CALIFORNIA
DEPARTMENT OF JUSTICE

Standardized Regulatory Impact Assessment: Player-dealer Rotation and Blackjack Regulations

Prepared for: California Department of Justice
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DISCLAIMER
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Abbreviations

AB – Assembly Bill
AG – Attorney General of California
BEAR – Berkeley Economic Advising and Research
BGC – Bureau of Gambling Control
CGE – Computable General Equilibrium
DOF – California Department of Finance
DOJ – California Department of Justice
FY – Fiscal Year
GSP – Gross State Product
NIGC - National Indian Gaming Commission
OAL – Office of Administrative Law
RSTF – Revenue Sharing Trust Fund
SAM – Social Accounting Matrix

SB – Senate Bill
SRIA – Standardized Regulatory Impact Assessment
TBC – To Be Completed
TPPPPS - Third-party Providers of Proposition Player Services

1 Introduction

1.1 Background and Summary of Proposed Regulations

The California Department of Justice, Division of Law Enforcement, Bureau of Gambling Control (BGC) is proposing two separate but related regulations. In order to improve interpretation and compliance with existing laws, these regulations would provide guidance on the activities allowed under existing laws. The first proposed regulation would implement a requirement that the player-dealer position be rotated between the seated players and the TPPPPS for games with player-dealers. The second proposed regulation would clarify which elements of games sufficiently differentiate them from twenty-one (or Blackjack), which is prohibited by statute in California.

1.1.1 Rotation of Player-dealer Position

Under California law, “banking games” or “banked games” are prohibited. A game will be determined to be a banking game if, under the rules of that game, it is possible that the House, another entity, a player, or an observer can maintain a bank or operate as a bank during the play of the game.

California law specifies that a game will not be considered a banking game if the game features a “player-dealer” position and the game rules provide that the player-dealer position is "continuously and systematically rotated amongst each participant during the play of the game..." (Bus. & Prof. Code, § 19805, subd. (c); Pen. Code, § 330.11.) The player-dealer is a position in a game in which the person designated as the player-dealer has the opportunity to wager against multiple people at the table, provided that this position is rotated amongst the other seated players in the game.

California law allows cardrooms to contract with third parties to provide "proposition player services" in their cardrooms. (Bus. & Prof. Code, § 19984.) These Third-party Providers of Proposition Player Services (TPPPPS) employ persons who participate in games that feature a rotating player-dealer position. In the vast majority of cardrooms, the TPPPPS currently acts as the player-dealer for nearly the entire time that the game is being played, i.e. the player-dealer position does not continuously and systematically rotate.

According to BGC, many currently approved controlled games featuring a rotating player-dealer position have game rules that allow for the offer of the opportunity to act as the player-dealer, without requiring that the player-dealer position actually rotate continuously

and systematically among the seated participants during the play of the game. This has resulted in the player-dealer position remaining with one party for an unrestricted time during the play of a controlled game featuring a player-dealer position, which allows that person to maintain or operate a bank. This is the type of game rule that was specifically held to be unlawful under Penal Code section 330. (See *Oliver v. County of L.A.* (1999) 66 Cal.App.4th 1397, 1407-1409.)

The proposed BGC regulations intend to clarify the role of the player-dealer position so that games will be played in compliance with the law. With the proposed regulations, BGC intends to address the problem of allowing the maintenance or operation of a bank in controlled games featuring a rotating player-dealer position by requiring that rotation of the player-dealer position actually occur, as specified. The regulations would also prohibit specified forms of wagering to prevent the maintenance or operation of a bank by any person. The regulations would impose clear restrictions on what a game's rules must provide for in a game featuring a rotating player-dealer position. Specifically, the proposed regulations would mandate the following:

Section 2076. Games with a Player-Dealer Position; Rotation; Operation of Game.

(a) A game that features a player-dealer position shall include in its rules the following:

(1) The player-dealer position may only be occupied by a person seated at the table, and shall be offered to the other seated players at the table before every hand. The game rules shall specify the means by which the player-dealer position is selected at the opening of a new game, and upon rotation of the player-dealer position to the next person.

(2) There shall be written notice at each table informing patrons when a player may accept the player-dealer position. The written notice shall state "Any player can assume the player-dealer position when it is offered. The player that assumes the player-dealer position cannot win or lose more than the amount they wager."

(3) Before every hand, the dealer shall offer the player-dealer position verbally and physically to each of the seated players at the table. The offer shall be visible to surveillance cameras.

(4) The player-dealer position shall rotate to at least two players other than the TPPPS every 40 minutes or the game shall end. If there is only one player at the table in addition to the TPPPS, the player-dealer position shall rotate to that player a minimum of two times every 40 minutes, or the game shall end.

(5) If rotation of the player-dealer position has not occurred and the game ends as prescribed in subdivision (a)(4) of this section, game play shall stop, the table shall be cleared of all wagers and cards, no cards shall be dealt, and no wagers shall be made. No further play

shall be allowed or commenced unless and until another person accepts the player-dealer position.

(6) If the 40-minute mark is reached during a round of play, the round of play may be completed before the game ends.

(7) If the player-dealer position is occupied by a TPPPS, as defined in California Code of Regulations, title 4, section 12002, subdivision (ap), the next person in the rotation of the player-dealer position shall not be the TPPPS.

(b) A game that features a rotating player-dealer position shall not:

(1) Allow any person to place a wager directly against the TPPPS when the TPPPS is not occupying the player-dealer position.

(2) The TPPPS shall not settle any wagers at the table when they are not occupying the player-dealer position.

(c) No more than one third-party provider of proposition player services shall be permitted to offer services at a table where a game that features a rotating player-dealer position is being offered for play.

Section 2077. Effect of Regulations on Previously Approved Games; Effect of Regulations on Pending Game Applications.

(a) No later than 60 days after the effective date of section 2076, a gambling enterprise that offers games featuring a player-dealer position approved by the Bureau that do not comply with section 2077, shall:

(1) Submit a written request to the Bureau seeking to modify the games for compliance with section 2076.

(2) Submit updated game rules that comply with section 2076.

(b) The Bureau shall approve or disapprove a request to review or an application to modify a previously approved game, as provided in subdivision (a), within 120 days of the receipt of the request.

(c) A game that is pending Bureau review when section 2076 becomes effective shall be approved only if it complies with section 2076. The gambling enterprise shall modify a pending game's rules, if necessary, to ensure that it complies with section 2076, or, withdraw the proposed game. Refunds of unused monies deposited for the review of a game that is withdrawn shall be made in accordance with section 2037, subdivision (a).

(d) An "Application for Controlled Game Review" BGC-APP-026 (Rev. 09/17) is not required to be submitted with the modification.

(e) One written request for modification of all California games approved for the gambling enterprise is sufficient; however, individual games rules must be modified and submitted with the written request.

(f) No other modifications shall be made to the game rules during this process.

(g) Any previously approved California games for which the Bureau has not received a request for modification as provided in subdivision (a), and that does not comply with section 2076, shall be deemed non-compliant with these regulations and approval for the game shall be withdrawn. Within 10 days of service of notice from the Bureau withdrawing authorization for a game as provided in this subdivision, an objection thereto may be filed with the Chief. The Chief, in the Chief's discretion, may then grant or deny the objection. Judicial review of the Chief's decision is subject to the limitation of Business and Professions Code Section 19804.

(h) The deposit required by section 2037, subdivision (a)(1)(L), shall be waived for a game that has been requested to be modified pursuant to subdivision (a) of this section.

Note: Authority cited: Section 19826, Business and Professions Code.

Reference: Sections 19805, 19826, Business and Professions Code; *Oliver v. County of Los Angeles* (1998) 66 Cal.App.4th 1397.

1.1.2 California-Style Blackjack

Under California law, “any” game of twenty-one, commonly referred to as Blackjack, is prohibited. (Pen. Code, § 330.)

According to BGC, twenty-one is, and historically has been, known by a variety of names. At the time that twenty-one was added to the list of games prohibited by Penal Code section 330, a number of variations of twenty-one had been recognized. Additionally, the game of “blackjack” has been referred to interchangeably with the game of “twenty-one” for decades in general parlance, in numerous California and federal judicial decisions, under the federal Indian Gaming Regulatory Act. “Blackjack” is played in a substantially similar manner both in New Jersey and Nevada, and in tribal casinos.

Games styled after the game of twenty-one, or Blackjack, have been played in California for many years. However, over the years, cardrooms have submitted game rule changes that make the currently approved Blackjack-style games nearly indistinguishable from the way traditional Blackjack is played in traditional casinos in Nevada or Class III tribal casinos, and which mimic those applicable to traditional Blackjack, or which merely give the impression that the games are played in a substantially different manner from the prohibited game. These include assigning point values to specified cards that are

operative only on the initial deal, in conjunction with a target point count that is obtainable only on the initial deal, and where the game is thereafter played with a functional target point count of 21.

With these proposed regulations, BGC intents to address the proliferation of questionable Blackjack-style card games being played in California cardrooms by imposing clear restrictions on what a game's rules may include to comply with state law.

The proposed regulation therefore seeks to

(1) identify the elements of the Blackjack game that are prohibited;

(2) identify the elements of a permissible alternative to Blackjack that will differentiate the game such that the game does not fall within the prohibition; and,

(3) provide procedures for modifying currently approved game rules that would not comply with the new regulation.

Impact summary: The proposed regulations would create compliance costs for the cardroom industry. Most notably, cardroom revenues may decrease and TPPPPS could be adversely affected as their role may become more limited. Additionally, cardrooms could see an additional decline in revenue if customers switch to tribal casinos to avoid the player-dealer rotation requirement or seek traditional Blackjack games. The threshold analysis is meant to illustrate that BGC's proposed regulations will likely generate greater than $50 million in economic impact within the first 12-months of implementation and will therefore necessitate a SRIA. This analysis is not meant to be definitive or inclusive of all economic impacts.

1.1.3 Enterprises to be Regulated

All cardrooms (or card clubs) in California would be subject to the proposed regulations. There are currently 86 licensed cardrooms, with 65 operating before the advent of COVID-19, distributed around the state. This SRIA will establish a baseline scenario using simple forecasts based on in-state industry growth over the last two decades. Gambling activities that are authorized at tribal casinos would not be subject to the proposed regulations.

1.1.4 Compliance Obligations

Under the proposed regulation for player-dealer rotation, TPPPPS would no longer be allowed to serve as player-dealer during every round of play. Instead, cardrooms would be required to either implement player-dealer rotation systems or come up with alternative (and *a priori* approved) responses to comply.

Under the Blackjack regulations, cardrooms would be obligated to change the game rules of currently approved games they offer in this category to sufficiently differentiate them from traditional Blackjack if the currently approved game rules do not comply with the proposed regulations. Any new permissible alternative to Blackjack will also have to be in compliance with the proposed regulations.

1.1.5 Potential Alternative Pathways to Compliance

There are two sources of uncertainty about compliance pathways for both regulations, one at the discretion of the agency and one that arises from innovation responses in the industry. We address each in turn. Agency discretion relates to the stipulated regulatory implementation schedules for the two rules, including rights of the industry to appeal for changes. At the moment, we are not aware of any such industry intentions and the agency has offered no specific mitigation or flexibility. For these reasons, our scenarios assume both regulations will be implemented to the letter of their current statute, and they are modeled as such in the Proposed Regulation scenarios. We have three such scenarios to illustrate the component impacts of the two regulations and their combined impact, but the first two of these are only illustrative.

1.1.6 Regulatory Implementation Schedule

With respect to scheduling, each regulation has its own timetable, but in fact they go into force only one month apart. Under the current timeline, the regulations would tentatively be effective (after approval by the Office of Administrative Law (OAL)) on October 1, 2025, assuming a rulemaking starts in October 2024. Under the current draft of the player-dealer rotation regulations, cardrooms will have 60 days to request review of game rules, and the Bureau will have 120 days to approve or disapprove changes to the game rules. That would mean that full implementation for Player-Dealer would be March 30, 2026. For Blackjack regulations, assuming the same October 1, 2025 effective date, there is a 60 day request to review, and 90 days for the Bureau to respond, which would result in a March 2, 2026 implementation date. The one-month gap makes implementation essentially simultaneous in the annual impact modeling framework, having its first full year impact in March 2027 and extending decadal assessment to 2026-2034.

