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Funding Formulas for California Schools III

An Analysis of Governor Brown's Weighted Pupil Funding Formula

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Summary

In his 2012–13 budget Governor Brown proposed a new system for allocating state revenue among California school districts. By all accounts the current system is complex and opaque. In contrast, the proposed system—a weighted pupil funding formula—is simple and transparent. Using the PPIC School Finance Model, we compare how this formula would allocate revenue among districts with the actual allocation of revenue in 2010–11. As the weighted pupil funding formula is phased in, school districts with high percentages of disadvantaged students would receive relatively large increases in revenue compared to other districts. These proposed changes reflect clear priorities on the part of Governor Brown—in particular, providing substantially greater resources for groups of students who, on average, are less academically successful than other students.

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Governor Brown's Proposal

The state of California allocates roughly 40 percent of its general revenue to public schools. This allocation flows through more than 60 channels, resulting in a school finance system that is both complex and opaque. In his 2012–13 budget Governor Brown proposed a radical simplification of this system: A single transparent formula would determine most of the revenue a school district receives.

The proposal would consolidate more than 40 existing revenue sources into one stream of revenue. This consolidation would have two main effects. First, much of the authority over the use of funds previously exercised by the state would be permanently transferred to local school districts. This authority is lodged in the revenue programs that would be consolidated, many of which have restrictions on the use of funds. Although most of these restrictions have been temporarily suspended to give school districts more flexibility in dealing with the revenue shortfalls of the past few years, the new formula would make the suspension permanent. Second, the new formula would allocate revenue among districts differently than the current system does. This paper concentrates on this second effect by comparing the allocation of revenue under the governor's proposal with the allocation of revenue among districts in 2010–11.

Under the current system, school districts receive funds from four main sources: state aid (65%), federal aid (7%), local property taxes (21%), and other local revenue (7%). Most of the state aid (60%) is allocated among districts to offset differences in local property tax revenue, a role the state would continue to perform under the governor's proposal. Using the new formula, the state would determine a revenue total for each district (its revenue entitlement), and provide each district with aid equal to the difference between its entitlement and its local property tax revenue. Increases or decreases in property tax revenue would be offset— dollar for dollar—by state aid, as is presently the case.

A district's entitlement would be determined by the characteristics of students enrolled in its schools, recognizing that some students may require additional resources to attain state academic goals. In particular, the state would provide additional revenue for English learners and for students from low-income families, two student groups that score lower than other groups on state achievement tests. The additional needs of these students are recognized in the current system, but the relationship between revenue and student need varies considerably by district type (elementary, high school, or unified), and by district size. More importantly, in the current system districts similar in type, size, and level of student need may receive very different amounts of revenue.[1]

The governor's proposal would eliminate these inequities. A district's revenue entitlement would be a base rate, a dollar amount per student, multiplied by a sum of student weights, a weighted pupil funding (WPF) formula. The weights represent differences in student need. A student with no additional needs receives a weight of 1.0. A student with family income low enough to qualify for a free or reduced-price lunch would have a weight of 1.37, as would an English learner. Students in either of these two groups are referred to as "disadvantaged" in the analysis that follows. Many students are both English learners and participants in the subsidized lunch program. They would also have a weight of 1.37. The weight for disadvantaged students increases when the percentage of those students in a district exceeds 50 percent, a concentration factor.

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[1] Sonstelie (2008) describes the current relationship between school district revenue and the economic status of students.

Under this formula a district's revenue entitlement per student is determined by the percentage of its students who are disadvantaged, a relationship expressed in the following equation:

