Received: 21 November 2022 | Accepted: 1 June 2023

DOI: 10.1111/1467-8489.12526

The Australian Journal of Agricultural and Resource Economics AARES

ORIGINAL ARTICLE

Loss of preferential access to the protected EU sugar market: Fiji's response

Kym Anderson[1,2]

[1]School of Economics and Public Policy, University of Adelaide, Adelaide, South Australia, Australia

[2]Crawford School of Public Policy, Australian National University, Canberra, Australia

Correspondence
Kym Anderson, School of Economics and Public Policy, University of Adelaide, Adelaide, SA 5005 Australia.
Email: kym.anderson@adelaide.edu.au

Funding information
World Bank Group

Abstract

The Fijian government's response since 2010 to the loss of preferential access to the European Union's previously highly protected sugar market has been to increasingly support its cane growers and millers. That support is now much higher than most other countries' assistance to the sugar industry. This study provides detailed estimates of the changing extent of those transfers to producers from both taxpayers and consumers during 2010–22. In doing so, it estimates for the first time an annual time series of nominal rates of assistance to producers and consumer tax equivalent rates (NRAs and CTEs, but they are also converted to producer and consumer support estimates as defined by the OECD). Those NRA and CTE estimates have been approaching 100%. The level of support was equivalent to 10% of Fiji's agricultural value added in 2018–21 and is around 5% of its government's consolidated revenue—at a time when the government has a very high debt-to-GDP ratio (90% in 2022). Since the nature of the support is economically inefficient, inequitable, environmentally damaging and fiscally unsustainable given foreseeable market prospects, suggestions are made as to how that support might be repurposed to provide better economic, social and environmental outcomes for Fiji.

KEYWORDS

agricultural subsidies, consumer taxation, international competitiveness, nominal rate of assistance, preferential market access

JEL CLASSIFICATION

F14, F54, H21, O13, Q18

1 | INTRODUCTION

For decades, many former colonies of European powers enjoyed preferential access to the high-priced protected agricultural markets of European Union (EU) member countries. In the case of sugar, EU consumer prices were nearly three times international prices up to the mid-2000s. That meant export prices for sugar from countries such as Fiji were well above what they would have been if the EU had not provided duty-free and quota-free import market access. But the liberalisation of the EU's sugar market that began in 2006 (and which eventually involved removing EU export subsidies and then quotas on EU production from 2017) led to precipitous drops in the effective tax of EU consumers and assistance to EU producers of sugar (OECD, 2022). That, and the formal ending of the Cotonou Agreement and its Sugar Protocol on 30 September 2009, was predicted to shock Fiji's sugar industry (Lal & Rita, 2005; Mahadevan, 2009; Stoler, 2005). In the event, they caused Fiji's export price in the late 2000s to plummet down to the international price.

Sugar consumer prices in the EU27 (and in the UK following Brexit) have since come down to less than 10% above world market prices over the past decade (OECD, 2022), two effects of which can be seen in Figure 1: the gap between Fiji's fob export price and the world indicator export price had closed by 2014, having been very wide from the mid-1990s to the late 2000s; and the volume of Fiji's sugar exports in the decade of the 2010s was only half that of the 2000s. This halving of exports occurred despite the Fijian government committing considerable public funds to increasingly support the sugar industry during the past dozen years—notwithstanding (a) numerous reports suggesting the need to restructure its rural sector away from sugar (ADB, 2005, 2009; Deloitte, 2010; EU, 2010; LMC International, 2005, 2016) and (b) the decision by the WTO membership in December 2015 to phase out subsidies to agricultural exports.

This paper provides estimates of the extent of growth in government assistance to Fiji's sugar industry since 2009 and the associated rise in the effective tax on consumers and transfer from the government's consolidated tax revenue. It first reviews key features of Fiji's sugar industry, its changing place in the national economy and components of its

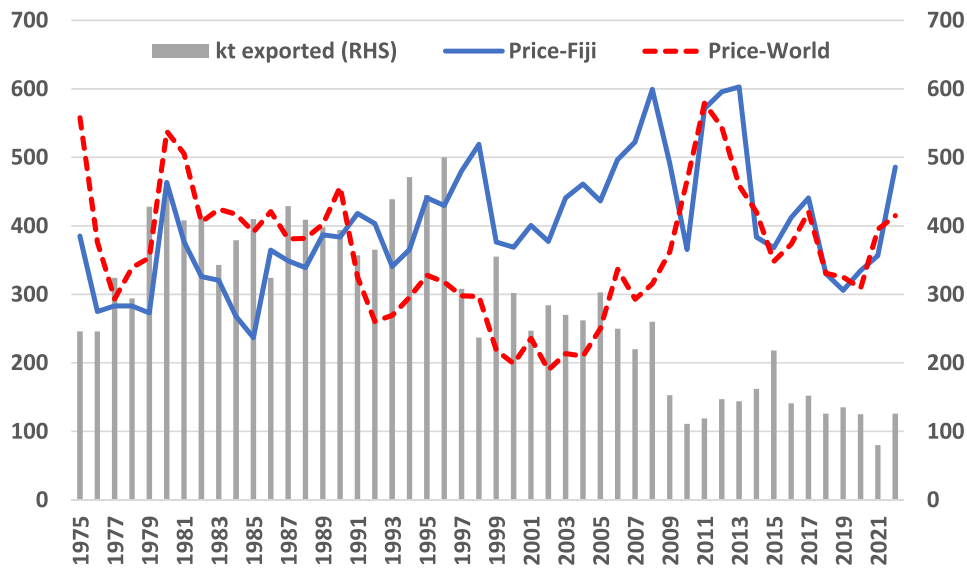

FIGURE 1 Export price of raw sugar, Fiji and the world, and volume of Fijian exports, 1975–2022 (nominal US$/tonne and KT). *Source*: Compiled from FAO (2023) and (from 1999) Fiji Bureau of Statistics data. [Colour figure can be viewed at wileyonlinelibrary.com]

declining competitiveness (Section 2). It then focusses on the various forms of public expenditure on the sugar industry over time before estimating the precise elements involved in the transfers from taxpayers and domestic consumers (Section 3). In Section 4, nominal rates of assistance to producers and sugar consumer tax equivalents (NRAs and CTEs) are estimated for the most recent fiscal years for which data are available (2009 to 2021/22). Section 5 then examines medium-term prospects for Fiji's sugar industry: they do not suggest a reversal of fortune is imminent. Since the current forms of assistance to the industry are both inefficient and inequitable, and since there appears to be little prospect for a reversal of the industry's decline in competitiveness, Section 5 explores possibilities for repurposing current supports for more sustainable and more inclusive economic growth in Fiji—bearing in mind that the government had a very high debt-to-GDP ratio in 2022, at 90% (World Bank, 2023). The final section concludes.

2 | SUGAR'S EVOLVING PLACE IN FIJI'S ECONOMY

Historically, sugar production has been the major agricultural activity and a key source of income and export earnings in Fiji. The industry expanded significantly in the latter 1970s and continued to provide the majority of the country's merchandise export earnings, before it plateaued over the 1980s and early 1990s. Since then, the industry has shrunk though. Its share of merchandise exports was 45% in 1980 and between one-quarter and one-third in the 1990s, but it is now barely 5%. As of 1995, sugar cane production accounted for 48% of Fiji's agricultural GDP and, with the processing of cane into sugar, the industry contributed 11% to total GDP, but by 2022 those shares were down to 10% and 0.8%, respectively (FBS, 2023). In the 1990s, there were more than 20,000 active cane growers, but in 2022 there were less than 11,000 (although more people are engaged in the sugar value chain as seasonal workers). Many of them would be part of the 37% of the population that was below the national poverty line in 2019, as the poverty rates in the two sugar-growing areas (Rural Western and Rural Northern) were 38% and 34%, respectively (FBS, 2022).

Meanwhile, the share of raw sugar and molasses in Fiji's merchandise export earnings has fallen from two-fifths in 1995 to 17% in 2012–14 and 5% in 2018–21, and its share of all goods and services exports was just 2% in 2018 and 2019 before COVID-19 decimated tourism exports (down >90%) in 2020 and 2021 (Figure 2). Following the export price slump in 2010, the Sugar Cane Industry Action Plan 2013–2022 was expected to stimulate sugar output and export growth and turn the industry around into a viable and vibrant commercial entity. Indeed, the volume of sugar exports did recover somewhat in the first half of the 2010s, but it has since been declining again and in 2021 was below the previously lowest level of 2010 (Figure 1).

