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# The Idea of Jurisdictional Representation in a Federation: A Proposal and Illustrations from Recent Canadian and US Elections

## Abstract

The idea of proportional representation has been circulating for over two hundred years and is widely practiced, among other, in post-war Europe. The primary focus is to allow smaller parties, minorities and other disenfranchised groups in society systematic representation in the national legislature. This paper proposes a novel idea of jurisdictional-level proportionality specifically targeted at federal systems. Emphasising the primacy of jurisdictions (namely provinces and states) within a federation, we use data on the voting pattern in each such jurisdiction to determine the allocation of elected delegates (or electoral seats for that matter) that would be utilized in the eventual makeup of the ruling government. The proposed scheme is the simplest that we know of. All it requires is the record of all votes cast by individuals in favour of the candidate of their choice in a given constituency. Our design ensures that the mechanism encompass the governance virtues such as (a) inclusivity and stability of the elected government, (b) accountability of elected delegates and their interface with voters, and (c) and fully conform to the principle of proportionality. In the parliamentary mode, while it may tend to predict minority governments more often, it allows each major party a greater degree of freedom to forge a ruling coalition. When reviewing the US Presidential election, it appears that the outcome here may change too, typically in favour of the plurality winner of nation-wide popular votes, even though the seat arithmetic is based on proportional votes within each state in the union.

JEL-Codes: D720, H770, I310.

Keywords: the agency problem, effective governance, gerrymandering, inclusive representation, jurisdictional representation, proportional representation, stable government.

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# The Idea of Jurisdictional Representation in a Federation: A Proposal and Illustrations from Recent Canadian and US Elections

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“The pure idea of democracy, according to its definition, is the government of the whole people by the whole people, equally represented. Democracy, as commonly conceived and hitherto practiced, is the government of the whole people by a mere majority of the people exclusively represented. The former is synonymous with the equality of all citizens; the latter, strangely confounded with it, is a government of privilege in favour of the numerical majority, who alone possess practically any voice in the state.” (J. S. Mill, 1861, p43)

**1. Motivation:** The issue of electoral reform is often invoked when the outcome of a general election, an exercise in adult suffrage, appears too close for comfort for supporters of the principal contestants. This leads to soul searching for ‘superior alternate’ modalities to determine the outcome. Though, in this paper the focus is primarily on the parliamentary system of government, which after all represents most democracies encompassing both republics as well as the constitutional monarchies (e.g., Britain, Holland, Sweden etc), we shall comment on the applicability of the analysis to the US Presidential election as well. Whether there are one or two chambers in the system is not central to the issue at hand since in the latter event the chief executive, e.g., the Prime Minister, is typically a member of the lower house, which serves as the primary law-making body. General elections to elect the Lower house members is what we mostly dwell on here, except when it comes to the US Presidential election. Also critical to the analysis that appears below is the federal structure of governance, though many elements of what we say may well be relevant for other contexts as well though left out of purview.

The observation that in a majoritarian electoral mechanism, also known as the ‘first-past-the-post’ (FPP) system, there will always be minor parties/groups who may fail to win representation to the level of its share of popular votes.<sup>1</sup> Thus a party may consistently bag 10-15% of all votes in a jurisdiction, and yet fail to win more than a few seats. Does the elected parliament reflect fairly the votes (or, the pattern thereof) cast by citizens? This is how we interpret the ‘representativeness’ of an electoral system and this is the primary issue in focus here.

*The Benchmark Scenario:* The central issue of the paper is on electoral (voting) systems or mechanisms, defined as the rules by which one aggregates all votes cast in a general election to determine the winner(s).<sup>2</sup> The latter category encompasses individual candidate(s) or individual parties (or, indeed, coalitions thereof) who would be declared elected and then, as appropriate, go on to form the next government. The benchmark scenario that we consider is

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<sup>1</sup> Though here we are only referring to the national level, the arguments of the paper apply equally well to all elections (e.g., provincial/state as well as municipal) that are governed by the FPP modality.

<sup>2</sup> Thus the terms *electoral system*, *voting system*, *electoral mechanism* or *voting mechanism* will all be used interchangeably from hereon.

the widely prevalent ‘first-past-the-post’ (FPP) or ‘winner-take-all’ modality as described below (e.g., as in Canada, India, or the UK). This is also known as the *plurality* version (as opposed to absolute majority requiring 50 % plus one vote) of the majoritarian voting system. Norris (1997) claims this to be the oldest electoral system, dating back at least to the 12th century. While many admit it to be not a perfect mechanism, Wikipedia lists 61 countries that practice this mode of declaring winners in national elections, especially to the lower house, including major old and newer democracies such as Bangladesh, Canada, Ghana, India, Kenya, Malaysia, Nigeria, Pakistan, Philippines, UK and the US. Arguably this is the simplest of all voting mechanisms.

However, the more egregious winner-take-all electoral modality is indeed the ‘electoral college’ (ECC) system in the US Presidential elections, whereby the entire tally of ECC ‘seats’ in a State (namely, the number of Congressional Districts plus the two Senate positions) goes to the plurality winner of popular votes in that State<sup>3</sup>, though Maine and Nebraska deviate from this rule to an extent.<sup>4</sup> Regardless of the electoral outcome in individual Congressional and Senatorial districts within a State, to clarify more fully, all ECC votes of a state are won by only one of the Presidential candidates as described here.<sup>5</sup> The ECC mechanism tends to produce landslides relative to even the FPP mode in the parliamentary systems, as we shall vividly see below. It would be legitimate to ask how democratic is a system that may allocate all of a State’s electoral seats to a candidate who has been opposed by a majority of voters of the State.<sup>6</sup> Hence the ECC modality would be more appropriately dubbed a ‘winner-reap-all’ scenario.

Given that the paper analyses and indeed offers some comparison among different electoral systems, we tend to pursue a common nomenclature whenever possible, though in specific contexts a somewhat different language may be in greater currency locally. Accordingly, let us call the primary geographical unit within the country, a ‘constituency’, where each voter conventionally casts her ballot for just ONE of the contestants nominated by various parties,

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<sup>3</sup> The total number of 538 ECC ‘seats’ in the country are arrived at as follows; add the 435 Congressional districts plus the 100 Senate seats (two for each State), and the *three* ECC seats assigned to the District of Columbia (DC). DC, though not a State as such, and have no representation either in the US Congress or the Senate, earned the right to have the ECC seats, especially for the Presidential election, by virtue of the 23<sup>rd</sup> amendment of the US Constitution ratified in March 1961, (<https://www.archives.gov/federal-register/electoral-college/about.html>).

<sup>4</sup> Maine and Nebraska, respectively, are entitled to 4 and 5 ECC members in the Presidential election. In these two cases, two electoral college seats are earmarked for the plurality winner of the State, but reserve one seat to each of the plurality winner of each Congressional district in the State (2 for Maine and 3 for Nebraska), [www.archives.gov/electoral-college/allocation](http://www.archives.gov/electoral-college/allocation).

<sup>5</sup> The actual process is bit of a curiosity. Each Presidential candidate is required to actually name that many persons (‘ECC electors’) as there are ECC seats in a State (or DC). The major parties however accomplish the task of selecting delegates pledged to them by different routes. Depending on the outcome of the popular vote in the election, these appointed electors pledged to the state-wise winning party actually congregate and cast their ballot to formally elect the President and the Vice-President of the United States ahead of the inauguration of the President. The above modality applies, *mutatis mutandis*, to Maine and Nebraska as well. Even more curious, at least to those less familiar with the ECC modalities, some states admit the practice of electors eventually casting their support not behind candidates that they had originally been pledged to. In the most recent election of 2016, both the major party candidates lost a few ECC seats due to such ‘faithless’ electors, which however proved inconsequential as to the outcome.

<sup>6</sup> This is what precisely happened in 2016 when the GOP candidate failed to win majority of votes cast in six States he eventually ‘won’, namely Arizona, Florida, Michigan, Pennsylvania, North Carolina and Wisconsin, accounting for a total of 101 electoral college seats. Incidentally, note that all 2016 election records cited in this paper are accessed from the official website of the US Federal Election Commission ([www.fec.gov](http://www.fec.gov)).

or indeed candidates running as ‘independents’. Constituencies are often referred to as ‘single-member districts’ or simply as ‘electoral districts’. Each electoral candidate therefore uniquely seeks to represent that particular constituency in the relevant legislature (say the national ‘parliament’ or the houses of the US Congress, Senate and the House of Representatives). We shall often refer to the legislative body in question as the parliament, without losing generality. The plurality vote winner in a district ordinarily becomes the elected representative on behalf of the constituency in question, whom we shall call a ‘delegate’. In specific contexts these are the ‘members’ of the parliament (MPs), Congressmen/Congresswomen, Senators etc. In a federation, each such constituency would uniquely belong to a province/state/territory (hereafter, ‘province’), which in turn collectively make up the federation.

Legislatures are often referred to by the number of constituencies it encompasses, e.g., the ‘338-seat’ Canadian Parliament or the 435-strong US House of Representatives. Elected delegates go on to occupy these seats each identified by the constituency it is earmarked for. Here the term ‘seat’ denotes a legislative slot reserved for each of its constituencies. Vacancies (e.g., due to resignation or death) usually calls for re-elections only in that particular district. The 538-seat electoral college in the US context is a distinct concept in this context since there is no physical legislature where 538 persons meet and deliberate the nation’s business, except for the brief formal event when these delegates actually turn up in DC and choose the President/Vice President in early January following the quadrennial election. Without confusion, we shall also refer to these 538 entities as ‘seats’, where a Presidential candidate has to win at least 270 seats to be declared elected. Those eligible to vote in a constituency are called a ‘voter’ or an ‘elector’, interchangeably, though not to be confused with the ‘electoral votes’ cast by the ‘ECC electors’ in the US system. The latter process has been clarified in footnote 5 above.

Continuing the description of the benchmark scenario, the party (to include coalitions from hereon) winning most constituencies in the nation forms the government if that constitutes an outright majority. Otherwise, the party with the most seats generally gets the first crack at forming a ‘Minority Government’. All these terms are commonly understood and hence are not further elaborated upon here. This paper reserves the term ‘jurisdiction’ to denote a hierarchically and administratively larger geographic entity beyond the constituency in the generic sense, i.e., being made up of a group of constituencies, e.g., those making up a province or a state. In other contexts, jurisdictions would also denote the ‘multiple-member districts’. Thus each country or nation will be made up of its constituent jurisdictions, namely provinces or states. Thus, for example, the US will be construed to comprise of 51 jurisdictions, namely the 50 states and DC. Jurisdictions generally have their own legislatures, though here we only deal with decision making at the national level.

The key concern of this paper is on representation. It often turns out that most smaller parties win relatively fewer seats even if they earn a more sizeable share of all votes cast, and thus find it hard to have their views heard in the parliamentary deliberations and hence reflected in the eventual decisions. This can easily happen say if there are two or three major parties and a handful of rather small ones, the latter often focussed on geographic regions or on specific issues. For illustration, we note that the recently concluded Canadian general election of 2019 failed to elect a majority government. Nevertheless, it allowed the Liberal Party (LIB) by just winning a mere 33% of all votes cast, to go on to form a minority government in a 338-seat Lower House of the Canadian Parliament gaining 157 seats (i.e., 46% of total seats) in the

process. In contrast, the New Democratic Party (NDP), while obtaining almost 16% of votes, roughly half of the LIB vote share, managed to get elected only in 24 constituencies. Worse, the Green Party's share of popular vote was 6.5%, but won just *three* seats.<sup>7</sup>

In a similar vein, in the 2016 US Election, nearly 6% of all voters (to be precise 7.8 million out of 136.7 million overall) found neither of the two major party candidates of appeal and voted for others. Lacking any means of representation, these votes merely stand to dent the relative strength of the two major parties depending on the proximity of their respective political platforms. Thus only very indirectly and that again on some occasions, these 'other' votes may lend a material effect on the eventual outcome of the election.<sup>8</sup> This raises the question: how can a system that prevents the voices of a significant fraction of tax-paying citizens from lending an imprint on the running of their own lives be declared fair?

In defence of the FPP system, Thomas Axworthy, former Canadian federal politician, cited that the recent exercise in 'governance indicators' (a World Bank device to rank countries), Canada scores very well, indeed placing her among the top ten in every category (Canada Report, 2016, p47). Good governance, it is perhaps fair to claim, occurs in spite of the electoral process; the latter simply does not do a good job of translating votes into seats. It would appear that a majority of countries typically ranked high in the above indicator does indeed practice some form of proportional representation (e.g., Denmark, Finland, Netherlands, Norway, Singapore, Sweden and Switzerland). The Canadian governance virtues, doubtless shared by others too, may be explained by factors such as a country's history, its norms and traditions, its economic structure and social insurance mechanisms and the like.

With this brief introduction, the remainder of the paper proceeds as follows. In Section 2, we review the basic idea of proportional representation, while Section 3 reviews the appropriate normative criteria we may adopt as guidelines in discriminating between and among alternative electoral mechanisms in the context of a federation. Next, in Section 4, we briefly examine the major forms of proportional representation that have emerged in major democracies till date. Section 5 presents a rather simple model of what is dubbed 'jurisdictional representation' in a federal context. Here we lay out in some detail how the idea may be implemented using only the record of votes cast, one vote per person in favour of a candidate of choice in each constituency, period. We go on to illustrate the consequence of this mechanism on the most recent elections held in Canada (Section 6) and the United States (Section 7). Concluding remarks are put together in section 8.

## **2. The Idea of Proportional Representation (PPR)**

John Stuart Mill, a philosopher, legislator and economist, was an ardent believer in proportional representation to overcome the awkward feature of the FPP system as pointed out above. "Democracy, thus constituted, does not even attain its ostensible object, that of giving the powers of government in all cases to the numerical majority"; he had famously declared, "...[it] does something very different; it gives them to a majority of the majority, who may be,

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<sup>7</sup> The figures are taken from the Elections Canada website: <https://enr.elections.ca/National.aspx/lang=e>.

<sup>8</sup> For example, if the Democratic party could garner all votes cast for the Green Party in Pennsylvania and Wisconsin and only a small fraction of their votes in Michigan, they would have earned 278 electoral college votes and go on to win the Presidency. Note that the Green Party finished in the 4<sup>th</sup> place in all three of these states cited here with barely 1% of the total votes or less.

and often are, but a minority of the whole” (1861 [2004], p43).<sup>9</sup> To wit, the 2015 Canadian election gave absolute majority to Justin Trudeau’s Liberals (indeed 184 out of 338 seats) by just winning a mere 39.6% of all votes, i.e., representing the wishes of a mere 27.1% of all registered voters.<sup>10</sup> Or, even more starkly, the Labour Party in the UK earned a majority in 2005 while garnering the support of just 21.1 % of registered voters; only 61.4 had participated in the election and the party’s vote share was 36%.

Mill was particularly concerned with the ‘class structure’ of society and to the extent that structure was or was not reflected in the electoral outcome in an election. He argued that every ‘minority’ of population be entitled to a representative (p46). Presumably, it may have been the case that the leading political parties of the 19<sup>th</sup> century Britain poorly represented the poorer sections of the population (whatever be their other identification in terms of ethnicity, race, gender, occupation etc). We do not dig deeper in this direction in the anticipation that individuals of every background and persuasion would find space inside one of the major national level political parties in major democracies of today. To the extent that is not the case, in the absence of significant barriers to entry, newer groups would enter the foray as is evident in many situations.<sup>11</sup> Returning to the Canadian election of 2019, note that upwards of 20 parties nominated candidates in some constituencies or other, some apparently championing a rather narrow platform (e.g., ‘Animal Protection Party’, ‘Communist Party’, ‘Radical Marijuana’ and ‘Stop Climate Change’). Nevertheless, the viable size of a small but effective party may well be too large for many marginalised or disenfranchised groups of population in society to launch and sustain.

Though the present analysis does not especially dwell on inclusive political participation, we observe that there are many examples of legislatures, often in developing countries, that feature a limited number of reserved seats for various ‘minority’ groups. Practices vary however both on the identification of the eligible group(s) as well as on the electoral process invoked to fill such reserved seats. In the 2019 Indian election, about 24% of seats in the Parliament (*Lok Shobha*) were exclusively reserved for the lower caste population (i.e., the ‘scheduled castes’ and ‘scheduled tribes’), approximately matching their share in the national population. While all voters of any caste or faith resident in the respective jurisdictions may cast their ballots for such candidates, the process appears to ensure full representation of these minorities. However, the process stops short and does not satisfy Mills’ advisory that “... every minority in the whole nation, consisting of a sufficiently large number to be, on principles of equal justice, entitled to a representative” (p. 46). In spite of necessary arbitrariness involved in identifying eligible minorities, especially in view of the ‘large number’ qualifier, it is plain to see that the Indian practice does not extend a similar accommodation to other groups (e.g., other religious minorities or tribes).