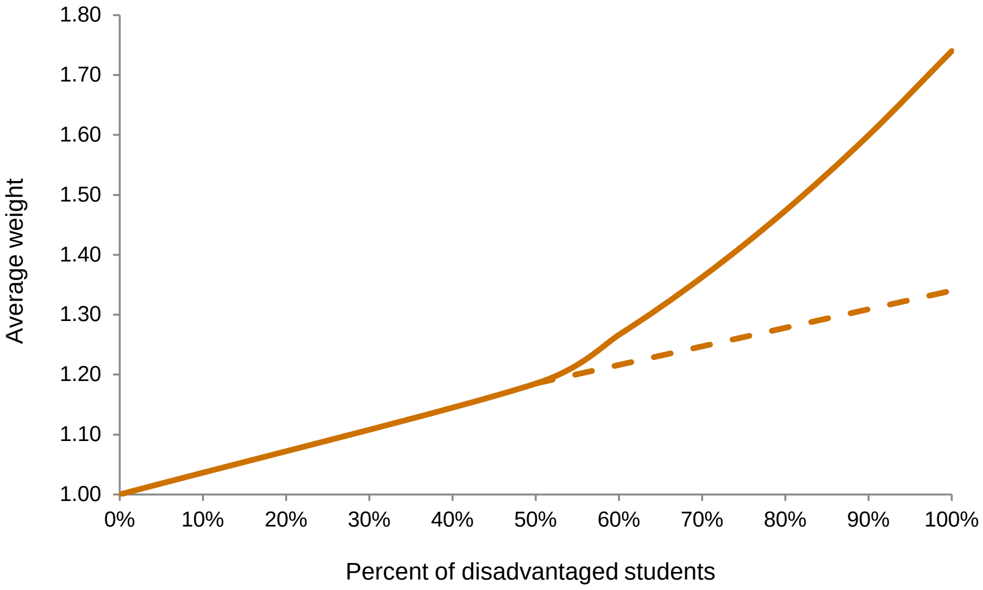
$$\text{WPF entitlement per student} = (\text{base rate})\ \text{X}\ \left(\frac{\text{sum of student weights}}{\text{students}}\right)$$

The third term in this equation is the average weight for students in a district, leading to this simple formula:

$$\text{WPF entitlement per student} = (\text{base rate})\ \text{X}\ (\text{average weight})$$

The base rate is the same for all districts, but the average weight varies with the percentage of disadvantaged students in the district. The bold line in Figure 1 shows the relationship between that percentage and the average weight. The concentration factor is the difference between the bold line and the broken line. For a district in which half the students are disadvantaged, this average weight is 1.185, implying that the district's entitlement per pupil is 18.5 percent higher than that of a district with no disadvantaged students. For a district in which all students are disadvantaged, the average weight is 1.74, implying a 74 percent higher entitlement, half of which is due to the concentration factor.

Figure 1. Average weight and the percent of disadvantaged students



SOURCE: California Department of Finance, 2012.

Several state programs would not be affected by the governor's proposal. The most important of these is special education, which accounted for 8 percent of school district revenue in 2010–11. The other state programs that would not be affected constitute only 3 percent of school district revenue.[2]

The governor proposes a gradual transition from the status quo to the full implementation of the WPF formula. In the first year, only 5 percent of a district's revenue would be allocated according to the new formula. That percentage would grow to 100 percent by 2017–18, when the program would be fully implemented. The base rate for calculating a district's entitlement would also increase during this period from $4,920 in 2012–13 to $6,990 in 2017–18, when the program is fully implemented.

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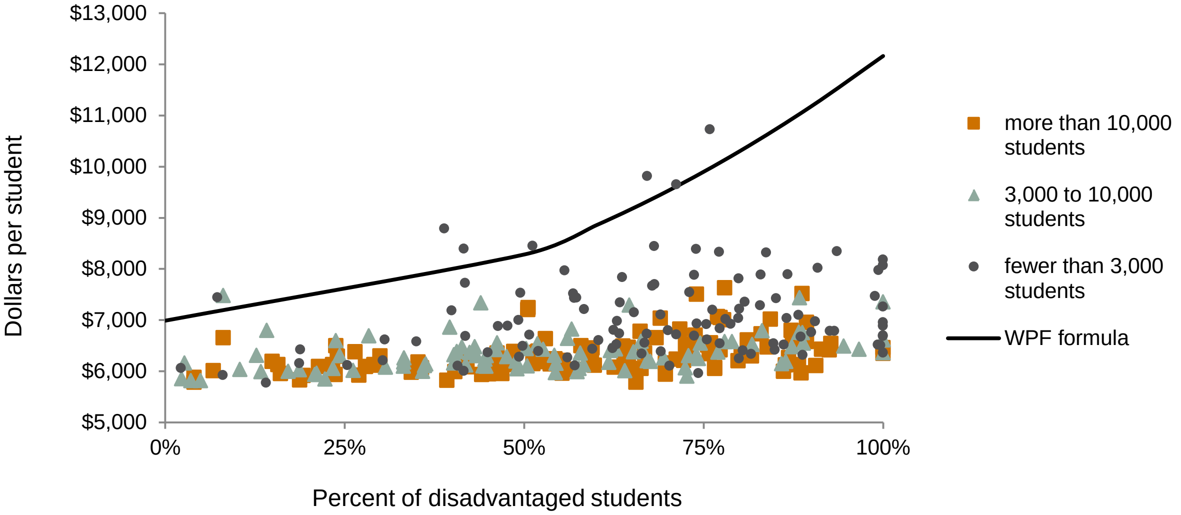
[2] The largest of these programs are the pre-kindergarten program, the school lunch program (linked to federal funding), the after-school program (instituted by ballot initiative), the Quality Education Act (part of a legal settlement), and necessary small schools (funding for schools in sparsely populated areas).