The sources of competitive stress have been several, affecting both supply and demand. On the supply side for sugar and for agriculture generally, climate change is causing extreme weather events to become more frequent and more damaging, including on Fiji's islands. Sugar technological change and productivity growth are occurring less rapidly in Fiji than elsewhere, as reflected in cane yields per hectare, which were 94% of the global average in the 1980s but are barely 60% of them now (FAO, 2023). Most farmland devoted to sugar cane in Fiji is communally owned by ethnic (iTaukei) Fijian extended families, but much has been leased, mainly to Indo-Fijians, for thirty-year periods (Duncan & Sing, 2009; Kurer, 2001; Lal et al., 2001; Lal & Rita, 2005). The bulk of those leases has expired in the past decade or soon will, and many are not being renewed. Indo-Fijians are leaving farms because sugar is no longer profitable enough and their lease does not allow them to use that land for other crops; and ethnic Fijian owners evidently are choosing to not take up sugar farming in their place. Despite the number of cane growers declining, the share of all farms with less than one

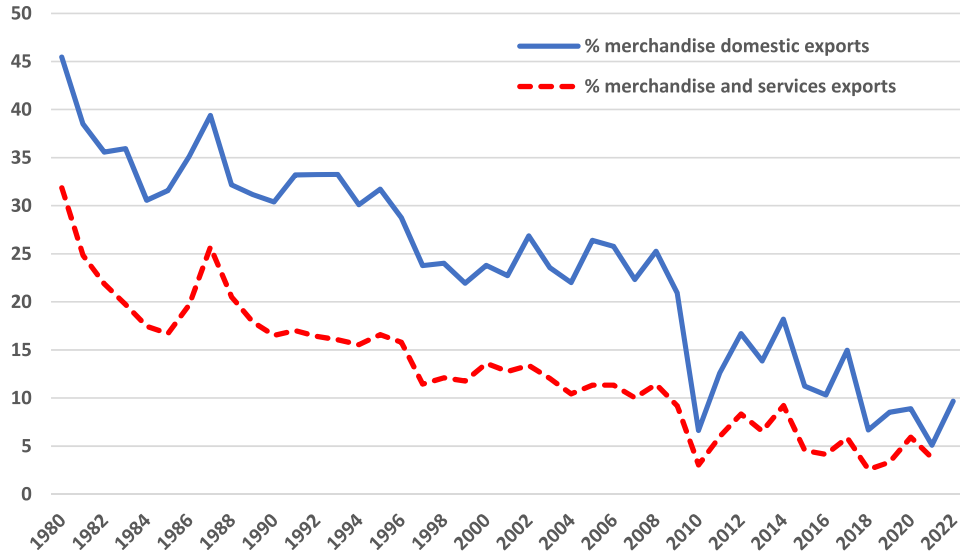

FIGURE 2 Share of sugar in Fiji's merchandise domestic exports and in its total exports of all goods and services, 1980–2022 (%). *Source*: Compiled from Reserve Bank of Fiji on 1 May 2023 at https://www.rbf.gov.fj/statistics/economic-and-financial-statistics/#1595821841266-57730128-1b5c [Colour figure can be viewed at wileyonlinelibrary.com]

hectare has grown from 44% in 2009 to 69% in 2020 and the share with more than 5 hectares has shrunk from 18% to 4% (FAO, 2010, 2020), suggesting farm consolidation to reap economies of size is regressing in Fiji.

On the export demand side, growth in global demand outpaced global supply in the 2000s for sugar and numerous other commodities, pushing up international prices before they fell again in 2014. However, Fiji had been fortunate in having preferential access to the high-priced protected markets of European Union (EU) member countries,[1] so most of its exports were sent to the United Kingdom and a few other EU countries where consumer prices were nearly three times international prices up to the mid-2000s. Thus, Fiji's export price for sugar was well above what it would have been if the EU had not provided Fiji with duty-free and quota-free import market access. But the liberalisation of the EU's sugar market that began in 2006, and the formal ending of the Cotonou Agreement and its Sugar Protocol on 30 September 2009, caused Fiji's export price to plummet in the late 2000s down to the international price, before rising with them at the start of the 2010s (Figure 1). These policy and price changes have added to the above supply-side factors in contributing to the dramatic decline in the area harvested and production of sugar cane in Fiji over the past 15 years (Figure 3).

Furthermore, costs of sugar cane production are falling in the rest of the world. In Australia, for example, the average cash cost of producing a tonne of cane in 2014 was equivalent to about F$53, but by 2021 it was about F$45 (1F$ = 0.66 AUD in mid-2023) when converted at official currency exchange rates (ABARES, 2015, 2021)—or barely half the supported price paid to Fijian growers in recent years of F$85/tonne. The cane yield in Australia during 2016–20 averaged 89 tonnes per hectare harvested, compared with Fiji's 43 tonnes. Technical efficiency in milling sugar by the FSC also seems to be deteriorating, and the tonnes of cane used to produce 1 tonne of raw sugar keeps rising in Fiji, unlike in major exporting countries. For example, Fiji's ratio was very close to Australia's in the mid-1970s and again in the mid-1980s at just under 8, but for Fiji it rose to an average of 9.0 in the 1990s, to 10.3 in the first two decades of this century and to 11.4 in 2020—while the average in Australia since 2000 has been 7.1 (ABARES, 2022), close to the global average in the past decade of just under 7 (FAO, 2023).

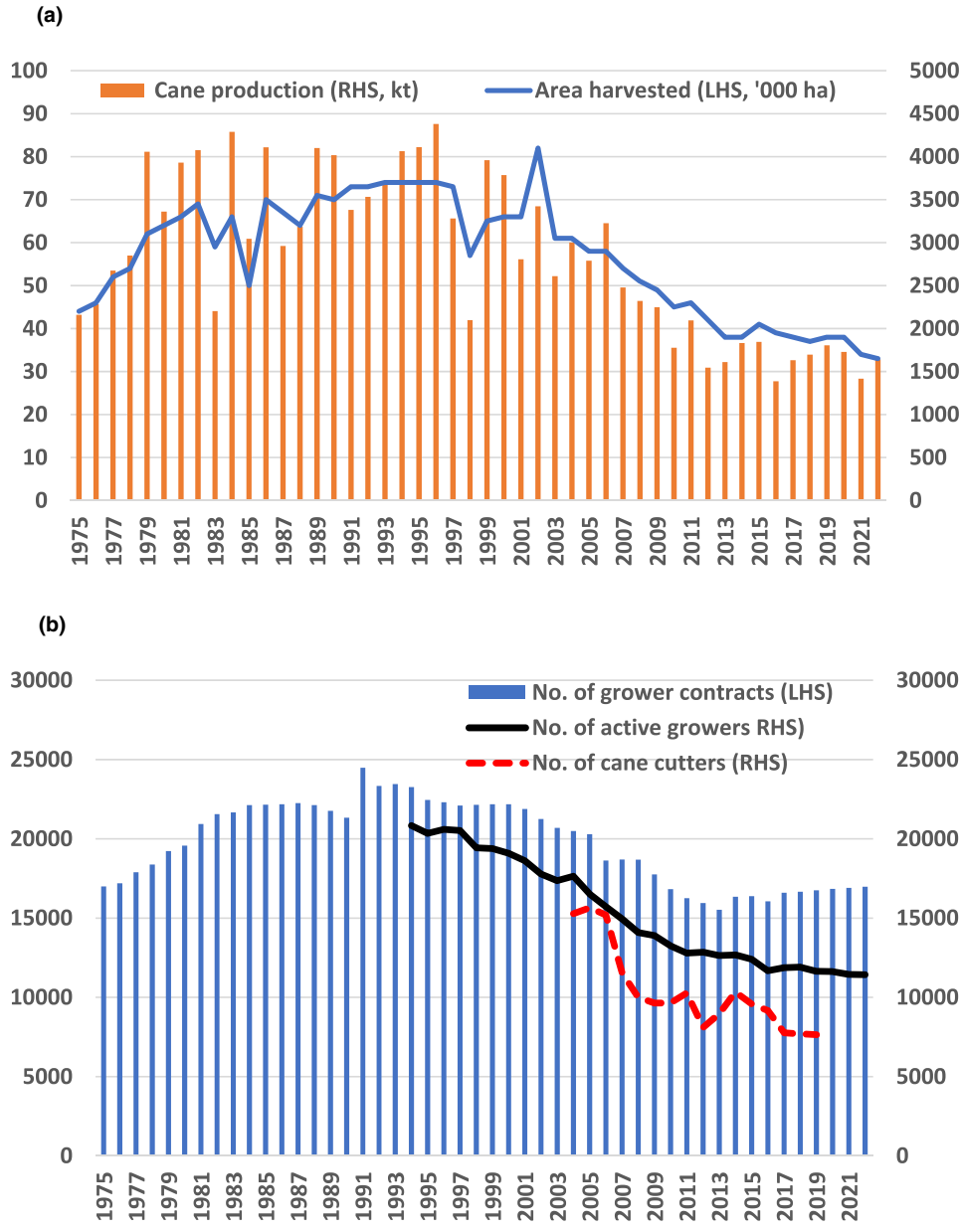

FIGURE 3 Area harvested, production of sugar cane and numbers of growers and cutters, Fiji, 1975–2022. (a) Area harvested and production of sugar cane (000 ha and kt). (b) Numbers of grower contracts, active growers and cane cutters. *Source*: Compiled from FBS (2023). [Colour figure can be viewed at wileyonlinelibrary.com]

Fiji and other Pacific Island countries, like all ACP developing countries, have had the opportunity to negotiate a WTO-compatible regional Economic Partnership Agreement (EPA) with the EU. To be WTO compatible, such agreements must be reciprocal, rather than unilateral as was the Cotonou Agreement. Fiji and others have struggled to reach an acceptable agreement because it involved opening its domestic markets to competition from EU imports, so they signed interim agreements in 2009. Fiji delayed ratification of its interim EPA agreement until July 2014, just ahead of parliamentary elections in September 2014. That meant access to EU aid for the reform of Fiji's sugar industry (24 million Euros

was allocated in 2009 alone) did not get transferred from the EU because of a constitutional crisis of April 2009 following the military coup d'état of December 2006. Negotiations to convert the interim EPA into a permanent agreement are still ongoing.

