



Public social services and sustainable development: estimating opportunities in the global south

Celia Lessa Kerstenetzky, Marcio Alvarenga Junior, Lucas Costa, and Ricardo Bielschowsky

ABSTRACT

In this article, which seeks to check the supposed potential of public social services to promote sustainable and equitable well-being, we assess, on the one hand, the magnitude of unmet social needs in Brazil in terms of additional public spending on education and health, and, on the other hand, the economic, social, and environmental benefits that might accrue from meeting these needs. Estimating the size of unmet social needs reveals abysmal distances between current service provision and a set of benchmarks. The huge size of these gaps reflects the lack of priority given to these services in the various national development projects of the past. In turn, the measurement of benefits, carried out with the help of the 2019 Brazilian Input Output Tables (IOTs), and the generation of an environmental matrix based on the IOTs, reveals that investments in these areas are key opportunities for promoting sustainable development. The greater capacity for galvanizing the economy and generating formal employment, and the smaller carbon footprint of public education and health services when compared to the average for the economy, stand out. Additionally, in comparison with the private social services provision network, public services stand out in terms of average wages, collection of taxes and contributions, formal employment, income multipliers and formal employment, and greenhouse gas emissions per unit of wage.

KEYWORDS

Public social services; input-output tables; environmental matrix; employment multipliers; sustainable development; well-being

By meeting the well-being demands of populations, public social services—the provision of health and education services in particular—have contributed to promoting social protection and integration in highly commodified modern economies. Following their introduction in the nineteenth and twentieth centuries, these services have established themselves; and by diversifying, to respond to new social needs, such as services for families and for qualifications among the workforce, they have come to represent

Celia Lessa Kerstenetzky is a professor of social policy at the Economics Institute, Federal University of Rio de Janeiro.

Marcio Alvarenga Junior is a PhD student at the Economics Institute, Federal University of Rio de Janeiro.

Lucas Costa is a PhD student at the Economics Institute, Federal University of Rio de Janeiro.

Ricardo Bielschowsky is a professor of economic development at the Economics Institute, Federal University of Rio de Janeiro.

up to 20% of the GDP in OECD countries, despite privatizing waves of varying intensity.

Recently, public social services (PSS) have (re)entered the repertoire of reforms considered essential in government action. This renewed interest in PSS stems from their being perceived as sufficiently multifunctional to deal with the multiple crises of carbon-intensive post-industrial capitalist economies—economic, social, environmental, and sanitary: crises that have been engulfing countries, regions, and the planet itself. The so-called “social infrastructure” agenda, an integral part of the fiscal stimuli designed in response to the COVID-19 health crisis, is apparently taking root. It is worth recalling that, in other crisis contexts in the past, any fiscal stimuli initiated were primarily aimed at physical infrastructure. A new social contract that includes the environment, the Green (New) Deal, has been presented as the normative reference for tax packages in the United States, the European Union, and in Asian countries, such as South Korea. In these packages, spending on health, education, and social care is the target of large investments and the target of arguments that allude to its multifunctionality.

However, implementation of these initiatives has met with great resistance in less developed countries, which are generally deprived by the dominance of fiscalist dogma of the right to plan their infrastructure, and their future. In fact, the gap between rich and non-rich countries in terms of PSS development has been and remains substantial. For example, PSS accounts for around 30% of jobs among the richest (the main source of jobs being in the services sector). In Brazil, where these services account for just over 10% of GDP, employment in them remains below 12% of total employment. In this country, most jobs in services are in poorly paid and unstable commercial services, and in the general distribution of goods. Additionally, the economic impacts of PSS on income, output, productivity, and economic stability are generally neglected. However, public social services, in addition to being an auxiliary force in economic recovery and softening economic cycles, can contribute to a country’s development by driving important structural change. For example, in less developed contexts, such as in Brazil, alongside completely inadequate levels of well-being for a large part of the population, there exists a labor market with strong markers of precarity, such as high levels of informal employment and low average earnings, which contributes to worsening poverty and inequality. Bearing in mind the international experience, especially that of rich economies, the expansion of PSS, while meeting largely unsatisfied social demands, could also have the potential to create a vast array of quality jobs; to which virtue could be added the bonus of strengthening a low-carbon economic sector.