Bangladesh, on the other hand, ensures minimum representation of women candidates only, traditionally one of the under-represented groups in society. Of course, women candidates can and do contest (as do SC/ST candidates in India) in the general election without the quota

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<sup>9</sup> All page citations to Mill (1861) refer the e-book edition of 2004 as detailed in the References.

<sup>10</sup> The 2015 election generated a relatively high turnout of 68.5%, the highest since 1993.

<sup>11</sup> While the formal cost of registering a ‘political’ party for the sake of being able to field candidates may not be onerous, running of election campaigns are costly which would be a strong deterrence to any numerically small group even with the best of public spirited goals. The participation issue is a difficult and important one from the perspective of an inclusive society, but would appear beyond the scope of the present analysis.



privilege, but the policy noted above adds 50 additional reserved women delegates on top of the 300 MPs elected by universal suffrage.<sup>12</sup> However, contrary to the tenets of democracy, these reserved slots are not filled by election, rather by party nomination reflecting their share of parliamentary seats won in the general election, which heightens the requirement that the entire electoral process be conducted in a free and fair environment.<sup>13</sup> The Bangladesh Parliament (i.e., the Jatiya Sangsad) therefore consists of 350 members. There is however no recognition of any ‘minority’ group, whatsoever.

The recent Report on Electoral Reform in Canada [hereafter, Canada Reform (2016)] has made recommendations as regard to representation and political participation. A key concern has been on electing a parliament that ‘mirrors Canada’, so to speak. In particular, Recommendation # 7 of the Report demand “that any electoral reform seek to enhance the likelihood of improving voter turnout and to increase the possibilities for historically disenfranchised and underrepresented groups (i.e. women, persons with disabilities, indigenous peoples, visible minorities, youth, and Canadians of lower economic means) to be elected” (p138). This would appear to match Mills passion: “... in a really equal democracy, every or any section would be represented, not disproportionately, but proportionately’ (p43).

The strict task of proportional representation in an actual setting, however, is much narrower, namely to find means of securing electoral seats for all parties (especially, smaller ones) that matches their relative success in attracting votes. In the remainder of the paper, therefore, we focus exclusively on the issue of the fair allocation of parliamentary seats regardless of whether any sizeable ‘minority group’ may or may not have been fully represented. Representation here refers to at least two distinct channels. First is that the voter list be carefully drawn up ensuring full participation of all relevant groups cited above. Secondly, efforts need to be undertaken by all stakeholders so that members belonging to each of the groups had been fully and proportionately nominated by the registered and fully functional political parties. The latter issues, forming the core of Mill’s focus on proportionality, remain largely beyond the scope of the current exercise except for the brief overview in section 3 below.

### **3. Normative Criteria for Evaluating Electoral Systems**

In any debate on the relative merits of the representativeness of an electoral system, it is natural to ask what are the relevant normative criteria against which we may judge a system. The preceding discussion would immediately suggest that ‘representation’ of smaller parties and minority groups has been the *raison d’être* of PRP, and hence this criterion has to head the list. Norris (1997) has proposed four evaluation criteria, which we analyse below. Canada Reform (2016) committee, at the very start of its deliberations, laid down five principles [(i) effectiveness and legitimacy, (ii) engagement, (iii) accessibility and inclusion, (iv) integrity, and (v) local representation] that any reform package ought to adhere to. Below we offer a brief

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<sup>12</sup> In the current Bangladesh parliament, which was the outcome of the December 2018 election, 22 of the 300-elected MPs were women, including of course, the Prime Minister.

<sup>13</sup> Wikipedia appears to liken the nomination process for the reserved women seats in Bangladesh to a ‘closed-list’ mixed-member representation. This is misleading since the allocation of these seats is determined exclusively by the relative share of party-wise elected members in the 300 constituencies in the country. Given that the latter 300 members are determined by the FPP mechanism, the share of popular votes obtained by a party in the general election has no direct bearing on the party’s share of reserved seats.

review of such criteria and the underlying rationale by first encompassing these under a set of three broader principles.

(a) *Inclusive Representation and Stability*: This criterion has been adequately discussed in the foregoing and it has been duly pointed out that FPP system does poorly to address the historical under-representation of smaller political parties and, seen from a demographic perspective, of women and various ethnically or behaviourally identifiable minorities and differently-abled persons. The above wording of ‘inclusivity’ covers both the concerns of PRP in general as well as what Norris refers to as ‘social representation’. However, it is clear that the identification of a ‘desirable’ system respecting proportionality by itself can only work at the level of political parties, and thus social representation in a holistic sense implied above has to come through additional reform measures (e.g., quotas, reserved seats and the like) over and above that of how to aggregate popular votes into seats in the parliament. A similar recognition appears to have been rendered by the 2016 Canada Reform exercise, especially in terms of its recommendation # 7 cited in the preceding section.

To the extent the adoption of a wholesome model of PRP leads to a parliament of many hues, questions are often raised as to the stability of the government, e.g., to last through the entire electoral term and/or that of its policy framework. The fringe parties, even if they do get a place under the sun, are rarely able to exert a decisive role in government decision making. The more likely scenario is that other smaller parties (ranked 3 or 4 in popularity nationwide) may win sufficient seats allowing them to be reckoned with if no one wins an outright majority. The way forward would inevitably be minority governments (or coalitions post-election) which would call for a re-ordering of ‘manifesto policies’ towards the lowest common denominator. However, the resulting system, as examples abound, need not be unstable. Neither the risk of government effectiveness being necessarily compromised be great. In a system with a vast number of political parties (e.g., Bangladesh, India or Israel), the situation is more complex and prior coalition formations are often seen as key to securing a stable majority.

By ‘effectiveness and legitimacy’, the first principle in the Canada Report (2016) demands that the proposed system reduce ‘distortion and strengthen the link between voter intention and the election of representatives’ (p41). Clearly any move away from FPP toward proportionality would address the criteria just cited. The same would also enhance voter ‘engagement’ and encourage their participation in the democratic process (principle # 2, p42).

(b) *Resolving the Agency Problem*: There is a distinct belief in many circles that voters believe that the elected representative is an ‘agent’ tasked to steer legislations that are beneficial to the principal. Though the direct linkage between party platform and the unity of voters underneath that may well be tenuous, the mutuality of the relationship cannot be denied.<sup>14</sup> Surely, a majority government has a better chance to implement the electoral manifesto, and that likelihood gets eroded in minority parliamentary situations, and more so, under a formal coalition of strange bed-fellows. The FPP system may thus be seen better equipped to resolve the agency problem at least on account of the observation that it leads more easily to majority governments. Often the latter outcome is facilitated by one or two major parties (i.e., based on past performance) contesting the election either solo or in prior coalition arrangements with a number of minor/regional parties in contrast to wholesome proportional representation

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<sup>14</sup> Economics Laureate Kenneth Arrow (1970) argued long ago that ‘... political representation is an outstanding example of the principal-agent relation’ (p13).

models.<sup>15</sup> The US system is more complex as the Presidential election is formally decomposable from that to the legislature, the latter itself consisting of two chambers. Though it is undeniable that a very popular (unpopular) candidate for the Presidency will also sway votes in favour of (against) the legislative candidates belonging to the same party. Then again, only a third of all Senate seats come up for election in each Presidential electoral cycle.

A related element of the agency issue is the obligation of the elected agent to remain in touch with her constituent principals, and thus remain both ‘responsive’ and ‘accountable’, as Norris puts it. She goes on to claim that the performance and evaluation of this dual role of an elected government is practicable only in ‘single-seat districts’. Most PRP models call for multi-member districts instead thereby eroding the accountability mechanism. Below we propose an alternative that, while fully respecting proportionality in a classical sense, essentially keeps the single-seat constituency idea intact. Ensuring ‘local representation’, namely the importance to citizens ‘having access to Members of Parliament to facilitate resolution of their concerns’, essentially speaks to the core of the agency issues raised above (policy #5, Canada Report, p42). Clearly single-seat districts are critical to maintaining voter’s access to elected delegates and foster a dialogue over local needs.

(c) *The Degree of Proportionality*: Given the avowed goal of proportionality, it is necessary that any proposed mechanism must exhibit a close match between the percentage of popular votes gained by a party at the national level and its share of elected seats in the parliament. There actually exist some numerical devices that calculate the goodness of the proportionality match; one such measure is called the *Gallagher Index* and this is widely cited in the literature.<sup>16</sup> The Canada Reform actually adopted a recommendation that ‘the government should seek to design a system that achieves a Gallagher score of 5 or less’ (2016, p95). Indeed, were the vote share and seat share to exactly match for each party, the deviation for each other would be zero, which will lead to the value of the index exactly of zero. The Canadian reference point is that the 2015 election results yielded a value of 12.2, considered rather high, though the index has no natural maximum value.

Norris also argues that FPP modalities facilitate and enhance the chances of majority governments, which in turn have an easier time implementing their ‘manifesto policies’ without much dilution. This she terms as a critical indicator of ‘government effectiveness’. However, the latter term is also claimed by a well-known indicator (one of six) of ‘governance’ popularized by the World Bank (WB) since the mid-1990s. In WB’s usage, the term ‘captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government’s commitment to such policies’ ([www.info.worldbank.org/governance/wgi/pdf/ge.pdf](http://www.info.worldbank.org/governance/wgi/pdf/ge.pdf)). Implementing party manifesto may thus be more intuitively likened to the agency issue as we have argued above.

Of the four criteria that Norris (1997) had advanced, ‘fairness to minor parties’ (#3) and ‘social representation’ (#4) have been subsumed under the framework proposed above, particularly

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<sup>15</sup> Recent examples of single-party majority governments include those by the Liberal or Conservative parties in Canada, the Labour or the Conservatives in the UK, while prior coalitions led by a major party examples are found in Bangladesh (led by the *Awami League* or the BNP in the past) and the BJP or Congress in India.

<sup>16</sup> The index is computed by first squaring the deviation in the percentage of votes less its seat share for each party, adding these up, and then take the square-root of half the value (Gallagher, 1991).

under (a) inclusive representation and stability. The remaining ideas of ‘responsive and accountable government’ (#2) and what she calls ‘government effectiveness’ (#1) too are captured fully by our principle (b) ‘resolving the agency problem’,

We have thus far referenced three of five criteria adopted by the Canada Reform (2016). The remaining two relates to ‘accessibility and inclusiveness’ (#3, mainly complexity of the mechanism) and ‘integrity’ (#4, public trust, objective and verifiable process, individual confidentiality). While these seem innocuous, many specific versions of PPR addressing such concerns would seem overly complex and lead to outcomes that are non-transparent at first glance. While below we attend to these objectives squarely, it is evident that not all such ‘principles’ need be mutually reinforcing.

**4. Modalities of Proportional Representation (PPR):** A central idea of proportional representation is that all ‘political groups’ in society deserve to be represented in the national parliament, albeit in strict proportion to their share of popular votes. By groups, we would henceforth refer to the registered political parties (large or small) or independents contesting in an election. Social representation, as interpreted above, will therefore not be central to what follows, though relevant comments will be offered as relevant.

The PPR literature cites a number of different modalities of securing the avowed goal of proportionality. Most authors believe that it is essential to drop exclusive reliance on single-member jurisdictions, the hallmark of the standard FPP system in many parliamentary forms of government. Instead, one needs to innovate upon multi-member jurisdictions (MMJ), rather common throughout Europe, which again can be accomplished in several ways.

*4.1 Multi-member Jurisdictions (MMJ):* These jurisdictions may be relatively small, as various authors point out, with only three or four members, or much larger, with ten or more members each. To illustrate with an elementary example, if in a 10-seat jurisdiction, 5 contesting parties poll at 42, 30, 18, 8 and 2 percent respectively, the seat allocation would be: 4, 3, 2, 1, 0, entailing some necessary rounding off.<sup>17</sup> Conceptually, as we shall see below, most MMJ modalities do poorly to accommodate smaller parties and independents thus undermining the spirit of proportionality.

While the above arithmetic appears simple enough, there are formidable problems in its implementation. First, for an individual voter to directly vote for a slate of candidates is awkward from both sides. Even for the conscientious voter, it is not convenient to learn much about multiple candidates especially beyond those originating from their immediate constituency. The candidates too, especially those belonging to smaller entities and independents, would ordinarily find the task of canvassing over a larger number of voters spread over a large geographic area logistically challenging (both time and money). This difficulty may be ameliorated in case of candidates who are already widely known, but then we are dealing with exceptions.

That said, there are additional issues on how to allocate the ten seats to the various contestants belonging to the four successful parties. The common methods in evidence are as follows.

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<sup>17</sup> The arithmetic principle invoked here is revisited further in what follows.

(i) Party List Voting: Amy (2000) observes that over 80% of the PPR systems used worldwide utilize some form of ‘party list voting’. However, there can be two types of lists, *open* and *closed*.

*Closed List:* This is the original format of list voting. The party ranks all its candidates (say 5) in an MMJ in order and if their vote share suggests 2 seats; the first two candidates go on to represent the jurisdiction on behalf of that party. Each individual voter would be asked to cast a single vote for the party of her choice and not for any particular candidate as such (except in the case of independents), though they each know what the party list looks like.

Many issues come which may be seen to undermine the Closed List concept. Some may liken the *de facto* voting for a party instead of a candidate to an indirect exercise in suffrage. Voting behaviour may poorly reflect the participants’ true preferences. Since public views of the relative merits of candidates may well differ from that of the party leadership, the closed-list may lead to biases in voting behaviour. Voting for an already prioritised slate may lead to strategic voting in case the voter does not like some of the top candidates in the list. This may motivate her to vote for a different party, which is not her first priority, or simply skip the vote or vote for an independent by default (bias issue). Awkwardly, this practice also does not promote democratic practices within the party machinery.

*Open List:* This actually appears most common in Europe. Here the party does append a prior list on the ballot, say alphabetically, but the order of appearance is not relevant to the outcome. Each voter would now cast a single vote in favour of only one candidate from among the various lists proposed by the parties in question as well as those running as independents. Here each voter in principle have to evaluate many individual candidates (say 50 in total, 10 each belonging to each of the 5 parties in the example cited above) who vie for the ten legislative seats in her jurisdiction. That task would appear to be a challenge, though in practice most voters would probably only choose among those familiar to them. ‘Star’ candidates, regardless of party affiliation, would again be expected to do better than say in a single-seat jurisdiction. In any case, each voter’s action would identify if she has chosen an independent over a party, or indeed, if the latter, also the identity of the party in question. Hence the electoral process itself would accomplish a ranking of candidates within each political entity. The relative vote shares of each party then, as in the closed list model, determines the final allocation of seats to parties and onto individual candidates. The open list therefore mends some of the lapses cited above for the closed-list alternative, but nevertheless suffers from the general malaise affecting multi-constituency jurisdiction idea as noted above.

(ii) The Allocation of Votes to Seats: In the opening paragraph on MMJ, we quickly glossed over the arithmetic of how to allocate votes to seats. The illustration utilized the absolute vote shares of 5 parties, arranged from the most to the least, as {42, 30, 18, 8, 2} adding up to 100 total eligible votes (N). In percentage terms, in this particular case (N = 100), the relative vote shares become the same values expressed as percentages. Given that there were ten seats to go around (n = 10), each party’s proportionate share of seats would be the same percentages. Therefore, the precise seat allocation would be {4.2, 3.0, 1.8, 0.8, 0.2}, in the

same order as earlier. However, in view of the fact that only whole numbers make sense, we necessarily rounded these up or down as per convention to {4, 3, 2, 1, 0}.<sup>18</sup>

Amy (2000), on the other hand, lays out a rather intuitive version of the rounding system in what in this literature is known as the ‘largest remainder method’ to serve the purpose of translating votes to seats. In the latter scheme a figure, called the *quota*, is derived by dividing the total votes (N) by the seats (n). Thus here the quota would equal (N/n), or, 10. Now dividing the party-wise absolute number of votes by the quota yields a whole number and ‘a remainder’ as follows: {4, 2; 3, 0; 1, 8; 0, 8; 0, 2}, where the remainders are, respectively, {2, 0, 8, 8, 2}. Now observing that 8 seats have been allocated by the whole numbers already (‘first-round’), we have two seats left for further distribution. The procedure here is to offer these ‘vacant’ seats to parties securing the largest values of the remainder. Thus in the second-round allocation of these two seats would be: {0, 0, 1, 1, 0}. The latter when added to the first-round allocation yields the same final outcome as the rounding of decimals method proposed above. Though formally equivalent, the rounding modality is followed in what follows here in view of the sheer complexity of the actual electoral outcomes in multi-party and multi-jurisdiction environments.