In terms of interaction between the regulations, there is some overlap between TPPPPS coverage and Blackjack. However, Blackjack games currently approved for play in California cardrooms are, and permissible alternatives to Blackjack under the proposed Blackjack regulations would be, played as player-dealer games. Accordingly, the player-dealer rotation regulations will necessarily impact the games that will be regulated under the Blackjack regulations and would require that the rules of those games be modified with regard to the rotation of the player-dealer position. Under the current draft regulations, the implementation period of the two regulations would be staggered, with the Blackjack regulations requiring a compliance period within 150 days after its effective date, and the Rotation of the Player-Dealer Position regulations requiring a compliance period within 180 days after its effective date. Because TPPPPS participation is decided on a game-by-game basis, there is no convenient rule to disentangle this from Blackjack activities. For this reason, we assume that annual retirement of both TPPPPS and Blackjack proceed in parallel.

1.1.7 Industry Responses

Because both cardrooms and TPPPPS stand to lose revenue from the proposed regulations, both groups could be incentivized to respond by creatively applying the proposed regulations. This may lead to alternative games that could be approved as compliant.

The proposed player-dealer rotation regulation requires that the player-dealer position rotate to two players, other than the TPPPPS, within a 40-minute period and then, if no rotation occurs, the game must stop. However, it is possible that a new, different game could immediately commence at that same table. Therefore, cardrooms could offer two different games at each table. This would allow TPPPPS players to remain in the player-dealer position for every hand while potentially complying with the regulation, although the game would have to change every 40 minutes.

Finally, the cardroom could contract with multiple TPPPPS to alternate the role of player-dealer in some agreed rotation from one TPPPPS to another, consistent with the regulation. This would allow for strictly compliant player rotation while still having TPPPPS players in the role of player-dealer for a large portion of the time during the 40-minute interval as proposed by the regulation. However, unless the TPPPPS players are simultaneously playing games at different tables and then switching (which could be hard to time) they risk losing half of their revenue opportunity as only one TPPPPS could play at a time, limiting the appeal of this option.

1.1.8 Potential Interactions between the Policies

Because the two regulations are essentially simultaneous, sequencing is not an issue. Because they are restricting different gaming activities simultaneously, interactions between their implementation will be limited and, in any case, would be very difficult to disentangle.[1] This implies that direct impacts are likely to be additive, double counting unlikely. Indirect and induced impacts have the potential to be offsetting, especially when mediated by price changes and resource shifts, and the role of the GE macroeconomic model is to capture these.

1.2 Regulatory Baseline

Senate Bill 617 (2011) requires that each SRIA identify and estimate economic impacts, both costs and benefits as these arise from specific regulatory measures needed to successfully implement state law. Assessment of economic impacts of the proposed regulations requires identifying them as additional or incremental with respect to what would have happened in the absence of regulation. This counterfactual scenario is referred to as the regulatory baseline. For this SRIA, it is assumed that the overall California economy would grow according to the macroeconomic projections of the California Department of Finance (DOF). [2, 3, 4] As a condition for implementation in SRIA analysis, economy-wide models must provide accurate reference baselines for comparison to their own SRIA regulatory scenarios as well as other state economic assessment[5] according to trajectories forecast by DOF in its regular forward projections, published twice per year.

There are three fundamental macroeconomic series of importance for baseline calibration: Population, Employment, and Personal Income. Because population is an exogenous input to the BEAR model, DOF projections are incorporated directly. In the

[1] There is no rigorous evidence available on direct substitution between these two gaming practices under regulatory modification. There is plenty of laboratory study of more abstract risk taking, but RCT's in commercial gambling are non-existent because of industry sensitivity and the expense of establishing control and treatment designs.
[2] California Code of Regulations, title 1, section 2003(b)
[3] http://www.dof.ca.gov/Forecasting/Demographics/
[4] http://www.dof.ca.gov/Forecasting/Economics/Eco_Forecasts_Us_Ca/
[5] We would like to express our thanks to the DOF Chief Economist and her staff for their cooperation and data sharing to support this calibration exercise. Any errors implementing these inputs are solely the responsibility of the authors. This version of the SRIA implements the latest DOF economic forecasts (as of 7/15/24) and last year's population projections. Although they were available this time last year, the latest estimates for population will not be available until mid-August, 2024.

case of Personal Income, DOF forecasts only extend to 2023, but BEAR tracks these exactly through a built-in calibration mechanism and extrapolates them to 2033.[6]

For the industry itself, several categories of economic statistics have been assembled from official and industry sources and, in some cases, estimates have been made to compensate for gaps in reporting. These are summarized in the next subsection.

2 Impacts on California Businesses

In this section we identify provisions in the proposed regulation that are assumed to have incremental economic impacts that would be (positively or negatively) incremental to the regulatory baseline. For each article in the proposed regulation, we briefly describe the general purpose of the article and in instances where no incremental impact is assumed, we provide a justification for this assumption.

2.1 Who is affected by the proposed regulations?

All cardrooms (or card clubs) in California would be subject to the proposed regulations. There are currently 86 licensed cardrooms located throughout the state, with 65 operating before the advent of COVID-19. In addition to the cardrooms themselves, all third-party businesses that provide gaming support services (known as third-party providers of proposition player services or TPPPPS) would be affected. There are currently 36 active TPPPPS in the state. Moreover, impacts are not expected to be limited to the gaming-related operations but to indirectly affect a variety of associated attractions or appurtenant services including restaurants, bar, and hotels. The entire cardroom industry, including cardrooms, TPPPPS, and associated non-gaming activities, employs an estimated 18,000 people in California, generating $730 million in wages and benefits, and contributes $3 billion to overall economic activity (GSP, see John Dunham & Associates, 2019).

California is also the nation's largest tribal gaming state, with 76 California tribal gaming casinos owned by 73 of the state's 109 tribes. Non-casino tribes receive a share of casino revenues through the state-managed Revenue Sharing Trust Fund (RSTF). California tribal casinos operate 70,000+ total slot machines and 2,000+ table games.

Table 2.1 shows revenue estimates by category. In 2018, cardroom gaming revenues in the state totalled $1.1 billion and TPPPPS revenues totalled $680 million. Including

[6] Full technical documentation of the BEAR model, including its DOF conforming baseline calibration, is available upon request to admin@bearecon.com

related suppliers to the industry as well as spending of employees, total direct economic output from cardrooms in 2016 was estimated to be $3.0 billion, while indirect output totalled $1.5 billion, and induced output totalled $1.1 billion.

Table 2.1: Overview of Baseline Gaming Sector Revenues

	Cardroom All Games	Cardroom Blackjack Revenue	Cardroom California and No Bust Blackjack	Cardroom Other Games	Tribal Casinos All Games	TPPPPS
2011	873	94	16	763	7,024	511
2012	885	95	17	773	6,924	518
2013	896	96	17	783	7,017	524
2014	907	97	17	793	7,323	531
2015	995	107	19	870	7,908	583
2016	1,081	116	20	945	8,410	633
2017	1,148	123	22	1,003	8,943	672
2018	1,163	125	22	1,016	9,600	681
2019	964	103	18	842	9,902	564
2020	411	49	14	343	10,450	241
2021	1,006	97	31	771	11,004	589
2022	1,220	121	33	991	11,520	714
2023	1,356	134	37	1,101	12,096	794

Notes: All figures in 2020 US $ millions. Source: CA Bureau of Gaming Control and industry.

Table 2.2: Other Baseline of Gaming Statistics

	Cardroom Dealers (FTE)	Casino Dealers (FTE)	Cardroom Service Revenue ($M)	Cardroom Allied Enterprise Revenue ($M)
2011	17,331	24,940	1,655	1,104
2012	17,557	25,264	1,634	1,089
2013	17,782	25,589	1,613	1,076
2014	18,008	25,914	1,593	1,062
2015	19,756	28,429	1,452	968
2016	21,460	30,881	1,337	891
2017	22,778	32,778	1,260	840
2018	23,078	33,209	1,243	829
2019	19,126	27,523	1,500	1,000
2020	8,049	11,583	631	421
2021	17,837	25,667	1,399	933
2022	22,722	32,698	1,782	1,188
2023	24,537	35,310	1,924	1,282

Notes: All figures in 2020 US $ millions or Full-Time Equivalent headcount.

2.2 Labor Costs

Labor costs directly impact California businesses and consumers, including wages, fringe benefits and overhead. Fringe benefits include a variety of costs such as health insurance, retirement plans, paid leave, etc. Overhead includes any costs to a firm that are related to labor beyond wages and fringe benefits. These include the fixed costs of a firm that manages employees and include things such as human resource salaries, office overhead, provisions for transport, and payroll services.

The wage estimates used in this SRIA come from the Bureau of Labor Statistics (BLS), Occupational Employment Statistics (OES) series. Mean wage estimates are used for two occupation types in California: Gambling Dealers and First-Line Supervisors of Gambling Services Workers. The OES does not report fringe benefits by occupation type. For this study fringe benefits are derived from the Employer Costs and Employee Compensation (ECEC), which reports wages and benefits for industry groups. Here estimates from the leisure and hospitality industry group are used, which report a fringe benefit rate of 21% (Table 2.3).

Table 2.3: Overview of Baseline Employment

Occupation	BLS Occupation Code	Mean Hourly Wage	Fringe Benefits	Overhead	Hourly Cost	Employment
Gambling Dealers	39-3011	$13.19	21%		$15.96	16,050
First-Line Supervisors of Gambling Services Workers	39-1013	$26.48	21%		$32.04	4,110

2.3 Compliance Costs

2.3.1 Rotation of Player-Dealer Position

In the case of the player-dealer rotation regulation, we assume that the proposed regulation will reduce the number of TPPPPS in cardrooms, ultimately removing a significant share of TPPPPS transaction revenues from California economic activity. This decrease in TPPPPS revenues could also result in fewer employees of TPPPPS.