Taking the twin assumptions of low spending on PSS and an urgent need to expand it, in this article we seek, first, to estimate the deficit in public social services in education and health in Brazil, and then, to estimate the socioeconomic and environmental impacts of a shock in public spending on these services. Our data for this exercise is the input-output matrix for the year 2019. To gauge the deficit in spending on public social services, we select some parameters as references for structuring quality public services. These are proposed as the first, approximate, indication of the magnitude of pent-up demand for well-being in Brazil. As for the socioeconomic and environmental effects, these are estimated from the likely impacts of a shock rise in public spending to the amount of 1 billion Brazilian Reais, on health and education. The effects of this shock are then compared with the effects of a similar shock on the private education and health segments. Effects include variation in added value, direct, indirect, induced, and formal employment, wage mass, taxes, and greenhouse gas emissions. The central question under investigation, as mentioned, is the economic, social, and environmental returns of this effort.

Our results confirm expectations regarding the huge deficit in the provision of public social services in the country, the reflection of an accumulation of historically neglected social needs. It is, however, argued that an assessment of these deficits should not stop with the analysis of the fiscal costs associated with their reduction. This is because, in addition to important direct positive effects on social well-being, it is necessary to take stock, as we only start to do here, of the substantial economic, social, and environmental benefits arising from an expansion of the provision of these services.

The paper is organized as follows. In section Motivation and related literature, we discuss the central motivation for this research and the related literature. In section Methodology and results, we present the methodology and results. In the final section, we offer comments and suggested directions for a future research agenda.

Motivation and related literature

In this study, the interest in public social services is not justified exclusively by the fact these services are, *prima facie*, an essential means of providing a universal, nonselective guarantee of well-being, i.e., quality services provided to all irrespective of ability to pay. The rationale for interest in PSS is also rooted in a new understanding of the potential for social policy and the welfare state to respond to contemporary problems—notably, rising social inequalities, the environmental crisis, and the threat of job losses with the advance of automation. And if these problems are already of

paramount importance for advanced economies, they are even more challenging for less developed countries in the Global South, historically the site of precarious jobs and deep inequalities, to which the impacts of the climate emergency are now added.

The notion that public social services can configure a new generation of “socioeconomies” (amalgamations of social and economic structures), resilient to “concentric crises,” if their magnitude and quality are substantial, has given rise to proposals, such as that for an “allocative welfare state” (Kerstenetzky 2021, 2016, 2012). In the interpretation suggested by this perspective, the welfare state has been changing since its origins in the nineteenth century, performing fewer passive functions as social problems have changed. In contrast to the typical postwar social policy aimed at replacing income lost due to illness, accidents, aging, and eventual unemployment, the post-globalization welfare state has taken over functions of social investment (Hemerijck and Ronchi 2021), openly supporting the operation of markets. This can be seen in the growing presence and diversification of publicly provided services which are associated with general productivity gains. However, from the normative perspective of an “allocative welfare state,” crises will increasingly demand an even more proactive role in social policy, one which will trigger deep social change. Social policy, PSS in particular, will then not only represent the tool at hand to solve problems created by the expansion of markets, such as increased inequalities, long-term unemployment, and pollution; it will also serve to reshape the socioeconomy and thus minimize the possibility of problems emerging in the first place. This re-reading of the potential role of PSS results from a careful observation of its multiple effects, which allows prefiguring its ability to constitute an effective and restructuring response to contemporary problems. To reach this end, it will be necessary to double the bet on that type of investment, expanding the share of PSS in the productive structure as well as in people’s consumption basket (which is comprised of market goods and services and publicly provided goods and services). If undertaken, the expansion of the provision of these services will also create quality jobs—an effect that should be all the greater, the less developed the current provision of these services is with regard to people’s social needs—thus contributing to a circumvention of the risks of elimination or precarization of jobs resulting from the automation of productive processes. In addition, inequalities will be reduced, as PSS increases the total household income available for consumption, especially the income of the poorest households, and emissions will be mitigated, given the low average intensity of emissions (tCO₂e) produced by PSS compared to those produced by other sectors of the economy. In short, re-signifying the role of PSS will mean shifting their status from that of mere protection of well-

being against the risks inherent in market economies (already no small feat) to a new, more proactive, and restructuring one. It will imply, in other words, reducing the scope of allocation of social resources via the market in favor of a more public-oriented allocation.