Modeling the Proposal

Using the PPIC School Finance Model,[3] we have simulated the WPF formula when fully implemented and compared the revenue that districts would receive under that model with what they received in 2010–11. These simulations assume the same demographic characteristics in each district as in 2010–11. To compute the percentage of disadvantaged students in each district, we have assumed that 25.8 percent of English learners are not eligible for free or reduced price lunch, a parameter estimated by the California Department of Finance. With these assumptions, the total WPF entitlement would be $51 billion when fully implemented in 2017–18, 41 percent higher than the sum of local property tax revenue and the revenue from consolidated programs. The Department of Finance projects that state tax revenue will be sufficient to finance this additional commitment.

Figure 2 illustrates how the WPF formula would change the allocation of revenue among unified districts, which are districts enrolling students in all grades. Each symbol in the figure represents one of those districts. The horizontal axis measures the percentage of the district's students who are disadvantaged. The vertical axis is the revenue per pupil the district received in 2010–11 from property taxes and the programs that would be consolidated into the new revenue stream. The solid line represents the WPF formula with a base rate of $6,990. A few small districts lie above that line; they would receive less revenue under the formula than they did in 2010–11. But most districts lie below the line, indicating that they would receive more revenue. Districts with enrollment greater than 10,000 students are represented by squares. Those with high percentages of disadvantaged students generally received more revenue in 2010–11 than other large districts, though there was significant variation among districts with similar percentages. During the transition to a fully implemented WPF formula, every district would move vertically to a point on the bold line, representing the formula. Though districts with high percentages of disadvantages students tended to have more revenue in 2010–11 than other districts, they also have the longest distance to travel in this transition. Thus they would receive the largest increase in revenue.

Figure 2. Revenue per pupil in programs replaced by weighted pupil funding, unified school districts in 2010–11



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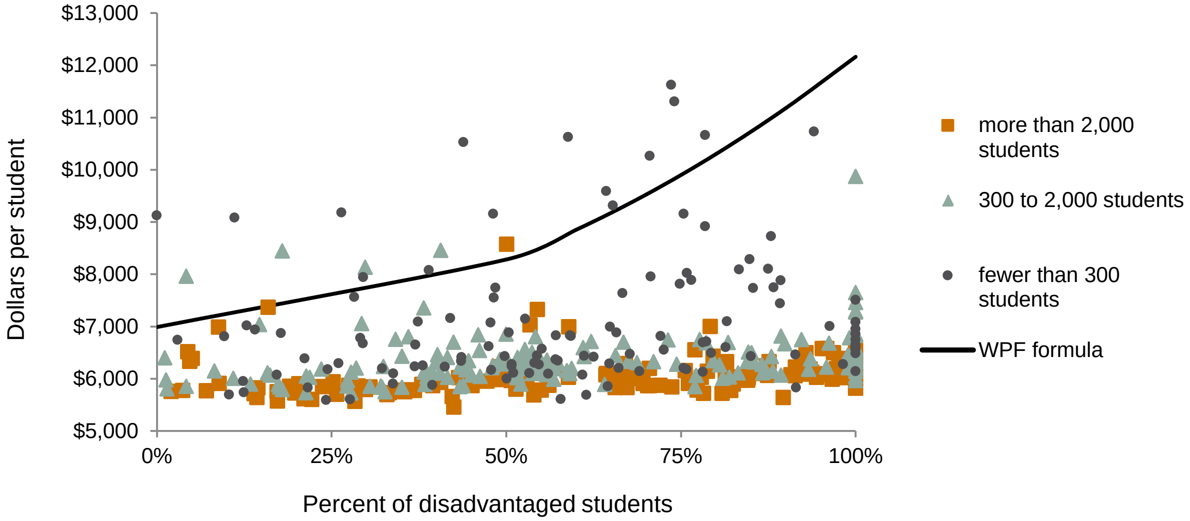
[3] The model and a separate spreadsheet that provides both the 2010–2011 revenue and the revenue generated under the WPF formula may be found in PPIC's Data Depot.