Additionally, we assume that changes to the player-dealer position will lead to the unintended consequence of some cardroom customers shifting patronage to tribal casinos. Although only a few very specific rules of existing games will change, nullifying returns to TPPPPS will likely change gaming dramatically and it is expected that about half of players will leave cardrooms. We also assume 50% of cardroom TPPPPS patronage (by revenue) will be diverted to tribal casinos. This estimate is consistent with expert opinion and also reflects the relatively remote nature of the tribal alternatives (cardrooms are concentrated in urban areas). Conversely, a substantial portion of TPPPPS customers may not elect to substitute their patronage to tribal casinos if innovations in gameplay deliver adapted games that are acceptable substitutes for their predecessors. In both scenarios, we assume overall casino patronage within California borders remains constant.[7] To summarize, the proposed regulatory scenario considered for the player-dealer rotation regulation is as follows:

Scenario A
Restricts TPPPPS

a) Eliminates 50% TPPPPS revenue from cardrooms
b) Diverts 25% of TPPPPS revenue from cardrooms to tribal casinos

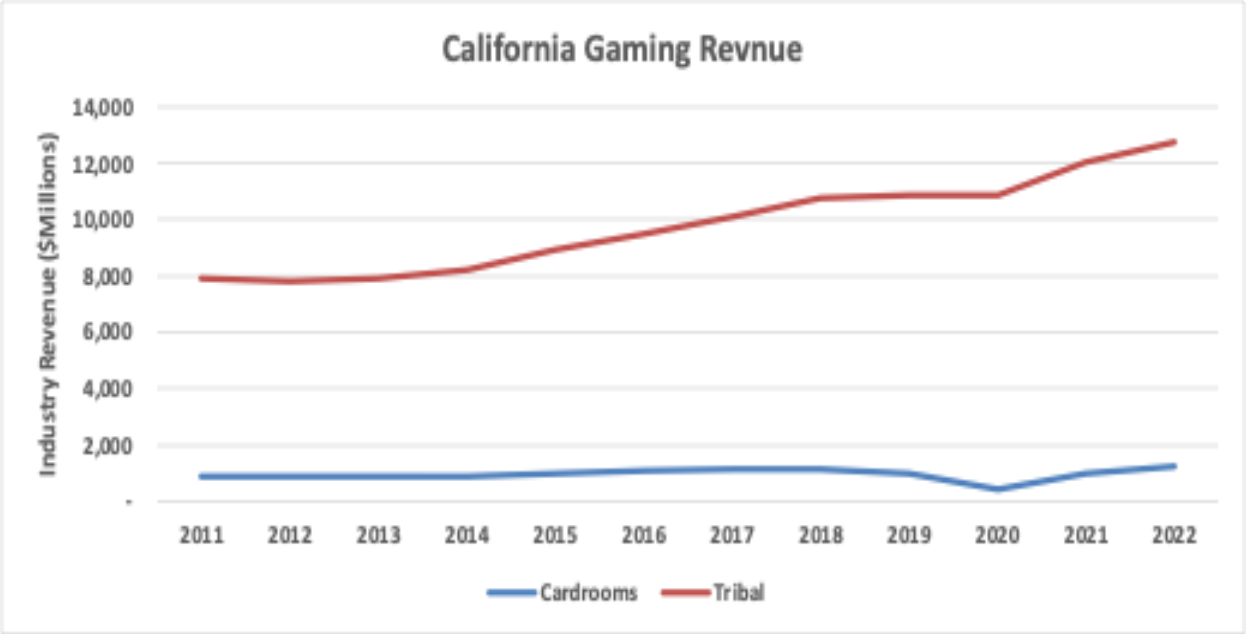
In 2023, TPPPPS revenue from cardrooms was approximately $793 million and total cardroom revenue was approximately $1.356 billion (BGC).

1. In Scenario A, elimination of 50% of TPPPPS revenue would represent a direct loss for cardrooms of $396M(million). Substitution of 25% of all gaming activities from cardrooms to tribal casinos could result in a direct benefit to them of $198 million. Total net direct costs to the gaming sector would thus be $198M, while cardrooms would lose $396M while tribal casinos gain $198M and the combined costs and benefits (falling on different stakeholders) is $594M.

2. Therefore, even estimated economic impacts in the low-cost scenario are more than ten times the $50M threshold requiring a SRIA, allowing reasonable uncertainty about behavioral responses.

[7] Note that “leakage” of casino patronage to neighboring states with gaming such as Arizona or Nevada would further increase the economic impact on the state economy, but including this effect is not needed for the present threshold assessment.

Figure 2.1: Annual Gaming Revenue by Venue



Source: Author estimates from BGC and industry data.

2.3.2 California-Style Blackjack

A similar approach would be used for the proposed Blackjack regulations. We assume that changes to currently approved Blackjack games could result in the elimination of revenues associated with these games as they are currently played in existing cardrooms. We also assume however, that new games (including permissible alternatives to Blackjack allowed under the proposed regulations) and patron loyalty result in a 50% increase of other cardroom activities, partially offsetting the lost revenue from Blackjack games. Additionally, we assume the unintended consequence that some portion of customers could switch patronage from cardrooms to tribal casinos to play traditional Blackjack. In this scenario we also assume that 25% of cardroom customers could shift their patronage to Blackjack gaming at tribal casinos. As Figure 2.1 suggests, tribal venues have ample capacity to absorb this diversion of business, although there may be higher transit costs for patrons.

Scenario B

Eliminates all Blackjack revenue from cardrooms.

a) New games replace 50% of lost Blackjack revenue for cardrooms.
b) Diverts 25% of lost Blackjack revenue from cardroom to tribal casinos.

Scenario C combines A and B
Restricts TPPPPS

a) Eliminates 50% TPPPPS revenue from cardrooms
b) Diverts 25% of TPPPPS revenue from cardrooms to tribal casinos

Elimination of all Blackjack revenue from cardrooms.

c) New games replace 50% of lost Blackjack revenue for cardrooms.
d) Diverts 25% of lost Blackjack revenue from cardroom to tribal casinos.

In 2023, existing Blackjack games in California cardrooms produced an estimated $136M in revenue (BGC). Thus, elimination of all Blackjack revenue from cardrooms with replacement of 50% of revenue from new games could represent a $68M cost to cardrooms while 25% Blackjack substitution to tribal casinos could represent a $34M increased revenues to tribal casinos. Combined impacts (costs+benefits) could therefore exceed $102Min this scenario.

Scenario C considers both regulations together that, implemented according to the current expected schedule, would proceed from late 2025 onward. Taken together, these measures would directly reduce Cardroom revenue by an estimated $464M and increase tribal casino revenue by and estimated $232M.

2.4 Benefits to California Businesses

The primary beneficiaries of the proposed regulations would be tribal casinos. Gaming at tribal casinos would not be covered by the proposed regulations. For this reason, both the player-dealer rotation and the Blackjack regulations will create incentives for some cardroom players to shift their patronage to tribal casinos. This would bring additional direct gaming revenue to tribal casinos as well as additional revenue to associated non-gaming activities, including the usual indirect and induced linkage effects.

Not all patrons who stop visiting cardrooms will substitute to tribal casinos, however. For example, some locations are far from a tribal casino, making the cost of substitution individually prohibitive. With no suitable substitutes, some or all of these former cardroom patrons may therefore reduce their in-person gaming activities. The option always exists for online gaming, but we assume that this is counted in the lost revenue scenarios. Since it is illegal to host real money websites within the state, there would be no offsetting revenue within California because of this substitution.

2.5 Major Regulation Determination

A Major Regulation in California is any proposed regulation that will have an economic impact on California business enterprises and individuals in an amount exceeding $50 million in any 12-month period between the date the major regulation is implemented, computed without regard to any offsetting benefits or costs that might result directly or indirectly from adoption of the regulation (Cal. Code Regs., tit. 1, § 2000, subd. (g)). Our assessment is that the costs for the proposed regulations will exceed the SRIA threshold. In a preliminary effort to ascertain approximate compliance costs for the proposed gaming regulations, we consider regulatory response scenarios for each proposed regulation that correspond to expert opinion from the agency and industry. To determine if the regulations will exceed the $50 million threshold, we focus on what are considered by agency and industry experts to be “median” expectations regarding compliance and player responses to each proposed regulation.

2.5.1 Declaration of Findings

Based on this preliminary assessment, using conservative approaches to calculate the economic impacts associated with the proposed regulations, it is our determination that both proposed regulations will exceed the $50M threshold requirement for performing a SRIA.

2.6 Other Benefits Expected Benefits that have not Been Quantified

A few benefits can be inferred from the proposed regulation, but reliable evidence is currently lacking to support their reliable estimation in the SRIA. These potential benefits to local and state communities include potential reductions in problem gambling and tribal revenue sharing and reinvestment.

2.6.1 Reduction in problem gambling

To the extent that the proposed regulations reduce gambling activity, they could help to mitigate “problem gambling.” According to the California Council on Problem Gambling, this behavioral issue is recognized as a chronic disorder marked by an uncontrollable urge to gamble. The individual cannot stop gambling despite ever-increasing negative consequences to themselves and those close to them. Problem gambling includes, but is

not limited to, the conditions known as “compulsive” or “pathological” gambling. In extreme cases, it can lead to financial ruin, domestic conflict, and criminal activity. According to statistical surveys, about 2% of gamblers in California can be classified as problem gamblers (Volberg et al (2017)). For the present assessment, the compulsive nature of their gambling behavior probably means the proposed regulations will have a negligible limiting effect on their overall time spend gambling. These individuals are much more likely to substitute games at their customary (more convenient) venues than to desist from gaming or to switch to previously unattended venues.

If reliable data were available to differentiate responses by this group from conventional gamblers, it might be possible to value a problem gambling “mitigation benefit” from the proposed regulations. Kohler (2014) and Browne et al (2017), for example, provide estimates for the social cost of problem gambling. However, in the absence of such response data, and recognizing their small aggregate number and expected tenacity of patronage, we assume the problem gambling mitigation effect of the proposed regulations is negligible.

2.6.2 Tribal Gaming Revenue Sharing

Tribal casinos have an agreement to share revenue through their Revenue Sharing Trust Fund (RSTF). For example, tribes that do not operate any casinos received $59 million in gaming revenues in 2015, but this revenue sharing doesn’t appear to be captured in the multipliers estimated in the Beacon Economics report on the economic impacts of tribal casinos. Moreover, much of this revenue sharing appears to be invested in education, public transportation, and health services each of which are likely to have co-benefits. This aspect of increasing tribal gaming revenues should be incorporated into the benefits either quantitatively or qualitatively.

2.6.3 Tribal Gaming Revenue Investment

Tribal casino operations can be seen as quasi-public enterprises, and a significant portion of their proceeds are distributed communally and reinvested in local public goods and services. For example, Wolfe et al (2012) and Kodish et al (2016) both find that increases in tribal casino gaming revenue is associated with better health outcomes among tribe members because casino revenue is used, in part, to fund health clinics. These types of estimates may not exist but if they did then we could quantify the additional health, educational, and livelihood co-benefits associated with increased tribal casino gaming revenues.

2.7 Incentives for Innovation

Substantive industry regulations can often be expected to induce innovation. The specific innovation drivers vary from case to case, but can include investment to offset expected incremental costs, perceived competitive disadvantage, or to take advantage of emergent opportunities. In situations like the present case, where existing practices are subjected to restrictions, it is reasonable to expect incumbent firms to invest in product differentiation to offset any loss of business arising from the restriction in question. As mentioned in the case of Blackjack, card rooms may invent new games or variations to retain patrons, while in the case of player-dealer rotation, TPPPPS may innovate roles to allow revenue-neutral rotation partnerships. In either case, the scenario approach was used above to "bracket" outcomes within a reasonable range of innovative responses. Beyond this, innovation processes are inherently subject to uncertainty, and it is not realistic to predict the advent of transformative technologies and products in this industry. Finally, while electronic technologies have dramatically altered many dimensions of gambling, card games have remained relatively stable around rule systems established over a century ago. Online gambling and other gaming have also dramatically innovated, but the proposed regulation changes are unlikely to interact substantially with these.

2.8 Small Business Impacts

The overwhelming majority of card room operations exceed the $2M small business revenue threshold in California, and since about 90% of their games are not Blackjack as defined by these regulations, they are unlikely to drive them out of business. Many providers of goods and services appurtenant to these operations may be small, but again the fractional nature of impacts on their host enterprises (cardrooms) will probably limit adversity. Because these are part of the indirect and induced effects estimated in the SRIA, they will share the costs and benefits of the regulated entities, and their supply chain linkages are, captured in the macroeconomic assessment below. Beyond this observation, no detailed data are available to measure the adjustments expected for this group.

2.9 Competitive Advantage/Disadvantages for California Businesses

While this SRIA accounts for the possibility of patronage shifting within the state, between cardrooms and tribal casinos, it does not directly consider "leakage" of gaming revenue to Nevada or other neighbouring jurisdictions that might result from the proposed regulations. This could happen but is likely to be limited because of the distances involved

for most California urbanites (most card room patrons) except on an occasional basis. In any case, there is no data available on (game-specific) gambling "migration" of this kind.

3 Macroeconomic Impacts

3.1 Methodology

The economy-wide impacts of the proposed BGC regulations have been evaluated using the BEAR forecasting model. The BEAR model is a dynamic computable general equilibrium (CGE) model of the California economy. The model simulates detailed patterns of demand, supply, and resource allocation across the state, estimating economic outcomes over the period 2026-2035. For this SRIA, the BEAR model is aggregated to 60 economic sectors, with detailed representation of the construction sectors most likely affected by the card room regulations.