In international debate, a recent perspective proposes “universal basic services” (UBS) as a normative platform for confronting poverty and inequalities—and as an alternative to universal basic income (UBI, Universal Basic Income), considering the former to be more effective, viable, and sustainable in achieving the same goals. The bet is that the expansion of public services to meet the well-being demands of populations, such as education, health care, social care, social housing, and public transport, will reduce inequality and poverty, and promote greater social solidarity and efficiency (especially through the social and environmental value attributed to these services and their expected long-term economic effects), in addition to contributing to planetary sustainability (Gough 2019; Coote 2021; Coote 2021). The prospect of sustainability is an important focus of this proposal. The conjecture is that the collective consumption of services is more consistent with planetary limits than the private consumption of goods and services, and that the former should expand to limit the relative expansion of the latter. In contrast to UBI and an exclusive focus on income (and therefore, on private consumption), UBS would be a more sustainable alternative.¹ Universal basic services occupy a prominent place within the broader normative platform of a “Social Guarantee.” The aim is to create suitable conditions for a “fair global consumption” and facilitate the achievement of the Paris Agreement target of limiting global average temperature rise to 1.5 °C relative to pre-industrial levels (Coote 2022, Gough et al. 2021).²

These normative references—an allocative welfare state and a UBS-Social Guarantee—are premised on the broad potential of social services. This goes well beyond the guarantee of well-being that has been the traditional focus of academic and policy attention.³ Complementing this literature, a recent body of empirical literature has been dedicated to testing some of the theoretically likely effects, even when these start from different (albeit congruent) assumptions. We highlight here some of the observed effects on

¹Within debates on the scope of UBS, there is extensive discussion of sustainable consumption, involving a distinction between needs that should be publicly protected via, for example, the provision of services, which are needs regulated by principles of satiability and sufficiency, and preferences and desires, whose fulfillment would need to be constrained by principles of sustainability and equity. See Coote (2022).

²A similar perspective, also an alternative to the UBI, but based on the more restricted objective of a public guarantee of employment (in public works and community services) is developed in Wray et al. (2018).

³Impacts on well-being associated with public education and health services in OECD countries and Brazil are well documented in the literature. Kerstenetzky (2022) systematizes some of these findings in terms, for example, of life expectancy, infant and maternal mortality, and equitable access to early childhood and higher education.

poverty, inequality, product and income multipliers, employment, and sustainability.

Recent studies have drawn attention to the direct redistributive impact of public spending on social services, an impact traditionally associated with government cash transfers and taxation. They have found that income distribution changes when the monetary value of publicly provided services is added to household incomes, especially (though not exclusively) the value of spending on health and education, the largest public expenditures. In fact, substantial reductions in poverty and inequality have been found to be associated with spending on a range of public social services (education, health, childcare, elderly care, and social housing) by an OECD study (Verbist, Förster, and Vaalavuo 2012) of wealthy countries—between a fifth (measured in Gini) and a third (measured in Theil) reduction in income inequality, and a reduction of up to 80% in the risk of poverty. Similar results were found in studies of fiscal incidence—which measure the effects of monetary transfers, public education and health, and direct and indirect taxation, on poverty and income inequality—for Latin American countries (Lustig 2015) and for Brazil (Lustig 2015; Silveira 2012; Silveira et al. 2013; Silveira and Passos 2017; Silveira et al. 2021). According to these studies, public spending on health and education has a greater redistributive impact than net cash transfers from the government to households.

The economic returns on public investment in social services have also attracted some scholarly attention, and the results of this have helped to break the dogma of an inevitable tradeoff between efficiency and equity. Research has found substantial economic returns on cash benefits (Sanchez and Carvalho 2022 find for the period 1997–2018 a product multiplier worth 3, in two years) and social spending as a whole, in Brazil (Castro, Mostafa, and Herculano 2011 find for 2006 a product multiplier equal to 1.85 and income multiplier equal to 1.37, greater than that generated by commodity exports and civil construction). Product, income, and employment multipliers directly associated with expenditure on education and health services, surpassing in impact a set of alternative private and public investments, have been reported in recent studies (Castro, Mostafa, and Herculano 2011, Marques et al. 2022), in addition to simultaneous effects of inequality reduction and economic growth, a conjunction of outcomes unique to social spending (Castro, Mostafa, and Herculano 2011).⁴

⁴For example, Castro et al. find a product multiplier equal to 1.85 associated with additional spending equivalent to 1% of GDP on education, and a contribution to reducing inequality equivalent to 1.1% of the Gini. When analyzing additional spending on health, the product multiplier is 1.7 and the Gini reduction is even greater: 1.5%. Marques et al. note that additional spending on social infrastructure can generate 10% more jobs in education or 25% more in health than an equivalent increase in spending on physical infrastructure, three times more jobs for women and two times more jobs for black women. The difference in magnitude between the multipliers found by Sanchez and Carvalho (2022) and Castro, Mostafa, and Herculano (2011) is due to the use of different methodologies. Sanchez' work uses time-series econometrics and

Research covering 74 low- and middle-income countries revealed a ratio on the order of 1–9 between spending on primary public health and GDP growth and preventing avoidable deaths (Stenberg et al. 2014, apud Coote 2022). Additionally, regarding the efficiency of public spending, Coote (2022) remarks that per capita spending on health care is two times higher in the USA (mainly private provision) than in the United Kingdom (mainly public provision), but that life expectation at birth is almost three years less (78.8 vs. 81.4 years).