SOURCE: Authors' calculations, based on the PPIC School Finance Model.

Two-thirds of public school students in California are enrolled in unified districts. The remaining students are enrolled in elementary districts with only primary grades (19%), high school districts with only secondary grades (9%), charter schools (4%), and schools operated by county offices of education (1%). Elementary school districts are represented in Figure 3. The figure reveals some of the same relationships as Figure 2. Revenue per pupil varies considerably for small districts, districts with high percentages of disadvantaged students in 2010–11 tend to have more revenue per student than other districts, and these districts would gain the most per student under the governor's proposal.

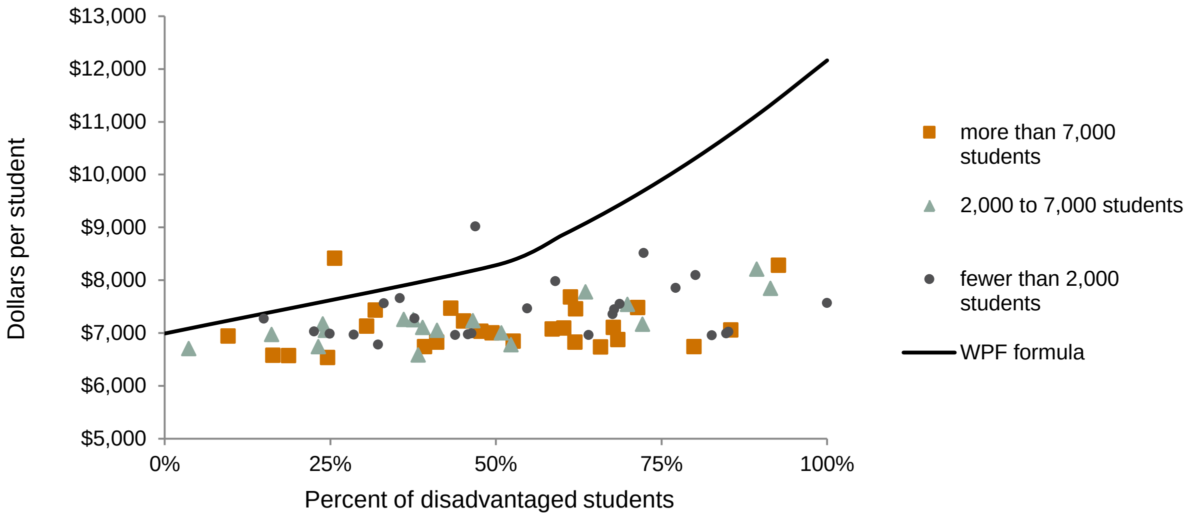
Figure 3. Revenue per pupil in programs replaced by weighted pupil funding, elementary school districts in 2010–11



SOURCE: Authors' calculations, based on the PPIC School Finance Model.

Figure 4 contains the same information for high school districts. Like elementary and unified districts, high school districts with high percentages of disadvantaged students would receive the largest increase in funding. Note, however, that high school districts had higher revenue per pupil in 2010–11 than elementary and unified districts, a result that is not due to explicit policy decisions but rather to the working out of a long process that began with court rulings in the 1970s. Because the weighted pupil funding formula is the same for every district type, high school districts gain less on average than other districts.