The current version of the BEAR model is calibrated using 2022 IMPLAN data for the California economy.[8] Both the baseline and policy scenarios use the DOF conforming forecasts from July 2024. The conforming forecast represents current official assumptions regarding baseline GDP growth and population forecasts for California (Appendix 1). BEAR model structure is summarized in Appendix 2 and fully documented in BEAR (2024).

3.2 Inputs to the Assessment

The macroeconomic assessment of the proposed BGC regulations is calibrated to incremental, sector-specific cardroom, Blackjack, and TPPPPS baseline and direct regulatory impact described above. Costs of lost cardroom profits are captured through changes in revenue patterns entered directly in the BEAR model.

More comprehensive indirect and induced effects are simulated as they would pass through supply and expenditure chains and institutional transfers across the state economy. All these effects are captured by the BEAR model and then aggregated into net economic impacts, annually over the period 2026-2035, and discounted using the Federal Funds rate as a proxy for intertemporal time preference.[9] The CGE model operates with real prices only, so inflation is not considered directly and all the

[8] The IMPLAN database is extensively documented at https://implan.com/
[9] See, e.g. https://fred.stlouisfed.org/series/FEDFUNDS

macroeconomic variables reported below should be interpreted as 2022 base year dollar ($) adjusted.

3.3 Macroeconomic Estimates

The following tables present results for three scenarios, impact assessments of the individual TPPPPS and Blackjack regulations individually, assuming they are each implemented alone, and a third scenario combining the two according to currently anticipated implementation schedules. All three scenarios are presented to elucidate the individual contributions of each gaming regulation and potential adjustments of the industry and the state economy. In the end, Scenario C (combining Scenario A and B) is considered to represent the recommended policy.

Scenario A
Restricts TPPPPS
a) Eliminates 50% TPPPPS revenue from cardrooms
b) Diverts 25% of TPPPPS revenue from cardrooms to tribal casinos

Table 3.1: Economy-Wide Impacts of Cardroom TPPPPS Regulations
Scenario A

Impact in 2022$M	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Average
Gross State Product ($M)	-194	-211	-230	-249	-270	-291	-313	-335	-359	-383	-283
Real Output	-291	-317	-345	-375	-405	-437	-471	-505	-541	-578	-427
Investment	-59	-62	-65	-68	-71	-74	-77	-80	-83	-86	-73
Employment	-130	-169	-208	-248	-289	-331	-373	-414	-456	-497	-311

Percent Change from Baseline	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Average
Gross State Product ($M)	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%
Real Output	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%
Investment	-0.002%	-0.002%	-0.002%	-0.002%	-0.002%	-0.002%	-0.002%	-0.002%	-0.002%	-0.002%	-0.002%
Employment	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

Present Value, 2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Average
Gross State Product	-191	-204	-217	-229	-239	-249	-259	-269	-278	-287	-242
Real Output	-286	-307	-325	-344	-360	-375	-391	-405	-420	-433	-365
Investment	-58	-60	-61	-62	-63	-63	-64	-64	-64	-65	-63

Notes: Author estimates. All financial variables in 2022 constant $ millions. Employment in FTE headcount.

The salient feature of scenario A (Table 3.1) is a 50% net reduction of TPPPPS revenue to the gaming sector, half of which is diverted to tribal casinos. This direct impact is comprised of a $396M direct cost to cardrooms, combined with diversion of 25% of

TPPPPS activities from cardrooms to tribal casinos, resulting in a direct benefit to them of $198M. Total net direct costs to the gaming sector would thus be $198M, but cardrooms would lose $396M while tribal casinos gain $198M and the combined sum of costs and benefits (falling on different stakeholders) is $594M. The all-inclusive result of this for the California economy, including direct, indirect, and induced supply chain and expenditure impacts, is not insignificant in absolute terms, with an annual average of $283M in lower GSP and 311 fewer jobs than the Baseline. In macroeconomic terms, however, these impacts are negligible, representing less than 1/1000 of one percent change in GSP for every year over the first decade of implementation.

In a brief note on methodology, it can be observed that a GE model like the one used here allows for complex, market (price) mediated adjustments in response to the regulation. Unlike linear or “multiplier” models, direct costs and benefits are not simply amplified across endless expenditure chains, but the economy is allowed to shift resources in response to real tightening and loosening of constraints. This means initial shocks will be tempered by structural adjustments (e.g., workers and investors shifting between sectors), but these will also be compounded over time. Thus, we see an initial GSP impact (year 2026) very close to the net direct regulatory impact ($194M vs $198M), but this diverges over time as investment and labor markets adapt to the new, regulated environment.

Scenario B

Eliminates all Blackjack revenue from cardrooms.

a) New games replace 50% of lost Blackjack revenue for cardrooms.
b) Diverts 25% of lost Blackjack revenue from cardroom to tribal casinos.

Blackjack games in California cardrooms produced $136M in revenue in 2023. Thus, elimination of all Blackjack revenue from cardrooms with replacement of 50% of revenue from new games could represent a $68M cost to cardrooms while 25% Blackjack substitution to tribal casinos could represent a $34M benefit to tribal casinos, yielding combined impacts exceeding $102M in this scenario.

Table 3.2: Economy-Wide Impacts of Cardroom Blackjack Regulations
Scenario B

Impact in 2022$M	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Average
Gross State Product ($M)	-33	-36	-39	-42	-46	-49	-53	-57	-61	-65	-48
Real Output	-49	-54	-58	-63	-68	-74	-80	-85	-91	-98	-72
Investment	-10	-10	-11	-11	-12	-12	-13	-14	-14	-15	-12
Employment	-22	-28	-35	-42	-49	-56	-63	-70	-77	-84	-53

Percent Change from Baseline	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Average
Gross State Product ($M)	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Real Output	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Investment	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Employment	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

Present Value, 2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Average
Gross State Product	-32	-35	-37	-39	-40	-42	-44	-45	-47	-49	-41
Real Output	-48	-52	-55	-58	-61	-63	-66	-68	-71	-73	-62
Investment	-10	-10	-10	-11	-11	-11	-11	-11	-11	-11	-11

Notes: Author estimates. All financial variables in 2022 constant $ millions. Employment in FTE headcount.

The Blackjack-only scenario (Scenario B, Table 3.2) has even smaller adverse impacts on the industry and state because Blackjack revenues are about 20% of their TPPPPS counterparts. The direction of all impacts is the same, but effects are negligible in macroeconomic terms and, with appropriate shifting to alternative games, the sector would not appear to be seriously threatened by the Blackjack prohibition. With respect to employment, we have assumed gambling dealers are retrained and can stay on the job. The cost of retraining is estimated generously, using average commercial dealer training rates ($450-650 per game). Assuming all Blackjack dealers know only that game in the Baseline case, the cost to the industry would be less than $10M, a modest price to pay for retaining over $68M in revenue.

Macroeconomic estimates for the recommended policy scenario are summarized in Table 3.3. A few salient features of the recommended policy impacts are immediately apparent. First, because the results reflect two policies, impacts are larger than Scenarios A or B. The recommended regulations are understandably significant and adverse to Baseline or “Business as Usual” economic activity in the state’s cardroom gaming sector, and this translates into real net losses for established cardroom enterprises and closely allied activities. Second, results are nearly additive, which is not surprising since they are implemented in the same years and address completely different games.

Table 3.3: Economy-Wide Impacts of Cardroom Combined Regulations
Proposed Regulatory Scenario C

Impact in 2022$M	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Average
Gross State Product ($M)	-227	-247	-269	-291	-315	-340	-365	-392	-419	-448	-331
Real Output	-340	-371	-404	-438	-474	-511	-550	-591	-632	-676	-499
Investment	-69	-73	-76	-79	-83	-86	-90	-94	-97	-101	-85
Employment	-153	-197	-243	-290	-338	-387	-436	-484	-533	-581	-364

Percent Change from Baseline	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Average
Gross State Product ($M)	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%
Real Output	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%
Investment	-0.002%	-0.002%	-0.002%	-0.002%	-0.002%	-0.002%	-0.002%	-0.002%	-0.002%	-0.002%	-0.002%
Employment	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

Present Value, 2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Average
Gross State Product	-223	-239	-253	-268	-280	-292	-303	-314	-325	-336	-283
Real Output	-334	-358	-380	-402	-421	-439	-457	-474	-491	-507	-426
Investment	-68	-70	-72	-73	-74	-74	-75	-75	-75	-76	-73

Notes: Author estimates. All financial variables in 2022 constant $ millions. Employment in FTE headcount.

Third, the recommended combination of TPPPPS and Blackjack regulation will have a relatively small net impact on the state's multi-trillion-dollar economy, reducing average annual real GSP relative to the Baseline reference by an average of $331M billion per year over the period 2026-2035, accompanied by an average of 364 fewer annual jobs than the Baseline. It must be emphasized that this number is completely overwhelmed by Baseline aggregate growth, meaning the result is negative only relative to no policy, and the state economy and the sector itself can otherwise continue the robust trend growth California has enjoyed for two generations.

3.3.1 Creation or Elimination of Jobs within California

The aggregate job results follow the slower growth trend in the sector, yielding an average of about 364 fewer new jobs per year, measured in Full-Time Equivalence (FTE or 1,900 working hours) units per year over the decade considered. Like most service sectors, the cardroom industry is about average in terms of skill intensity. When a policy represses investment in such a sector, job losses are more easily offset than in highly skilled sectors. At the aggregate level, however, these changes are nearly imperceptible (much less than a tenth of one percent on average), and do not reverse Baseline job growth in this industry or across California.

3.3.2 Creation of New Businesses or the Elimination of Existing Businesses within California

The implications of the regulations for cardrooms and other gaming sector actors are intuitive, more restrictive treatment of TPPPPS and Blackjack will threaten cardroom revenue, divert business to tribal casinos and out-of-state alternatives, and offer incentives for product differentiation. In all cases, however, expected revenue shortfalls are single-digit percentages of Baseline operating values. Thus, it is unlikely that any but the most specialized small cardrooms will see significant revenue risk and in any case they have the same options for diversifying gaming services to offset this. Only time will tell how this adjustment plays out at the firm level, where it depends on detailed initial conditions and many sources of behavioral uncertainty.

3.3.3 Competitive Advantages or Disadvantages for Businesses Currently Doing Business within California

To the extent that the regulation restricts the offerings of cardrooms, it will certainly undermine their individual competitiveness against tribal casino operators and out-of-state competitors. We do not possess sufficiently detailed enterprise-level data to predict these competitive adjustments at the microeconomic level. Having said that, however, our analysis reveals that California itself will not suffer significant cardroom revenue and employment declines, estimated to be single-digit percentages of a growing trend baseline.

These findings can be seen in Table 3.4 below, which shows supply, demand, and related estimates for the 3-digit North American Industry Classification System (NAICS) sector including cardroom and casino activities, NAICS-713 Amusement, gambling, and recreation industries. Several features deserve closer examination. Note that this accounting will net out all gaming “diversion” between cardrooms and tribal casinos as these are both in NAICS-713, since more detailed data are not available on economy-wide linkages for these activities. As expected, the regulation increases cost and reduces revenue for some operators, reducing in-state gaming revenue and investment in the sector, but this decline averages less than one-tenth of one percent in each year (not compounded) of the forecast period. Despite a net loss of gaming revenue, the larger NAICs-713 sector appears to be quite resilient, retaining over 99% of revenue on a growing baseline.[10]

[10] It should be emphasized that the GE model assumes labor and investment are highly mobile and can shift activities within the larger sector and across the economy relatively easily. Adjustments for individual workers and managers may be more challenging, but the micromodel cannot track this.

With respect to out-of-state competition, it is apparent from these results that, as demand falls less than supply in all years, some gaming revenue is being diverted across California's border to readily available alternatives in Nevada (denoted "Leakage" in the table). This is to be expected, but the net slowing of growth for in-state gambling remains modest. Relative impacts (as a percent of revenue) for the sector are of course more substantial than in comparison to the state economy, but they remain very modest.