**4.2 Mixed-member Representation (MMP):** Here a fixed share (say half) of the parliamentary seats are determined in the usual FPP mode via direct voting in single-candidate jurisdictions.<sup>19</sup> The remaining share (namely, half) of the seats are filled, however, by proportional representation from a ‘closed-list’ party-wise voting. In this instance, like any closed-list contest, voters choose the party they opt for, period. Thus each voter gets to cast two parallel ballots at the same time. The first vote is to be cast for one of the candidates in her own single-seat jurisdiction (geographically situated within the province/state/‘lander’), and a second ballot for the party of her choice. The party however proposes a slate of closed-list of ‘federal’ candidates (i.e., drawn up from within the entire federation). The goal of the second vote is to ‘determine’ the pattern of overall proportional representation in the parliament and is therefore crucial as to how each party fares in the legislative leadership hierarchy.

The dual mechanism allows major parties to ensure inclusion of candidates in the parliament whom it considers ‘key’ to their electoral agenda. This is accomplished since even if a ‘star’ candidate loses in a particular constituency in the first ballot, the same candidates can be placed at whatever order the party deems right in its party-list for the second ballot. If elected directly in round-1, the candidate’s name is automatically deleted from the closed-list in determining the final slate of candidates to be represented in the parliament.<sup>20</sup>

Loosely put, if in a 100-seat parliament (50:50 split between the two votes), a party winning 30% of votes in the second ballot, has the right to have a maximum 30 total delegates in the

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<sup>18</sup> Surely, contentions may arise in more complex real life situations and hence the rounding rules and the like ought to be clarified by the electoral authorities in advance of the polls. See more on this below when we deal with actual (recent) election data for Canada and the US.

<sup>19</sup> The description of MMP, particularly that relating to the German system is based on web information: [https://en.wikipedia.org/wiki/Electoral\\_system\\_of\\_Germany](https://en.wikipedia.org/wiki/Electoral_system_of_Germany), retrieved as of Nov 7, 2019. The critical comments and remarks of course belong to the author.

<sup>20</sup> Of course, a similar recourse is feasible in some direct parliamentary elections governed by the FPP system whereby ‘stars’ can be nominated in multiple constituencies, though they can hold only one seat in case of victory in plural locations (as in Bangladesh, India and possibly elsewhere).

parliament.<sup>21</sup> This implies that if it gets 10 delegates elected in the FPP mode, that party would be entitled to elect the remaining 20 members from the closed list. Save minor details, this is how the German electoral system works, which has been in force since the second war with minor adjustments.

The MMR mechanism is often claimed to offer the best of both worlds. It is argued that the first vote allows the election process to be ‘personalised’ where candidates seek out voter support and the voters, in turn, can claim to have elected or defeated a candidate, as the case maybe. The second vote ‘ensures’ overall proportional representation. As stated earlier, the closed-list idea has serious drawbacks. Moreover, many find the two votes required of each individual elector confusing and some may view the second vote to be of a lesser consequence! Even if public education can ameliorate that over time, additional issues call for further analysis. Among others, the MMR mode, as we see below, appears to favour larger and more established political parties, which defeats the spirit of representativeness.

(i) The Adding-Up Issue: While it is touted that the ratio of votes for the party-wise ‘second vote’ determines the overall share of seats in the new parliament, this is subject to important qualifications. For one, if the second-round vote share is inadequate to justify the number of single-seat constituencies it has already won, we are led into a puzzle. This can happen easily whereby, say a regional party wins 15 seats by polling 30 % within the jurisdiction, but only 10% in the second ballot. This party then become eligible to have a total of 10 members in the 100-seat parliament. In practice, the excess five members are NOT denied seats in the German system. Such an instance occurs often, which leads to a proliferation of seats, called ‘excess mandates’. If only one party becomes entitled to such excess seats, to continue the example cited above, the parliament would end up with 105 seats, five more than the designated 100-member parliament.<sup>22</sup> In reality, after the 2017 election, the Bundestag indeed had 631 members, i.e., 33 more than the designated 598 seats, 299 each from the two polls (single-seat and party-list).

However, the underlying favourable outcome for a more established party is evident by realizing that vis-à-vis the regional outfit, it would, with a similar effort, would be more likely to poll at the 20 % level in both rounds, and thus be entitled to gain 20 seats overall vis-à-vis 15 for the regional party.

(ii) Reform Within: The adding-up anomaly could have been mostly avoided by averaging the share of popular votes from both ballots, namely the single-member districts as well as the party-list voting. Thus, to pursue the example laid out above, consider a party winning 15 seats (out of 50), i.e., 30 % of seats in the first ballot, by gaining a within-jurisdiction (State/province/‘lander’) vote share of say, 30 %. Even if this party were to poll 10% in the second ballot, the simple average would be 20%, thus enabling it to claim an additional 5 seats on top of the 15 seats it had already won in round-1. Thus under the averaging formula cited here, the regional party in the example above would not encroach upon the excess mandate privilege. This mechanism would appear to exert a moderating influence on a

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<sup>21</sup> While we have been using terms such a ‘first’ and ‘second’ ballot or the ‘first’ and ‘second’ vote to describe the dual vote in the MMR mechanism, we remind the reader that these were temporally parallel or contemporaneous events.

<sup>22</sup> This is an oversimplified illustration. There appears additional checks and balances designed in part to trim the excess mandates.

regional party's risk of using up excess mandate in the national assembly without however eliminating it altogether. More on a positive note, it would instead afford a greater degree of proportionality to such parties than in the extant mechanism in Germany. In effect, such a measure would appear to move the system closer to one of pure proportionality.

However, while the averaging solution would work well in most cases, this need not necessarily resolve what we have termed the 'adding-up issue'. If the said party in the example above, had indeed obtained 16% vote share in round-1 while polling 10% in round-2, the average would come down to 13%, entitling it to have a total of 13 seats in the 100-member house. Thus, not all 15 seats directly won cannot be accommodated in this fashion. Evidently there are many different ways to avoid the latter difficulty, e.g., having a prioritised list in round -1 as well, or, preferably, rationing by means of the margin of victory rule (see more on this below).

(iii) Threshold vs Inclusivity: There arises the provision of a 'minimum threshold' idea practiced in some systems. In Germany as of now, only if a party secures a minimum of 5% in the second ballot, it is entitled to proportional representation and retain the full party status in the parliament. An exception is made if it had successfully elected at least three delegates in the single-seat constituencies first. While there maybe merits to rationalisation on grounds of logistics to not extend official party status to those polling just enough to elect just one or two members in the parliament, the very foundation of proportional representation à la Mills is the extension of such privileges to all on grounds of inclusivity.

4.3 *Single Transferable Vote (STV)*: This is a mechanism, also known as Choice Voting, that allows vote transfers among candidates vying for a slot in multi-member jurisdictions, MMJ, all of whom would be ranked by voters. They are allowed however to rank as many or as few candidates as they wish. The electoral process utilises the recorded strength of voter preference to transfer votes among candidates.<sup>23</sup> The objective is to offer smaller parties, independents and various minority groups a higher chance of being elected than may be possible under the FPP system. As reported in Wikipedia, the method is practiced in national elections in Ireland and Malta.

The STV mechanism builds on the idea of an *electoral threshold*, namely, the minimum number of votes required to win in an MMJ. The threshold definition often used in the literature is described as

$$T(N, S) = \lceil \{N/(S+1)\} + 1 \rceil,$$

where N denotes the number of valid ballots and 'S' the number of seats in the jurisdiction. This threshold formula has an interesting interpretation. For smaller values of S, one need not gain as many votes as the fraction (1/S) would require to be declared 'elected'; however, as n-becomes larger, the fraction approaches (1/S). However, as S-rises, so does the threshold approaching to (N/S), meaning that a winning candidate must 'obtain' the exact proportion of votes as there are seats in a contest. For illustration, in a 2-seat jurisdiction, with 1,000 voters, the threshold, T(2), would be 334, far below 500. Now, in contrast, if S = 24, it follows that

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<sup>23</sup> The STV system reviewed here, apparently developed in Denmark and England in the 19<sup>th</sup> century, is also known variously as 'choice voting', or the 'Hare-Clark system' in different contexts. Sir Thomas Hare (1806-1891), a contemporary of Mills, championed the cause of proportional representation and authored several books on the theme, some in plural editions, between 1859 and 1873.



$T(24) = 41$ , which is rather close to 42, or  $(N/24)$  rounding off decimals as is standard. Another nice feature is that it reproduces the majority-vote rule in a standard single-seat jurisdiction, where  $T(1) = 501$  if 1,000 votes were cast. We shall comment more on this definition later in the discussion.

Observe that the above scheme invokes the idea of ‘surplus votes’, that is excess votes garnered than actually needed to win, i.e., those in *excess* of the threshold. It is claimed that in the FPP system, all such surplus votes are wasted, while under STV, these are utilised to bolster the chances of weaker candidates (Amy, 2000). A critical feature of the mechanism is that the electoral outcome is determined by examining the pattern of voter preferences and thus a fair amount of computation is required to determine the winners. It starts off by counting all first preferences; all who meet the threshold under this criterion are declared winners (Round-1). If seats remain unfilled, in Round-2, the second preferences of the excess votes assigned to the just ‘elected candidates’ are re-assigned to reach the threshold. Should the latter process fail to elect sufficient candidates, in the 3<sup>rd</sup> round, the person with the least votes is eliminated, and these votes are redistributed according to that person’s second preferences. This process continues in the above manner until all seats are filled. Evidently, if the first round outcome fails to elect anyone at all, the process starts by eliminating the candidate with the least number of first preference votes and so on.

The actual process of vote transfers therefore may prove arduous requiring judgements or calling for additional rules agreed upon in advance. We choose to illustrate the STV mechanism by means of a relatively simple example, where 100 electors are choosing three delegates out of six running for office, i.e.,  $S = 3$  and  $N = 100$  such that  $T(100, 3) = 26$ .

**Table 1: STV Mechanism, An Illustration ( $N = 100, S = 3, T = 26$ )**

Candidates	Round-1	Round-2	Round-3	Round-4	Remarks
<b>A</b>	36	26 (-10)	26	26	Elected in R-1
<b>B</b>	22	22	24 (+2)	26 (+2)	Elected in R-4
<b>C</b>	19	19	19	27 (+8)	Elected in R-4
<b>D</b>	12	19 (+7)	19	19	
<b>E</b>	9	12 (+3)	12	0 (-12)	Eliminated in R-4; 2 of these voters did not rank beyond 2 <sup>nd</sup> preference
<b>F</b>	2	2	0 (-2)	0	Eliminated in R-3

Source: Author’s construction

Several points are in order. First, the number of rounds it may take to complete the electoral process can be numerous, though just four in the illustration above. Secondly, in principle, it requires a detailed knowledge of *each voter’s complete set of preferences*. In Round-2, the ten excess votes were to be transferred to eligible candidates. Since the 36 who ranked ‘A’ as their first choice could have ranked B and C equally as their second preference, i.e., 18 each, or any numerous ways!<sup>24</sup> Which particular 10 ballots are to count? Randomisation would be the only viable solution, but that could be challenged by candidates alleging bias,

<sup>24</sup> The only unique case would have been if fortuitously, only 10 out of 36 had a second preference at all.

intended or otherwise. A similar remark applies to all cases of vote transfers, the hallmark of the mechanism!

In round-4 here, we utilised the feature that not all voters may rank all or most candidates. A final point, though not a matter of logic, is the naming of the mechanism, ‘single transferable vote’, since in practice votes may have to be transferred multiple times. As seen in Table-1, E received 3 votes from A in round-2, but all these could have been further transferred on to candidates B and/or C. Presumably, in practical contexts, ad-hoc rules may be used to either short-circuit the process or keep the computation running ad-indefinitum. While technology can handle the complexity hands on, the process may lack the appearance of transparency to the electorate.

It is probably not a surprise, though it does not appear to have been recorded in the literature in spite of its long history, that STV mechanism does not get around the *paradox of voting* type of situations. The paradox, as one would recall, arises in choosing among three candidates (A, B, and C), where in spite of each voter being consistent and having ranked all candidates, the transitivity rule of aggregating preferences fail to find a majoritarian winner.<sup>25</sup> Recast here, consider a 2-seat MMJ, where the preferences of numerous voters were evenly distributed into three categories of ranking similar to those of voters 1, 2 and 3 in the example of the preceding footnote. In round-1, there will be no winner as each candidate would gain  $(N/3)$ -votes, against the requirement of  $[(N/3) + 1]$ . The transfer mechanism fails altogether since each candidate gains  $(N/3)$  votes when aggregated under each rank of 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> preferences.<sup>26</sup>

**Table 2: Paradox of Voting and the STV Mechanism: (N = 99, S = 2, T = 34)**

Candidates	Rank-1	Rank-2	Rank-3	Round-1	Remarks
A	33	33	33	No one elected	No vote transfer possible; no one has a surplus; also no unique laggard
B	33	33	33		
C	33	33	33		

Source: Author’s construction

In spite of the odds outlined above, one positive argument in favour of STV is that there is minimal wastage of votes as surplus votes from outright winners can be transferred to elect others (and on occasion, via the elimination of least-vote candidates). This may be seen to empower voters and induce them to show up to vote in MMJ contexts, a feature that cannot attributed to other proportional systems.

**5. Jurisdictional Representation (JDR), a ‘New’ Proposal:** The issue of a fuller representation of voters in the Parliament in a federal system is quite distinct as those arising in a unitary form of government. The case for fulsome representation here must take into account the scope of such representation from the perspective of each and every geographic entity, call it a jurisdiction, large or small, that make up the Federation, as for example the 13 provinces and territories that make up Canada. Each of these entities would often have different

<sup>25</sup> If voter-1 (hereafter, V1 etc), ranks A to B to C, transitivity requires that V1 prefers A to C. If now V2 ranks B to C to A and V3 comes in as C to A to B. While aggregating these preferences, we get a majority of 2-to-1 in favour of pairs: A to B, B to C as well as C to A, and thus by transitivity A to C. The latter outcome however contradicts the direct vote 2-to-1 in favour of C to A. The paradox was first discovered by Condorcet (1785).

<sup>26</sup> There is nothing clever about  $N = 99$  in Table 2; where only whole numbers make sense, any figure when divided by three yields an integer will do.

histories and thus differ in environmental, societal and cultural attributes from each other. Therefore, voters' prioritisation of issues to be dealt with in a Parliament would in principle also vary among jurisdictions. Thus the 'minorities' or 'sections' in society that Mill was preoccupied with in his essay would apply *mutatis mutandis* particularly to the smaller entities in the Federation. In this paper, we relate the term 'jurisdictional representation' to denote the primacy of representation viewed from the perspective of the constituent jurisdictions (namely, provinces or states) within a federation. Here, put differently, jurisdictional vote shares enjoy dominance in deciding outcomes over the majoritarian ranking of candidates in single-seat constituencies that make up a jurisdiction.

How can the principle of 'jurisdictional representation' (JDR) be made operational respecting proportionality in the simplest manner possible in a federal democracy without demanding a lot of the voters in terms of their capacity to articulate their wishes? The benchmark scenario requires each voter to cast her unique ballot in a given constituency in favour of just one of the candidates fielded by various parties or independents running on their own cognizance. By 'operational', we mean that each jurisdiction would be represented in the parliament by delegates strictly by party-wise vote shares within the jurisdiction, albeit subject to necessary rounding. How do we allocate the seats to votes? The essence is as follows. If the jurisdictional vote share suggests 8 seats, but the party would have won 12 single-seat districts by the plurality criteria in the status-quo FPP mode, it has to relinquish claim to the 'excess' four seats in some orderly fashion. Intuitively it appears ideal that one declare just 8 of the constituencies where the party received eight highest share of votes as having been won by that party. The remaining 4 seats would go to other parties strictly as per their vote shares in that jurisdiction. Thus it is quite likely that an individual constituency may be represented in the parliament by a party with the second-highest or the third-highest vote share in the constituency.