Figure 4. Revenue per pupil in programs replaced by weighted pupil funding, high school districts in 2010–11



SOURCE: Authors' calculations, based on the PPIC School Finance Model.

These average gains are shown in Table 1. Districts are categorized by type and by percentage of students who are disadvantaged. For each category, the table reports the average gain in revenue per pupil in moving from the allocation in 2010–11 to the allocation districts would receive if the WPF formula were fully implemented with a base rate of $6,990. Average gains are weighted by the number of students in a district. Unified districts with fewer than 20 percent of students who are disadvantaged would gain an average of $1,229 per student with the WPF formula. In comparison, unified districts in which more than 80 percent of students are disadvantaged would receive an additional $3,963 per student on average. This pattern also holds true for elementary and high school districts. Districts with few disadvantaged students receive substantially smaller increases than districts with high percentages of disadvantaged students. Echoing another trend revealed in Figures 1, 2, and 3, for any given category of disadvantaged student, high school districts gain less on average than elementary and unified districts, reflecting the relative advantage high school districts hold in the status quo.

Table 1. Average change due to weighted pupil-funding formula, dollars per student

	District type		
Disadvantaged students (%)	**Unified**	**Elementary**	**High school**
0–20	$1,229	$1,241	$631
20–40	1,576	1,956	621
40–60	2,073	2,199	1,134
60–80	3,124	3,542	1,998
80–100	3,963	5,287	3,369

SOURCE: Authors' calculations, based on the PPIC School Finance Model.

The table and figures exclude two categories of districts. The first is the 81 districts (enrolling less than 0.5% of students) in which more than 75 percent of students attend either a necessary small school[4] or a locally funded charter school. Many other districts also have necessary small schools and locally funded charter schools. These districts are represented in our table and figures, but in determining revenue and students in those districts, we have excluded both the funding for these schools and the students attending them.

The second excluded category consists of 64 districts (2% of students) that have higher property tax revenue than their entitlement under the WPF formula. Under the new funding formula they would receive no state aid; their revenue would be their property tax revenue, not their WPF entitlement. Though these districts would have higher revenue than their WPF entitlement, they would lose revenue relative to the status quo because each currently receives revenue from categorical programs that would be consolidated into the new funding formula. On average, these districts would lose $1,037 per pupil.

The distribution of gains in Table 1 reveals the priorities in the governor's proposal: significantly higher revenue for districts with high percentages of disadvantaged students. Additional revenue would not be equally distributed across districts, as it has tended to be in the past. It would be concentrated in some districts as Table 2 shows. Twenty-seven percent of students attend schools in the 165 districts that would receive a revenue gain of 30 to 40 percent. However, 277 districts (32% of students) would receive revenue gains of more than 50 percent, and 198 districts (11% of students) would receive revenue gains of less than 20 percent. The districts losing revenue under the governor's proposal are mainly districts with property tax revenue in excess of the WPF entitlement.

Table 2. The distribution across districts of additional revenue

Change in Revenue (%)	Districts	Students	Students (%)
less than -10	45	61,851	1.1
-10–0	51	80,749	1.4
0–10	38	143,834	2.6
10–20	64	344,654	6.2
20–30	152	925,465	16.5
30–40	165	1,502,210	26.8
40–50	89	731,469	13.1
50–60	68	518,398	9.3
60–70	58	419,109	7.5
70–80	56	393,665	7.0
80–90	48	233,660	4.2
90–100	40	206,356	3.7
100–110	7	42,338	0.8

SOURCE: Authors' calculations, based on the PPIC School Finance Model.

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[4] Necessary small schools are schools serving students in sparsely populated areas. They are funded through a different revenue channel than are other schools.

Three important qualifications pertain to the numbers presented in Tables 1 and 2. First, the revenue gains are nominal, as they are not adjusted for inflation. Second, we have assumed that student demographics will not change. Third, we have assumed that state tax revenues will be sufficient to fully implement the governor's proposal, an assumption underlying the administration's choice of base rates and student weights. If revenue falls short, the base rate will surely be adjusted downward. If revenue is higher than anticipated, upward adjustments are likely.