Table 3.4: Sector Impacts of the Combined Regulations
Scenario C

Impact in 2022$M	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Average
California Supply	-187	-195	-203	-212	-221	-230	-240	-249	-260	-270	-227
California Demand	-146	-152	-159	-166	-174	-181	-189	-198	-206	-215	-179
Leakage	-41	-43	-44	-46	-47	-49	-50	-52	-53	-55	-48
Investment	-14	-14	-15	-15	-15	-15	-16	-16	-16	-17	-15
Employment	-631	-645	-658	-671	-683	-696	-709	-721	-734	-747	-690

Percent Change from Baseline	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Average
California Supply	-0.06%	-0.06%	-0.06%	-0.06%	-0.06%	-0.06%	-0.06%	-0.06%	-0.06%	-0.06%	-0.06%
Calfornia Demand	-0.05%	-0.05%	-0.05%	-0.05%	-0.05%	-0.05%	-0.05%	-0.05%	-0.05%	-0.05%	-0.05%
Investment	-0.03%	-0.03%	-0.03%	-0.03%	-0.03%	-0.03%	-0.03%	-0.03%	-0.03%	-0.03%	-0.03%
Employment	-0.02%	-0.02%	-0.02%	-0.02%	-0.02%	-0.02%	-0.02%	-0.02%	-0.02%	-0.02%	-0.02%

Present Value, 2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Average
California Supply	-184	-188	-191	-194	-196	-197	-199	-200	-201	-203	-195
California Demand	-143	-147	-150	-152	-154	-156	-157	-159	-160	-161	-154
Leakage	-24	-25	-17	-17	-14	-14	-15	-15	-16	-16	-17
Investment	-14	-14	-14	-14	-13	-13	-13	-13	-13	-13	-13

Notes: Author estimates. All financial variables in 2022 constant $ millions. Employment in FTE headcount.

3.3.4 Increase or Decrease of Investment in California

Although the macroeconomic impact on state investment is relatively small, cardroom gaming restrictions will have more direct but complex impacts on the regulated sector. The investment climate will be affected by the regulation in different directions, with three primary factors to consider. First, lower revenue and gaming limitations will discourage investment by some cardroom investors. Second, options for more innovative investment may be taken up by such firms, competitors, or new entrants (more on this in the next section). Finally, higher costs for gamers to reach more remote Blackjack opportunities will slightly diminish sector competitiveness. We have estimated the investment impact in

both the macro and sector contexts above, but no data is currently available to predict the innovation or productivity impacts.

4 FISCAL IMPACTS

4.1 State and Federal Revenues

One might expect that reductions of gaming revenue and GSP/GDP would be accompanied by lower revenue from many income-based fiscal sources. In the Recommended Scenario case, our GE model estimates very small net increases in state and federal revenue. This can happen as the result of shifting economic activity away from gaming toward more heavily taxed activities. For example, a food safety scare might shift shoppers from farmer's markets to supermarkets, resulting in higher sales tax revenues for the same total household expenditure. These effects are summarized in Table 4.1. A much more detailed fiscal model would be needed to trace all the components of these revenue gains. Suffice for the present to say that they are net effects of many public income and expenditure decisions and in any case are extremely small relative to baseline fiscal values.

Table 4.1: Estimated State and Federal Revenue Impacts of the Proposed Regulations

Impact in 2022$M	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Average
State Tax Revenue	21	22	22	22	22	22	22	23	23	23	22
Federal Tax Revenue	26	26	26	26	26	26	26	26	26	26	26

Percent Change from Baseline	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Average
State Tax Revenue	.0014%	.0014%	.0014%	.0014%	.0014%	.0013%	.0013%	.0013%	.0013%	.0013%	.0013%
Federal Tax Revenue	.0006%	.0006%	.0007%	.0007%	.0007%	.0007%	.0007%	.0007%	.0007%	.0007%	.0007%

Present Value, 2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Average
State Tax Revenue	21	21	21	20	20	19	19	18	18	17	19
Federal Tax Revenue	26	25	25	24	23	23	22	21	20	20	23

Notes: Author estimates. All financial variables in 2022 constant $ millions. Employment in FTE headcount.

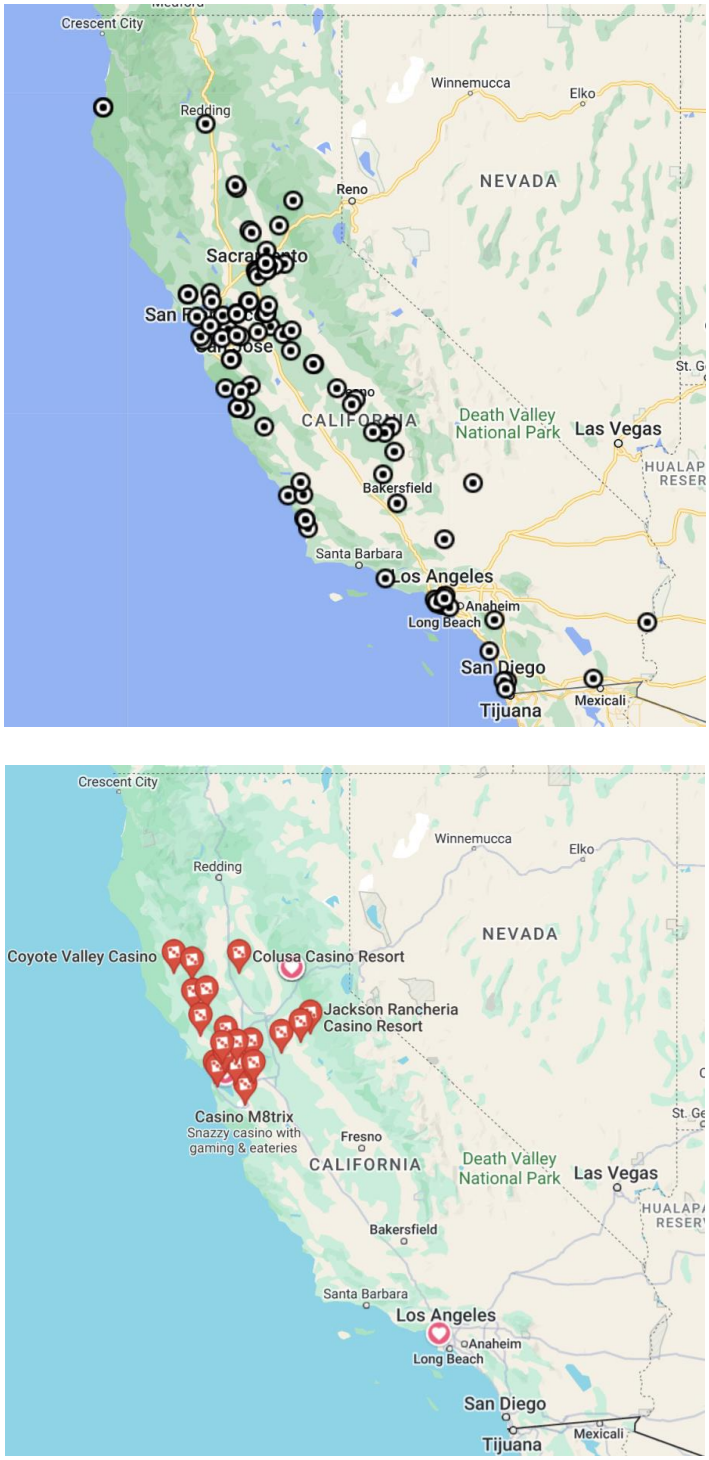
It should also be noted that the BEAR model aggregates state and local government revenue streams, and there will be disproportionate impacts in localities where cardrooms are concentrated. Benefits to tribal casinos and their communities are likewise concentrated geographically, but unfortunately, we lack the spatial data needed to

disaggregate within the NAICS-713 sector and across space. This issue is discussed further in the next sub-section, but for income-based taxes it is reasonable to assume that the regulations will impact aggregate State and Federal revenues negligibly over the next decade.

4.2 Local Government

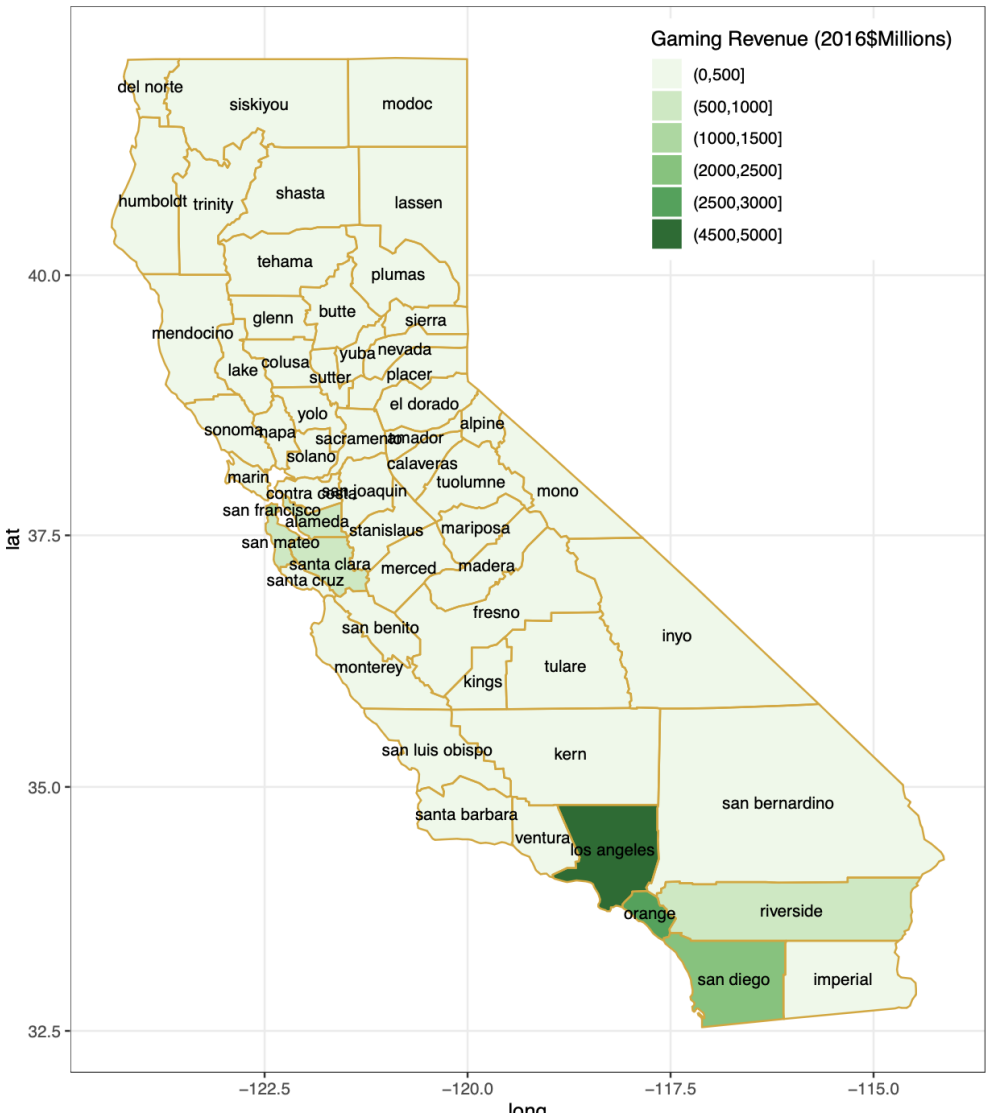
Generally, cardrooms and casinos are quite unevenly dispersed across the state. For this reason, their state and local tax revenues may be disproportionately important to communities hosting their activities. Figures 4.1-4.3 highlight this from different perspectives, showing (respectively) geographic locations of cardrooms, gaming revenue by county across the state, and county gaming revenue per capita.