When the focus is on the labor market, whose analysis is still tainted by the notion that contemporary jobs, almost exclusively created in the tertiary sector, are inevitably polarized—at one pole, there are well-paid jobs in business services and high technology, on the other, low-paid, and unstable personal or distributive service jobs—looking at PSS jobs reveals a series of opportunities to be seized. When looking at indicators of employment-related well-being (employment conditions plus wage income) and equity, studies point to the advantages of social services in general, in terms of the proportion of formal jobs, the low incidence of long hours, union density, wage floors, and the low incidence of wages below the minimum wage and wage inequalities (Kerstenetzky and Machado 2018); and, in the case of *public* social services, jobs for women and non-whites in comparison, for example, with the construction sector labor market (Marques et al. 2022).

Finally, regarding the impacts of PSS on the environment, a topic the academic interest of which is still mainly incipient, there are, nevertheless, some findings to report. For example, Alvarenga Junior, Costa, and Young (2021) note that PSS is in line with the imperative of low-carbon growth, given their low intensity of greenhouse gas emissions. Studies comparing private and public health sector emissions in rich countries offer similar results (Coote 2022).⁵

Our study adds to this emerging literature by investigating the social, economic, and environmental returns on public social services, with a focus on education and health, which are the highest areas of expenditure in social services in Brazil. Exploring the issue raised in Kerstenetzky (2021) and Kerstenetzky and Machado (2018) regarding the absolute and relative underdevelopment of Brazilian public social services, we seek initially to estimate the existing gap in these services, as we explain in the next section. Subsequently, drawing on input-output tables estimated for the year 2019, we measure the social, economic, and environmental impacts resulting

computes the cumulative impact of social benefits over time, while Castro et al. calculate the impact at a single point in time.

⁵The results mentioned here, and others, are systematized in Kerstenetzky (2022), where, in addition, several theoretical arguments and debates are discussed in which public social services are included as partial solutions to contemporary problems.

from an increase of BRL 1 billion in public health and education spending. The information thus obtained should be useful for informing the exercise of social choice regarding the level and sequencing of expenditures desired by Brazilian society.

From the point of view of empirical strategy, our study is directly related to a study by Castro, Mostafa, and Herculano (2011) that computes income and product multipliers, and one by Marques et al. (2022) that documents effects on employment. The first of these investigates economic returns on social policies, and its results identify the equity and economic growth effects associated with various social policies, including public education and health. The second ostensibly seeks to compare social reproduction activities (services) and productive activities (the construction sector) or social infrastructure with physical infrastructure, but concludes, like the other study, by highlighting the economic returns on social policies. In addition to these works, our study, which seeks to investigate the potential of PSS to induce social change (cf. Kerstenetzky 2021), starts from estimates of the deficit that Brazilian spending represents when compared with spending on some quality parameters, including by other countries. Furthermore, when seeking to estimate the impacts on a wide range of economic and social variables associated with a generic shock of BRL 1 billion, our exercise expands the focus to include environmental sustainability indicators, providing unprecedented results for Brazil and even at an international level. Additionally, with “allocative welfare” in mind, that is, the ambition for a greater participation of the public sector of social services in the allocation of social resources, we investigate the comparative performances, in terms of the aforementioned variables, of the public and market sectors of social services and of the public social services sector compared to the average for the economy.

Methodology and results

Estimating education and health expenditure deficits

There is no objective and uncontroversial way to accurately measure the deficit in public spending on education and health in any country. Estimates of such deficits will always be approximate and dependent, among other things, on data availability. For the Brazilian case in this study, the approach adopted to estimate unmet or underserved social needs in education and health in the country was 2-fold.