While alternative coherent systems may exist by which to accomplish the task of allocating seats among the contestants, below we show that the intensity of voter preferences, as measured by the share of votes a candidate earns in a particular constituency turns out to be the critical element. We also need to construct the pattern of this intensity across all constituencies within a given jurisdiction. Together, these two properties prove sufficient to allocate seats under JDR. The only data we require is the record of votes in each and every constituency polled by all candidates competing in the election.

Though it may give an appearance of a minor digression, in view of the fact that some elementary calculations are in order, we believe it is helpful to present a brief algebraic model of how the JDR system may be implemented and present this in a standard welfare-theoretic perspective. In the context of the electoral choice confronting us, the mechanism in question here may be likened to a 'stretch' open-list multiple-member jurisdiction, but importantly the multi-member entity is the 'jurisdiction', namely the state or province. The ordering of candidates in the 'open-list' is being accomplished by the exercise of suffrage and not by overt party machinations. Strategic parachuting of star candidates to constituencies may be thwarted in part by the requirements of 'local residency' as well as by voter wrath at such opportunistic devices.

*Choice Before Society:* In the next few paragraphs, we describe how a society would go about aggregating the popular votes cast in various constituencies into choice of delegates that would represent the jurisdiction in the national parliament. It appears useful to offer a heuristic

interpretation of the underlying process by attributing a real-valued welfare function  $W$ , the latter cherishing varied political/constitutional ‘views’ exhibited by different parties contesting the election. Societal preferences adopt the strength of voter preferences exclusively determined by vote shares that each party receives, i.e., societal views are ‘Paretian’, being entirely dictated by individual voters’ choices. For illustration, we assume that in a given jurisdiction, the election in question is being contested by four national-level political parties (A, B, C and D), two independents (I-1 and I-2, separated by hyphens) and a plethora of minor parties active in the jurisdiction (defined as ‘registered only in the jurisdiction’). For further simplicity, when appropriate, initially we lump I-2 and the minor parties together as ‘Others’ (R) in this section.

Now we may denote the welfare function as:

$$(1) \quad W = W(A, B, C, D, I-1, R), \quad W_A, W_B, W_C, W_D, W_{I-1}, W_R \geq 0,$$

where the arguments of the  $W$ -function, namely  $\{A, B, \dots, R\}$ , are denoted by positive integers, being the whole number of constituencies that each political party would be entitled to under the jurisdictional representation idea as proposed in this paper (condition 2 below). The  $W_K$ -values, symmetric for all  $K$ ,  $K = A, B, \dots, R$ , denote incremental values (or, ‘difference quotients’) of the  $W$ -function as  $K$  increases in magnitude, which themselves decrease in their own arguments. Observe that while throughout the paper we denote the various political parties by the labels  $\{A, B, \dots, R\}$ , whenever we refer to the seat entitlement of a party, without any confusion we use the same labels as explained by condition (2) below:

$$(2) \quad K \leq \lceil \{S n(K)\} / N \rceil, \quad K \geq 0, \text{ and } K = A, B, \dots, R,$$

where  $S$  denotes the total number of constituencies/seats in the jurisdiction,  $N$  the number of valid votes cast within the jurisdiction and  $n(K)$  is the number of votes gained by party- $K$  throughout the entire jurisdiction. Note that the proportionality rule as defined above, by which any party, whose vote share within the jurisdiction multiplied by the total number of seats within the jurisdiction rounds to the nearest integer (including 1), will be allowed representation in the parliament. This feature must be seen as the fairest feasible in terms of inclusivity, though can be diluted by invoking the idea of a threshold on the vote share,  $\lceil \{n(K)/N\} \rceil$ . The threshold issue is taken up later in the discussion.

It is intuitive that the proportionality rule would have to be modified in case of independents, since the appeal of such a candidate to the electorate can only be meaningfully measured by her vote share within the electoral district in question. Below we return to this point in greater detail.

Returning to the seat-allocation matter, of necessity we would require<sup>27</sup>

$$(3) \quad \sum K = [A + B + C + D + I-1 + R] \leq S.$$

Condition (3) ensures that we do not at this time admit the idea of ‘excess mandate’ as, for example, in the German context. No political party, following the proportionality rule (2)

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<sup>27</sup> The weak inequality in (2) and (3) implies that the election authorities may not be able to declare all seats duly filled due to rounding norms, thus requiring a by-election or two. We return to the latter issue in due course.

above, may be entitled to any additional seats within the jurisdiction beyond as mandated by (2). We may reinforce the latter statement by

$$(4) \quad W(K+1) = 0 \text{ for all } K, \text{ where } K = A, B, \dots, R.$$

Condition (4) may be likened to reaching a point of satiation on the part of society. Observe that conditions (2) and (3) uniquely solve for the proportionality rule being proposed here, except for details of rounding, especially when  $S$  is in single digits, that we shall take up below. Thus with the values of each of  $\{A, B, \dots, R\}$  determined by (2) and (3), the  $W$ -function is fully determined, which *ex-post* is high or low depending on how many non-zero values are there, the more the merrier.<sup>28</sup> Without further structure, we are not able to dwell on whether dispersion among the magnitude of the arguments of  $W$  would make society better off or not.

However, the above description still does not solve who among the contestants belonging to various parties get to be ‘elected’. In order to derive a decision rule, we focus on the critical element, namely the percentage vote share of party- $K$  in a given constituency within the jurisdiction, denoted by  $q^i(K)$  such that:

$$(5) \quad q^i(K) = [n^i(K)/N^i], \text{ such that } \sum_i q^i(K) = 1, \text{ each-}i, i = 1, 2, \dots, S, \text{ and all } K,$$

where  $N^i$  [ $\sum_i N^i = N$ ] denotes the total votes cast in constituency- $i$  of which  $n^i(K)$  is the number of votes polled by party- $K$ .

*Decision Rule:* Within each constituency, the decision rule would be as follows. First we rank all the toppers (i.e., in terms of vote share) of each constituency, denoted by  $q^{01}(i)$ , from the highest to the lowest among all contestants. Thus

$$(6) \quad q^{01}(i, K) = \text{Max} \{q^i(K)\}, \text{ all } i= 1, 2, \dots, S.$$

Note that under the plurality FPP mode, these are precisely the members who would have been declared elected. Under JDR, however, we have the restraint imposed by condition (2) above. Hence here the seat allocation exercise, namely rule (6) would have to continue, as necessary, albeit sequentially for those coming in second, third and so on in respective constituencies (i.e.,  $\{q^{02}(i)\}, \{q^{03}(i)\}, \{q^{04}(i)\}$ ) within the jurisdiction. Observe that any ordered sequence  $\{q^{0j}(i, K); i = 1, 2, \dots, S; j = 1, 2, 3, \dots\}$  tells us the precise value of the vote share in district- $i$  as well as who the candidate- $K$  was.

Thus one would require a few rounds to accomplish the entire task; however as illustrated below, the computational task becomes a lot easier as we progress since the number of constituencies and the number of parties still in play fall off sequentially. In round-1, any party that claims some of the  $i$ -constituencies in (6) will be entitled to these seats in the same order as they appear in  $\{q^{01}(i)\}$ , so long as condition (2) is satisfied. Evidently this will leave some parties, especially smaller parties and independents, unable to find a slot as allowed by (2). Larger parties may find its candidates unhappy that in spite of being a topper in some constituencies, they have to forfeit their seats by virtue of their parties having already met their due seat shares as determined by their fortune in popular votes (i.e., by condition 2). The latter seats become open for further reallocation. Again the same rule as (6) above applies, except now we evaluate those finishing second, third and lower down the order,  $\{q^{0j}(i, K), j = 2, 3, 4, \dots,$

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<sup>28</sup> Thus, for example, in a 30-seat jurisdiction,  $W(10, 10, 6, 2, 2)$  would be ranked higher than  $W(10, 10, 6, 4, 0)$  etc. Note the marginal valuations ( $W_K$ ) are all positive and that they each decrease in their own arguments.

where by virtue of (2) and (4), the domain of S and of K have already been curtailed. The process continues until we have identified all winners, or indeed, as seen below, vacancies emerge.

An important by-product of the device presented above, born as it is to emphasize inclusion, is that it strikes a near fatal blow to the proclivity for *gerrymandering*, widely perceived to be guided by opportunistic behaviour at best. In specific contexts and in specific epochs such manoeuvres have often been portrayed as predatory attempts to deny the rights of the minorities or other disenfranchised groups in society (see e.g., Lowenthal, 2019). Since, under JDR, the overall seat share of a party is determined by its share of votes over the entire jurisdiction, it may not be able to hang on to all the single-member districts it would 'win' via FPP. That force by itself weakens the impetus to engage in such behaviour. By allocating its popular support thinly among a larger number of constituencies, while its chances of winning the plurality of votes in the number of districts may go up, its overall vote share throughout the jurisdiction need not budge much. This would expose the party more vulnerable as its 'top' vote shares would tend to rank lower down the order, than in the absence of clever re-districting, as per condition (6) above. And thus diluting its chances of hanging on to the many low-vote wins under jurisdictional allocation.

This completes a brief description of the JDR idea we propose here in allocating seats in an election. To remind the reader of the basic simplicity of the mechanism at play here, each voter casts just one ballot in favour of a particular candidate in her own constituency and that is the only data that we need to allocate seats proportionally such that conditions (2) - (6) are satisfied.

While we undertake a 'validation' exercise in the context of actual election results in order to elucidate the differences of the proposed system from alternative modes of aggregating votes, a quick example may serve as a point of departure. While this may strike one as overtly simple, it would prove to be an adequate description of how the JDR principle may be implemented in an actual situation. Indeed, it is rich enough to invoke most of the major concerns that come to mind. As laid out above, in a given jurisdiction, let the contestants be four national level parties (A, B, C and D), two independents (I-1 and I-2) running in two specific constituencies and some minor parties. Some of the latter may well be entirely regional in character and thus being different entities in different jurisdictions. As before, whenever convenient, we lump I-2 and the minor parties together as 'Others' (R).

Let there be two jurisdictions (I & II), respectively with 20 and 10 single-seat constituencies in each, thus making up the total 30 seats in the (federal) parliament. Let the percentage vote shares in Jurisdiction-I be {43, 27, 14, 10, 3, 3}, respectively for the parties in order; while in II we have {30, 40, 20, 4, 4, 2}. How should these votes be aggregated? Let us examine the data reproduced in Table 3.

We further hypothesize that, under the FPP mode, party-A by polling 43 and 30 percent, respectively, in the two Jurisdictions, gains a total of 16 of seats and thus outright goes on to form a majority government. However, as shown in columns (7) and (8), the story is very different under jurisdictional presentation. We are very much in a minority or coalitional government territory; moreover, both the leading parties have paths of heading the government depending on their ideological proximity to Party-C. Were the number of parties in the contest been higher, as is often the case in parliamentary systems, the coalitional, *de facto* or otherwise, opportunities would be even greater.

**Table 3: Jurisdictional Representation, An Example**

Party	% Votes in Jurisdictions		Hypothetical FPP Outcome			# of Seats under JDR		
	I	II	I	II	Total Seats	I (% of total seats)	II (% of total seats)	Total Seats
<b>A</b>	43	30	8	8	16	4 (40)	6 (30)	<b>10</b>
<b>B</b>	27	40	2	11	13	3 (30)	8 (40)	<b>11</b>
<b>C</b>	14	20	0	1	1	1 (10)	4 (20)	<b>5</b>
<b>D</b>	10	4	0	0	0	1 (10)	1 (5)	<b>2</b>
<b>I-1</b>	3	4	0	0	0	1 (10)	1 (5)	<b>2</b>
<b>R</b>	3	2	0	0	0		0	
<b>Total</b>	<b>100</b>	<b>100</b>	<b>10</b>	<b>20</b>	<b>30</b>	<b>10</b>	<b>20</b>	<b>30</b>

Source: Author's construction

Now we get into the core issue of who to declare elected under JDR, namely put faces to figures in the last column drawn up from all contestants. It appears to render a happy ending whereby each party, large or small, has found a place under the sun! Given the details, from hereon we only focus on Jurisdiction-I, which comprises of just 10 seats. Let us start by ranking the topper in each constituency by their respective vote shares. These are indeed the ten individuals who would have gone on to outright gaining the 10 seats under the majoritarian system. Arranged from the highest to the lowest, the pattern of party affiliation may well be {A, A, B, B, A, A, A, A, A, A}, which reflects the outcome depicted in column-4 above.<sup>29</sup> The respective constituencies will henceforth be labelled {S1, S2, ..., S10}. Under JDR, party-A would get to retain {S1, S2, S5, S6}, while {S3, S4} would be claimed by party-B, thus using up 6 seats altogether. Hence we need to examine {S7, S8, S9, S10} for further reallocation, and noting that party-A has no further claim, thus restricting the domain of both i and K. As per equation system (6) above, we examine the second, third and possibly fourth place finishers, namely { $q^{02}(i)$ }, { $q^{03}(i)$ }, { $q^{04}(i)$ } in these four constituencies. Let the next one emerge as follows:

$$(7a) \quad \{q^{02}(i, K)\} = \{B, B, C, B\}, i = \{S7, S8, S9, S10\}$$

It is easy to observe that S7 goes to B, while S9 goes to C, fulfilling their respective quotas, and hence then on candidates running under the banner of party-B and C would also be disqualified from any further claims. Thus we are left with a narrow domain of just two constituencies, S8 and S10 and only 3 contestants, D, I-1 and R. Examining the next rounds, we have:

$$(7b) \quad \{q^{03}(S8, S10; K)\} = \{D, C\};$$

$$(7c) \quad \{q^{04}(S10; K)\} = \{R\}$$

Hence by (7b), S8 goes to party-D, and in the last round, here 4<sup>th</sup>, we succeed in allocating the last seat to party-R, namely 'Others'.

*Thresholds, Vacancies and By-Elections:* Turning to the details of the jurisdictional representation idea, below we take up some special situations that may require additional guidance from the parliament than contained in the brief outline presented above. The point of

<sup>29</sup> Observe that this statement is a consequence of conditions (5) and (6) above.

the exercise is not to offer definitive specifics at this stage, but merely observe that such circumstances can be dealt with given foresight and experimentation. While in Table 3, we have deliberately been vague in not describing who exactly won the seat for ‘Others’. The point being deliberated here is whether society wishes to offer a seat to individuals or minor parties, who together earned 6% of popular votes in a 10-seat jurisdiction. By rounding, 0.6 is close to unity; however, the issue is that most votes anyone earned was the independent, who gained only 3% of popular votes. On her own merit, she would not qualify as per the proportionality condition (2) above.

The question of a threshold, though contentious, is relevant here. Presumably the issue has historically been a concern of endowing an official party status to a small party with few followers in the parliament, which has certain resource and procedural implications. While we do not intend to debate the point much except to note that such concerns do not arise in case of independents acting of their own cognizance. Further, by virtue of the inclusivity principle, it would have been unfair to pit an independent running in a particular constituency, against a political party even of a regional nature. The 3% vote share over the entire jurisdiction may have been contributed by a more substantive share, say 20% or more, in the constituency in question. Nevertheless, if the vote share of I-1 were too low (say below 5% of votes in that constituency), the seat could have been declared *vacant* and, in due course, a by-election called. Thus to highlight such a contingency, in principle, we chose to allocate a seat to ‘Others’ in Jurisdiction-I. By contrast, in jurisdiction II, as seen in Table 3 (column 8), another independent, also labelled I-1 there secures 4% of jurisdiction-wide votes, which entitles her to a full seat (i.e., 5% of the total seats at play) on merit [i.e., as per condition (2)] in a 20-seat jurisdiction.

It is important to examine the implications of condition (2) holding with a strict inequality, namely that some seats will remain vacant. That can only occur if independents and minor parties (or any party for that matter) collectively win enough votes to deny larger parties a clean sweep of seats within the jurisdiction, without any single entity however winning enough votes to claim a seat under the proportionality rule, (2). The discussion in the preceding paragraph suggests that in such a case, independents may still be allocated seats event if they individually fail to qualify as per condition (2) so long as the constituency-wide threshold is met, i.e.,

$$(2a) \quad \text{Even if } \lfloor \frac{S_n(K)}{N} \rfloor < 1, K = 1 \text{ if and only if } q^i(K) \geq \tau, K = I-1, I-2,$$

where  $\tau$  denotes the constituency-wise threshold value (in percentage terms) and  $\lfloor \frac{S_n(K)}{K} \rfloor$  is rounded to a whole number.

