carey 2012), but Beijing eventually soured on SNTV because, by the late 1990s, it was used only in Taiwan (Lau 1999). Ultimately, the National People's Congress opted for list PR, with the goal of allowing pro-Beijing politicians to transfer their roughly 40% support in the electorate into a corresponding number of seats in the LegCo. In combination with the functional constituency seats, which over-represent business and financial interests inclined to avoid direct confrontation with Beijing, the system has realized its designers' goals of preventing the development of a pro-democracy party that could control the LegCo and use it as a platform to challenge the chief executive's dominance in setting policy (Ma and Choy 1999).

Scholars of Hong Kong elections have widely noted that the adoption of PR provided insurance for Beijing against a pro-democracy *tsumami* in the LegCo (Fung 1996, Ho 1999, Baum 2000, Choy 2013). These accounts note, correctly, that PR provides fewer incentives for the formation of broad electoral alliances than do the majoritarian electoral rules that governed contests for the LegCo's directly elected seats in 1991 and 1995 (Duverger 1951; Cox 1997). Nevertheless, there are two relevant comparisons at work here. The first is between majoritarian electoral rules and PR, and the second is among PR formulas. Scholarship on Hong Kong elections has widely recognized the former, emphasizing that PR elections have fostered more party fragmentation than would majoritarian ones (Cheng 2001 and 2010, Cheung 2005, Lee 2010, Yip 2014), but less frequently recognized the role played by the choice of HQLR rather than other available PR formulas.

The most prominent exceptions are a series of studies by Ma Ngoc and Choy Chi-keung, both individually and in collaboration. These scholars emphasized early on that Beijing's support of PR elections was a strategic move that could fragment the pro-democracy camp's forces in the LegCo (Ma and Choy 1999, Ma 2001 and 2002). The experience of the first two elections after the transfer of sovereignty, in 1998 and 2000, featured rivalries within parties, and the first instances of strategic list splitting (Choy 2002). Ma and Choy presciently attributed this phenomenon to the disadvantage that large lists face under HQLR in winning "the last seat" in any given district (2003a, fn.7), and for the 1998 election they identified two districts in which seat distributions across parties would have differed had the D'Hondt formula been used rather than HQLR (2003b). As strategic list-splitting has increased in Hong Kong and spread from the pro-democratic to the pro-Beijing camp, these scholars have chronicled the fragmentation, diagnosed HQLR as a motivating factor, and identified the phenomenon as a contributing factor to the LegCo's weakness as a counterweight to the chief executive (Ma 2005, 2012, 2014; Choy 2014; see also Chen 2015).

Building on the foundation established by Ma and Choy, the remainder of this paper offers a number of further contributions. I illustrate the virtual disappearance from Hong Kong elections of competition for seats by full quota. Then, using district-level returns from every election since 1998, I produce simulated outcomes showing that the impetus toward fragmentation would not have applied – indeed, it would have been reversed – if Hong Kong employed the more widely used D'Hondt divisor PR formula rather than HQLR. I also produce simulations that illustrate how recent electoral results would have differed under HQLR had the pro-democratic camp not pursued list fragmentation. In all, these analyses indicate that the current rules make list fragmentation an effective strategy for party leaders, whereas other rules would alter strategies, and could produce a LegCo with broader party alliances.

Distributional consequences: Electoral efficiency, size, and seat bonuses

Electoral efficiency means winning the most seats possible, given one's level of support in the electorate. Imagine a set of politicians who share a common purpose – whether to increase (or reduce) tax rates, to increase (or reduce) social welfare spending, to increase (or relax) environmental regulations – and who expect some level, X, of support for this platform among voters. For this set of politicians, maximizing electoral efficiency means converting X into the largest possible share of seats in the legislature. Under HQLR purchasing seats with remainder votes is always more efficient than purchasing them with full quotas. It follows that any group of politicians maximizes its efficiency by purchasing as many seats as possible by remainders and as few as possible by full quota. To win any seat by full quota is to over-pay.

Hong Kong politicians have learned this lesson well. Figure 2 shows the percentage of seats won by full quota among lists within each camp for each election since 1998. For the first three elections, both camps paid full price for about half of their seats, and purchased the other half at reduced prices, by remainders. The proliferation of lists that jumped most dramatically in 2008 corresponded to sharp reductions in the share of seats for which each camp paid full price. By the 2012 election, of the 34 seats captured by lists from the two major camps, only three were won by full quota.