We have used our school finance model to simulate the WPF formula with both higher and lower base rates than the rate specified in the governor's proposal. A higher base rate increases gains proportionally, and a lower base rate decreases those gains. However, changes in the base rate do not change the pattern of gains. Districts with high percentages of disadvantaged students have relatively larger increases. The key issue in the governor's proposal is not the base rate, which will change over time according to economic conditions, but the weight assigned to disadvantaged students, which will determine how increases in state revenues are distributed among school districts.

The status quo used in our comparisons is the revenue school districts received in 2010–11, which is an amount substantially less than they would have received without the state's revenue shortfalls. In fact, during that school year districts received 18 percent less in revenue than they were entitled to under the current system. Accordingly, another natural basis for comparison is the revenue that districts would receive if they had received their full entitlement under the current system. We have also used our model to make that comparison, with similar results. Whether judged from the perspective of what districts actually received, or of what they would have received without the revenue shortfall, the pattern of gains is the same. Districts with high percentages of disadvantaged students receive the largest gain.

Conclusion

In Rose, Sonstelie, and Weston (2010), we proposed five principles to guide reforms in California's school finance system. The governor's proposal is generally consistent with those principles. The first principle is to allocate revenue according to need. The governor's proposal clearly addresses one particular element of need, the additional resources needed to raise the academic performance of disadvantaged students. But one large question remains: Are these additional resources enough? (We intend to address this difficult question in a subsequent paper.) In addition, the governor's proposal ignores a major factor regarding resources, regional labor markets, which cause obvious differences among districts in their need for revenue. As documented in Rose, Sengupta, Sonstelie, and Reinhard (2008), districts in regions of the state with high labor costs must pay their teachers more, resulting in fewer teachers per student and larger class sizes. To provide the same level of resources to their students, these districts need additional revenue, a fact not addressed in the governor's proposal.

A second principle involves the incentives a school finance system provides for school districts. In attempting to address differences in resource need, a school finance system may sometimes inadvertently provide perverse incentives to districts. For example, a system that allocates additional revenue to districts with low student performance may be allocating revenue where needs are great, but it runs the risk of rewarding inefficiency. Such improper incentives can be avoided by allocating revenue according to indicators of need that are external to a district and unlikely to be affected by its actions. The governor's proposal follows that approach by allocating additional revenue to districts with many students from low-income families. On average, these students tend to be less academically successful than other students and may thus need additional support. Because revenue would be allocated according to the economic status of students, not their achievement, a district would not lose revenue if it were particularly effective in raising the achievement of all its students. On the other hand, the governor's proposal would provide improper incentives for the effective education of English learners. A district that moves such English learners quickly to fluency would receive less revenue than a district that was less effective in educating these students.

The governor's proposal is generally consistent with the remaining three principles. The WPF formula allocates funds transparently, and because of that transparency it treats similar districts equitably. The last principle involves the difficult question of balancing state and local authority. By consolidating many funding sources, each with its own state-imposed requirements, into one funding stream with few requirements, the governor's proposal would move the state closer to a balance of state and local interests in which the state is focused on educational outcomes and local school districts have more freedom in determining how those outcomes are achieved.

Overall, Governor Brown's weighted pupil-funding formula is a bold proposal with clear priorities. By comparing the allocation of resources under the proposal with the status quo, we have highlighted those priorities—substantially greater resources for groups of students who, on average, are less academically successful than other students. If enacted, the proposal would be phased in gradually, giving districts several years to adjust. As the legislature takes up this proposal, the adjustments required by districts will take center stage, and amendments will surely be offered. The important question is whether, at the end of this process, a simpler, more transparent, and more stable system for financing public education will emerge.

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Heather Rose is an adjunct policy fellow at PPIC and an assistant professor at the School of Education at the University of California, Davis. She specializes in the economics of education, school finance, and the effect of the education process on different racial and ethnic groups. Her current projects include the study described above and also a study of affirmative action policies at the college level and an investigation of how high school curriculum affects the test score gap between white and minority students. She has also studied the effects of high-school curriculum on students' subsequent earnings. She holds a B.A. in economics from U.C. Berkeley and an M.A. and Ph.D. in economics from U.C. San Diego.

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