As is, (2a) only applies to independents. What about thresholds for minor parties? Note that by our proportionality rule, any party whose vote share within the jurisdiction multiplied by the total number of seats within the jurisdiction ( $S$ ), rounds to any integer (including 1), will be allowed representation. This feature must be seen as fairest in terms of inclusivity. If society wishes to extend the same privilege to all minor parties without any differentiation, then the allocation will proceed by prioritising those with the most votes as above. The latter situation would require that condition (6) above be amended to apply to vacant seats as per the following:

$$(6a) \quad q^{0j}(i, K) = \text{Max} \{q^i(K); q^i \geq \tau\}, \text{ all } j, \text{ where } j = 1, 2, \dots(\text{the round identifier}); \\ \text{and } K = I1, I2, \text{ and } R.$$



If, on the other hand, the parliament wished to impose a jurisdictional level threshold applicable to political parties registered at the national level too, one has to revise both (2) and (6) to accommodate the scenario. That however would not, by definition, apply to independents. These are easy to state in algebra at the expense of additional notation, but not truly necessary for the arguments of the paper to proceed.

If seats do fall vacant as discussed above, one manner these may be filled up without the contrivance of by-elections would be via a reallocation of the ‘unutilized votes’ (meaning those votes earned by entities who were far short of the threshold to claim any representation whatsoever). The beneficiaries of the proportional (to original vote share within the jurisdiction) redistribution would be each of the parties who have already secured some representation (major/minor/independents). This may allow some to gain additional representation using up all seats within the jurisdiction, i.e., condition (3) holding with equality. If this failed to work, by-elections would appear to be the only way out of the impasse.

If by-elections were to be the path, who would be eligible to run? In the spirit of inclusivity, insofar as this concerns Jurisdiction-I in the present illustration, only independents and minor parties would contest. Individual candidates aligned with the top four parties, would be ineligible to contest the run-off as implied by rule  $W(K+1) = 0$  for all  $K$ .<sup>30</sup> Thus the by-election eligibility extends only to those who had already contested the election but have failed to outright win any seats or have gained seats below their share of popular votes.

A further contingency may warrant a discussion. This concerns an event whereby a registered political party (say, C in the example above) polls much better than anticipated so much so that it fails to nominate enough candidates than its vote share would warrant.<sup>31</sup> Vacancies would emerge by virtue of conditions (2) and (3). In such an environment, several avenues open up as alternative paths to fill the seats. First, the electoral authorities may go ahead with by-election(s) in the relevant constituencies by modalities as have already been spelled out.<sup>32</sup> Second, treating bygone be by-gones, rules (2), (5) and (6) would suggest that we continue to allocate seats in the same manner as described above. Effectively this implies that the curious case is being totally ignored by JDR. Third, showering an abundance of fairness, society may designate the said vacant seats as ‘reserved’ for party-C (subject to meeting condition 2). The latter may then be asked to run US primary-style elections or some such exercise to choose delegates to fill these seats. But the choice between these options is to be made by the parliament and not the job of an academic exercise and hence is left out of further deliberation here.<sup>33</sup> Thus under the jurisdictional rule, the general election becomes sacrosanct, namely the seat allocation formula, once completed following the election, remains valid till the next general election. Future by-elections during the life of the current parliament to fill vacant seats, say arising out of illness, death or resignation by a member, would essentially become within-party

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<sup>30</sup> The rule would have to disqualify all who had held a registration in any of the top four parties as of the day the election schedule was announced. This procedure would eliminate mischief by individuals quitting an established party and switch to minor parties or pretend to run as independents in the same electoral cycle.

<sup>31</sup> By contrast, overly successful independents running in particular constituencies in smaller jurisdictions, thereby overwhelming the overall vote share there, has no particular consequences than the guarantee to each of winning the seat they have contested.

<sup>32</sup> Importantly, these excess votes need not be construed as ‘unutilized’ as interpreted above; other parties too may have votes in excess of what is needed for the seats (a whole number) that they were eligible for.

<sup>33</sup> While elements of the proportional representation methods described above may be likened to a lexicographic ordering (e.g., Fishburn, 1974), we do not pursue a formal analogy.

decisions. Filling of such vacancies can therefore proceed much as in US-style within-party primaries. This creates a room for a more stable governing coalition than in alternative systems.

*How does the above system measure up in terms of the normative criteria reviewed in section 3 above?* The first criterion we had flagged above, namely ‘inclusive representation’, is clearly satisfied by the jurisdictional representation scheme being analysed here. Earlier we noted that two of the principles proposed in the Canada Report (2016), namely, ‘effectiveness and legitimacy’ (i.e., strengthening the link between voter intention and electoral outcomes) and the enhancement of voter ‘engagement’ (i.e., encourage their participation in elections) are both fully addressed here. Likewise, two of the four criteria discussed by Norris, namely ‘fairness to minor parties’ and ‘social representation’ are also satisfied here, especially to the extent the latter can be accommodated within political party system as elaborated upon already.

Further the stipulating that the electoral results, mainly the share of votes earned by each party in a general election, be respected during the entire electoral cycle, by itself, endow the process more stable than is the case under FPP scenarios. Vacancies occurring during the life of the parliament will only be filled by within-party votes, which ensures unfettered guarantees that the relative party status in the legislature (e.g., majority/ minority/coalitional structure) remain intact.

The *second criterion* proposed in the paper is resolving what we call the ‘agency issues’. A standard feature of proportional representation is the departure from single-seat districts, which is obviated in the scheme proposed here since each and every ‘elected’ delegate would represent one and only one particular constituency. Though it may indeed be represented by someone not winning the plurality of votes cast, the legally elected delegate ought to interact with her constituent principals as in any single-district systems. Jurisdictional representation, as interpreted here, therefore overcomes Norris’ concern about the elected agent remaining both ‘responsive’ and ‘accountable’ to the electors as well as a similar concern raised in Canada Reform (2016), namely, the virtues of ‘local representation’. By the latter, the Report highlighted the primacy of the elected delegates’ understanding of local needs and advancing these causes to the ‘national level’.

The modalities of the ‘proportional selection’ of the elected delegates in a given jurisdiction (i.e., province/state) as proposed here also respects the ‘integrity’ clause of Canada Reform (2016). The design ensures that ‘reliable and verifiable results’ are ‘obtained through an effective and objective process’ as well as guaranteeing the confidentiality of an individual voter. Jurisdictional representation is also the simplest mode of proportionality examined above; *vis-à-vis* the *status-quo*, all it does is to allocate seats to constituencies a little differently. The signal that a single party will only earn as many seats in a jurisdiction as its popular vote share is easily comprehensible to any voter, possibly with a simple announcement (video/pamphlet etc). If that were to lead to strategic voting on part of some, that too would be easily grasped by a voter; even candidates can exploit this angle in seeking their fortunes. Therefore, this scheme also satisfies the last remaining criteria set forth in the Canada Report ‘that the proposed measure would avoid undue complexity in the voting process’ (called, ‘accessibility and inclusiveness’).

We noted earlier that Norris cites that a great virtue of the FPP system is that the latter tends on balance to yield majority governments, which are able to implement their party election manifesto without much dilution. This she terms ‘government effectiveness’. Surely any

proportional alternative, including the jurisdictional proposed here, would tend to elect minority of coalitional governments (seen more explicitly below). However, that need not detract it from quality governance; indeed, the broader WB governance indicators illustrate that a majority of the consistently top ten global performers feature proportional representation of one kind or another (save Canada, also on the list).

Finally, what about the degree of proportionality such as the Gallagher index, our *third criterion*? It is logical that if each of the constituencies in each jurisdiction had an identical number of electors, then in the proposed mechanism the vote and seat share would have matched exactly for each party, except possibly for those gaining negligible vote shares and thus not entitled to any seat due to rounding. That scenario would have yielded an index of near zero (i.e., again ignoring the rounding errors). Though the constituency design runs roughly along such lines, there are actual discrepancies in any real context due to the varying population densities among jurisdictions, especially in case of mountainous or other geographically unique regions. Below we examine the consequence of jurisdictional representation on the degree of proportionality achieved as measured by Gallagher's index in actual scenarios, namely most recent Canadian (2019) and US (2016) elections.

The above discussion therefore clarifies fully how the jurisdictional representation idea proposed and expounded above meets the normative standards reviewed in section 3 of the paper, especially concerns of inclusive representation, accountability and the agency problem and adherence to the concept of proportionality.

## **6. Jurisdictional Representation: An Illustration from Canada**

Let us now review the Canadian national election of October 2019, held under the *status-quo* FPP system. In Table 4, we present the basic data that can be used to examine various rules by which popular votes may be aggregated to determine different outcomes. That would then serve as a platform to debate the 'representativeness' of each alternative rule. Table 4 thus illustrates the actual election results in Canada 2019 as per the existing majoritarian mode, called rule-1 below. The summary outcome in the second-last row of the table reveals that as many as 6 political parties (counting each independent as a party of one) have been represented in the new parliament. The seat allocation however, determined by the FPP mode, is lopsided at 157 vs 121 for the two largest vote gainers even though the aggregate vote shares were rather similar, indeed lower for the Liberals (33.1 vs 34.4 for the Conservatives). The latter feature has been much in evidence in various US Presidential elections, which as we know can and does occur easily under the FPP mode in a parliamentary system as well. Here the two leading parties, together, gain 82 % of all 338 seats at paly by winning just 67.5 % of all votes cast.

Though no one has seriously proposed so, it is hard to conceive the consequences of the more one-sided ('winner reap all') calculus of the US-style electoral college (ECC) in a parliamentary system. A bland adaptation, dubbed Rule-2 here, shown in the extreme right-hand column, where the winning party in a jurisdiction 'earns' all seats allocated to that jurisdiction, would have effectively fielded just two parties in the parliament. The latter would have offered an extreme majority to the Liberals 233 vs 104 for the PC, with a lone NDP member drizzling on the parade. However, this leads to many unpleasant connotations. Especially when just two largest provinces together make up virtually 60% of all parliamentary

seats in the country, an application of the ECC mode of allocating seats would turn the very idea of the Canadian Federation on its head and is not further dealt with here.<sup>34</sup>

**Table 4: Allocation of Popular Votes Cast in Canada 2019**

(1) Jurisdiction: Province/ Region (# of districts)	(2) Liberals (LB)	(3) Prog Conservatives (PC)	(4) NDP	(5) BQ/Green (G)/ PPC (R)/Ind (I)	Alt Rule_2 ECC
<b>AB (34):</b>	13.8 (0)	69.0 (33)	11.6 (1)	G: 2.8(0); R:2.2(0)	<b>PC: 34</b>
<b>BC (42)</b>	26.2 (11)	34.0 (17)	24.4 (11)	G: 12.5 (2) Ind: 0.9 (1), R: 1.7(0)	<b>PC: 42</b>
<b>MAN (14)</b>	26.5 (4)	45.2 (7)	20.8 (3)	G: 5.1 (0), R:1.7 (0)	<b>PC: 14</b>
<b>NB (10)</b>	37.5 (6)	32.8 (3)	9.4 (0)	G: 17.2 (1), R:2.0 (0), I = 0.7 (0)	<b>LB: 10</b>
<b>NFL (07)</b>	44.9 (6)	27.9 (0)	23.7 (1)	G: 3.1 (0)	<b>LB: 7</b>
<b>NS (11)</b>	41.4 (10)	25.7 (1)	18.9 (0)	G: 11.0(0), I: 1.5(0)	<b>LB: 11</b>
<b>NVT (01)</b>	30.9 (0)	26.1 (0)	40.8 (1)	G: 2.1 (0)	<b>NDP: 1</b>
<b>NWT (01)</b>	39.7 (1)	25.5 (0)	22.3 (0)	G: 10.6 (0)	<b>LB:1</b>
<b>ON (121)</b>	41.6 (79)	33.1 (36)	16.8 (6)	G: 6.2 (0), R: 1.6(0), I: 0.4 (0)	<b>LB: 121</b>
<b>PEI (04)</b>	43.7 (4)	27.3 (0)	7.6 (0)	G: 20.9 (0)	<b>LB: 4</b>
<b>QC (78)</b>	34.3 (35)	16.0 (10)	10.8 (1)	BQ: 32.4 (32); G: 4.5 (0), R: 1.5 (0)	<b>LB: 78</b>
<b>SK (14)</b>	11.7 (0)	64.0 (14)	19.6 (0)	G: 2.6 (0), R: 1.8 (0)	<b>PC: 14</b>
<b>YK (01)</b>	33.5 (1)	32.7 (0)	22.0 (0)	G: 10.5 (0); R:1.4(0)	<b>LB: 1</b>
<b>Rule-1 FPP (338)</b>	<b>33.1 (157)</b>	<b>34.4 (121)</b>	<b>16.0 (24)</b>	<b>BQ: 7.6 (32) G: 6.5 (3), I: 0.4(1)</b>	<b>338</b>
<b>Rule-2: ECC (338)</b>	<b>233</b>	<b>104</b>	<b>1</b>	<b>0</b>	<b>338</b>

*Source:* The data used here is the currently updated version as existing on October 22, 2020 on the Election Canada official website ([www.elections.ca/](http://www.elections.ca/)).

*Notes:* (i) In each cell the first figure denotes the share of popular vote within the relevant province/region, while the ones in bracket is the number of electoral seats won in the region as per Rule\_1, namely the FPP mode under the parliamentary system.

(ii) The vote shares in each row do not always add up to 100% since smaller parties (or, independents for that matter) garner some votes without winning any seat at all.

(iii) Rule\_2 denotes the US Style Electoral College, ECC (... 'Winner reap all').

(iv) Note that at least on two cases (NS and SK) where the number constituencies ran to double digits each, the NDP winning close to 20% of vote shares failed to win a single seat in either.

<sup>34</sup> In a parliamentary system, it is not meaningful to elect a Primer Minister without allocating to her the number of delegates commensurate with the margin of victory, namely the majority/minority issue. To suggest that all constituencies in a province be filled by only one party in the parliament by virtue of its popular vote share, would not only be absurd; it would tantamount to a dissolution of the Federation.

We now turn to the aggregation of jurisdiction-wise seat allocation, which is shown in Table 5 (Rule-3). We begin by reproducing the raw data on the 2019 Canadian general election one more time. Recall that now the jurisdictional share of popular votes determines the level of representation earned by each political party within the jurisdiction. Voters, to repeat, choose a party more than they choose individual delegates and thus many ‘winners’ of specific constituencies may not earn their seats if the party does not perform commensurately well. In effect, for this mechanism to work smoothly, each party ought to field delegates in a sufficient number of constituencies that is consistent with its anticipated vote share. Though proportional representation modalities differ across countries, as explained above, we propose individuals to contest each constituency so that only direct popular votes count, even incompletely, in determining the ultimate composition of the parliament.

**Table 5: Allocation of Constituency Seats on a Proportional basis**

(1) <b>Jurisdiction: Province/ Region (# of districts)</b>	(2) <b>Liberals (LB)</b>	(3) <b>Prog Conservatives (PC)</b>	(4) <b>NDP</b>	(5) <b>BQ/Green (G)/ PPC (R)/Ind (I)</b>
<b>AB (34):</b>	13.8 (5)	69.0 (24)	11.6 (4)	G: 2.8(1); R:2.2(0)
<b>BC (42)</b>	26.2 (11)	34.0 (14)	24.4 (10)	G: 12.4 (5) I: 0.9 (1), R: 1.7(1)
<b>MAN (14)</b>	26.5 (4)	45.2 (6)	20.8 (3)	G: 5.1 (0), R:1.7 (0)
<b>NB (10)</b>	37.5 (4)	32.8 (3)	9.4 (1)	G: 17.0 (2), R:2.0 (0), I = 0.7 (0)
<b>NFL (07)</b>	44.9 (3)	27.9 (2)	23.7 (2)	G: 3.1 (0)
<b>NS (11)</b>	41.4 (5)	25.7 (3)	18.9 (2)	G: 11.0 (1), I: 1.5(0)
<b>NVT (01)</b>	30.9 (0)	26.1 (0)	40.8 (1)	G: 2.1 (0)
<b>NWT (01)</b>	39.7 (1)	25.5 (0)	22.3 (0)	G: 10.6 (0)
<b>ON (121)</b>	41.6 (50)	33.1 (40)	16.8 (20)	G: 6.2 (8), R: 1.6 (2), I: 0.4 (1)
<b>PEI (04)</b>	43.7 (2)	27.3 (1)	7.6 (0)	G: 20.8 (1)
<b>QC (78)</b>	34.3 (27)	16.0 (13)	10.8 (8)	BQ: 32.5 (25); G: 4.4 (4), R: 1.5 (1)
<b>SK (14)</b>	11.7 (2)	64.0 (9)	19.6 (3)	G: 2.5 (0), R: 1.8 (0)
<b>YK (01)</b>	33.5 (1)	32.7 (0)	22.0 (0)	G: 10.3 (0); R:1.4(0)
<b>Rule-1: FPP (338)</b>	<b>33.1 (157)</b>	<b>34.4 (121)</b>	<b>15.9 (24)</b>	<b>BQ: 32 Gr: 3; Ind:1</b>
<b>Rule_3: JDR (338)</b>	<b>115</b>	<b>115</b>	<b>54</b>	<b>BQ = 25; GR = 23; PPC = 4; Ind =2</b>

*Source:* The data shown above was updated on Oct 22, 2020 from the Election Canada official website ([www.enr.elections.ca/](http://www.enr.elections.ca/)).