[Figure 2]

Another way to think about electoral efficiency is in terms of whether the share of seats won by a party or a camp exceeds its share of the vote (a bonus), or falls short of its vote share (a penalty). Drawing on the district-level electoral data described above, I calculated the bonus for every party (and nonpartisan list) that contested any district-level elections in Hong Kong from 1998 to 2012. Figure 3 shows a series of plots, one for each election, of each party's overall vote share against its seat bonus. The smallest parties win some, albeit modest, vote shares and no representation and so, by definition, suffer penalties. Those penalties afford for surplus representation that is distributed across the parties winning seats. But *how* the bonuses are distributed illustrates the relationship between electoral size and electoral rewards. Each plot in Figure 3 includes the quadratic best-fit line, illustrating the shape of the vote-bonus function. In the first two elections, the function was convex, which is to say there were diminishing returns to scale. The largest parties did not necessarily win largest seat bonuses. By winning seats with full quotas, they were over-paying, and converting voter support into representation inefficiently. Efficiency was greatest for parties capturing moderate vote shares, between 5-15%, which were winning seats based only on remainder votes.

[Figure 3]

Note also that the vote share of the largest party tends to diminish over time, from 43% in 1998, to 29% in 2000, to 21% in 2004, rising slightly to 23% in 2008, and falling again to 18% in 2012. This is no accident; instead, it is the result of the strategic response of politicians to the diminishing returns to size in the early elections under HQLR. When being big does not convey an electoral reward, politicians – even potential allies – are motivated to diverge rather than to coalesce. As the size of the largest parties diminishes, there are no more competitors who would ever pay full price for a seat. The vote-bonus function, which is sensitive to the strategic behavior of parties under HQLR, loses its convex shape. The proliferation of parties within each camp and, in some cases, the lists within each party is a strategy to maximize electoral efficiency

– never paying full price for a seat that could be won more cheaply, and ideally channeling surplus votes to *other* lists fighting for more or less the same set of policies.

Now consider how these incentives would have differed had Hong Kong used D'Hondt rather than HQLR. Figure 4 replicates the plots from Figure 3, this time simulating the outcomes that *would* have obtained had Hong Kong used the D'Hondt formula rather than HQLR. The D'Hondt formula rewards size, providing economies of electoral scale, and conferring larger bonuses to larger parties. Note that the shape of the vote-bonus function under D'Hondt is consistently concave, even in the face of increasing party and list fragmentation. D'Hondt provides increasing return to scale, rewarding larger lists with larger seat bonuses at any level of list fragmentation, thus motivating politicians to form and sustain broad alliances.

[Figure 4]

We can also simulate what would have happened to Hong Kong's electoral alliances under HQLR had they pursued unification rather than fragmentation. By 2008, for example, fragmentation reached its mature form among the pro-democratic camp, which won only one of its nineteen seats by full quota. Figure 5 shows the analogous plots for the 2008 and 2012 elections conducted under HQLR, but this time with votes for all the lists from the pro-democracy camp pooled together within each district as if the pro-democrats had run unified lists.[6] In both cases, the broad alliance wins little or no seat bonus, whereas much smaller lists (in these cases, pro-Beijing and non-aligned lists) win larger bonuses.

[Figure 5]

The lessons from these various exercises are consistent: Electoral efficiency under HQLR's dual-pricing system means avoiding paying full price for a seat. In each election to date, Hong Kong voters have confronted an increasingly cacophonous set of choices when they cast their LegCo ballots. This is not because political leaders are inherently individualistic or uncooperative. They are simply responding to the incentives generated by HQLR, where the optimal strategy is fragmentation. Under a different PR formula, incentives could push in the opposite direction, encouraging broad alliances in the HKSAR rather than fragmentation. D'Hondt is one option, and it rewards size the most. Other alternatives are also available (for example, the St. Lague divisors method), which are somewhat more generous to small and mid-sized lists while avoiding the dual-price system of HQLR. The key point is that, under other PR formulas, the imperative of electoral efficiency is to unify the largest possible vote share behind a common list.

Discussion

The implications of PR for the directly elected seats in the LegCo have been widely noted by scholars, and the pioneering work by Ma and Choy has emphasized the specific effects of the HQLR formula. This paper pursues that issue, highlighting the strategic response of Hong Kong politicians to HQLR, and how electoral results would have differed under an alternative PR formula.