Meanwhile, Australia signed a free trade agreement (FTA) with the United Kingdom (UK) in 2021 that provides a steady phase-in to duty-free and quota-free access to the UK sugar market by 2030; and Australia is currently negotiating an FTA with the European Union that may soon also provide it with freer access to EU27 sugar markets. Before that, the South African Development Community signed an Economic Partnership Agreement with the EU in 2016 that allows South Africa duty-free access for 100kt of raw sugar exports (and 50kt of refined sugar exports) to the EU each year. Hence, not only did the diminishing support provided to Fiji sugar production and exports from past ACP unilateral preferential trading agreements disappear entirely after 2017, but also stronger competition from newly preferred suppliers is growing in the UK and EU27. Any new FTA between Fiji and the UK or EU27 would at best only partially offset the negative effect on Fiji of Australia's and South Africa's new preferential trading arrangements with those major sugar-importing countries. In addition, as the other ACP countries have been adjusting to the EU policy change, they have repositioned themselves according to their evolving competitiveness: several have shrunk their sugar exports like Fiji but other bigger, less remote countries with more suitable sugar cane-growing conditions have expanded their global market share (Figure 4).

In short, Fiji's sugar industry is no longer very competitive internationally. Following the election of a new reform-minded government in December 2022, with its focus also on the high level of public debt that it inherited, now is an appropriate time to evaluate the Fijian government's policies that have been and are currently assisting the industry and to reassess the industry's prospects.

3 | FIJI'S PUBLIC EXPENDITURE ON ITS SUGAR INDUSTRY

As mentioned at the outset, the extent of support provided to Fiji sugar production and exports from EU protection and preferential trading agreements has been greatly diminished over the past 15 years (Kopp et al., 2016; Nolte et al., 2012). The squeeze on profits of both growers and the Fiji Sugar Corporation (FSC) prompted the Government of Fiji to step in from 2010.[2] It appointed Deloitte to undertake an independent review of FSC's performance and capital structure to help it identify the level of financial support required to keep FSC operating. The key recommendation

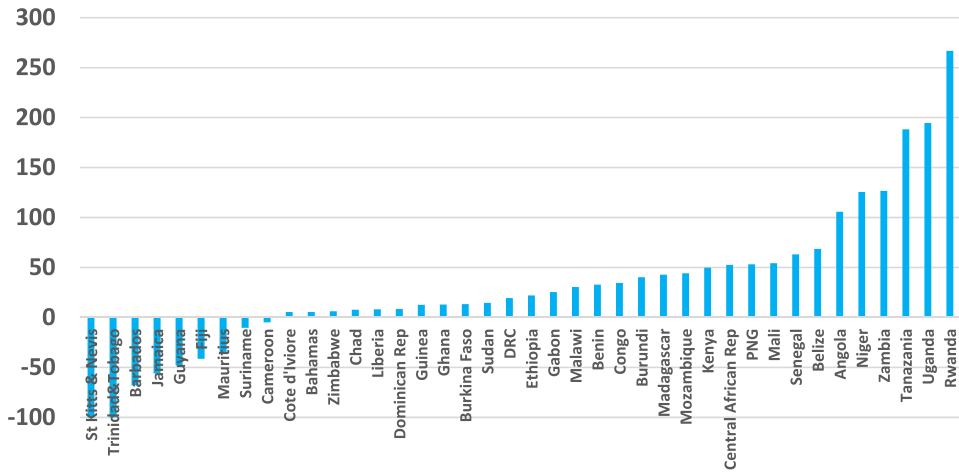

FIGURE 4 Percentage change in sugar cane harvested area between 2000–04 and 2017–21, Fiji and other ACP countries. *Source*: FAO (2023). [Colour figure can be viewed at wileyonlinelibrary.com]

by Deloitte (2010) was for the government to take over FSC's debt and to take 100% ownership and control of FSC. FSC was delisted from the South Pacific Stock Exchange on 24 February 2011, when F$123 m was provided by the government to revive the sugar industry.

As well, to help stem the previous decade's drift of farmers away from growing sugar cane, fertiliser and weedicide subsidies were introduced, and they have gradually increased over the past dozen years: on a per-hectare basis in the late 2010s, they were more than three times what they were in the early 2010s. Various other forms of support for growing and milling sugar also have been channelled through FSC. They range from funds to maintain cane access roads, support farm mechanisation and farmer advisory services, provide small grants to individual cane growers, assist new growers and subsidise cane cartage. These supports are on top of funds to cover operational expenditure each year of the Ministry of Sugar Industry and to contribute an average of one-quarter of the income of the Sugar Research Institute of Fiji (Figure 5).

The fiscal cost of all public expenditure on the sugar industry averaged F$79 million per year from 2017/18 to 2021/22 (see Table S1 for details). That is equivalent to 3.3% of government revenue in 2021/22 (Ministry of Economy, 2022). If it all went to growers, it would be equivalent to F$2135 per hectare of cane and F$7850 per active grower (without counting the transfer from sugar consumers—see Section 4 below).

Sugar productivity growth is the goal of investment in sugar R&D. SRIF's annual budget has averaged a little over F$3.1 million over the past dozen years, or around 3% of value added by sugar cane growing and processing. By the standards of developing countries that is a very high rate of investment, with an average of one-quarter being contributed by the government, one-quarter from each of FSC and cane growers, and the remaining one-quarter from the EU and other aid donors. The average public R&D investment for developing countries' farm sectors has been just 0.5% of sectoral value added for decades (Beintema et al., 2020), with another 0.25% from the private sector (Fuglie, 2016; table 3.1 of Fuglie et al., 2020). That is not to say Fiji has an excessive level of investment necessarily, because the marginal rates of return from agricultural R&D investment are extremely high in most developing countries (Rao et al., 2020), suggesting they are hugely underinvesting in this source of economic growth; and Fiji's R&D investment in 2019 and 2020 was 20% lower than in the previous 5 years. Since much of the benefit from its sugar research is captured by sugar producers and little by the

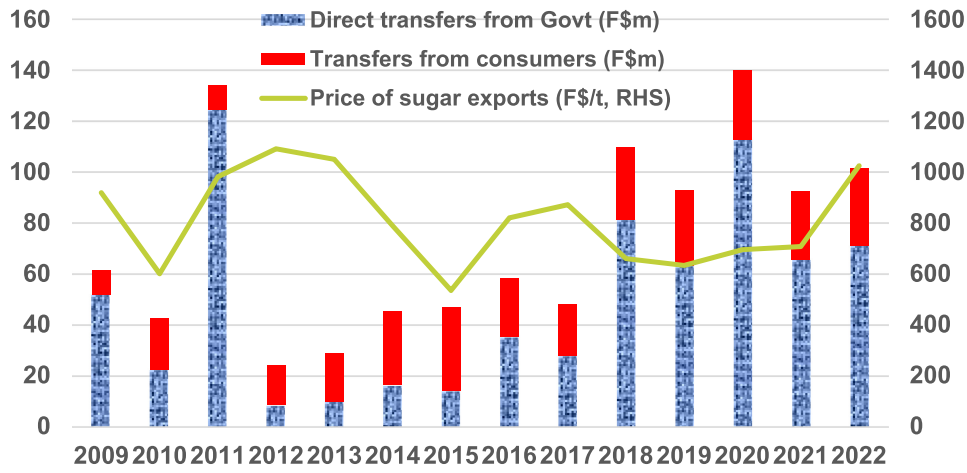

FIGURE 5 Public expenditure on the sugar industry, Fiji, 2009 to 2021/22[a] (F$ million). [a]Fiscal years ending 31 July from 2017, calendar years prior to that. *Source*: Compiled from FSC (2021 and earlier), Ministry of Sugar Industry (2021 and earlier), SRIF (2021 and earlier) and Ministry of Economy (2022). [Colour figure can be viewed at wileyonlinelibrary.com]

rest of the economy, just one-quarter of the SRFI's budget coming from the government is a reasonable share.[3]

After further FSC losses in 2015–17 and then the export price falling further, the government introduced in 2018 a Sugar Stabilization Fund. Its purpose to date has been to continue to provide a deficiency payment to ensure the price received by growers each year does not fall below F$85 per tonne of cane. The government has also allowed the FSC to set a high wholesale price for raw sugar (FCC, 2017; FCCC, 2022). With FSC having monopoly control of the raw sugar market including over imports, the wholesale price has been maintained well above what it would have been in a free market—and in January 2022 it was raised even higher, from F$1490 to F$2300 per tonne. That effective tax on domestic consumers helps to finance the deficiency payment to producers, reducing the extent to which the government would have to draw on revenue from taxpayers.[4]

Thanks to the Sugar Stabilization Fund, the grower price of sugar (ignoring processing and transport costs) has gone from one-third below the export price during the 2000s and one-sixth below in 2010–17 to one-third *above* during 2018–20. Being one-third below the export price is consistent with no producer price support, as that is the ratio used in contracts in the free-market setting in Australia, for example (MSF Sugar, 2016, page 3); being one-third *above* the export price, as in 2018–20, implies very considerable assistance to cane growers from taxpayers and/or consumers (see Section 4).