*Notes:* The broad remarks on the construction of the table above is similar to that of Table 3 analysed earlier. However, the figures in the brackets in each cell (rows 2-14) denote the delegates/seats each party gets to keep in the Parliament as per JDR formula (2) of section 5.

As the bottom row of Table 5 reflects, the application of the procedure described above would lead to a parliament consisting of *eight* parties (again inclusive of independents), a little higher than in the FPP allocation reviewed in Table 4. However, the substance of the difference is that both the larger parties would lose a good number of seats, which would be picked up by the smaller ones. Hence the strength of the ‘minorities’ (e.g., the Greens) would be significantly enhanced, hence more representative! Comparing these two tables, it is evident that while both the majoritarian and JDR mechanisms predict a minority government, under the latter proposal however, there are more numerous pathways to forming a ruling coalition led by either of the two largest stakeholders than was the case with FPP.

To go over the functioning of the proposed mechanism at a more granular level, let us take the case of British Columbia (BC) province with its quantum of 42 parliamentary seats (electoral districts). Proceeding as described in section 5 above, we examine the pattern of the toppers in these 42 constituencies,  $q^{01}(i, K)$ . Given the results in row-3 of Table 4, we know that of these 42  $q$ -values, there are 17 from PC, 11 from LB, 11 from NDP, 2 from Green (G), and one independent. Given conditions (2) and (2a), we observe that all 11 LB members would qualify, as well as the top 14 of the PCs, the 2 Greens and, of course, the lone independent. Curiously enough, the independent here topped the list in that constituency winning 33.2% of all votes cast there.<sup>35</sup> Thus it appears that altogether 38 seats would have been filled in round-1, leaving 4 vacant seats (3 taken from PCs and one from NDP). Examining  $q^{01}(i, PC)$  figures we discover the 3 constituencies where they fared the worst in descending order were: {Cloverdale, Pitt Meadows, Port Moody}.<sup>36</sup> Similarly we find that the NDP has to relinquish the constituency of Victoria where it polled just 33.2% of all votes, the lowest of the 11 districts that they had topped within the jurisdiction of BC. Thus the information contained in  $\{q^{01}(i, K)\}$  would be sufficient to identify the vacancies.

Now on to the reallocation of these 4 vacant seats to the deserving as described in the last column of Table 5 above (row 3 for BC). The proportional claim of Greens is 5, while they obtained just two in round-1, leaving them a claim of 3 more seats, while ‘Others’ (R) have a potential claim to one seat since its their jurisdiction-wide vote share, absent party-level threshold (see condition 6a above). Hence we sequentially review  $q^{0j}(i, K)$ , where there are just 4 constituencies while parties LB, PC and NDP have forfeited further claims. However, as it turns in round-2, we have  $q^{02}(i, K) = \{LB, LB, NDP, G\}$ , where the order of constituencies was {Cloverdale, Pitt Meadows, Port Moody, Victoria}. Thus Victoria would go to the Greens, still leaving them two short of the target. There are no more winners here as the rest of the slate are occupied by the disqualified. Proceeding as above,  $q^{03}(i, K)$ , yields no luck; while in round-4, we get  $q^{04}(i, K) = \{G (6.4), G (8.0), G (7.2)\}$ , where the three remaining constituencies are in the same order as before, i.e., {Cloverdale, Pitt Meadows, Port Moody}.<sup>37</sup> Given that Greens are due two of these seats, they ought to be allocated the last two slots to remain consistent with decision rule (6) or (6a) as relevant. In round-5, since most parties have been eliminated for further consideration by now, the R-candidate (representing a party known as People’s Party of Canada, PPC) secures the 5<sup>th</sup> place in the constituency of Cloverdale. The issue here

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<sup>35</sup> The candidate indeed was a former LB cabinet member who had resigned from the party some time back due to dispute with the Prime Minister over serious policy stance.

<sup>36</sup> The respective vote shares were {37.7, 36.2, 31.2}; source: [www.elections.ca](http://www.elections.ca).

<sup>37</sup> Figures in parentheses next to party label are the percentage share of votes in the constituency.

is that the vote share is a mere 1.7% of some 55,000-plus votes cast in the district. Such a low voter enthusiasm would surely fail any reasonable threshold test (say  $\tau \geq 0.05$ ).

As discussed above, the quantum of 1.7% of popular votes is an example of what we have called ‘unutilized votes’ in section 5 above. The ideal alternative would be to redistribute these back to all parties (other than R), but proportional to their original vote share. It turns out in this instance that PCs manage to eke out another seat in the process, taking their tally to 15, thus using up the full complement of 42 electoral districts of BC.<sup>38</sup> If this process does not work to eliminate vacancies, by-elections will appear to be the only path forward, where as we have argued already only independents and minor parties may contest. Anyone aligned to the parties who won seats fully proportional to their respective vote shares, namely LB, PC, NDP or the Greens will be declared as ineligible in the current electoral cycle.<sup>39</sup>

How good is the degree of proportionality achieved via the jurisdictional route vis-à-vis the majoritarian FPP mode as has been the practice to date? Table A1 (appendix) presents the Gallagher index analysed for the 2019 Canadian General Election. Recall that the least distortion is indicated by an index of zero, while the Canada Reform (2016) report calls for a value below 5 as ideal. The jurisdictional route does extremely well. We see that the index value of the actual October 2019 results came to 12.1 (column 5) under the current practice, while under the JRD rule (as summed up in the last row of Table 5 above), this value of the index is below unity (0.84, to be precise), not far from zero. Note that the construction in question is not a tautology; we are comparing national level vote shares and contrasting that to the seat shares, the latter being themselves determined by jurisdictional vote share across the whole range of provinces and territories that differ in their economic structure, level of urbanization, language and cultural practices, climate and topography.

## **7. Is Jurisdictional Representation Applicable to the US Style Presidential Elections?**

Finally, we explore the applicability of the JDR idea in the US Presidential election.<sup>40</sup> Earlier we had described the system whereby the majoritarian winner of popular votes in a State automatically becomes entitled to the full complement of ECC seats assigned to the State as an egregious device tending to produce landslides. A mock illustration of the scheme in the Canadian context show that this would have endowed anyone winning 198 electoral seats of Ontario and Quebec out of the 338-strong House, an absurd stranglehold on power for all times to come! Returning to the US situation, it appears blatantly odd, perhaps undemocratic, that a candidate can go on to win a State, and possibly the Presidency, even when a majority of voters in that State had opposed him (her). In the 2016 election, the GOP candidate went on to ‘win’ no less than six major States (accounting for a total of 101 ECC votes) in this manner: Arizona

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<sup>38</sup> PC vote share of 34.0% when augmented by this factor yields 34.6% which upon multiplication by 42 (see condition 2 above) yields 14.53, which may be rounded up to 15.

<sup>39</sup> While, lacking a better device, we are using the past election, held under the FPP mode, to dwell on how the results can be utilized to determine the composition of the parliament under the jurisdictional representation, it is important to note that had the electoral process been known to the contestants and voters in advance, the outcome of the election would have generally been different and some issues encountered here may not even have arisen.

<sup>40</sup> In this section of the paper, whenever we refer to the choice of the ‘President’, we ideally mean the ‘Presidential ticket’, namely the choice of ‘the President and the Vice President’, no slight intended.

(11), Florida (29), Michigan (16), North Carolina (15), Pennsylvania (20) and Wisconsin (10).<sup>41</sup>

The interest in exploring alternatives would therefore appear to be firmly grounded in the quest for representativeness as argued above. Blakemore (2020) cites that in a poll published by the Pew Research Center in March 2020, 58 percent of U.S. adults said that they support eliminating the current system in favour of a popular vote deciding the winner of the election. In our view that, namely the popular vote metric, need not, at least in principle, correspond to the notion of representativeness in a federation either. To wit, if a major party candidate gains a 10-percentage point advantage over the principal rival in the two largest States (TX and CA), that can overwhelm a modest 2-percentage point lead by the other candidate in the rest of the country (all 48 states and DC).<sup>42</sup> That would not be the idea of an ideal reflection of people's wishes as demonstrated by one vote for each eligible person in a federation.

Unlike the parliamentary system, where its composition itself determines who gets to form the government, the choice of the US President, by design, has been in the economist's language 'decomposable' from the process that chooses the composition of the US Congress. Moreover, there exist important differences and overlaps in the time path of the electoral process between the two. In contrast to the quadrennial presidential elections, the entire House of Representatives get elected every two even years, though only about a third of the Senators, who hold six-year terms, get to face voters every two even years.

*The Electoral College Idea:* A unique feature of the US system is the institution of electoral college (ECC), the key elements of which have been briefly outlined in the introduction. Though much debated since inception, the process has endured since the first quadrennial Presidential election of 1788-89. As an accounting device the allocation of 538 'electoral college votes' to the leading candidates, as per the majoritarian rule, can be perfectly put to work and the process entirely completed when all states (and DC) have certified their poll results following the early November election. Earlier, we have duly noted that Maine and Nebraska follow a slightly different path than the majoritarian outcome, but that does not pose an issue for the task just described. The actual practice however has been that the ECC delegates, all 538 physical persons identified by each party ahead of the election and formally pledged to the candidate selecting them, actually gather in DC in early January and start declaring their votes in a ceremony held in a special joint session of the US Congress, which is presided over by then Vice President, the lame duck or otherwise. Once the session is over, namely these 'electors', faithless or otherwise, *en masse* sail into oblivion.<sup>43</sup> Blakemore fittingly describes the ECC as "a temporary voting body that elects the president of the United States. When voters select their presidential and vice-presidential candidates on Election Day,

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<sup>41</sup> The figures in parentheses are the ECC votes assigned to the State. The winner's vote shares were, respectively, 48.7, 49.0, 47.5, 49.8, 48.2 and 47.2 in these States ([www.fec.gov](http://www.fec.gov)).

<sup>42</sup> The claim here is based on a back-of-the envelope accounting that about 60% of registered voters typically casting a ballot in an election would yield approximately 144 million out of 240 million registered voters in the country. The California-Texas share of likely voters is estimated at about 30 million. Thus a 10-point margin (3 million) is about 2.6% of the remaining 114 million votes from the rest of USA.

<sup>43</sup> We have already cited the incidence of 'faithless' ECC electors breaking their pledge, a practice permitted by some States. While the US Supreme Court has recently (July 2020) ruled that "states can enforce electors' pledges by penalizing rogue electors or removing them from the slate" (Blakemore, 2020), the enforcement aspect ultimately remains a choice for the States in question.



they are actually choosing the members of this body who will cast votes on their behalf in the days and weeks after the election” (2020, p1).

To the uninitiated, the January exercise would appear redundant except perhaps for a wistful attachment to the pomp from an era past its grandeur. The paper does not delve into the merits of such style, except to focus on the substance of the accounting exercise described above. Neither does it debate whether reforms at issue here fit the US Constitution, which apparently leaves wide powers to the individual States in the union to each determine its mode of allocating the electoral votes at its disposal, witness, for example, the fairly recent initiatives undertaken by Maine and Nebraska. However, to put mildly, it is highly unlikely that all 50 States (and DC) would in unison choose to implement a proportionate sharing of ECC seats within their respective jurisdictions. Hence ideally a constitutional amendment would be necessary to bring about a change of the magnitude as is proposed here for review. For the very nature of a federation, here consisting of a large number of entities (50+), the allocation of ECC seats on a jurisdictional basis is particularly relevant, possibly more so than in Canada depending on how one evaluates the degree of diversity in all its dimensions, especially historical, within the federation.

*Third Parties and the Rule of 270:* We have argued above that the very idea of proportional representation is to promote third parties (including independents). Though complex, that task is more meaningful in a parliamentary system where third parties may actually earn a seat and thus participate fully in the governance process of the nation. In the US style Presidential system, even if third party candidates, by virtue of proportionality, go on to ‘win’ a handful or more of the 538 ECC seats, there is no easy way to offer them representation in any legislative forum as rules stand now. The question that reemerges therefore is on what ethical basis do we ignore the wishes of millions of voters who do not support the platform of either of the major parties. Indeed, in the 2016 exercise, a total of about 8 million (or, 6% of all valid votes cast) fell into the latter category.

One idea may be to create the German style ‘excess mandates’ and allow all eligible to win a whole number of ECC seats that many additional seats (four year terms) in the House of Representatives beyond the current complement of 435. In our view, that would have been a clever innovation allowing some recognition of inclusivity and offer a voice to the disaffected. Any such measure however would require a major amendment of the US constitution and is therefore a moot alternative from the paper’s perspective. Hence we refrain from deliberating further on how an expanded House of Representatives would accommodate such a diverse group of new ‘Federal Congresspersons’ or, for that matter, say how the Green Party would be allowed to choose its Congress members commensurate with its proportionate vote share. Absent such a departure, entitling each minor parties their share of ECC seats merely on paper would tantamount to taking away the corresponding number of seats out of 538 that major party candidates would get to retain under the proportional formula. Therefore, the ‘path to 270’ would no longer be a sacred rule determining who gets to win; logically then a simple majoritarian winner of the electoral votes would be declared to have won the election, a point that Daviss and Richie (2015) appear to miss.<sup>44</sup>

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<sup>44</sup> The whole point of proportional representation is to give due credit to the minor parties, especially so when their share of votes exceeds a nominal figure. Forcing a 270-rule flies in the face of this preamble, though ‘unconstitutional’ it maybe at this point.

Over and above giving a modicum of cognizance to the millions who appear disgruntled by the major party agendas, the latter mechanism would serve as a reminder to the major parties that collectively they have failed to win enough votes to earn all ECC seats. Put differently, this would afford a minimal lip service to the dictum that no one disagrees with, namely that ‘every vote should count’. The threshold test makes sense only where some physical representation is to be allowed on that basis and hence it is no longer relevant to the election of the US President. Hence in Table 6, we allow all who would qualify to retain a whole number of seats by virtue of their actual share of popular votes within the State.

If, on the other hand, the rule of 270 is deemed sacrosanct, the only alternative would be to take away the votes earned by third parties and reallocate these to the two major parties. Note that this would be entirely distinct from the reallocation of the ‘unused votes’ discussed in the context of parliament democracy in Sections 5 and 6 of the paper.<sup>45</sup> But that would defeat the entire focus on representativeness, which is the *raison d’être* of the paper. Hence the latter view is not pursued any longer.

We analyse the consequences of the principle of JDR as expounded here for the allocation of the 538 ECC seats in the choice of the US President. The allocation has to merely respect the share of popular votes earned by a candidate within each jurisdiction. Logically this is eminently feasible and overcomes many of the hurdles encountered in the parliamentary system as encountered above where the composition of the entire parliament was at stake.<sup>46</sup> The present task therefore is much simpler since the allocation exercise is essentially an accounting process, though the arithmetic of reducing decimal figures to a ‘whole’ number of electoral seats remains a challenge, especially when it comes to States with single digit allocations.<sup>47</sup> The change *vis-à-vis* the *status quo ante* is that rather than the majoritarian rule, we implement the proportionate rule to allocate ECC seats assigned to a State.<sup>48</sup> For simplicity, we shall ignore the special cases of Maine and Nebraska, since the reform proposal reviewed here effectively pushes their ‘timid’ attempt at proportionality to its full logical extent. In Table 6, we illustrate the functioning of the proposed mechanism in the context of the most recent, namely the 2016 US Presidential election. The background data utilizing the actual number of votes cast State-wise in favour each candidate is reproduced in Table A3 of the Appendix.