---

[6] In a recent conference paper, Judy Chia Yin Wei (2012) analyzes the effectiveness of the list-splitting strategies pursued by the major camps, emphasizing the importance of coordinating campaign efforts to equalize vote tallies across the lists chasing "cheap" seats by remainders.

It is worth noting that the Hong Kong experience is not unique. During most of the 20th Century and until 2002, Colombia elected its House of Representatives using HQLR in 33 districts with an average DM around 5, akin to Hong Kong's. Like Hong Kong, Colombia allowed parties to run multiple lists in a given district – and split they did. In the Bogota district in 2002, 256 separate lists ran, none captured a full quota (5.6%), and all 18 seats were won by remainders (Pahcon & Shugart 2010). Splitting lists in order to capture seats by remainders rather than full quotas was such a staple strategy in Colombia that it was widely known as *operacion avispas* (operation wasps), to convey that a target was more effectively attacked by a swarm of small predators than by a single, larger assailant. Because Colombian legislators were in competition as much with other lists from their own parties as with other parties, they lacked incentives to cultivate broad party platforms that would make the legislature as a whole an effective policy-making actor.

With the goal of strengthening its Congress, Colombia adopted a reform in 2006 that made three important changes: switching the PR formula from HQLR to D'Hondt, limiting each party to one list per district, and allowing parties to run their single lists under either an open format – thus affording voters the opportunity to cast preference votes among candidates – or a closed format (Shugart, Moreno, and Fajardo 2007). Following the reform, the number of lists dropped (a forgone conclusion given the requirement of one list per party) and intra-party competition shifted from across split lists to within open lists (Pachon and Shugart 2010). Notably, the correlation between the vote shares of the largest parties and their seat bonuses grew stronger (Shugart, Moreno, and Fajardo 2007, Tables 7.4 and 7.8). The move to D'Hondt rewards economies of scale and broader electoral alliances united under a common banner.

The choice of PR formula is a technical matter but it can have profound effects on the behavior of politicians, the choices offered to voters, and the composition of the legislative alliances. The decision to adopt HQLR for Hong Kong's LegCo elections was momentous, and the effects were consistent with the goals attributed by Lau (1999) to Beijing's electoral system designers, to impede the development of an effective pro-democratic block in the LegCo. Were Hong Kong to use a formula that encouraged alliance, rather than fragmentation, the LegCo's potential to represent broad interests within the Hong Kong policymaking process could be substantially stronger.

References

Baum, Richard. 2000. "Democracy deformed: Hong Kong's1998 legislative elections - and beyond." *China Quarterly* 162:439-464.

Chen Weiyang. 2015. 香港立法会地区直选制度政治效应的实证分析 ("Empirical analysis of the electoral system's effects on directly elected representatives to the Hong Kong Legislative Council.") *Journal of Chongqing Institute of Socialism* 2:38-42.

Cheng, Joseph Y.S. 2001. "Elections and political parties in Hong Kong's political development." *Journal of Contemporary Asia* 31(3):346-374.

Cheng, Joseph Y. S. 2010. "Maintaining the Political Status Quo? Hong Kong's Legislative Council Elections." *Issues and Studies* 46(4):181-216.

Cheung, CK. 2005. "Who won political elections in Hong Kong over time?" *Social Science Journal* 42(2):183-199.

Choy Chi-keung. 2002. "The decisive effect of the proportional representation system: From inter-part competition to intra-party competition," in *Out of the shadow of 1997? The 2000 Legislative Council election in the Hong Kong Special Administrative Region*, Kuan Hsin-chi, Lau Siu-kai Timothy Ka-ying Wong, editors. Hong Kong: The Chinese University Press.

Choy Chi-keung. 2013. "比例代表制：早知今日，何必当初" ("Proportional representation: Had we known the outcome, we would not have implemented this system.") *Ming Pao Daily News*. August 1.

Colomer, Josep. 2004. *Handbook of electoral system choice*. New York: Palgrave Macmillan.

Cox, Gary W. 1997. *Making votes count: Strategic coordination in the world's electoral systems.* New York: Cambridge University Press.

Cox, Gary W. and Matthew Soberg Shugart. 1996. "Strategic voting under proportional representation." *Journal of Law, Economics, and Organization* 12(2):299-234.

Cox, Gary W., Frances M. Mosenbluth, and Michael F. Thies. 1999. "Electoral reform and the fate of factions: The case of Japan's Liberal Democratic Party." *British Journal of Political Science* 29:33-56.