Figure 4.1: Cardroom and Casino Locations Across California



Source: Google Maps: 2024

Figure 4.2: California Gaming Revenue by County (2016)

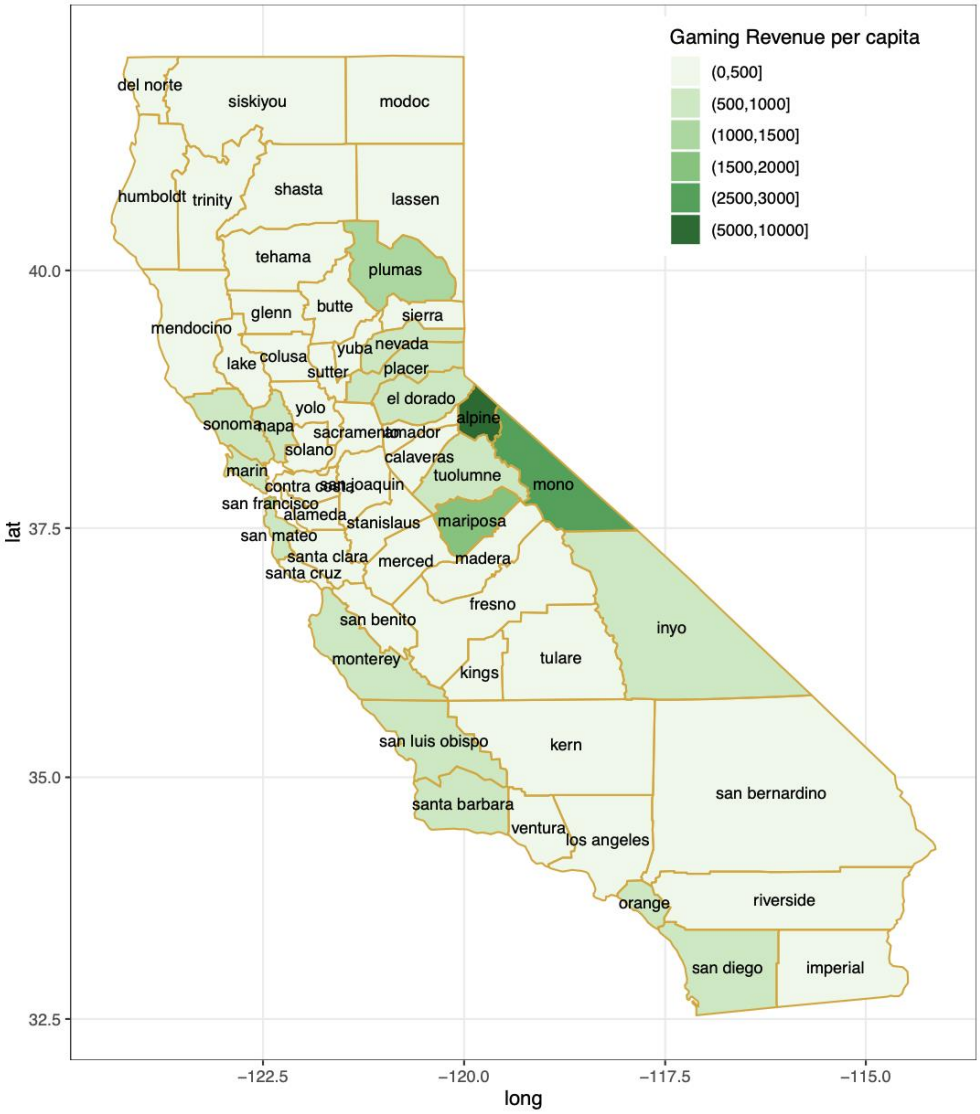


Source: BGC and industry data.

Figures 4.1 and 4.2 show that gaming sites are concentrated in certain areas, particularly tribal and major metropolitan jurisdictions. For tribal casinos, fiscal impacts of the new regulations will be unambiguously positive, although spatial distribution of these effects cannot be accurately predicted using available data.

Of potentially greater significance is the unequal distribution of gaming revenues in terms of per capita local populations. Figure 4.3 makes it clear that gaming revenue and its attendant local tax revenues are of special significance in many lower income counties. While our results do not allow accurate spatial forecasting, this distributional consequence of the regulation may justify closer inspection during the compliance interval.

Figure 4.3: California Gaming Revenue per Capita by County



Source: BGC and industry data.

4.3 State Government Finances

DOJ has been closely enforcing regulations specific to cardroom gaming for decades, and the adjustments estimated to follow from these regulations should not significantly impact these responsibilities. Games to be supervised may change in response to the regulations and these are expected to mitigate adverse impacts on gaming revenue. Historically, the sector has proven quite innovative in differentiating games and retraining staff in response to changing tastes and technology, so it is reasonable to expect continuity in both cardroom income and employment levels. If such adaptations continue, the agency's supervisory duties are not expected to change because of the regulations.

One area of uncertainty is litigation in response to the regulations, but in the runup to these rule changes, the agency has been quite transparent about its intentions in this context, and this has not aroused any peremptory legal actions on the part of the industry. There is also no evidence of national interest in the rule changes. The US gaming market remains very fragmented, differentiated, and competitive, and unlike (e.g.) CARB's Low Carbon Fuel Standard, there is no industry perception that these regulations will lead to national regulatory action.

4.4 Other State Agencies

Changes in cardroom regulations that reduce gambling have the potential to confer social and health benefits, and these might implicate public health, law enforcement, and other social service agencies. Unfortunately, there is no reliable evidence that would permit us to estimate these benefits in the context of the specific games being addressed with these rule changes. As was emphasized earlier, it is anticipated that most cardroom activity will shift to existing alternatives, differentiated new games, or tribal casino substitutes. None of these responses would be likely to confer the aforementioned benefits. On the other hand, there is no reason to assume alternative games or venues would increase the burden on social service agencies.

5 ECONOMIC IMPACTS OF THE REGULATORY ALTERNATIVES

In addition to the Baseline and the Proposed Regulatory Scenario (PRS), DOF's guidelines require agencies to evaluate two feasible alternatives to the Proposed Regulatory Scenario (PRS). This implies that each SRIA will include at least three scenarios (we have included eight to examine sources of uncertainty). One of the two alternatives should include regulatory actions that could be interpreted as less stringent

or with lower direct cost. This is meant to represent a “second best” option in terms of providing lesser benefits to the proposed regulation. The second alternative should be considered more stringent, with higher direct costs and perhaps higher direct benefits. To the extent possible, the baseline and alternatives should be analyzed with the same quantitative rigor as the proposed regulation.

5.1 Less Stringent Regulatory Alternative

For the present regulation, we consider a less stringent alternative to be a three-year extension of the deadline for full compliance with Scenario C. This would simply defer full direct costs and benefits until 2027, and we assume compliance progresses linearly from 2025 (i.e., in three equal steps). It can be assumed that extending compliance time will allow for more innovation and adaptation, leveraging additional annual savings for investment to reduce adjustment costs. Unfortunately, we have neither the data nor a convincing behavioral model to estimate innovation pathways.

Scenario D
Implements the Recommended Policy (Scenario C) over three years

5.2 More Stringent Regulatory Alternative

To examine a more stringent alternative, we assume that cardroom gaming is prohibited for all categories of play. Although circumstances like this have been discussed in public dialog and even advocated by some stakeholders, it must be emphasized that this scenario is completely hypothetical and in no way reflects policy intention. Having said this, it does help to identify the importance of the sector economically and its relationship with a much larger California casino industry administered on tribal lands. For this scenario, we assume 50% of gaming from the retired cardroom sector is diverted to tribal casinos.

Scenario E more restrictive
Eliminates cardroom gaming in California, diverting half of its baseline revenue to tribal casinos.

5.3 Macroeconomic Impacts

The regulatory alternatives are compared with the proposed regulation in Tables 5.1-5.3 below, showing the annual macroeconomic impacts against Baseline values over the evaluation period 2025-33.[11] At the outset, it must be emphasized that, because the California economy is assumed to be growing over this period without the regulation, all three regulatory scenarios would see rising macroeconomic aggregates over time and this table only shows small adjustments to that upward trajectory.

Table 5.1: Macroeconomic Impacts of the Proposed Regulation Scenario C (Table 3.3 restated)

Impact in 2022$M	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Average
Gross State Product ($M)	-227	-247	-269	-291	-315	-340	-365	-392	-419	-448	-331
Real Output	-340	-371	-404	-438	-474	-511	-550	-591	-632	-676	-499
Investment	-69	-73	-76	-79	-83	-86	-90	-94	-97	-101	-85
Employment	-153	-197	-243	-290	-338	-387	-436	-484	-533	-581	-364

Percent Change from Baseline	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Average
Gross State Product ($M)	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%
Real Output	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%
Investment	-0.002%	-0.002%	-0.002%	-0.002%	-0.002%	-0.002%	-0.002%	-0.002%	-0.002%	-0.002%	-0.002%
Employment	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

Present Value, 2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Average
Gross State Product	-223	-239	-253	-268	-280	-292	-303	-314	-325	-336	-283
Real Output	-334	-358	-380	-402	-421	-439	-457	-474	-491	-507	-426
Investment	-68	-70	-72	-73	-74	-74	-75	-75	-75	-76	-73

Notes: Author estimates. All financial variables in 2022 constant $ millions. Employment in FTE headcount.

The Proposed Regulatory Scenario (C) has already been discussed in Section 3 above. The Less Stringent Alternative (Scenario D, Table 5.1) reflects the same general approach of restricting TPPPPS and Blackjack activities but allows for compliance across the first three years in equal incremental steps. The result, as expected, is a smoothing of adjustment costs and lower average annual impacts across all metrics. Anticipated annual and cumulative (economic and social) benefits can of course also be expected to be smaller, and if the primary intention of the recommended policy arises from these, the pecuniary savings may not be justified.

[11] This period was extended from 2024-2031 to accommodate the more restrictive alternative, going into force immediately.

Table 5.2: Macroeconomic Impacts of the Less Stringent Alternative Scenario D

Impact in 2022$M	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Average
Gross State Product ($M)	-76	-82	-90	-97	-105	-113	-122	-131	-140	-149	-110
Real Output	-113	-124	-134	-146	-158	-170	-183	-197	-211	-225	-166
Investment	-23	-24	-25	-26	-28	-29	-30	-31	-32	-34	-28
Employment	-51	-66	-81	-97	-113	-129	-145	-161	-177	-193	-121

Percent Change from Baseline	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Average
Gross State Product ($M)	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Real Output	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Investment	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%
Employment	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%

Present Value, 2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Average
Gross State Product	-74	-80	-84	-89	-93	-97	-101	-105	-108	-112	-94
Real Output	-111	-119	-127	-134	-140	-146	-152	-158	-163	-169	-142
Investment	-23	-23	-24	-24	-24	-25	-25	-25	-25	-25	-24

Notes: Author estimates. All financial variables in 2022 constant $ millions. Employment in FTE headcount.

The more restrictive alternative is hypothetical and relatively extreme. Cardrooms contribute substantially to their local and state economies. By 2035, cessation of cardroom gambling would reduce state GSP by over $1.3B and jobs by more than 1,000. The recommended regulatory alternative would avert this and preserve over 90% of these economic benefits for the industry, its employees, patrons, and local communities where they are active.