With this as background, we turn now to estimate the extent to which producers have been assisted, domestic sugar consumers have been taxed, and tax revenue has been affected by the Sugar Stabilization Fund and other government transfers and sugar market interventions.

4 | RATES OF ASSISTANCE TO SUGAR PRODUCERS AND TAXATION OF SUGAR CONSUMERS

4.1 | Basic methodology

There are standard ways to estimate the rates of distortion to markets due to government policy interventions. These were pioneered by the Australian government in the later 1960s as nominal and effective rates of assistance to agricultural and manufacturing industries and their consumer tax equivalents (IAC, 1987). That approach has been used by the World Bank to estimate 50+ years of agricultural producer and consumer rates of assistance or taxation for scores of farm products, including sugar, in 82 countries (Anderson, 2009; Anderson et al., 2008). In the mid-1980s, the OECD Secretariat developed a similar approach to annual monitoring and evaluation of agricultural policies of its member countries, differing mainly in that rates of assistance or taxation are expressed relative not to what the value of production would be under free markets but rather as a percentage of the producers' assistance-inclusive earnings, which means they have a maximum value of 100%—and similarly for consumer tax equivalents (OECD, 2016, 2022). The OECD calls its indicators producer and consumer support estimates (PSE and CSE). They are closely related to the nominal rate of assistance (NRA) and the consumer tax equivalent rate (CTE) though. Specifically, in what follows we report estimates of both sets of indicators which, when they are expressed in percentages, are:

- $NRA = PSE/(100 - PSE)$ and
- $CTE = -CSE/(100 + CSE)$.

The OECD has provided annual estimates from 1986 for its member countries and more recently for 13 major emerging economies. Sugar is monitored in 19 of those countries plus the

EU-27. The most recent years of their estimates are 2018–2021, which are compared with the estimates below for Fiji.

The process of calculating these policy indicators is laid out in the first column of Table S2. Rows are numbered with Roman numerals for ease of citing in the formulae reported there.

When there is no consumer price intervention other than a border measure such as an import tariff or export subsidy, the OECD compares the wholesale price of sugar (which includes the cost of processing) with the border price of a 'like' processed product. That generates an NRA (or PSE) that is equal to the CTE (or the negative of the CSE) at the wholesale point in the value chain. That method needs to be modified slightly to capture the features of Fiji's sugar policies, however, as Fiji's wholesale price of raw sugar has been regulated by the Fiji Competition and Consumer Commission (FCCC) and its predecessors to be above the producer price equivalent, rather than market determined. Hence, the available cane grower price has to be first converted to a price that is comparable with the fob export price of raw sugar.

4.2 | Fiji's sugar market

Fiji's current sugar market is depicted in Figure 6, where DD is the domestic demand curve, SS is what the domestic supply curve would be in the absence of government policies affecting production costs, and SS' is the domestic supply curve in the presence of government policies such as fertiliser subsidies that lower production costs. The horizontal line at the export price, P_e, is the foreign demand curve, P_c is the regulated domestic consumer price, and P_p is the regulated domestic producer price. Thus, C is the quantity of raw sugar consumed domestically, Q is the quantity produced, and Q-C is the quantity exported. Not shown is the cane growers' supply curve.

At those regulated prices, the area abP_eP_c is the transfer from consumers to producers, the area cdhg (= area cdP_eP_p minus area abP_eP_c, where the area abP_eP_c is identical to the area ghP_eP_p) is the transfer from taxpayers for output price support, the area Sjc represents the transfer from taxpayers to producers that lower their marginal costs, and the area cdP_eP_p plus

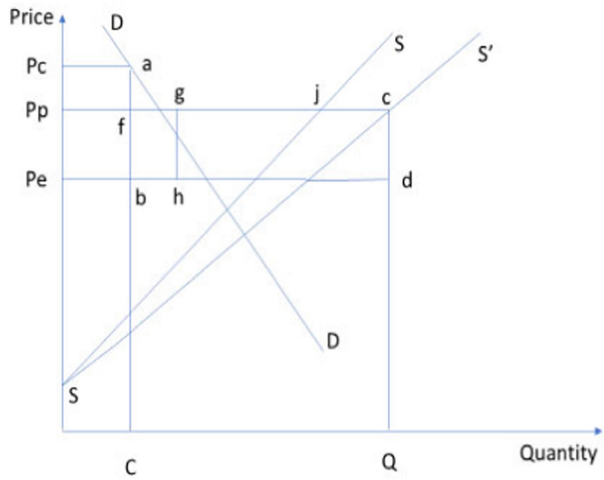

FIGURE 6 Market for raw sugar in Fiji. *Source*: Author's depiction. [Colour figure can be viewed at wileyonlinelibrary.com]

the area Sjc is the total transfer to producers where the area afP_pP_c equals the area bfgh and a and g are on a rectangular hyperbola with its origin at P_e.

In addition to setting the regulated domestic price of raw sugar and producer price equivalent of cane above the average border price of raw sugar (so-called market price support, or MPS),[5] there are numerous other forms of assistance provided to the industry by the government, mostly via the FSC. How much of the overall assistance that is passed through to growers from FSC and SPF is not known, but for present purposes it is assumed to be 70%. This share is chosen because the FSC is obliged to redistribute 70% of its net revenue to growers (and has done so since the 1990s, see Sugar Industry Tribunal, 2018).[6]

4.3 | NRA and CTE estimates

The results summarised in Table 1 and reported in detail in Table S3 suggest the following about the years to 2022:

- The NRA to sugar cane growers is very high, averaging 81% in 2018–22 which is nearly three times that for 2014–17. It amounts to a transfer from consumers and taxpayers of F$9700 per active grower, or F$3060 per hectare.
- One-third of that 81% NRA is contributed through market price support in 2018–22 (27 of the 81 percentage points), the rest coming from various domestic subsidies to producers as listed in Table S1.
- Total transfers to producers averaged F$111 million per year, which equates to 10% of agricultural value added and 1% of total GDP in 2018–22. Just over 70% of that involved transfers from taxpayers, the remainder from domestic consumers. The direct taxpayer portion represents 3.4% of budgeted government revenue in 2018–22. If the transfer from consumers to growers is treated as foregone consumer tax revenue, that cost to government consolidated revenue rises to 4.8%.
- The rate of consumer tax equivalent (CTE) is considerably higher than the NRA, at 114% in 2018–22.
- For the sugar industry as a whole (including the processing of cane into raw sugar), the NRA averaged 71%.

These numbers for the most recent 5 years are all higher than those for the two previous four-year periods, 2010–13 and 2014–17. They were able to be lower earlier in part because the consumers' share of the total support to producers earlier was 47% instead of just 30%,

TABLE 1 Sugar NRAs, PSEs and CTEs, Fiji, 2010–2022 (%).

	2010–13	2014–17	2018–22
NRA for cane growers (%)	36	31	81
PSE for cane growers (%)	25	23	44
NRA for total sugar industry (%)	31	22	71
PSE for total sugar industry (%)	22	18	40
Sugar CTE (%)	53	108	114
Share of support from taxpayers (%)	51	43	70
Transfer per grower per year (F$)	4650	4390	9700
Transfer to grower per ha. per year (F$)	1360	1360	3060

Note: See Table S3.

Abbreviations: CTE, consumer tax equivalent; NRA, nominal rate of assistance; PSE, producer support estimates.

at which time the CTEs were 56% and 108% in 2010–13 and 2014–17, compared with 114% in 2018–22. Those rates over the previous decade are huge compared with the average rates in that decade for the EU and are approaching the rates that prevailed in the EU in the decade prior to the start of its sugar policy reforms in 2006 (Figure 7).