Duverger, Maurice. 1951. "The influence of electoral systems on political life." *International Social Science Bulletin* 3:314-352.

Fung, Wing K. 1996. "The Last Legislative Election of Hong Kong under British Rule, 1995." *Electoral Studies* 15(1):119-123.

Ho, Karl. 1999. "The Hong Kong legislative election of 1998." *Electoral Studies* 18(3) 438-445.

Ip, Eric C. 2014. " The High Court of the People: Popular Constitutionalism in Hong Kong under Chinese Sovereignty." *Law and Policy* 36(3):314-338.

Langer, Lorenz. 2007. "The elusive aim of universal suffrage: Constitutional developments in Hong Kong." *ICON – International Journal of Constitutional Law* 5(3):419-452.

Lau Siu-kai. 1999. "The making of the electoral system," in *Power transfer & electoral politics: The first legislative election in the Hong Kong Special Administrative Region*. Kuan Hsin-chi, Lau Siu-kai, Louie Kin-sheun, and Timothy Ka-ying Wong, editors. Hong Kong: The

Chinese University Press, pp.3-34.

Lee, Francis L. F. 2010. "Pragmatism, Perceived Reality, and Hong Kong People's Attitudes toward Democratic Reform." *Issues and Studies* 46(1):189-219.

Ma Ngoc. 2001. "The decline of the Democratic Party in Hong Kong." *Asian Survey* 41(4):564-583.

Ma Ngoc. 2002. "Factionalism in the Democratic Party and the 2000 election," in *Out of the shadow of 1997? The 2000 Legislative Council election in the Hong Kong Special Administrative Region*, Kuan Hsin-chi, Lau Siu-kai Timothy Ka-ying Wong, editors. Hong Kong: The Chinese University Press

Ma Ngok. 2005. "Strategic Coordination under Proportional Representation: A Study at the Candidate Level." Presented at the Conference on the 2004 Legislative Council Elections, Chinese University of Hong Kong. April 8.

Ma Ngoc. 2012. "Political parties and elections," in *Contemporary Hong Kong Government and Politics*, Lam Wai-man, Percy Luen-tim Lui, and Wilson Wong, editors. Hong Kong University Press:159-176.

Ma Ngoc. 2014. "Increased pluralization and fragmentation: Party system and electoral politics and the 2012 elections," in *New trends of political participation in Hong Kong*, Joseph Y.S. Cheng, editor. City University of Hong Kong Press: 185-210.

Ma, Ngok. 2015. "The Rise of "Anti-China" Sentiments in Hong Kong and the 2012 Legislative Council Elections." *China Review – An Interdisciplinary Journal on Greater China* 15(1):39-66.

Ma Ngok, and Chi-keung Choy. 1999. "The evolution of the electoral system and party politics in Hong Kong." *Issues and Studies* 35(1):167-194.

Ma Ngoc, and Chi-keung Choy. 2003a. "The impact of electoral rule change on party campaign strategy – Hong Kong as a case study." *Party Politics* 9(3):347-367.

Ma Ngoc, and Chi-keung Choy. 2003b. 選舉制度的政治效果:港式比例代表制的經驗 (*Political consequences of electoral systems: The Hong Kong proportional representation system*.) Hong Kong: City University of Hong Kong Press.

Nohlen, Dieter. 2005. *Elections in the Americas: A data handbook*. New York: Oxford University Press.

Oxford Analytica. 2015. "Hong Kong hits stalemate as political reform stalls." *Daily Brief*. June 22. https://dailybrief.oxan.com/Analysis/DB200431/Hong-Kong-hits-stalemate-as-political-reform-stalls

Pachon, Monica and Matthew Soberg Shugart. 2010. "Electoral reform and the mirror image of inter-party and intra-party competition: The adoption of party lists in Colombia." *Electoral Studies* 29(4):648-660.

Pepper, Suzanne. 2000. "Elections, political change and basic law government: The Hong Kong system in search of a political form." *China Quarterly* 163:410-438.

Reynolds, Andrew and John M. Carey. 2012. *The Political Consequences of Election Design in Afghanistan.* Kabul, Afghanistan: Afghan Research and Evaluation Unit.

Shugart, Matthew Soberg, Erika Moreno, and Luis E. Fajardo. 2007. "Deepening democracy by

renovating political practices: The struggle for electoral reform in Colombia," in Christopher Welna and Gustavo Gallon, eds., *Peace, democracy, and human rights in Colombia*. Notre Dame, IN: University of Notre Dame Press, pp.202-267.

