
COMMENTARY

COMMENTS ON GILLETTE,
“VOTING WITH YOUR HANDS:
DIRECT DEMOCRACY IN
ANNEXATION”

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Clayton Gillette’s paper¹ is very penetrating and full of insights regarding the incentives involved in the annexation decision and the effect of political arrangements on the outcome. My goal in these comments will be to provide a complementary formal analysis of some of the issues exposed by the paper, using a diagrammatic approach. This approach can clearly show the gains and losses from annexation that accrue to the various parties, as well as revealing whether an annexation is socially desirable in an overall sense.

The analysis depicts a number of different scenarios that might arise in an annexation, illustrating some of the cases mentioned in Gillette’s discussion. For example, annexation might be socially undesirable, reducing the combined surplus of annexees and city residents, while being narrowly beneficial to the latter group. By contrast, annexation may benefit both groups, thus raising social welfare. While any voting arrangement will yield the right outcome in the second case, some institutional setups (for example, only city residents vote) will lead to inefficient annexation in the first case.

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1. Clayton P. Gillette, *Voting with Your Hands: Direct Democracy in Annexation*, 78 S. CAL. L. REV. 835 (2005).

The analysis is based on a number of simplifying assumptions. First, both the city and the annexation area provide a single public good, denoted Z . Second, without loss of generality, the city and annexation area each have just one resident. Third, public-good demands differ between the areas, being high in the annexation area (which may correspond to higher-income suburbs) and low in the city (which has a disproportionate share of the poor). Prior to annexation, public-good levels in the two areas are chosen separately according to these different demands. Fourth, after annexation, a common public-good level is provided to both areas. Fifth, after annexation, the level of the common public good is chosen by the city resident (this outcome would reflect the city's larger population when population sizes are set realistically).

Two motives for annexation are explored. The first is exploitation of the annexation area's higher per capita tax base by the city resident. Because of this tax-base differential, annexation forces the annexee to subsidize the public-good consumption of the city resident. The second (nonexploitative) motive for annexation, by contrast, is a desire to secure the benefits from economies of scale in public-good provision, which are achieved by providing the good at a uniform level to a larger population. In both situations, the analysis explores the effect of political arrangements on the efficiency of the annexation outcome.

To start, consider a benchmark case in which both these elements are absent, so that per capita tax bases are equal and there are no economies of scale in the provision of Z . This case is shown in Figure 1, where D_A is the annexee's public-good demand curve, D_C is the demand curve of the city resident, and α is the per capita cost per unit of Z . Without annexation, the city's public good level is set at Z_C^* and the annexation area's level is set at Z_A^* . With annexation, the common public-good level, which is denoted Z^{**} , is set at Z_C^{**} , the desired level of the city resident.

Note that, with annexation, there is no change in the per capita cost of Z to the city resident given that subsidization does not occur and economies of scale are absent. As a result, his desired level of Z , as well as the surplus he enjoys, is unchanged. By contrast, since the annexee is now receiving less public good than before and paying the same cost per unit, his surplus falls by the area Q . Thus, in this situation, neither party benefits from annexation, and regardless of political arrangements, we would expect annexation not to occur. This is the right outcome, given that annexation clearly reduces total surplus and thus social welfare.

Consider now a situation where economies of scale are still absent but where per capita tax bases differ. Concretely, the city resident might live in a small, low-valued dwelling, while the annexee lives in a large, higher-valued house. In this case, application of a common property tax rate to both houses will generate a larger tax liability for the annexee than for the city resident. As a result, cost per unit of Z for the annexee will be higher than the public good's production cost per unit, α , while cost per unit for the city resident will be lower than α . The resulting costs per unit of Z for the two individuals are denoted α_A and α_C , with Figure 2 showing that $\alpha_A > \alpha_C$. Thus, with annexation, the public-good costs of the city resident are subsidized by the annexee.

Once again, the city resident chooses Z following annexation, so that Z^{**} is set at the level where his demand curve, D_C , cuts the α_C line, as seen in Figure 2. Because the city resident gets the public-good level he wants and pays a lower cost, his surplus rises by the area $P + S$. By contrast, because the annexee pays a higher cost and loses control over his public consumption, his surplus falls. Since his previous surplus equaled the area under D_A above the α line up to Z_A^* while his post-annexation surplus is the area under D_A above the α_A line up to Z^{**} , surplus falls by the area $R + Q + T$. Since the loss area R is larger than the city resident's gain, $P + S$, total surplus falls with annexation. Thus, annexation is not socially desirable in the case shown in Figure 2, and this conclusion holds generally, not being dependent on how the figure is drawn. The reason for this general result is that annexation generates no efficiency gains while constraining the choices of the annexee.