*Closeness of the Rivals:* Even without looking at the results, it is intuitive that any proportional allocation of ECC seats would narrow the differential between the shares going to each major candidate since most elections end up being fairly close in terms of popular votes even though presently the analysis is being carried out at the level of the State. Is that an issue? We believe

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<sup>45</sup> In the earlier context, the unused votes were earned by entities (including independents) who failed to meet the minimum threshold for representation in the parliament.

<sup>46</sup> Of course the full extent of the complexity encountered in the Canadian case, would re-emerge had we chosen to extend the process to the composition of the US House of Representatives with all its 435 seats determined on a proportionate basis. Indeed, that would have been a logical extension of the JDR idea to go along with the choice of the Presidential ticket. At this point, that would seem a bridge too far!

<sup>47</sup> The percentage calculation involved was carried out in Excel with up to 9-decimals in each case in order to be as accurate as practicable when it comes to reducing the results into a whole number of ECC seats.

<sup>48</sup> When the final version of the present paper was nearly complete, it came to our attention that Daviss and Richie (2015) offered an examination of a similar idea for the US, which they dubbed ‘whole number proportional system’. However, they erroneously concluded that it was not feasible. We challenge that view and explain our position in what follows, while refraining to dwell on the many inconsistencies in the arguments advanced by the authors

not. In the parliamentary system, regardless of how the seat tally of each candidate is enumerated, the majoritarian winner would typically get to be the party to form the government, even if a Minority. The US rule of 270 itself is a majoritarian rule. Therefore, there is nothing new here to the anticipated degree of closeness, by design if you like. What about a tie, admittedly a rare occurrence? Well ties can and have occurred even under the present US system, and the current relief via Amendments # 12 and #20 of the US Constitution can still be applicable if Congress so wishes, supposedly with an equal degree of equanimity. There is nothing inherently novel about the contingency under JDR and thus we see no imperative to demur.

**Table 6: Popular Votes and the Composition of the ECC in US 2016  
under Alternative Rules**

(1) Jurisdiction: State/DC (ECC seats)	Vote Shares (ECC Seats: Majoritarian)			ECC Seats (JDR) <sup>(a)</sup>		
	GOP	Dems	Others	GOP	Dems	Others
<b>Northeast (9: 96)<sup>(b)</sup></b>						
<b>CT (7)</b>	0.41 (0)	0.55 (7)	0.05 (0)	3	4	0
<b>MA (11)</b>	0.33 (0)	0.60 (11)	0.07 (0)	4	7	1
<b>ME (4)<sup>(c)</sup></b>	0.45 (1)	0.48 (3)	0.07 (0)	2	2	0
<b>NH (4)</b>	0.46 (0)	0.47 (4)	0.07 (0)	2	2	0
<b>NJ (14)</b>	0.41 (0)	0.55 (14)	0.03 (0)	6	8	0
<b>NY (29)</b>	0.37 (0)	0.59 (29)	0.04 (0)	11	17	1
<b>PA (20)</b>	0.48 (20)	0.47 (0)	0.04 (0)	10	10	1
<b>RI (4)</b>	0.39 (0)	0.54 (4)	0.07 (0)	2	2	0
<b>VT (3)</b>	0.30 (0)	0.57 (3)	0.13 (0)	1	2	0
<b>Sub-Total (96/98)<sup>(d)</sup></b>	<b>21</b>	<b>75</b>	<b>0</b>	<b>41</b>	<b>54</b>	<b>3</b>
<b>Midwest (12: 118)<sup>(b)</sup></b>						
<b>IA (6)</b>	0.51 (6)	0.42 (0)	0.07 (0)	3	2	0
<b>IL (20)</b>	0.39 (0)	0.56 (20)	0.05 (0)	8	11	1
<b>IN (11)</b>	0.57 (11)	0.38 (0)	0.05 (0)	6	4	1
<b>KS (6)</b>	0.57 (6)	0.36 (0)	0.07 (0)	3	2	0
<b>MI (16)</b>	0.47 (16)	0.47 (0)	0.05 (0)	8	8	1
<b>MN (10)</b>	0.45 (0)	0.46 (10)	0.09 (0)	4	5	1
<b>MO (10)</b>	0.57 (10)	0.38 (0)	0.05 (0)	6	4	1
<b>NE (5)<sup>(c)</sup></b>	0.59 (5)	0.34 (0)	0.08 (0)	3	2	0
<b>ND (3)</b>	0.63 (3)	0.27 (0)	0.10 (0)	2	1	0
<b>OH (18)</b>	0.52 (18)	0.44 (0)	0.05 (0)	9	8	1
<b>SD (3)</b>	0.62 (3)	0.32 (0)	0.07 (0)	2	1	0

<b>WI (10)</b>	0.47 (10)	0.46 (0)	0.06 (0)	5	5	0
<b>Sub-Total (118/118)<sup>(d)</sup></b>	<b>88</b>	<b>30</b>	<b>0</b>	<b>59</b>	<b>53</b>	<b>6</b>
<b>South (17: 196)<sup>(b)</sup></b>						
<b>AL (9)</b>	0.62 (9)	0.34 (0)	0.04 (0)	6	3	0
<b>AR (6)</b>	0.61 (6)	0.34 (0)	0.06 (0)	4	2	0
<b>DC (3)</b>	0.04 (0)	0.91 (3)	0.05 (0)	0	3	0
<b>DE (3)</b>	0.42 (0)	0.53 (3)	0.05 (0)	1	2	0
<b>FL (29)</b>	0.49 (29)	0.48 (0)	0.03 (0)	14	14	1
<b>GA (16)</b>	0.51 (16)	0.46 (0)	0.04 (0)	8	7	1
<b>KY (8)</b>	0.63 (8)	0.33 (0)	0.05 (0)	5	3	0
<b>LA (8)</b>	0.58 (8)	0.38 (0)	0.03 (0)	5	3	0
<b>MD (10)</b>	0.34 (0)	0.60 (10)	0.06 (0)	3	6	1
<b>MS (6)</b>	0.58 (6)	0.40 (0)	0.02 (0)	3	2	0
<b>NC (15)</b>	0.50 (15)	0.46 (0)	0.04 (0)	7	7	1
<b>OK (7)</b>	0.65 (7)	0.29 (0)	0.06 (0)	5	2	0
<b>SC (9)</b>	0.55 (9)	0.41 (0)	0.04 (0)	5	4	0
<b>TN (11)</b>	0.61 (11)	0.35 (0)	0.05 (0)	7	4	0
<b>TX (38)</b>	0.52 (38)	0.43(0)	0.05 (0)	20	16	2
<b>VA (13)</b>	0.44 (0)	0.50 (13)	0.06 (0)	6	6	1
<b>WV (5)<sup>(b)</sup></b>	0.68 (5)	0.26 (0)	0.05 (0)	3	1	0
<b>Sub-Total (196/194)<sup>(d)</sup></b>	<b>167</b>	<b>29</b>	<b>0</b>	<b>102</b>	<b>85</b>	<b>7</b>
<b>West (13: 128)<sup>(b)</sup></b>						
<b>AK (3)</b>	0.51 (3)	0.37 (0)	0.12 (0)	2	1	0
<b>AZ (11)</b>	0.49 (11)	0.45 (0)	0.06 (0)	5	5	1
<b>CA (55)<sup>(c)</sup></b>	0.32 (0)	0.62 (55)	0.07 (0)	17	34	4
<b>CO (9)</b>	0.43 (0)	0.48 (9)	0.09 (0)	4	4	1
<b>HI (4)</b>	0.30 (0)	0.62 (4)	0.08 (0)	1	2	0
<b>ID (4)<sup>(b)</sup></b>	0.59 (4)	0.27 (0)	0.13 (0)	2	1	1
<b>MT (3)</b>	0.56 (3)	0.36 (0)	0.08 (0)	2	1	0
<b>NM (5)</b>	0.40 (0)	0.48 (5)	0.12 (0)	2	2	1
<b>NV (6)</b>	0.46 (0)	0.48 (6)	0.07 (0)	3	3	0
<b>OR (7)</b>	0.39 (0)	0.50 (7)	0.11 (0)	3	4	1
<b>UT (6)</b>	0.46 (6)	0.27 (0)	0.27 (0)	3	2	2
<b>WA (12)</b>	0.37 (0)	0.53 (12)	0.11 (0)	4	6	1

<b>WY (3)</b>	0.68 (3)	0.22 (0)	0.10 (0)	<b>2</b>	<b>1</b>	<b>0</b>
<b>Sub-Total (128/128)<sup>(d)</sup></b>	<b>30</b>	<b>98</b>	<b>0</b>	<b>50</b>	<b>66</b>	<b>12</b>
<b>Rule-1: Status quo [Statutory # 538]</b>	<b>232<sup>(d)</sup></b>	<b>306<sup>(d)</sup></b>	<b>0</b>	<b>NA</b>		
<b>Rule-3: JDR [Statutory # 538]</b>	<b>NA</b>			<b>252</b>	<b>258</b>	<b>28</b>

*Source:* Author's construction based on data accessed from <<www.fec.gov>> on various dates but finally updated as of Oct, 2020. See the Appendix Tables A3 and A4, including the explanatory notes appearing there for additional details.

*Notes:* (a) Columns (5) - (7) above display the ECC seat allocation as per JDR. Because of rounding of decimals to a whole number, it turns out that in some cases the State-wise allocation is not fully exhausted by proportional distribution to the parties, including 'Others'. Likewise, there are also the opposite occurrence where the proportionality demands one seat in excess of the total a State is entitled to. It so happens that with the 2016 data that these two anomalies eventually cancel out. It is important to note that even if we refrain from allocating seats to 'Others' when no vacant seats exist in that State, the tally of the two major parties do not change whatsoever. Only the share of 'Others' would be modified a little. See notes(c) to TableA3 for additional comments.

(b) Here the first figure in the parenthesis denotes the number of States in the region and then the total number of ECC seats at stake region-wide.

(c) Presently only Maine and Nebraska, as noted above, allow splitting of its pledged electoral delegates between political parties winning the most votes in the State and the winners of its electoral districts. It so happened that during the 2016 election, all three of Nebraska's electoral districts were won by Republicans. The GOP also won one of Maine's two districts, though not he State-wise popular vote.

(d) Columns (2) - (4) in the regional summary row adds up the ECC seats won by each party in that region, e.g., the Northeast. Given the goal is to compare the majoritarian outcome with the proportional allocation, we ignore the actual voting behaviour (namely that 'faithless electors' may act differently than pledged in advance) in the January Congressional event following the election. Only the statutory number seats won are displayed. See explanatory notes (b) – (d) below Appendix Table A3.

*US 2016: The JDR Outcome in Rear-view Mirror.* Table 6 starts off by first reproducing the actual results of the 2016 US Presidential Election where the state-wise vote shares and ECC seats won by the candidates under the current majoritarian system are presented in columns in columns (2 -4). The table itself is based on very detailed calculations shown in the appendix Tables A3, where the actual number of votes are also presented. The second last row in Table 6 illustrates the familiar result that by winning a mere 46.1% of all votes, GOP went on to win 306 (or 57%) of the 538 ECC seats and thus gain the Presidency.<sup>49</sup>

By contrast, columns 5-6 illustrate, the allocation of ECC seats as per the jurisdictional representation idea among Democrats, GOP and 'Others'. Since we do not at this instance propose to offer any physical representation to 'Others' in the US Congress, there is little point in poring over the details of which actual group (even independents) among the 'others' would win how many seats. The allocation exercise here, as explained above, is therefore entirely of an accounting nature. For the same reason, and unlike the parliamentary system where we carefully examined the idea of a threshold, the latter issue is redundant for the present. The precise derivation is discussed in further detail in Table A4 of the appendix, including the

<sup>49</sup> Figures in the same row also illustrate the curious case that in spite of having won 306 ECC statutory seats, the GOP candidate actually earned two less, that is 304 seats, due to faithless electors in the actual ECC seat allocation ceremony of January 6, 2017. Similarly, the Democrats lost 5 seats (227 instead of 232). See further elaboration in the notes to Table A3 in the Appendix.

explanatory notes accompanying the latter table. The last row in Table 6 illustrates that the Democratic party would have won the 2016 election winning 258 electoral votes to 252 won by the GOP.

Returning to the question of the degree of proportionality, here we see that the jurisdictional mode of allocating seats achieves a much greater concordance between the former and the nationwide pattern of popular votes. The resulting share of ECC seats, 48.0 vs 46.8 % between the two parties, respectively, matches the share of popular votes rather well (48.2 vs 46.1). As opposed to a Gallagher index of 9.35 for the actual 2016 electoral outcome, the JDR route yields the value of 0.67, again rather close to zero. The high degree of proportionality, as we have argued, cannot be explained away by merely citing the proximity of the national vote shares with ECC seat shares since these two figures are enumerated on separate basis. The US jurisdictions, similar to remarks made in the Canadian context, possibly affords even a greater degree of diversity across the 50 States (and DC) since we have to add ethnic composition of the population as a more dominant feature than in Canada. There are of course significant variations across the land along the standard dimensions noted already (namely, economic structure, language and culture, urbanization, topography and climate).

The point of the above exercise is to demonstrate that the idea of jurisdictional representation is an important one and that it can easily be implemented for the US Presidential Election with only 'minor' deviations of interpretation. The primary departure happens to be the primacy of 270 as the magical goal; instead that each party win the plurality of ECC delegates in proportion to its share of state-wise popular votes. If vote shares of the two major parties do not add up to more or less 100% collectively, they do not deserve to win the full complement of ECC delegates. At this point, we refrain from discussing whether that interpretation is consistent with the US Constitution or, for that matter, whether these are permissible by the powers that the constitution endows to each State in the Union. The latter are indeed matters deserving of serious examination by students of electoral reform, but one that appears well beyond the scope of the present attempt.

## **8. Conclusion**

The idea of proportional representation has been around for over two hundred years, and while it has gotten a foothold in most of Europe and beyond, it remains practically absent in North America, at least at the national or provincial/state levels. The primary appeal behind the idea appears to be the imperative to allow smaller parties, minorities and other disenfranchised groups in society, (not all mutually exclusive as construed by these phrases), systematic representation in the governance of the nation. This paper proposes a novel idea of jurisdictional-level proportionality specifically designed for polities embracing federalism. We argue how such a system can be endowed with normative properties that appear lacking in the extant first-past-the post electoral systems. The normative criteria comprise the governance virtues such as (a) inclusivity and stability of the elected government, (b) accountability of elected delegates and their interface with voters (dubbed the 'agency problem'), and (c) the true extent of proportionality of the voting outcome. These are argued to claim priority in judging between electoral systems. The proposed JDR mechanism appears to score very well and appears a lot simpler in terms of the demands on voter compliance as well as the transparency of the process vis-à-vis most alternative ideas of proportional representation practiced elsewhere (e.g., party-list voting, multi-member representation, transferable votes

and the like). All we require is the record of all votes cast by individuals (just one ballot each) in favour of the candidate of their choice in a given constituency, normally a single-member district within a province or state. In the election of the Presidential election, however, the constituency is itself the state (or, DC).

We go on to illustrate the practicability of the JDR system, both with numerical examples as well as by reference to most recent general election data for Canada (2019) and the US (2016). We find that as per the Gallagher index, a measure of the degree of proportionality, popular in the literature, proportionality achieved by JDR is much higher than that in the existing FPP systems and exceed the benchmarks encountered in the electoral reform literature. The above index, we should emphasize, matches the national vote share with the allocation of electoral seats nationally, while under JDR that allocation is actually accomplished by matching the jurisdictional (namely province /state/) share of votes with the tally of seats within the jurisdiction. Hence eventual closeness between the two cannot be the artefact of tautology, especially in the context where we are dealing with of a large number of jurisdictions within the nation.

Our analysis shows that implementing JDR principles would alter the outcome of the election (vis-à-vis FPP) in a significant way; in the parliamentary mode, while it may tend to predict minority governments more often, it allows each major party a greater degree of freedom to forge a ruling coalition. Moreover, the final outcome is likely to be more durable than under current systems since the composition of relative party strengths, by JDR design, cannot change during a given electoral cycle. When reviewing the Presidential election, it appears that the outcome here changes too, typically in favour of the plurality winner of nation-wide popular votes, even though the seat arithmetic is based on proportional votes within each state in the union.