Wei, Judy Chia Yin. 2012. "The Parties' Strategic Entry in Hong Kong's Legislative Council Elections under the Largest Remainder Proportional Representation." Presented at the American Association for Chinese Studies 54th Annual Conference. October 13.

Wong, Timothy Ka-ying. 1998. The first Legislative Council election of the Hong Kong Special Administrative Region: Meaning and impact." *Issues & Studies* 34(9):124:149.

Yip, Stan; Yeung, Ronald. 2014. "The 2012 Legislative Council election in Hong Kong." *Electoral Studies* 35:366-370.

Young, Simon N.M. 2014. "Realising universal suffrage in Hong Kong after the Standing Committee's decision." *Hong Kong Law Journal* 44:689-708.

Zhang Baohui. 2010. "Beijing's 2007 political reform plan and prospects for Hong Kong's democratization." *Democratization* 17(3):442-464.

Tables and Figures for "Electoral Formula and Fragmentation in Hong Kong"

Table 1. Illustration of the DHD method in a hypothetical district

List	A	B	C	D
Votes	405	325	185	85
1st Q	405.0	325.0	185.0	85.0
2nd Q	202.5	162.5	92.5	42.5
3rd Q	135.0	108.3	61.7	28.3
4th Q	101.3	81.3	46.3	21.3

Table 2. Directly and indirectly elected membership in the LegCo

Year	Elected		Total Membership
	Directly	**Indirectly**	
1998	20	30	50
2000	24	36	60
2004	30	30	60
2008	30	30	60
2012	35	35	70

Table 3. Seats per geographical constituency

Constituency	1998	2000	2004	2008	2012
Hong Kong Island	4	5	6	6	7
Kowloon East	3	4	5	4	5
Kowloon West	3	4	4	5	5
New Territories East	5	5	7	7	9
New Territories West	5	6	8	8	9
Total	20	24	30	30	35