Firstly, we looked for an internal parameter with which to compare public spending on education and health. A likely candidate was the per capita private expenditure on these services in Brazil. The underlying idea in choosing this parameter was that, while a significant portion of the

population uses free-at-the-point-of-delivery public services (the 72% poorest), a smaller—and wealthier—fraction (the 28% richest) mainly uses the supposedly more accessible and/or better-quality private services (cf. Malta et al. 2017). However, in terms of social justice, there is no justification for differentiating between and segregating, these services, either in accessibility or quality. In fact, access to education and health services is a constitution-guaranteed right in Brazil. Therefore, the distance between the two per capita expenditures might contribute to providing an approximation of the spending deficit we were seeking to estimate. Regarding the hypothesis that 28% of the population uses only private services, this is an estimate extended to education from what currently happens in health in Brazil. In reality, studies indicate that, in the case of education, considering enrollments at the three levels, the private sector serves an even smaller fraction of the student population (26.6% of total enrollments: 17% in basic education, 77% in higher education) (cf. MEC/INEP 2021a, 2021b). In the absence of more precise numbers that would allow us to calculate the percentages of the Brazilian population using the private or the public network, we opted for a conservative estimate.⁶

However, our internal approach proved unproductive. This was because, although data was available to calculate the per capita private expenditure on health in Brazil, the same was not true when it came to education. Thus, the solution we found to standardize treatment in both sectors was indirect. Using information regarding employment in public and private services obtained from the System of National Accounts (SNA) and adopting the “28 vs. 72%” population split, we were able to calculate the potential employee-user ratios for health and education from public and private providers. And, with the employee-to-user ratios, which are substantially higher in the private segment, we were able to calculate the “missing jobs” in the public sector. That is, we assumed that the employee-to-user ratio was a good indicator of the availability and quality of such services, and the difference of magnitude between public and private reflected how much better and more accessible private services were when compared to the public ones.⁷ Finally, using the Input-Output Tables (IOTs), we calculated the additional expenditure required to generate the number of missing employees in the public health and education sectors to meet the employee-user ratio of the private segment. Equations (1) and (2) show the calculation formulas for private-to-public gaps in health and education,

⁶It is reasonable to assume that poorer families have more children and teenagers than richer families. And, although it is also reasonable to assume that the university student population is not concentrated in the poorest strata, the student population in basic education is over five times more numerous than the university population.

⁷For example, while on average one employee is available to attend to seventeen users in the private health segment, this number rises to 1–66 in the public segment.

Table 1. Deficit of public sector employees in education and health services—Brazil, 2019.

	Public employees (millions) (A)	Public employee/user ratio in the private sector* (B)	Required number of public employees (millions) (C = B × 151.9 millions)	Shortage of employees in the public sector (millions) (D = C – A)
Education	4.34	0.049	7.45	3.19
Health	2.24	0.06	9.11	6.87
Total	6.58		16.56	10.06

Source: Own elaboration. National Accounts, 2019, IBGE.

*In 2019, the number of employees in private education was 2.93 million and in private health, 3.54 million. These workers, we hypothesized, served 59.1 million Brazilians. The total population amounted to 211 million.

respectively.

$$FD_{h,pu} = [(E/U)_{h,pr} - (E/U)_{h,pu}] * U_{h,pu} * G_{h,pu} \quad (1)$$

$FD_{h,pu}$ = value of the final demand shock for the public health sector;

$(E/U)_{h,pr}$ = employee-to-user ratio in the private health system;

$(E/U)_{h,pu}$ = employee-to-user ratio in the public health system;

$U_{h,pu}$ = number of users of the public health system;

$G_{f,pu}$ = spending on hiring new employees in the public health sector;⁸

$$FD_{e,pu} = [(E/U)_{e,pr} - (E/U)_{e,pu}] * U_{e,pu} * G_{e,pu} \quad (2)$$

DF_e = value of the final demand shock for the public education sector;

$(E/U)_{e,pr}$ = employee-to-user ratio in the private education system;

$(E/U)_{e,pu}$ = employee-to-user ratio in the public education system;

$U_{e,pu}$ = number of users of the public education system;

$G_{e,pu}$ = spending on hiring new employees in the public education sector⁹

Using the calculations outlined above, we found that it would be necessary to hire an additional 10 million employees in the public health and education systems to meet the employee-to-user ratios observed in the private segments. Again, the missing jobs were calculated by multiplying the employee-to-user ratio found in the private sector by the number of users (72% of the Brazilian population, ~152 million people) in the public sector and subtracting from this number the effective number of employees in public education and health activities (Table 1, below).