4.4 | Comparisons with other countries

In Figure 8, the average rates of producer assistance and consumer taxation in 2017/18 to 2020/21 for Fiji's sugar industry as a whole (including processing) are compared with those estimated for many other countries by the OECD for 2018–21. The sugar industry's NRA and CTE for Fiji are roughly double the OECD averages. Only five of those countries have a higher CTE than Fiji (China, Japan, the United States, Ukraine and Indonesia), and only six countries (those same five plus the Philippines) have a higher NRA. Figure 9 reports earlier estimates of at least the nominal rates of protection at the border of several other developing countries. Among those in the earlier years (but not in 2018–20), the extent of producer support is higher than in Fiji for Kenya, Jamaica and Guatemala, but support is zero or negative for Belize and Dominican Republic—the two countries that have been able to expand their cane-growing area over the past decade. Evidently, Fiji has been highly protective by international standards for more than a decade in terms of its support for its sugar industry. Even if a few other countries still have high rates of sugar protection, for persistent political economy reasons (Anderson et al., 2013), that is not a reason for Fiji to continue its costly support programme.[7]

Since Mauritius was very similar to Fiji in many respects, how has it managed the adjustment to the reform of EU sugar policy? Past similarities are in terms of cost of cane production, the high share of sugar in total exports, dependence on the EU market, and the projected fall in its sugar price due to EU sugar policy reform (LMC International, 2016). Also, the decline in Mauritius' sugar area is only slightly greater than Fiji's. But the similarities end there. Mauritius had a slightly lower per capita income than Fiji around 1980, but it is now twice as prosperous as Fiji; and its political and social development also has

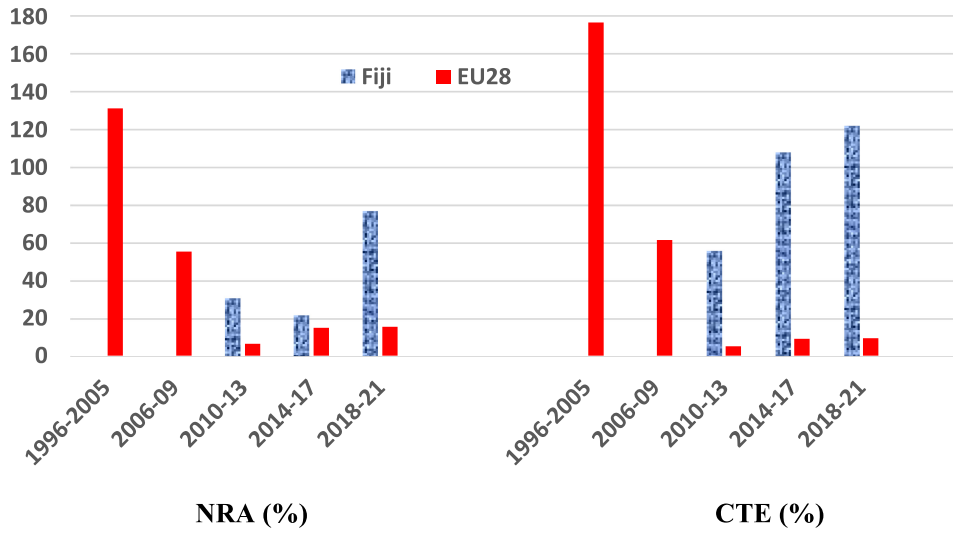

FIGURE 7 Nominal rates of assistance and consumer tax equivalents of sugar policies, Fiji, from 2010 to 2021 and EU28 from 1996 to 2021 (%). *Source*: Compiled from PSE and CSE estimates in OECD (2022) plus, for Fiji, Table S3. [Colour figure can be viewed at wileyonlinelibrary.com]

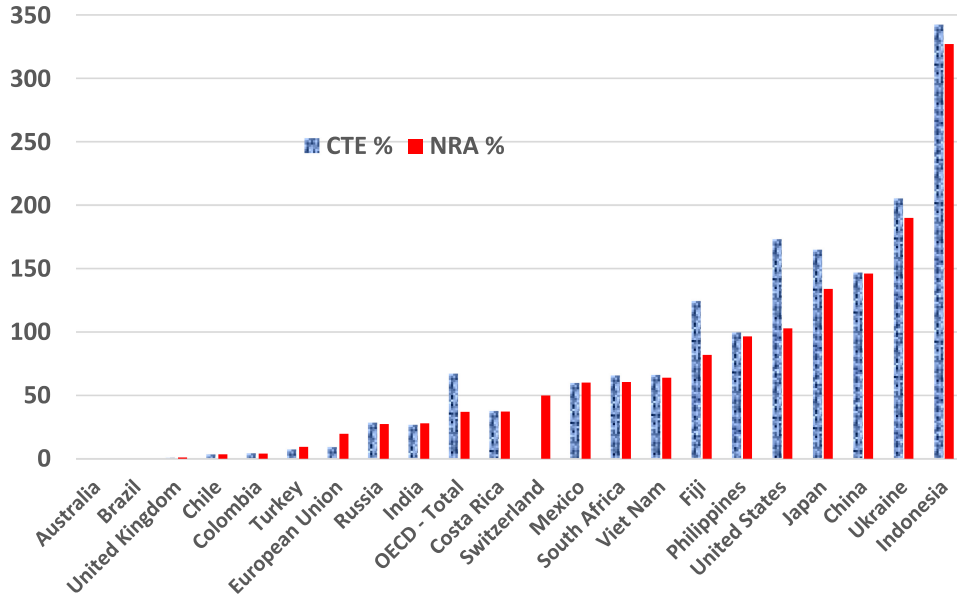

FIGURE 8 Nominal rates of assistance and consumer tax equivalents of sugar policies, Fiji and other countries, 2018–20 (%). *Source*: Compiled from PSE and CSE estimates in OECD (2022) plus, for Fiji, Table S2. [Colour figure can be viewed at wileyonlinelibrary.com]

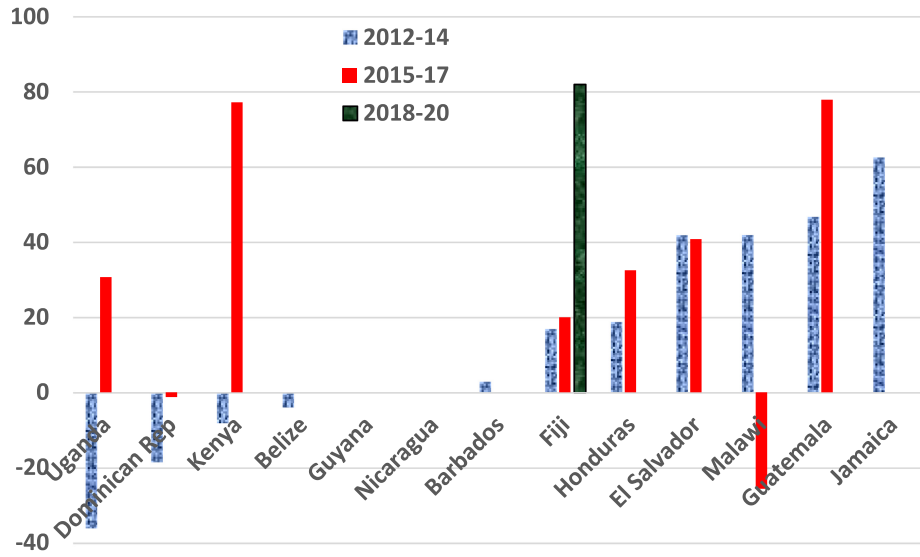

FIGURE 9 Nominal rates of protection of sugar, Fiji and other middle-income countries, 2012–21[a] (%). [a]Belize and Nicaragua are zero in 2012–14, as is Nicaragua in 2015–17. Estimates for Belize, Barbados, Guyana and Jamaica are unavailable for 2015–17. Only Fiji is available for 2018–20, from Table S2. *Source*: www.ag-incentives.org (accessed 12 April 2022). [Colour figure can be viewed at wileyonlinelibrary.com]

been far faster than Fiji's (Howes & Surandiran, 2021a). This is partly because Mauritius has diversified its economy, more than has Fiji, beyond sugar and tourism and towards a wider range of services (Howes & Surandiran, 2021b). More to the point, unlike Fiji,

Mauritius has not chosen to provide huge government support for cane growers, nor to tax its sugar consumers as an alternative way of supporting growers. Instead, its governance has encouraged foreign direct investment, and mobile resources previously employed in its sugar industry have been attracted to more lucrative employment, improving the efficiency of overall resource allocation in Mauritius and boosting its economic growth and structural transformation.

4.5 | Impacts of support on farmers, landowners and the environment

Regardless of whether the current annual deficiency payment and other cane producer support is financed by taxpayers or domestic consumers, the transfer aimed at reducing the industry's decline will need to continue to rise over time if producer competitiveness keeps declining. And while the producer price of sugar cane ($F85/tonne) is not subject to quality adjustments, there is no incentive for cane growers to improve the quality (as distinct from quantity) of cane they deliver.

It also needs to be kept in mind that assisting the production of one farm industry alone is both inefficient and inequitable. This is because assistance to just sugar producers is equivalent to taxing the production of all other farm products that could employ those same land, labour and capital resources. That assistance also reduces the extent of risk-spreading diversification by rural households. Even so, Fiji's farmers evidently have found numerous other crops to be more profitable than sugar cane—despite the assistance currently provided to sugar growing. Singh (2020), for example, finds for the Lomawai area that sugar farmers who have been diversifying their crop mix are reaping profits from those alternative crops that average well over twice those from sugar.

Assisting sugar production with fertiliser and weedicide subsidies is also inefficient and inequitable, because it encourages their use relative to that of other farm inputs, and it benefits most those with the largest farm areas (Ghins et al., 2017; Giné et al., 2022; Jayne & Rashid, 2013). The sole supplier of fertilisers and weedicides to cane growers, South Pacific Fertilizers Ltd, also is likely to retain some of the benefit of subsidised use of those inputs, since that distribution service is regulated so as to be not contestable. Moreover, if those chemical inputs are pollutive of soil, water and air, the optimal intervention would be a tax rather than a subsidy on their use in farming. Apart from improving the environment, such a policy swop would also make it easier for those farmers wishing to avoid chemical inputs to claim to be organic producers.