Figure 1. Hong Kong LegCo Elections: Party List Vote Shares by Camp
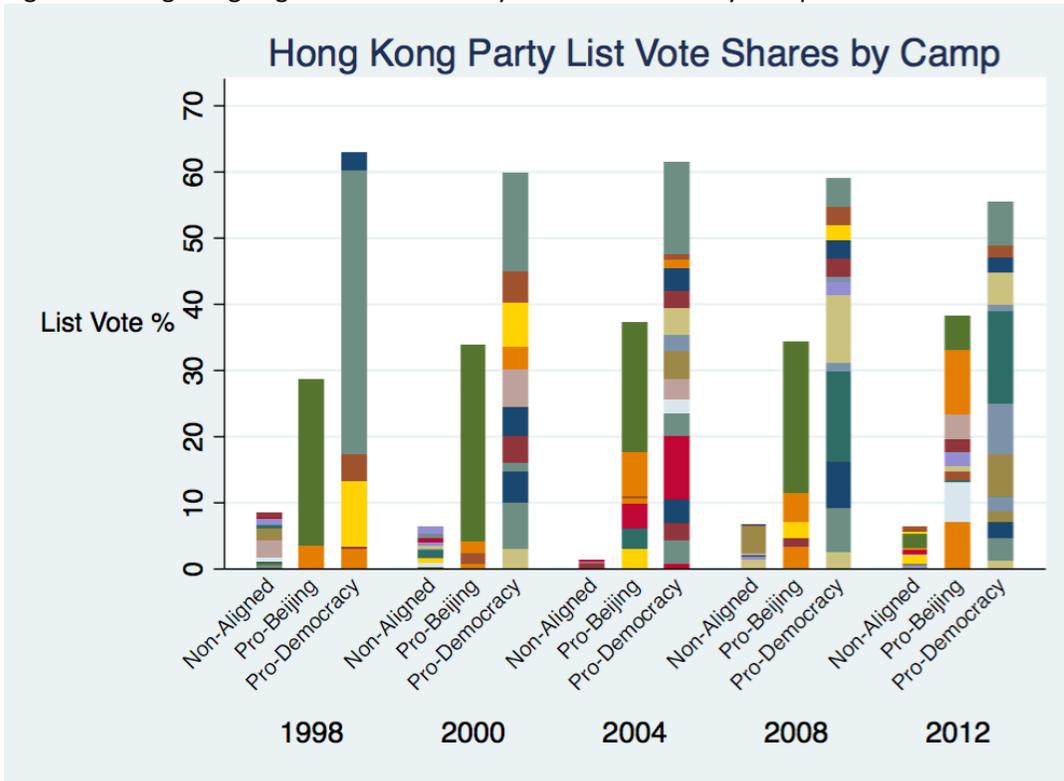
Figure 2. Percentage of seats for which lists paid "full price."
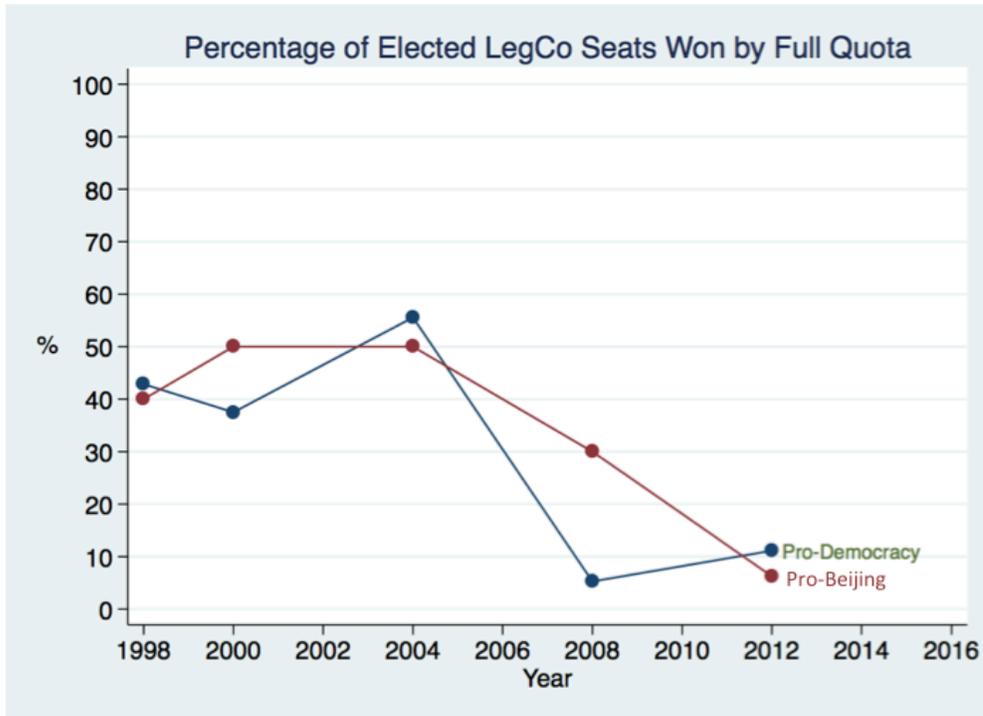
Figure 3. Seat bonuses by vote share in Hong Kong elections.
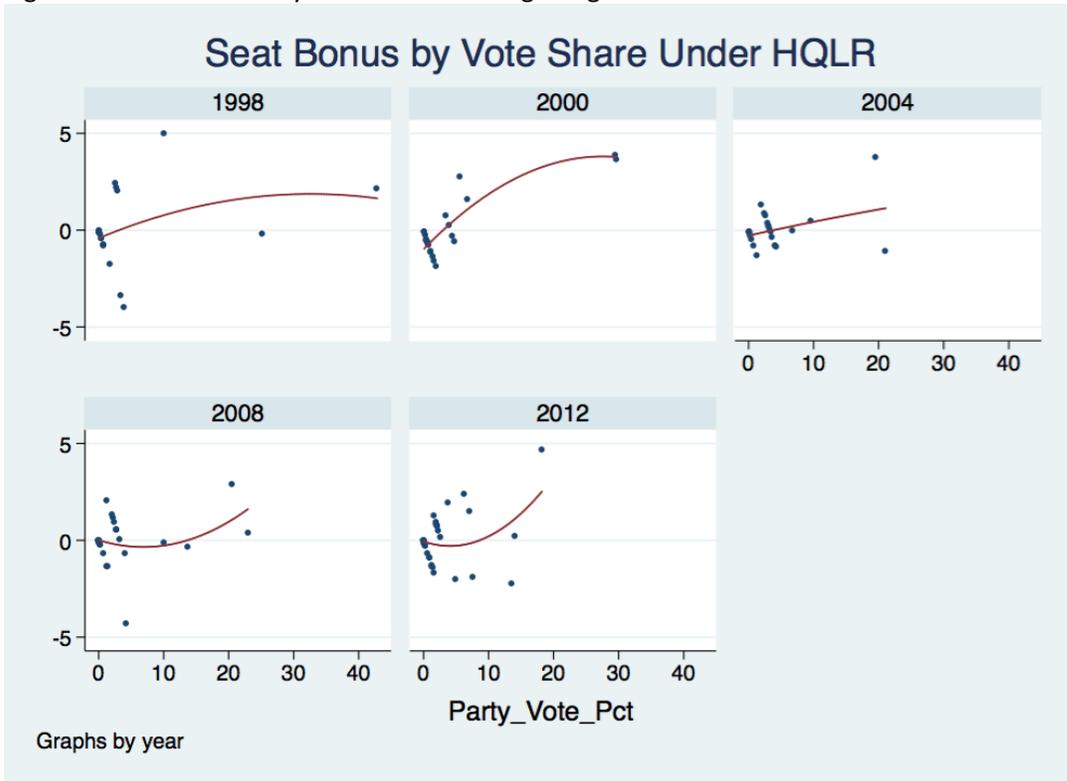