The annexation outcome in this case depends on political arrangements. If the city residents alone decide the outcome, then the gain they reap leads to approval of annexation, an inefficient result. The same outcome occurs if all residents vote and the city resident's vote carries more weight, as would be true with realistic population sizes. However, if both parties must approve annexation for it to occur, then the annexation proposal fails given the harm suffered by the annexee. Thus, in this situation, prevention of socially undesirable annexation requires that veto power be vested in the annexee.

Suppose now that per capita tax bases are equal but that, because of economies of scale, annexation reduces the per capita cost of producing Z from α to α^{**} , as shown in Figure 3. In contrast to the cases of Figures 1 and 2, this efficiency gain may make annexation socially desirable. With annexation, the public-good level is now set at the Z^{**} value where D_C cuts

the α^{**} line, and the city resident's surplus rises by the area $R + S$. Since surplus for the annexee now equals the area under D_A above the α^{**} line up to Z^{**} , his surplus change relative to the no-annexation case equals $R + S + T - Q$. Given the way the figure is drawn, this surplus change is positive, so that the annexee benefits from annexation along with the city resident. As a result, total surplus, and thus social welfare, rises, indicating that annexation is efficient. The reason for the annexee's gain, and for the social desirability of annexation, is that the cost of Z falls enough to compensate for loss of the annexee's control over his public consumption.

Any of the three political arrangements from above leads to the right annexation outcome in this case. Regardless of whether the city resident alone decides the outcome, both parties vote, or the annexee has veto power, the result is approval of the annexation proposal, which is in society's interest.

Figure 3, however, can be redrawn to yield different conclusions. Figure 4 shows a situation in which the cost savings from annexation are smaller than in Figure 3, while the difference in demands between the city resident and the annexee is larger. In this case, the city resident continues to gain from annexation (a general conclusion), while the annexee now loses. This change occurs because the annexee's loss of surplus from relinquishing control over his Z consumption (the area Q) is larger than his surplus gain from the lower cost of Z (the area $R + S + T$). Nevertheless, since $2(R + S) + T - Q$ is positive, total surplus still rises with annexation in the case shown, indicating the efficiency of annexation.

This case illustrates a situation not seen in the previous examples: socially desirable annexation that is opposed by the annexee. In this situation, annexation is approved if the city resident or the entire population votes, but annexation is blocked if the annexee has veto power. Thus, in contrast to the case of Figure 2, where giving the annexee such power prevents inefficient annexation, veto power in the case of Figure 4 blocks annexation when it is socially desirable.

However, a fifth case that it is not explicitly shown yields a situation similar to that of Figure 2. This case can be generated by raising the D_A curve from its position in Figure 4, which increases the area Q . Annexation then generates a larger surplus loss for the annexee than in Figure 4, and if D_A is high enough, annexation becomes socially undesirable as well. The reason is that, with greater demand diversity, the cost savings from annexation are not sufficient to compensate for the loss from imposing a common public-good level. As in the case of Figure 2, giving veto power to

the annexee leads to the right outcome in this case, with inefficient annexation being blocked.

The upshot is that conferring veto power on the annexee blocks annexation in two key situations where it is undesirable: when annexation is designed purely to exploit tax base differentials in the absence of cost savings (Figure 2) and when cost savings exist but high demand diversity creates a large loss by imposing a common public-good level throughout the metropolitan area (modified Figure 4).

On the other hand, veto power may also block desirable annexations in situations where cost savings exist and demand diversity is moderate (Figure 4). The two alternative political arrangements, where the city resident decides the outcome, generate the right result in this case but they open the door to the wrong outcomes in the cases of Figure 2 and the modified Figure 4.

As explained by Gillette, the entire question of political arrangements would become moot if Coasian transfers between the annexee and city resident were possible. In any situation where the political setup would lead to an inefficient outcome (annexation or its blockage), transfers could undo the inefficiency. An annexee harmed by inefficient annexation could pay the city resident enough to prevent it (inefficiency means that his loss, and thus his potential payment to avoid annexation, exceeds the gain of the city resident). Conversely, if efficient annexation is blocked by the annexee, the city resident can make a large enough payment to remove this opposition. As noted by Gillette, however, the institutional framework for such intercommunity transfers does not appear to be available in actuality, suggesting that a Coasian solution to the problem of inefficient annexation may not be possible.