Assistance to sugar producers is inequitable also because it raises the profitability and hence value of sugar-growing land in direct proportion to the size of each person's holding, thus benefitting the largest/wealthiest most and the poorest cane growers least (as found in simulations by Rakotoarisoa & Chang, 2017, p. 39). Around 80% of land planted to cane in Fiji is leased, and 60% of those growers are aged 55 years or over, with the younger generation showing less interest in cane farming (LMC International, 2016). Insofar as lease payments are eventually raised in step with the degree of subsidisation of the industry, the benefit of the government's support would be ultimately captured by landowners—and in proportion to the size of their landholding, thus benefitting the wealthiest most (Ciaian et al., 2021).

Even if the price-stabilising component of the Sugar Stabilization Fund was able to perfectly stabilise sugar prices domestically, that would not stabilise farmer incomes completely because there would still be weather-induced yield fluctuations (which also destabilise FSC and national foreign exchange earnings), and sugar contributes only a part of farmers' net incomes (especially if one includes remittances). More targeted instruments for dealing with rural income fluctuations are available at much lower social cost, as discussed below in Section 5.

4.6 | Impacts on sugar consumers

While there may be a social benefit in terms of human health from setting a high consumer price for raw sugar, the present mechanism is not the optimal way to achieve that social benefit. This is because the revenue from that consumer tax goes to sugar producers rather than into consolidated revenue for more generic uses. As well, many imported processed foods and beverages that contain sugar would escape that tax and so crowd out local manufacturing of sugar-rich products, unless a border tax adjustment was introduced to prevent that (or if instead an excise tax was imposed on all sugar-rich processed foods, both domestic and imported). Even then, a limit on the sugar content of foods might also be required for the intervention to be optimal from a health viewpoint (Alston & Okrent, 2017; Calcott, 2022; Thow et al., 2011).

5 | SUGAR INDUSTRY PROSPECTS AND WAYS TO REPURPOSE GOVERNMENT SUPPORT

5.1 | Sugar price prospects

According to the agricultural outlook to 2030 provided by OECD-FAO (2022), real international sugar prices are expected to resume their long-term decline thanks to productivity growth in major producing countries. Price levels are expected to be below the average of the past two decades. This projection is consistent with that of the World Bank (2021), which also foresees a slight decline in real sugar prices through to 2035.

One contributor to those price projections has to do with ethanol demand: it was boosted in the first two decades of this century by subsidies and mandates to expand its use as an alternative fuel, especially in the US and EU, but that source of demand is fading thanks to rapid technological advances in producing fuel from other renewable sources such as wind and sun and to concerns that such subsidies and mandates have been pushing up the price of food globally (de Gorter et al., 2013; Le Page, 2022).

Competition in the UK and EU27 sugar markets will remain intense from local producers and from those gaining new preferential access to those markets, including Australia and South Africa. Since the EU sugar policy reforms began in 2006, its sugar production adjusted initially to the stepwise lowering of prices and the eventual removal from 2017 of EU production quotas, which allowed beet growing to relocate to the regions within the EU that are better suited to it (sections 3.1 and 5.4 of EC, 2022).

Sugar consumption globally is being adversely affected by more widespread dissemination of health warnings and, in numerous countries, the taxing of consumption of sugar-based foods and beverages (Calcott, 2022; Calì et al., 2013; Lane et al., 2021; Lane & Bhardwaj, 2021). Some analysts project that its use will decline in a manner similar to tobacco's, as health lobbies sharpen their focus on the product.

These sober prospects, plus the attributes of Fiji's current sugar policy regime noted at the end of the previous section, raise the question of whether there are better ways to encourage more sustainable and more inclusive rural economic growth in Fiji than transferring funds from taxpayers and consumers to cane growers.

5.2 | Repurposing farmer supports

Repurposing farmer supports has been shown to be feasible in many settings. Notwithstanding some notable exceptions including for sugar (see Figure 8), it is becoming more of a focus of policymakers and their advisors in both high-income and developing countries and in major

international organisations (FAO, UNDP and UNEP, 2021; IMF, OECD, World Bank and WTO, 2022; World Bank and IFPRI, 2022). While one size does not fit all countries, the most common proposals involve transforming those production-expanding transfers currently going to producers, as a private good coupled to production, into decoupled payments that can contribute more to public goods or the community more broadly.

As reported above, over the 5 years to 2022 there was an annual average transfer of F$111 million to sugar producers, equivalent to 4.8% of Fiji's government revenue. How might that government revenue be better spent within and beyond the sugar industry portfolio to improve the welfare of Fijians? Possibilities include the following.

First, integrating the Sugar Research Institute of Fiji into an all-encompassing Crop and Livestock (or Farming Systems) Research Institute involving both biological and social sciences may well boost the welfare of all (not just cane) farmers and landowners and also of consumers insofar as the farm productivity growth that it stimulates lowers prices for net buyers of foods that are not traded internationally.

Second, the expenditure on cane access roads and cane cartage and FSC trucks could instead be used to generally improve rural transport infrastructure, thereby reducing transport/logistics costs in rural areas, in which case the benefits are shared between all farmers—whose net returns rise and costs of commuting to part-time off-farm jobs fall—and consumers (whose retail food prices fall). Such broadening of transport infrastructure investments would reduce inequality, partly because it would increase the opportunities for subsistence farmers to sell their outputs and labour to a broader range of markets (Gollin & Rogerson, 2014).

Third, subsidies to fertiliser and weedicides just for cane growers are inefficient and inequitable on multiple grounds. Within the sugar industry, they are inefficient in that they encourage the use of those purchased inputs relative to other inputs (Warr, 1977); and they are inequitable in that the larger the grower, the bigger the benefit. If there is suboptimal use of those yield-improving inputs in Fiji due, for example, to lack of farmer knowledge of their economic benefits, investing more in extension efforts to disseminate such information more widely would be far cheaper than subsidising those chemical inputs. And if the use of these chemicals is pollutive, the optimal policy is not a subsidy but rather a tax on those chemicals, thereby adding to rather than drawing on government revenue.

Fourth, more targeted instruments for dealing with rural income fluctuations are available at much lower social cost (Byerlee et al., 2006; IAC, 1978). Credit markets and private markets for index-based weather insurance are more likely to be developed in the absence of a sugar price stabilisation scheme. Both price risk and yield/ha risk could be offset somewhat by allowing farm income tax averaging over several years or, for reaching the poorest households, by providing countercyclical social safety nets/trampolines (Alderman & Haque, 2006).

Fifth, with some of the current expenditure freed up, more could be spent on building human capital in poorer rural households. Specifically, greater investment in basic education and health in rural areas, and in vocational training for the less skilled, would help sugar growers and other farm families to become better farm managers or labourers and, for those wishing to migrate to nonfarm areas and occupations, to make the transition easier and more lucrative in the long run. Such investments could be financed to facilitate adjustment by retaining the current high consumer price of sugar for, say, 5 years and using the gap between it and the producer price to provide grants or loans to cane growers and mill workers to assist their adjustment.

Finally, insofar as there are social benefits in terms of human health from maintaining a high consumer price for sugar, a lowering of sugar industry supports need not involve reducing the current wholesale sugar price. Instead, that price could be maintained indefinitely via an excise tax (revenue from which would go into consolidated revenue), plus a comparable tariff on the most sugar rich of imported processed foods and beverages so they do not unfairly

crowd out local manufacturing of such products. Alternatively, that excise tax could be imposed on all sugar-rich processed foods according to their sugar content, both domestic and imported.

An example of a phased reform package involving adjustment assistance (drawing on Australia's very successful dairy policy reform experience, see Edwards (2003) and Harris (2005)) is the following:

- Announce that subsidies to the industry are to be replaced by a direct payment from the government, which would reduce each year from 2023 to 2027 and go to cane growers based on their production in 2020–22; and
- The cost of those direct payments is financed by replacing the FSC's monopoly on raw sugar production and imports with an excise tax on domestic raw and refined sugar sales (plus an equivalent tax on imported sugar-rich processed food and beverages).

Basing the producer direct payments on past production would ensure those incentives are completely decoupled from current production; and basing part of the financing of those payments on an excise tax on consumers need not raise the cost to consumers if it is set no higher than the recent consumer tax equivalent. Table 2 illustrates the costs of this direct payment system (in F$ million) based on the levels of support provided to producers during 2021/22 from taxpayers (F$71 m/year) and consumers (F$35 m/year), as reported earlier. Its cost net of the excise collected from sugar consumers would fall from the 2021/22 level of $71 million to zero by 2027, and thereafter, and it would provide new revenue of F$35 million per year from the excise tax. Hence, the net fiscal gain from the reform would rise from F$16 million in 2023 to F$106 million per year from 2027. Such a reform would also bring Fiji into line with the spirit of the WTO membership's decision in late 2015 to begin phasing out agricultural export subsidies.