Table 5.3: Macroeconomic Impacts of the More Stringent Alternative Scenario E

Impact in 2022$M	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Average
Gross State Product ($M)	-663	-723	-786	-853	-922	-994	-1,069	-1,147	-1,227	-1,310	-969
Real Output	-994	-1,085	-1,181	-1,281	-1,386	-1,496	-1,610	-1,728	-1,850	-1,976	-1,459
Investment	-203	-212	-222	-232	-242	-253	-263	-274	-284	-295	-248
Employment	-448	-578	-713	-851	-991	-1,133	-1,276	-1,419	-1,561	-1,701	-1,067

Percent Change from Baseline	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Average
Gross State Product ($M)	-0.002%	-0.002%	-0.002%	-0.003%	-0.003%	-0.003%	-0.003%	-0.003%	-0.003%	-0.003%	-0.003%
Real Output	-0.002%	-0.002%	-0.003%	-0.003%	-0.003%	-0.003%	-0.003%	-0.003%	-0.003%	-0.003%	-0.003%
Investment	-0.006%	-0.006%	-0.006%	-0.006%	-0.006%	-0.006%	-0.006%	-0.006%	-0.006%	-0.006%	-0.006%
Employment	0.000%	0.000%	0.000%	0.000%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%	-0.001%

Present Value, 2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	Average
Gross State Product	-652	-699	-741	-783	-818	-853	-887	-920	-952	-982	-829
Real Output	-977	-1,048	-1,113	-1,176	-1,230	-1,284	-1,336	-1,386	-1,435	-1,482	-1,247
Investment	-200	-205	-209	-213	-215	-217	-218	-220	-220	-221	-214

Notes: Author estimates. All financial variables in 2022 constant $ millions. Employment in FTE headcount.

6 Summary of Economic Assessment

DOJ is proposing two separate but related regulations. In order to improve interpretation and compliance with existing laws, these regulations would provide guidance on the activities allowed under existing laws. The first proposed regulation would implement a requirement that the player-dealer position be rotated among the seated players and the TPPPPS for games with player-dealers. The second proposed regulation would clarify which elements of games sufficiently differentiate them from Blackjack, which is prohibited by statute in California.

Based on a preliminary assessment using conservative approaches to combined direct economic costs and benefits, the regulatory impacts are estimated to exceed $600M annually over the decade following enactment (2025). Thus, it is our determination that the proposed regulations together will exceed the $50M threshold requirement for performing a SRIA.

In terms of economywide impacts, three salient findings deserve emphasis. First, the regulation is understandably significant and adverse to Baseline or “Business as Usual” economic activity in the state’s cardroom gaming sector, and this translates into real net

losses for established cardroom enterprises and closely allied activities. Second, results are nearly additive, meaning the combination of TPPPPS and Blackjack regulation will have a relatively small net impact on the state's multi-trillion-dollar economy, reducing average annual real GSP relative to the Baseline reference by $331M per year over the period 2026-2035, accompanied by 364 fewer annual jobs than the Baseline. As is emphasized throughout this assessment, this number is completely overwhelmed by Baseline aggregate growth, meaning the result is negative only relative to no policy, and the state economy and the sector itself can otherwise continue the robust trend growth it has enjoyed for two generations.

Impacts on sector and state competitiveness are consistent with intuition but modest for the sector and negligible for the state economy. Because California's boundaries also encompass the largest tribal gaming sector of any state, gaming diversion is not expected to be net loss to the California economy. Fiscal impacts are very localized and differentially impact communities because of the sparse distribution of gaming venues, with lower income communities more impacted than metropolitan areas where the overwhelming majority of cardroom business is conducted.

Finally, empirical comparisons to more and less stringent alternatives suggest that the proposed policy strikes a better balance between the desire to limit questionable gaming activities and recognition of the gaming sector's importance to many local communities in terms of private and public income and employment.

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8 APPENDIX 1 - DEPARTMENT OF FINANCE COMPLIANT BASELINE CALIBRATION

8.1 Introduction

The California Department of Finance requires that, for dynamic macroeconomic assessment work, a SRIA Baseline scenario be calibrated to conform with its macroeconomic projections to the most recent projections (July, 2024).[12, 13, 14] This approach enables the SRIA to create accurate reference baselines for comparison to regulatory scenarios.[15]

8.2 Macroeconomic Baseline Forecasts

There are three fundamental macroeconomic series of importance for Baseline calibration: Population, Employment, and Personal Income. As it happens, population, baseline employment, and annual real GSP growth are exogenous (input) to the BEAR model, though these two series are identical.

8.3 Baseline Calibration of the BEAR Model

The BEAR model is calibrated to state real Personal Income growth rates, obtained from DOF and used to proxy real GSP growth. Using exogenous rates of implied growth in total factor productivity (TFP), the model computes supply, demand, and trade patterns compatible with domestic and state market equilibrium conditions. Equilibrium is achieved by adjustments in the relative prices of domestic resources and commodities, while international equilibrium is achieved by adjusting trade patterns and real exchange rates to satisfy fixed real balance of payments constraints.

The calibration procedure highlights the two salient adjustment mechanisms in the model (as well as the real economies), prices in California, U.S. domestic and international markets. General equilibrium price adjustments are generally well understood by professional economists but the degree of segmentation between state, national, and global markets depend on many factors.

[12] California Code of Regulations, title 1, section 2003(b)

[13] https://www.dof.ca.gov/forecasting/demographics/projections/

[14] https://www.dof.ca.gov/Forecasting/Economics/

[15] We would like to express our thanks to the DOF Chief Economist and her staff for their cooperation and data sharing to support this calibration exercise. Any errors implementing these inputs are solely the responsibility of the authors.

Because CGE like this do not capture the aggregate price level or other nominal quantities, there are no pure inflationary or monetary effects in the sense of traditional macroeconomics or finance. Since there is no money metric in the model, all prices are relative prices. If there were financial assets in the model, one could define a nominal inflation and interest rates as the relative prices of financial assets (money, bonds, etc.). Without them, prices only reflect real purchasing power, i.e., the relative price of goods and services in terms of each other.

9 APPENDIX 2 - TECHNICAL SUMMARY OF THE BEAR MODEL

The Berkeley Energy and Resources (BEAR) model is in reality a constellation of research tools designed to elucidate linkages across the California economy. The schematics in Figures 9.1. and 9.2 describe the four generic components of the modeling facility and their interactions. This section provides a brief summary of the BEAR model's formal structure.[16] For the purposes of this report, the 2013 California Social Accounting Matrix (SAM), was aggregated along certain dimensions. The model's current version includes 195 activity sectors, 22 occupations, and ten households aggregated from the original California SAM. The equations of the model are completely documented elsewhere (BEAR: 2024), and for the present we only review its salient structural components.

9.1 Structure of the CGE Model

Technically, a CGE model is a system of simultaneous equations that simulate price-directed interactions between firms and households in commodity and factor markets. The role of government, capital markets, and other trading partners are also specified, with varying degrees of detail and passivity, to close the model and account for economywide resource allocation, production, and income determination.

The role of markets is to mediate exchange, usually with a flexible system of prices, the most important endogenous variables in a typical CGE model. As in a real market economy, commodity and factor price changes induce changes in the level and composition of supply and demand, production and income, and the remaining endogenous variables in the system. In CGE models, an equation system is solved for prices that correspond to equilibrium in markets and satisfy the accounting identities governing economic behavior. If such a system is precisely specified, equilibrium always exists, and such a consistent model can be calibrated to a base period data set. The resulting calibrated general equilibrium model is then used to simulate the economywide (and regional) effects of alternative policies or external events.

The distinguishing feature of a general equilibrium model, applied or theoretical, is its closed-form specification of all activities in the economic system under study. This can be contrasted with more traditional partial equilibrium analysis, where linkages to other domestic markets and agents are deliberately excluded from consideration. A large and growing body of evidence suggests that indirect effects (e.g., upstream and downstream

[16] See Roland-Holst (2024) for a complete model description.

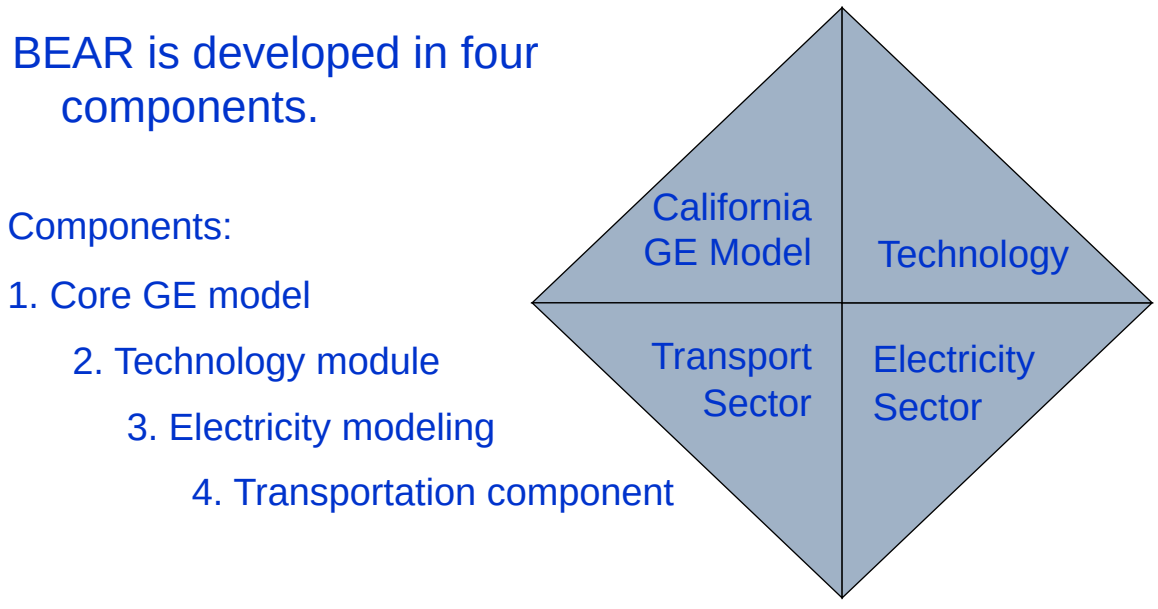
production linkages) arising from policy changes are not only substantial but may in some cases even outweigh direct effects. Only a model that consistently specifies economywide interactions can fully assess the implications of economic policies or business strategies. In a multi-country model like the one used in this study, indirect effects include the trade linkages between countries and regions which themselves can have policy implications.

The model we use for this work has been constructed according to generally accepted specification standards, implemented in the GAMS programming language, and calibrated to the new California SAM estimated for the year 2012. The result is a single economy model calibrated over the thirty-five-year interval time-path from 2015 to 2050. Using the very detailed accounts of the California SAM, we include the following in the present model:

9.2 Production

All sectors are assumed to operate under constant returns to scale and cost optimization. Production technology is modelled by a nesting of constant-elasticity-of-substitution (CES) function.

Figure 9.1: Component Structure of the Modeling Facility



In each period, the supply of primary factors — capital, land, and labor — is usually predetermined.[17] The model includes adjustment rigidities. An important feature is the distinction between old and new capital goods. In addition, capital is assumed to be partially mobile, reflecting differences in the marketability of capital goods across sectors.[18] Once the optimal combination of inputs is determined, sectoral output prices are calculated assuming competitive supply conditions in all markets.

9.3 Consumption and Closure Rule

All income generated by economic activity is assumed to be distributed to consumers. Each representative consumer allocates optimally his/her disposable income among the different commodities and saving. The consumption/saving decision is completely static: saving is treated as a "good" and its amount is determined simultaneously with the demand for the other commodities, the price of saving being set arbitrarily equal to the average price of consumer goods.

The government collects income taxes, indirect taxes on intermediate inputs, outputs and consumer expenditures. The default closure of the model assumes that the government deficit/saving is exogenously specified.[19] The indirect tax schedule will shift to accommodate any changes in the balance between government revenues and government expenditures.

The current account surplus (deficit) is fixed in nominal terms. The counterpart of this imbalance is a net outflow (inflow) of capital, which is subtracted (added to) the domestic flow of saving. In each period, the model equates gross investment to net saving (equal to the sum of saving by households, the net budget position of the government and foreign capital inflows). This particular closure rule implies that investment is driven by saving.

9.4 Trade

Goods are assumed to be differentiated by region of origin. In other words, goods classified in the same sector are different according to whether they are produced domestically or imported. This assumption is frequently known as the *Armington* assumption. The degree of substitutability, as well as the import penetration shares are

[17] Capital supply is to some extent influenced by the current period's level of investment.

[18] For simplicity, it is assumed that old capital goods supplied in second-hand markets and new capital goods are homogeneous. This formulation makes it possible to introduce downward rigidities in the adjustment of capital without increasing excessively the number of equilibrium prices to be determined by the model.