## Appendix

### 1. The Gallagher Index

**Table A1 Gallagher Index: 2019 Canada, Plurality vs Jurisdictional Representation**

(1) Party	(2) % Votes	Majoritarian Rule			JDR		
		(3) % Seats	(4): (2)–(3) Difference	(5) Diff- squared	(6) Proposed Seats (%)	(7) Diff: (2)-(6)	(8) Diff-Sq (new)
<b>BQ</b>	7.7	9.5	-1.8	3.24	25 (7.4)	0.3	0.09
<b>Green</b>	6.5	0.9	5.6	30.25	23 (6.8)	-0.3	0.09
<b>Independents</b>	0.4	0.3	0.1	0.01	2 (0.6)	-0.2	0.04
<b>LIB</b>	33.1	46.4	-13.3	176.89	115 (34.0)	-0.9	0.81
<b>NDP</b>	15.9	7.1	8.8	77.44	54 (16.0)	-0.1	0.01
<b>PC</b>	34.4	35.8	-1.4	1.96	115 (34.0)	0.4	0.16
<b>Peoples Party (PPC)</b>	1.6	0	1.6	2.56	4 (1.4)	0.2	0.04
<b>Others</b>	0.4	0	0.4	0.16	0	0.4	0.16
<b>Diff-Squared</b>				<b>292.51</b>	<b>1.4</b>		
<b>Gallagher Index</b>				<b>12.09</b>	<b>0.84</b>		

Source: Author's construction based on election data obtained from the Election Canada official website ([www.enr.elections.ca/](http://www.enr.elections.ca/)). The Gallagher index and its methods are described in Gallagher (1991).

**Table A2 Gallagher Index: 2016 United States Presidential Election,  
Plurality vs Jurisdictional Representation**

(1) Party	(2) % Votes	Majoritarian Rule			JDR		
		(3) % Delegates	(4): (2)–(3) Difference	(5) Diff- squared	(6) Proposed Delegates (%)	(7) Diff: (2)-(6)	(8) Diff- Sq (new)
<b>Democrats</b>	48.18	43.12	5.06	25.60	47.96	0.22	0.048
<b>GOP</b>	46.09	56.88	-10.79	116.42	46.84	-0.75	0.562
<b>Others</b>	5.73	0	5.73	32.83	5.20	0.53	0.28
<b>Diff- Squared</b>				<b>174.85</b>	<b>0.89</b>		
<b>Gallagher Index</b>				<b>9.35</b>	<b>0.67</b>		

Source: Author's construction based on data in Tables A3 and A4 and Gallagher (1991).



**Table A3 US Presidential Election 2016: Popular Votes & Electoral College Allocation**

States/DC	EC Delegates	Popular Votes				Electoral College	
		GOP	Dems	Others	Total	GOP	Dems
AL	9	1,318,255	729,547	75,570	2,123,372	9	0
AK	3	163,387	116,454	38,767	318,608	3	0
AZ	11	1,252,401	1,161,167	159,597	2,573,165	11	0
AR	6	684,872	380,494	65,310	1,130,676	6	0
CA	55	4,483,814	8,753,792	943,998	14,181,604	0	55
CO	9	1,202,484	1,338,870	238,893	2,780,247	0	9
CT	7	673,215	897,572	74,133	1,644,920	0	7
DE	3	185,127	235,603	23,084	443,814	0	3
DC	3	12,723	282,830	15,715	311,268	0	3
FL	29	4,617,886	4,504,975	297,178	9,420,039	29	0
GA	16	2,089,104	1,877,963	147,665	4,114,732	16	0
HI <sup>(b)</sup>	4	128,847	266,891	33,199	428,937	0	3
ID	4	409,055	189,765	91,435	690,255	4	0
IL	20	2,146,015	3,090,729	299,680	5,536,424	0	20
IN	11	1,557,286	1,033,126	144,546	2,734,958	11	0
IA	6	800,983	653,669	111,379	1,566,031	6	0
KS	6	671,018	427,005	86,379	1,184,402	6	0
KY	8	1,202,971	628,854	92,324	1,924,149	8	0
LA	8	1,178,638	780,154	70,240	2,029,032	8	9
ME <sup>(a)</sup>	4	335,593	357,735	54,599	747,927	1	3
MD	10	943,169	1,677,928	160,349	2,781,446	0	10
MA	11	1,090,893	1,995,196	238,957	3,325,046	0	11
MI	16	2,279,543	2,268,839	250,902	4,799,284	16	0
MN	10	1,322,951	1,367,716	254,146	2,944,813	0	10
MS	6	700,714	485,131	23,512	1,209,357	6	0
MO	10	1,594,511	1,071,068	143,026	2,808,605	10	0
MT	3	279,240	177,709	40,198	497,147	3	0
NE <sup>(a)</sup>	5	495,961	284,494	63,772	844,227	5	0
NV	6	512,058	539,260	74,067	1,125,385	0	6
NH	4	345,790	348,526	49,980	744,296	0	4
NJ	14	1,601,933	2,148,278	123,835	3,874,046	0	14
NM	5	319,667	385,234	93,418	798,319	0	5
NY	29	2,819,533	4,556,118	345,791	7,721,442	0	29
NC	15	2,362,631	2,189,316	189,617	4,741,564	15	0
ND	3	216,794	93,758	33,808	344,360	3	0
OH	18	2,841,005	2,394,164	261,318	5,496,487	18	0
OK	7	949,136	420,375	83,481	1,452,992	7	0
OR	7	782,403	1,002,106	216,827	2,001,336	0	7
PA	20	2,970,733	2,926,441	268,304	6,165,478	20	0
RI	4	180,543	252,525	31,076	464,144	0	4
SC	9	1,155,389	855,373	92,265	2,103,027	9	0
SD	3	227,721	117,458	24,914	370,093	3	0
TN	11	1,522,925	870,695	114,407	2,508,027	11	0
TX <sup>(c)</sup>	38	4,685,047	3,877,868	406,311	8,969,226	36	0
UT	6	515,231	310,676	305,523	1,131,430	6	0
VT	3	95,369	178,573	41,125	315,067	0	3
VA	13	1,769,443	1,981,473	233,715	3,984,631	0	13

<b>WA<sup>(d)</sup></b>	<b>12</b>	1,221,747	1,742,718	352,554	3,317,019	0	8
<b>WV</b>	<b>5</b>	489,371	188,794	36,258	714,423	5	0
<b>WI</b>	<b>10</b>	1,405,284	1,382,536	188,330	2,976,150	10	0
<b>WY</b>	<b>3</b>	174,419	55,973	25,457	255,849	3	0
<b>Total:</b>	<b>538</b>	<b>62,984,828</b> <b>(46.09%)</b>	<b>65,853,514</b> <b>(48.18%)</b>	<b>7,830,934</b> <b>(5.73%)</b>	<b>136,669,276</b> <b>(100%)</b>	<b>304</b> <b>(306)</b>	<b>227</b> <b>(232)</b>

*Source:* The election data, especially the number of votes earned by various political parties, shown in columns (3)-(6) as well as the allocation of Electoral College votes are all taken from Federal Election Commission website ([www.fec.gov/documents/federalections2016](http://www.fec.gov/documents/federalections2016)). This was updated on September 25, 2020.

*Notes:* (a) As already outline in the text, Maine and Nebraska use a variant of the majoritarian device in the allocation of its electoral seats ([www.archives.gov/electoral-college/allocation](http://www.archives.gov/electoral-college/allocation)).

(b) – (d): The election website clarifies that in several cases, the electoral delegates chosen/determined by the Presidential candidate/parties in advance of the election, actually ended up voting differently than they had pledged. While Hawaii has 4 Electoral Votes, 1 was cast for Bernie Sanders instead of the Democratic candidate Hillary Clinton.

(c) Similarly, out of Texas’ 38 Electoral Votes, 1 was cast for John Kasich and 1 was cast for Ron Paul.

(d) Out of Washington State’s 12 Electoral Votes, 3 were cast for Colin Powell and 1 was cast for Faith Spotted Eagle.

**Table A4 US 2016 Electoral College Allocation: Jurisdictional Representation**

States/DC	EC Delegates	Share of Popular Votes <sup>(a)</sup>			Share of Electoral College <sup>(b)</sup>		
		GOP	Dems	Others	GOP	Dems	Others <sup>(c)</sup>
<b>AL</b>	<b>9</b>	0.62	0.34	0.04	<b>6</b>	<b>3</b>	<b>0</b>
<b>AK</b>	<b>3</b>	0.51	0.37	0.12	<b>2</b>	<b>1</b>	<b>0</b>
<b>AZ</b>	<b>11</b>	0.49	0.45	0.06	<b>5</b>	<b>5</b>	<b>1</b>
<b>AR</b>	<b>6</b>	0.61	0.34	0.06	<b>4</b>	<b>2</b>	<b>0</b>
<b>CA</b>	<b>55</b>	0.32	0.62	0.07	<b>17</b>	<b>34</b>	<b>4</b>
<b>CO</b>	<b>9</b>	0.43	0.48	0.09	<b>4</b>	<b>4</b>	<b>1</b>
<b>CT</b>	<b>7</b>	0.41	0.55	0.05	<b>3</b>	<b>4</b>	<b>0</b>
<b>DE</b>	<b>3</b>	0.42	0.53	0.05	<b>1</b>	<b>2</b>	<b>0</b>
<b>DC</b>	<b>3</b>	0.04	0.91	0.05	<b>0</b>	<b>3</b>	<b>0</b>
<b>FL</b>	<b>29</b>	0.49	0.48	0.03	<b>14</b>	<b>14</b>	<b>1</b>
<b>GA</b>	<b>16</b>	0.51	0.46	0.04	<b>8</b>	<b>7</b>	<b>1</b>
<b>HI*</b>	<b>4</b>	0.30	0.62	0.08	<b>1</b>	<b>2</b>	<b>0</b>
<b>ID</b>	<b>4</b>	0.59	0.27	0.13	<b>2</b>	<b>1</b>	<b>1</b>
<b>IL</b>	<b>20</b>	0.39	0.56	0.05	<b>8</b>	<b>11</b>	<b>1</b>
<b>IN</b>	<b>11</b>	0.57	0.38	0.05	<b>6</b>	<b>4</b>	<b>1</b>
<b>IA*</b>	<b>6</b>	0.51	0.42	0.07	<b>3</b>	<b>2</b>	<b>0</b>
<b>KS</b>	<b>6</b>	0.57	0.36	0.07	<b>3</b>	<b>2</b>	<b>0</b>
<b>KY</b>	<b>8</b>	0.63	0.33	0.05	<b>5</b>	<b>3</b>	<b>0</b>
<b>LA</b>	<b>8</b>	0.58	0.38	0.03	<b>5</b>	<b>3</b>	<b>0</b>
<b>ME</b>	<b>4</b>	0.45	0.48	0.07	<b>2</b>	<b>2</b>	<b>0</b>
<b>MD</b>	<b>10</b>	0.34	0.60	0.06	<b>3</b>	<b>6</b>	<b>1</b>
<b>MA</b>	<b>11</b>	0.33	0.60	0.07	<b>4</b>	<b>7</b>	<b>1<sup>(c)</sup></b>

<b>MI</b>	<b>16</b>	0.47	0.47	0.05	<b>8</b>	<b>8</b>	<b>1</b>
<b>MN*</b>	<b>10</b>	0.45	0.46	0.09	<b>4</b>	<b>5</b>	<b>1</b>
<b>MS</b>	<b>6</b>	0.58	0.40	0.02	<b>3</b>	<b>2</b>	<b>0</b>
<b>MO</b>	<b>10</b>	0.57	0.38	0.05	<b>6</b>	<b>4</b>	<b>1</b>
<b>MT</b>	<b>3</b>	0.56	0.36	0.08	<b>2</b>	<b>1</b>	<b>0</b>
<b>NE</b>	<b>5</b>	0.59	0.34	0.08	<b>3</b>	<b>2</b>	<b>0</b>
<b>NV</b>	<b>6</b>	0.46	0.48	0.07	<b>3</b>	<b>3</b>	<b>0</b>
<b>NH</b>	<b>4</b>	0.46	0.47	0.07	<b>2</b>	<b>2</b>	<b>0</b>
<b>NJ</b>	<b>14</b>	0.41	0.55	0.03	<b>6</b>	<b>8</b>	<b>0</b>
<b>NM</b>	<b>5</b>	0.40	0.48	0.12	<b>2</b>	<b>2</b>	<b>1</b>
<b>NY</b>	<b>29</b>	0.37	0.59	0.04	<b>11</b>	<b>17</b>	<b>1</b>
<b>NC</b>	<b>15</b>	0.50	0.46	0.04	<b>7</b>	<b>7</b>	<b>1</b>
<b>ND</b>	<b>3</b>	0.63	0.27	0.10	<b>2</b>	<b>1</b>	<b>0</b>
<b>OH</b>	<b>18</b>	0.52	0.44	0.05	<b>9</b>	<b>8</b>	<b>1</b>
<b>OK</b>	<b>7</b>	0.65	0.29	0.06	<b>5</b>	<b>2</b>	<b>0</b>
<b>OR</b>	<b>7</b>	0.39	0.50	0.11	<b>3</b>	<b>4</b>	<b>1</b>
<b>PA*</b>	<b>20</b>	0.48	0.47	0.04	<b>10</b>	<b>10</b>	<b>1</b>
<b>RI</b>	<b>4</b>	0.39	0.54	0.07	<b>2</b>	<b>2</b>	<b>0</b>
<b>SC</b>	<b>9</b>	0.55	0.41	0.04	<b>5</b>	<b>4</b>	<b>0</b>
<b>SD</b>	<b>3</b>	0.62	0.32	0.07	<b>2</b>	<b>1</b>	<b>0</b>
<b>TN</b>	<b>11</b>	0.61	0.35	0.05	<b>7</b>	<b>4</b>	<b>0</b>
<b>TX</b>	<b>38</b>	0.52	0.43	0.05	<b>20</b>	<b>16</b>	<b>2</b>
<b>UT</b>	<b>6</b>	0.46	0.27	0.27	<b>3</b>	<b>2</b>	<b>2</b>
<b>VT</b>	<b>3</b>	0.30	0.57	0.13	<b>1</b>	<b>2</b>	<b>0</b>
<b>VA*</b>	<b>13</b>	0.44	0.50	0.06	<b>6</b>	<b>6</b>	<b>1</b>
<b>WA</b>	<b>12</b>	0.37	0.53	0.11	<b>4</b>	<b>6</b>	<b>1</b>
<b>WV</b>	<b>5</b>	0.68	0.26	0.05	<b>3</b>	<b>1</b>	<b>0</b>
<b>WI</b>	<b>10</b>	0.47	0.46	0.06	<b>5</b>	<b>5</b>	<b>0</b>
<b>WY</b>	<b>3</b>	0.68	0.22	0.10	<b>2</b>	<b>1</b>	<b>0</b>
<b>Total</b>	<b>538</b>	0.46	0.48	0.06	<b>252</b>	<b>258</b>	<b>28</b>

*Source:* Author's calculation based on the raw election data taken from the Federal Election website as cited under Table A3.

*Notes:* (a) For greater accuracy, all calculations reported in Table A4, namely column (3) - (8) have been generated by Excel with up to **nine** decimal places. The vote shares, shown in columns (3) - (5) have then been rounded down to two as reported above.

(b) Similarly, the number of Electoral College votes to be allocated via jurisdictional representation method (presented in columns 6-8) have been whittled down to a whole number starting with nine decimals. In such an exercise, one ends up addressing how to deal with 0.50. The system used in rounding the decimals follow the methods of 'unbiased' rounding whereby one rounds up only to even values (e.g., 3.5 is a 4 while 4.5 is also a 4). In column 6 (GOP) the precise 0.5 value occurred only once (4.5 in Minnesota rounded to 4), while for the Democrats (column 5) it occurred thrice (2.5 rounded to 2 in Iowa, 3.5 rounded to 4 in Oregon and 9.5 rounded to 10 in Pennsylvania). In the 'Others' column, there was a 0.5 for Tennessee which was rounded to zero.

(c) It turns out that the vote shares of the 'Others' often demanded a seat even when the total ECC seats assigned to a State was fully accounted for by the major parties; this calls for what one may call excess mandate of sorts. Parallely, due to rounding, in several cases, the opposite happened namely that third party votes did not warrant a consideration even though major parties failed to exhaust the available quota of seats in a State, leading to 'wastes'. It turns out, supposedly by the law of numbers, that these two types of 'anomalies' mutually cancelled out in the end. That is why we see that exactly 28 seats going to Others, which is exactly the number of ECC seats that the together two major parties failed to garner by their appeal to the voters.

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