6 | CONCLUSION

Moving away from coupled support to an industry, however inefficient and inequitable it has been, will always be politically difficult, and more so the longer that support has been in place to entrench its value in the industry's most immobile assets. Should that supported industry's share of the economy shrink, as has been the case for Fiji sugar, the political opposition to supporting it may decline initially as the economic cost of that support becomes more affordable (Hillman, 1982). But if the international competitiveness of that industry is destined to continue to decline despite that support, again as seems to be the case for Fiji sugar, the day will come when the political cost of withdrawing that support is less than the political support received from the rest of the community from doing so (Cassing & Hillman, 1986). That day

TABLE 2 Fiscal costs of Fiji's sugar producer support in 2022 and potential savings from a gradual switch to a direct payment system decoupled from current sugar production, 2023–2027 (in F$ million).

	2022	2023	2024	2025	2026	2027+
Excise tax on consumers, paid to producers	35	35	35	35	35	0
Other direct payment to producers from govt	71	50	35	15	5	0
Total direct payments to producers	106	85	70	55	40	0
Govt revenue savings relative to 2021/221	0	21	36	51	66	106

Source: Author's computations drawing from Table S2.

can be brought forward if a roadmap for reform is clearly designed to include compensation to the potential losers and if the reform package is announced in advance of its implementation. Sugar policies have been among the most difficult sectoral support policies to reform, but substantial progress was made around the world in the closing years of the 20th century (Larson & Borrell, 2001) and far more since then, most notably in the EU (EC, 2022). How soon that day may arrive in Fiji only time will tell.

ACKNOWLEDGEMENTS

The author is grateful for data assistance from Fiji government officials, for comments on an earlier draft by participants in a 2022 mission to Fiji that led to a report by the World Bank (2023) and for helpful comments by anonymous AJARE referees and an Associate Editor. The views expressed are the author's alone and not necessarily those of the Government of Fiji or the World Bank. Open access publishing facilitated by The University of Adelaide, as part of the Wiley - The University of Adelaide agreement via the Council of Australian University Librarians.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are openly available in the Fiji Government publications cited in the list of References.

ORCID

Kym Anderson https://orcid.org/0000-0002-1472-3352

ENDNOTES

[1] The 1951 Commonwealth Sugar Agreement between the United Kingdom and former British colonies was succeeded in 1973, when the UK joined the EEC (now EU), by the Sugar Protocol that was part of the various Lomé Conventions and then the Cotonou Agreement between the EU and former African, Caribbean and Pacific (ACP) colonies.

[2] Since 2011, the FSC has been the sole manufacturer and seller of raw sugar in Fiji. Earlier that monopoly was held by CSR. FSC also sells molasses, a by-product of the sugar milling process. It has a monopoly on the milling of cane as well as on the import of sugar (subject to a WTO-bound MFN tariff of 32%) and the export of sugar that was subject to a 3% export tax until 2011 but is now traded freely (WTO, 2016). Most of the cane that is processed into raw sugar is exported (85% during 2016–20, mostly to the European Union), while small amounts of raw and refined sugar are imported.

[3] Australia spends about 5% of its sugar industry's value added on sugar cane research (SRA, 2021), with additional R&D on sugar milling done separately by Australia's not-for-profit Sugar Research Institute (www.sri.org.au). Only one-quarter of Australia's sugar cane research budget (p. 84 of SRA, 2021) and none of its milling research budget comes from the government. As in Fiji, this is appropriate because the sector is very much export focussed and so most of the benefit from that research accrues to producers and little to the rest of the economy (Edwards & Freebairn, 1984).

[4] This type of policy is what in Australia was called a home consumption price scheme (Longworth, 1966, 1967; Mauldon, 2021; Parmenter et al., 1981). In effect, it is a disguised form of export subsidy, funded in part by domestic consumers whereby the producer price is a sales-weighted average of the high domestic wholesale price and the lower export price (as depicted in Figure 6 below).

[5] MPS to producers is the component of assistance derived from ensuring the producer price is above the border price. In this case, in aggregate it is area cdP_eP_p and, when expressed in percentage terms, it is $100 * (P_p - P_e)/P_e$.

[6] This is a little above what prevails in Australia where the sugar markets are undistorted: in the standard contract there, one-third of the raw sugar export price is retained by the processor and the other two-thirds is paid to the cane grower (MSF Sugar, 2016). That ratio is also consistent with the value added to cane sugar by sugar manufacturers in Australia: during 2018–20, cane's share of the raw sugar value of production averaged 68% (ABARES, 2022; ABS, 2021).

[7] Fiji's sugar sector is likely to be an outlier compared with support for Fiji's other farm industries too, although there are no NRA/CTE estimates for other industries within Fiji to compare with those for sugar.

REFERENCES

ABARES. (2015) *Australian sugarcane farm businesses: financial performance, 2013–14, Research Report 15.14*. Canberra, ACT: Australian Bureau of Agricultural and Resource Economics and Sciences.

ABARES. (2021) *Financial performance of sugarcane farms, 2020–21 to 2021–22, Research Report 21.19*. Canberra, ACT: Australian Bureau of Agricultural and Resource Economics and Sciences.

ABARES. (2022) *Australian commodities*. Canberra, ACT: Australian Bureau of Agricultural and Resource Economics and Sciences.

ABS. (2021) *Australian industries*. Catalogue No. 81550DO003, 28 May.

ADB. (2005) *Fiji Islands alternative livelihoods development project: report and recommendation of the president, RRP FIJ 32541*. Manila: Asian Development Bank.

ADB. (2009) *Fiji Islands: alternative livelihoods development project: completion report, project number: 32541*. Manila: Asian Development Bank.

Alderman, H. & Haque, T. (2006) Countercyclical safety nets for the poor and vulnerable. *Food Policy*, 31(4), 372–383.

Alston, J.M. & Okrent, A.M. (2017) *The effects of farm and food policy on obesity in the United States*. New York, NY: Palgrave Macmillan.

Anderson, K. (Ed.). (2009) *Distortions to agricultural incentives: a global perspective, 1955–2007*. London: Palgrave Macmillan; Washington, DC: World Bank.

Anderson, K., Kurzweil, M., Martin, W., Sandri, D. & Valenzuela, E. (2008) Measuring distortions to agricultural incentives, revisited. *World Trade Review*, 7(4), 675–704.

Anderson, K., Rausser, G. & Swinnen, J.F.M. (2013) Political economy of public policies: insights from distortions to agricultural and food markets. *Journal of Economic Literature*, 51(2), 423–477.

Beintema, N., Nin Pratt, A. & Stads, G.-J. (2020) *Key trends in global agricultural research investment, ASTI Update*. Washington, DC: IFPRI.

Byerlee, D., Jayne, T.S. & Myers, R.J. (2006) Managing food price risks and instability in a liberalizing market environment: overview and policy options. *Food Policy*, 31(4), 275–287.

Calcott, P. (2022) Regulating ingredients in sin goods. *American Journal of Agricultural Economics*, 104(3), 1120–1139.

Calì, M., Nolte, S. & Cantore, N. (2013) Sweet and sour changes in trade regimes. *The World Economy*, 36(6), 786–806.

Cassing, J.H. & Hillman, A.L. (1986) Shifting comparative advantage and senescent industry collapse. *American Economic Review*, 76, 516–523.

Ciaian, P., Baldoni, E., Kancs, D.A. & Drabik, D. (2021) The capitalization of agricultural subsidies into land prices. *Annual Review of Resource Economics*, 13, 14.1–14.22.

de Gorter, H., Drabik, D., Just, D.R. & Kliauga, E.M. (2013) The impact of OECD biofuels policies on developing countries. *Agricultural Economics*, 44(4), 477–486.

Deloitte. (2010) *Restructuring Fiji sugar: report to the Fiji government sugar taskforce on restructuring the Fiji sugar Corporation's debt and reforming the Fiji sugar industry*. Suva: Deloitte.

Duncan, R. & Sing, Y.W. (2009) The failure of agricultural policymaking in Fiji. *Pacific Economic Bulletin*, 24(2), 168–184.

EC. (2022) *Study on the adaptation strategies of the sugar supply chain after the end of the sugar quotas, AGRI/2020/OP/0001*. Luxembourg: Publications Office of the European Union.

Edwards, G.W. (2003) The story of deregulation in the dairy industry. *Australian Journal of Agricultural and Resource Economics*, 47(1), 75–98.

Edwards, G.W. & Freebairn, J.W. (1984) The gains from research into tradable commodities. *American Journal of Agricultural Economics*, 66(1), 41–49.

EU. (2010) *National adaptation strategy for the Fiji sugar industry*. Draft Report by a consultant to the European Union, Brussels.

FAO. (2010) *2009 Fiji agricultural census*. Rome: FAO and Suva: Parliamentary Paper.

FAO. (2020) *2020 Fiji agricultural census*. Rome: FAO and Suva: Parliamentary Paper.

FAO. (2023) *FAOSTAT*. Rome: FAO. Available from: https://www.fao.org/faostat/en [Accessed 11th May].

FAO, UNDP and UNEP. (2021) *A multi-billion-Dollar opportunity: repurposing agricultural support to transform food systems*. Rome: FAO.

FBS. (2022) *2019–20 household income and expenditure survey: main report*. Suva: Fiji Bureau of Statistics.