[19] In the reference simulation, the real government fiscal balance converges (linearly) towards 0 by the final period of the simulation.

allowed to vary across commodities. The model assumes a single Armington agent. This strong assumption implies that the propensity to import and the degree of substitutability between domestic and imported goods is uniform across economic agents. This assumption reduces tremendously the dimensionality of the model. In many cases this assumption is imposed by the data. A symmetric assumption is made on the export side where domestic producers are assumed to differentiate the domestic market and the export market. This is modelled using a *Constant-Elasticity-of-Transformation* (CET) function.

9.5 Dynamic Features and Calibration

The model's current version has a simple recursive dynamic structure as agents are assumed to be myopic and to base their decisions on static expectations about prices and quantities. Dynamics in the model originate in three sources: i) accumulation of productive capital and labor growth; ii) shifts in production technology; and iii) the putty/semi-putty specification of technology.

9.6 Capital Accumulation

In the aggregate, the basic capital accumulation function equates the current capital stock to the depreciated stock inherited from the previous period plus gross investment. However, at the sectoral level, the specific accumulation functions may differ because the demand for (old and new) capital can be less than the depreciated stock of old capital. In this case, the sector contracts over time by releasing old capital goods. Consequently, in each period, the new capital vintage available to expanding industries is equal to the sum of disinvested capital in contracting industries plus total saving generated by the economy, consistent with the model's closure rule.

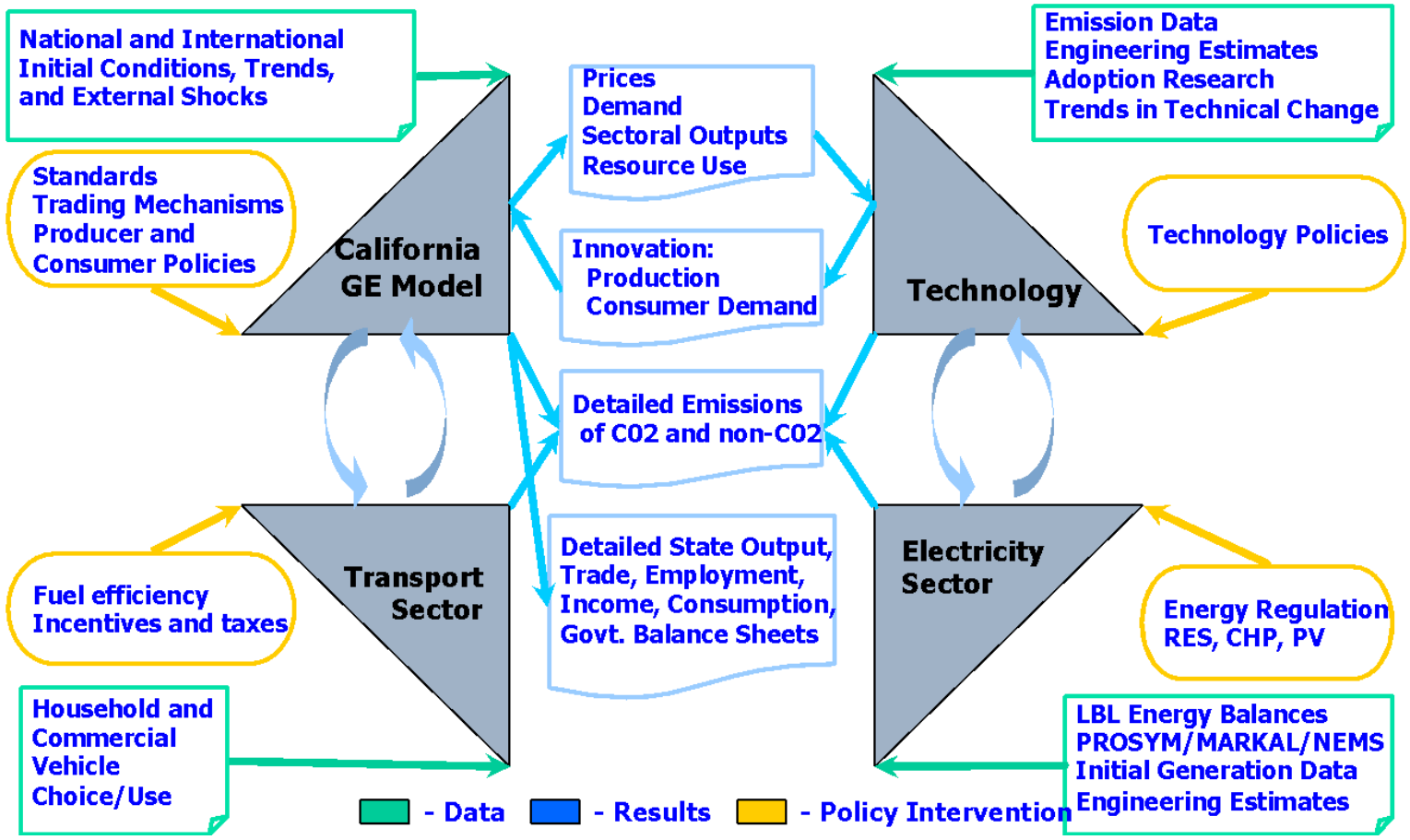
9.7 The Putty/Semi-Putty Specification

The substitution possibilities among production factors are assumed to be higher with the new than the old capital vintages — technology has a putty/semi-putty specification. Hence, when a shock to relative prices occurs (e.g., the imposition of an emissions fee), the demands for production factors adjust gradually to the long-run optimum because the substitution effects are delayed over time. The adjustment path depends on the values of the short-run elasticities of substitution and the replacement rate of capital. As the latter determines the pace at which new vintages are installed.

9.8 Profits, Adjustment Costs, and Expectations

Firms output and investment decisions are modelled in accordance with the innovative approach of Goulder and co-authors (2009). In particular, we allow for the possibility that firms reap windfall profits from events such as free permit distribution. We assume that these profits accrue to U.S. and foreign residents in proportion to equity shares of publicly traded US corporations (16% in 2009, Swartz and Tillman:2010). Between California and other US residents, the shares are assumed to be proportional to GSP in GDP (11% in 2009).

Figure 9.2: Schematic Linkage between Model Components



9.9 Dynamic Calibration

The model is calibrated on exogenous growth rates of population, labor force, and GDP. In the so-called Baseline scenario, the dynamics are calibrated in each region by imposing the assumption of a balanced growth path. This implies that the ratio between labor and capital (in efficiency units) is held constant over time.[20] When alternative scenarios around the Baseline are simulated, the technical efficiency parameter is held constant, and the growth of capital is endogenously determined by the saving/investment relation.

Table 9.1: California SAM for 2013 – Structural Characteristics

1. 50 commodities (includes trade and transport margins)
2. 24 factors of production
3. 22 labor categories
4. Capital
5. Land
6. 10 Household types, defined by income tax bracket
7. Enterprises
8. Federal Government (7 fiscal accounts)
9. State Government (27 fiscal accounts)
10. Local Government (11 fiscal accounts)
11. Consolidated capital account
12. External Trade Account

9.10 Sectoring Scheme for the BEAR Model

The 50 Production Sectors and Commodity Groups represent the aggregation of the 534 original sectors that were aggregated from a 2022 California Social Accounting Matrix (CGE) estimated by IMPLAN.

[20] This involves computing in each period a measure of Harrod-neutral technical progress in the capital-labor bundle as a residual. This is a standard calibration procedure in dynamic CGE modeling.

Table 9.2: Aggregate Accounts for the SRIA Assessment

	Label	Description
1	A01Agric	Agriculture
2	A02Cattle	Cattle and Feedlots
3	A03Dairy	Dairy Cattle and Milk Production
4	A04Forest	Forestry, Fishery, Mining, Quarrying
5	A05OilGas	Oil and Gas Extraction
6	A06OthPrim	Other Primary Products
7	A07DistElec	Generation and Distribution of Electricity
8	A08DistGas	Natural Gas Distribution
9	A09DistOth	Water, Sewage, Steam
10	A10ConRes	Residential Construction
11	A11ConNRes	Non-Residential Construction
12	A12Constr	Construction
13	A13FoodPrc	Food Processing
14	A14TxtAprl	Textiles and Apparel
15	A15WoodPlp	Wood, Pulp, and Paper
16	A16PapPrnt	Printing and Publishing
17	A17OilRef	Oil Refining
18	A18Chemicl	Chemicals
19	A19Pharma	Pharmaceutical Manufacturing
20	A20Cement	Cement
21	A21Metal	Metal Manufacture and Fabrication
22	A22Aluminm	Aluminum
23	A23Machnry	General Machinery
24	A24AirCon	Air Conditioning and Refrigeration
25	A25SemiCon	Semi-conductor and Other Computer Manufacturing
26	A26ElecApp	Electrical Appliances
27	A27Autos	Automobiles and Light Trucks
28	A28OthVeh	Vehicle Manufacturing
29	A29AeroMfg	Aeroplane and Aerospace Manufacturing
30	A30OthInd	Other Industry
31	A31WhlTrad	Wholesale Trade
32	A32RetVeh	Retail Vehicle Sales and Service
33	A33AirTrns	Air Transport Services
34	A34GndTrns	Ground Transport Services
35	A35WatTrns	Water Transport Services
36	A36TrkTrns	Truck Transport Services
37	A37PubTrns	Public Transport Services

	Label	Description
38	A38RetAppl	Retail Electronics
39	A39RetGen	Retail General Merchandise
40	A40InfCom	Information and Communication Services
41	A41FinServ	Financial Services
42	A42OthProf	Other Professional Services
43	A43BusServ	Business Services
44	A44WstServ	Waste Services
45	A45LandFill	Landfill Services
46	A46Educatn	Educational Services
47	A47Medicin	Medical Services
48	A48Recratn	Recreation Services
49	A49HotRest	Hotel and Restaurant Services
50	A50OthPrSv	Other Private Services

These data enable us to trace the effects of responses to climate change and other policies at unprecedented levels of detail, tracing linkages across the economy and clearly indicating the indirect benefits and trade-offs that might result from comprehensive policies, pollution taxes or trading systems. As we shall see in the results section, the effects of climate policy can be quite complex. In particular, cumulative indirect effects often outweigh direct consequences, and affected groups are often far from the policy target group. For these reasons, it is essential for policy makers to anticipate linkage effects like those revealed in a general equilibrium model and dataset like the ones used here.

It should be noted that the SAM used with BEAR departs in a few substantive respects from the original 2012 California SAM. The two main differences have to do with the structure of production, as reflected in the input-output accounts, and with consumption good aggregation. To specify production technology in the BEAR model, we rely on both activity and commodity accounting, while the original SAM has consolidated activity accounts. We chose to maintain separate activity and commodity accounts to maintain transparency in the technology of emissions and patterns of tax incidence. The difference is non-trivial and considerable additional effort was needed to reconcile use and make tables separately. This also facilitated the second SAM extension, however, where we maintained final demand at the full 119 commodity level of aggregation, rather than adopting six aggregate commodities like the original SAM.

9.11 Emissions Data

Emissions data were obtained from California's own detailed emissions inventory. In most of the primary pollution databases like this, measured emissions are directly associated with the volume of output. This has several consequences. First, from a behavioral perspective, the only way to reduce emissions, with a given technology, is to reduce output. This obviously biases results by exaggerating the abatement-growth trade-off and sends a misleading and unwelcome message to policy makers.

More intrinsically, output-based pollution modelling imperfectly captures the observed pattern of abatement behavior. Generally, firms respond to abatement incentives and penalties in much more complex and sophisticated ways by varying internal conditions of production. These responses include varying the sources, quality, and composition of inputs, choice of technology, etc. The third shortcoming of the output approach is that it gives us no guidance about other important pollution sources outside the production process, especially pollution in use of final goods. The most important example of this category is household consumption. BEAR estimates emissions from both intermediate and (in-state) final demand.