Figure 4. Seat bonuses by vote share in Hong Kong elections – D'Hondt simulated results.
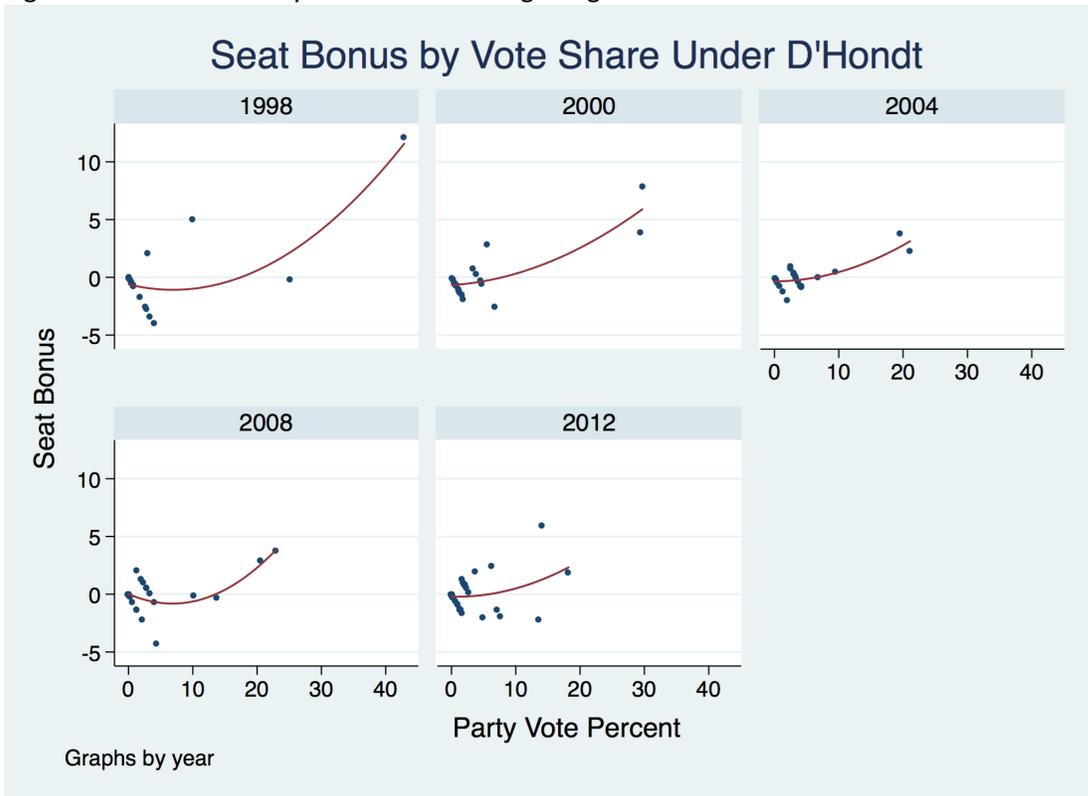
Figure 5. Seat bonuses by vote share in the 2008 and 2012 elections – Simulation with votes from all Pro-Democratic lists in each district pooled.

Seat Bonus by Vote Share Under HQLR
Simulation With All Pro-Democratic Lists Pooled