In conclusion, it is interesting to note that annexation could be viewed as a way of reversing the process of Tiebout sorting, which leads individuals with different demands for public goods to separate into homogeneous jurisdictions. This view is implicitly acknowledged in the title of Gillette's paper, where the phrase "voting with one's hands" replaces Tiebout's notion of "voting with one's feet." In effect, the grabbing hands of the annexing city serve to undo the results of Tiebout sorting. Given the widespread view that Tiebout sorting leads to desirable outcomes, an observer might initially view annexation with a skeptical eye, a view that is affirmed by the examples in Figures 1, 2, and the modified Figure 4. On the other hand, it may be true that the Tiebout process leaves

unexploited gains from public-sector cost savings, as in the cases of Figures 3 and 4. In such a case, annexation may be in society's interest.

FIGURE 1. Annexation with equal tax bases and no cost savings

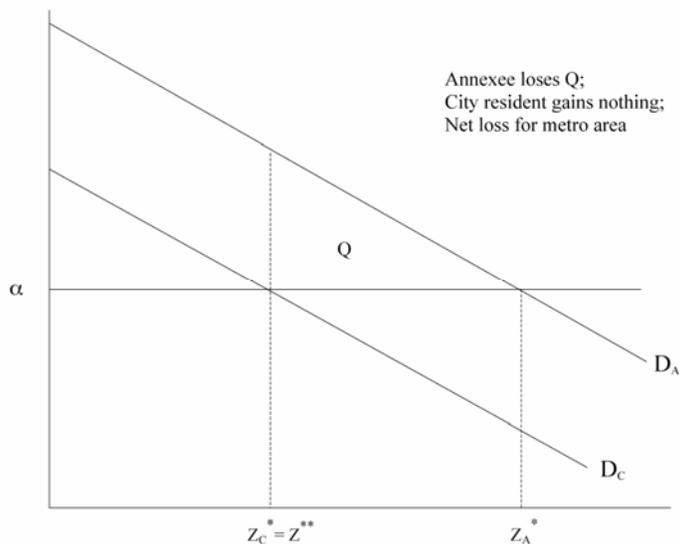


FIGURE 2. Annexation with unequal tax bases and no cost savings

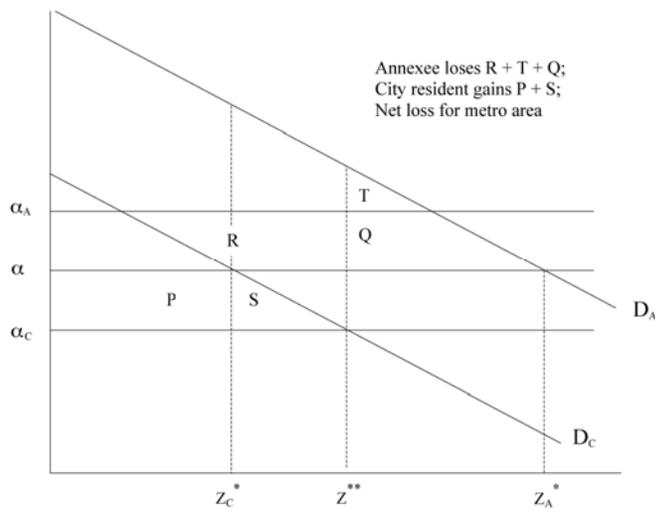


FIGURE 3. Cost-reducing, welfare-improving annexation with universal support

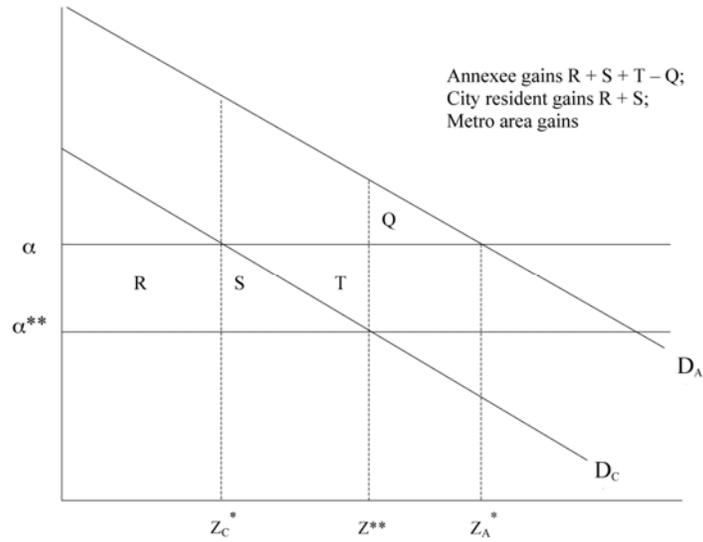


FIGURE 4. Cost-reducing, welfare-improving annexation opposed by annexee