FBS. (2023) *Key statistics*. Suva: Fiji Bureau of Statistics. Available from: https://www.statsfiji.gov.fj/index.php/latest-releases/key-stats [Accessed 20th April 2023].

FCC. (2017) *Final authorization on price for the FSC*. Suva: Fiji Commerce Commission.

FCCC. (2022) *Price review for FSC's 'sugars of Fiji', media release*. Suva: Fiji Competition and Consumer Commission.

FSC. (2021 and earlier) *Annual report 2020*. Suva: Fiji Sugar Corporation.

Fuglie, K. (2016) The growing role of the private sector in agricultural research and development world-wide. *Global Food Security*, 10, 29–38.
Fuglie, K., Gautam, M., Goyal, A. & Maloney, W.F. (2020) *Harvesting prosperity: technology and productivity growth in agriculture*. Washington, DC: World Bank.
Ghins, L., Mas Aparisi, A. & Balié, J. (2017) Myths and realities about input subsidies in sub-Saharan Africa. *Development and Policy Review*, 5(S2), 214–233.
Giné, X., Patel, S., Ribeiro, B. & Valley, I. (2022) Efficiency and equity of input subsidies: experimental evidence from Tanzania. *American Journal of Agricultural Economics*. Available from: https://doi.org/10.1111/ajae.12314
Gollin, D. & Rogerson, R. (2014) Productivity, transport costs, and subsistence agriculture. *Journal of Development Economics*, 107, 38–48.
Harris, D.N. (2005) *Industry adjustment to policy reform: a case study of the Australian dairy industry, RIRDC publication No 05/110*. Canberra, ACT: Rural Industries Research and Development Corporation. Available from: https://agrifutures.com.au/wp-content/uploads/publications/05-110.pdf
Hillman, A.L. (1982) Declining industries and political-support protectionist motives. *American Economic Review*, 72(5), 1180–1187.
Howes, S. & Surandiran, S. (2021a) Mauritius has just become a high-income country; Fiji is less than halfway there. *DEVPOLICYBLOG*, Australian National University, Canberra. Available from: https://devpolicy.org/mauritius-has-just-become-a-high-income-country-fiji-is-less-than-halfway-there-20210429-2/
Howes, S. & Surandiran, S. (2021b) Why has Mauritius left Fiji so far behind? *DEVPOLICYBLOG*, Australian National University, Canberra. Available from: https://devpolicy.org/why-has-mauritius-left-fiji-so-far-behind-20210505
IAC. (1978) *Rural income fluctuations, Report No. 161*. Canberra, ACT: Industries Assistance Commission (now called Productivity Commission).
IAC. (1987) *Assistance to agricultural and manufacturing industries*. Canberra, ACT: Industries Assistance Commission (now called Productivity Commission).
IMF, OECD, World Bank and WTO. (2022) *Subsidies, trade and international cooperation*. Washington, DC: International Monetary Fund.
Jayne, T.S. & Rashid, S. (2013) Input subsidy programs in sub-Saharan Africa: a synthesis of recent evidence. *Agricultural Economics*, 44(6), 547–562.
Kopp, T., Prehn, S. & Brümmer, B. (2016) Preference erosion – the case of everything but arms and sugar. *The World Economy*, 39(9), 1339–1359.
Kurer, O. (2001) Land tenure and sugar production in Fiji: property rights and economic performance. *Pacific Economic Bulletin*, 16(2), 94–105.
Lal, P., Lim-Applegate, H. & Reddy, M. (2001) The land tenure dilemma in Fiji – can Fijian landowners and Indo-Fijian tenants have their cake and eat it too? *Pacific Economic Bulletin*, 16(2), 106–119.
Lal, P. & Rita, R. (2005) Potential impacts of EU sugar reform on the Fiji sugar industry. *Pacific Economic Bulletin*, 20(3), 18–42.
Lane, C. & Bhardwaj, V. (2021) *Meeting the global health challenge to reduce death and disability from alcohol, tobacco, and sugar-sweetened beverage consumption with corrective taxes*. CGD policy paper 240, Washington, DC: Center for Global Development.
Lane, C., Glassman, A. & Smitham, E. (2021) *Using health taxes to support revenue: an action agenda for the IMF and World Bank*. CGD Policy Paper 203. Washington, DC: Center for Global Development.
Larson, D.F. & Borrell, B. (2001) *Sugar policy and reform*. Policy research working paper 2602. Washington, DC: World Bank.
Le Page, M. (2022) Cutting biofuels can help avoid global food shock from Ukraine war. *New Scientist*, 22 March.
LMC International. (2005) *An assessment of the financial assistance required by the Fiji sugar industry in light of the EC's reform proposals*. Report to European Commission.
LMC International. (2016) *Study on current and forecast market developments for ACP sugar suppliers to the EU market: final report*. Specific contract 2015/370301. Brussels: European Commission.
Longworth, J.W. (1966) The Australian wheat industry stabilization scheme: an analytical model. *The Economic Record*, 42(98), 244–255.
Longworth, J.W. (1967) The stabilization and distribution effects of the Australian wheat industry stabilization scheme. *Australian Journal of Agricultural Economics*, 11(1), 20–35.
Mahadevan, R. (2009) The withdrawal of EU sugar preferences and the bittersweet reform pill for Fiji. *Pacific Economic Bulletin*, 24(2), 82–94.
Mauldon, R.G. (2021) Early analytical agricultural economics in Australia. *Australian Economic History Review*, 61(1), 45–63.
Ministry of Economy. (2022) *Revised budget estimates 2021–2022, as approved by parliament*. Suva: Ministry of Economy.
Ministry of Sugar Industry. (2021) *Annual Report 2018–19*. Parliamentary Paper No. 35 of 2021, Suva.
MSF Sugar. (2016) *Cane pricing guide*. Gordonvale, Qld: MSF Sugar. Available from: https://www.msfsugar.com.au/sugar-marketing/

Nolte, S., Buysse, J. & van Huylenbroeck, G. (2012) Modelling the effects of an abolition of the EU sugar quota on internal prices, production and imports. *European Review of Agricultural Economics*, 39(1), 75–94.
OECD. (2016) *OECD'S producer support estimate and related indicators of agricultural support: concepts, calculations, interpretation and use (the PSE manual)*. Paris: OECD.
OECD. (2022) *Producer and consumer support estimates*. Available from: https://www.oecd.org/agriculture/topics/agricultural-policy-monitoring-and-evaluation/
OECD-FAO. (2022) *OECD-FAO Agricultural outlook 2022–2031*. Paris: OECD.
Parmenter, B.R., Sams, D. & Vincent, D.P. (1981) Who pays for home consumption pricing schemes? *The Economic Record*, 57, 168–178.
Rakotoarisoa, M.A. & Chang, K. (2017) *The sugar sub-sector in Africa-Caribbean-Pacific (ACP) countries in the post-2017 era: impacts of European Union production quota elimination and ACP-EU reciprocal preferential access on ACP sugar market and trade*. Rome: FAO.
Rao, X., Hurley, T.M. & Pardey, P.G. (2020) Recalibrating the reported returns to agricultural R&D: what if we all heeded Griliches? *Australian Journal of Agricultural and Resource Economics*, 64, 977–1001.
Singh, A. (2020) Benefits of crop diversification in Fiji's sugarcane farming. *Asia and the Pacific Policy Studies*, 7(1), 65–80.
SRA. (2021) *Annual report 2020–21*. Indooroopilly, Qld: Sugar Research Australia.
SRIF. (2021 and earlier) *Annual report*. Parliamentary Paper No. 50 of 2021 (and earlier years). Drasa: Sugar Research Institute of Fiji.
Stoler, A. (2005) Fiji: preparing for the end of preferences? In: Gallagher, P., Low, P. & Stoler, A. (Eds.) *Managing the challenges of WTO participation: 45 case studies*. Cambridge and New York: Cambridge University Press, pp. 189–200.
Sugar Industry Tribunal. (2018) *Annual report 2015*. Lautoka: Sugar Industry Tribunal.
Thow, A.M., Quested, C., Juventin, L., Kun, R., Khan, A.N. & Swinburn, B. (2011) Taxing soft drinks in the Pacific: implementation lessons for improving health. *Health Promotion International*, 26(1), 55–64.
Warr, P.G. (1977) Tariff compensation via input subsidies. *The Economic Record*, 53(144), 508–516.
World Bank. (2021) *Commodity markets outlook*. Washington, DC: World Bank.
World Bank. (2023) *Fiji public expenditure review: towards fiscal sustainability and improved spending quality*. Washington, DC: World Bank.
World Bank and IFPRI. (2022) *Repurposing agricultural policies and support: options to transform agriculture and food systems to better serve the health of people, economies, and the planet*. Report No: AUS0002236. Washington, DC.
WTO. (2016) *Trade policy review: report by the secretariat, WT/TPR/S/330*. Geneva: World Trade Organization.

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Anderson, K. (2023) Loss of preferential access to the protected EU sugar market: Fiji's response. *Australian Journal of Agricultural and Resource Economics*, 67, 480–499. Available from: https://doi.org/10.1111/1467-8489.12526