It is important to note that the values reported for public and private health and education in the SNA data only incorporated figures for service provision, not for gross capital formation (such as the construction of schools and hospitals, and the purchase of machinery and equipment, for

⁸To be precise, $G_{h,pu}$ corresponds to the value that needs to be spent in the public health sector to ensure a level of employment exactly equal to that needed to close the gap in the employee-to-user ratio between the public and private health sectors.

⁹Analogous to $G_{h,pu}$.

example). From the SNA standpoint, the demand for capital goods by the health and education sectors is expressed in terms of the production of other economic activities, and it is difficult to separate out the share of the production of these activities that serves the demand for capital goods from the health and education sectors. This estimation should be addressed in future work.

Since the gross fixed capital formation (GFCF) of these sectors is not considered, the quality gap between public and private tends to be underestimated, at least in the health sector. Holguin et al. (2022) reveal that total private investment in the health sector between 2010 and 2018 was 150% higher than public investment in the same period. Thus, the discrepancy in quality between the public and private segments of health may be expressed in terms of physical infrastructure (more and better equipped hospitals, for instance), in addition to the employee-to-user ratio mentioned above. Although the data for education is unknown, it is reasonable to assume higher investment rates in the private segment, especially after the deterioration of the country's fiscal situation in the mid-2010s, and the implementation of a new fiscal regime with an "expenditure ceiling."

Despite the limitations mentioned above, there are two advantages of using this data. The first concerns their compatibility with OECD data, whose figures also exclude gross fixed capital formation, allowing us to make assessments against international benchmarks. In addition, the use of these data has made it possible to counter the objection that private spending tends to be inflated by luxury services and high profits, including financial ones. By focusing on the employee-to-user ratio, we avoid "importing" such figures into the analysis. Indeed, the estimate of the gap only includes the number of "missing employees" in the public segment when it is compared to the private one.

Our second approach consisted of comparing per capita public spending on education and health in Brazil with that of OECD countries. When choosing such benchmarks, account should be taken of the fact that the OECD presents a very wide range of per capita income among its country members. For that reason, this investigation worked with three different benchmarks: one corresponding to the average, and the other two corresponding to the first and second quartiles, of OECD per capita public spending on health and education.¹⁰

When we analyzed Brazil's position relative to the average for OECD countries, some well-known stylized facts were confirmed; but there were also surprises. For example, regarding education, it is often claimed that Brazil's public spending as a percentage of GDP is compatible with, or

¹⁰The countries that compose the different quartiles are presented in Table 8 in the annex.

even slightly higher than the average spending of the OECD—hence that Brazil does not perform badly in this regard. However, when we turned our analysis to public expenditure per student on the three levels of education, a completely different picture emerged: Brazilian expenditure was 3.5 times lower than the average amount spent per student in OECD countries.

Some might argue that this disparity is explained by the difference between Brazilian and OECD per capita income. Since per capita income in Brazil is much lower than the average for the OECD, the country will have fewer resources to spend on education, and thus, expenditure per student can be expected to be lower. However, the country still appears to be underspending, even if these per capita differences are considered. Brazilian per capita GDP is one-third of the OECD average but the country's spending per student is 3.5 times lower (the situation is especially serious in basic education)—therefore, OECD countries on average spend a higher fraction of their per capita GDP on education than Brazil (26 vs. 23%).

It is worth noting that some OECD countries that fall below the OECD average expenditure on education seem to be trying to catch-up by undertaking higher spending on public education relative to their per capita GDP. Portugal stands out as an example, where public spending on education is equivalent to 28% of the country's per capita GDP (OECD 2022). As such a strategy has not been followed by Brazil, the disparity in the quality and availability of public education between this country and OECD countries is likely to keep rising.

When it comes to public spending on health, the situation is even more alarming. Public expenditure on health represents <40% of total health spending in the country, even though the public health system reaches out to a much higher proportion of the Brazilian population. Putting this into

Table 2. Public expenditure on education and health—Brazil and OECD.

	Education		Health	
	Brazil	OCDE	Brazil	OECD
%GDP	6%	5.1%	3.8%	6.2%
Expenditure per student or per capita	3361.45	11,585.34	610.22	3460.7
Expenditure per capita/GDP per capita	23%	26%	4.17%	7.76%

Source: Own elaboration of data from the World Bank (2023); MEC/INEP; *Education at a Glance* (2022); and *Health at a Glance* 2021. The values from the World Bank database are reported in USD PPP and international prices are constant to the base year of 2017.

Table 3. GDP per capita—Brazil and OECD.

	OECD	BRAZIL
GDP per capita	44,559	14,615
Ratio	3	1

Source: Own elaboration of figures from the World Bank database, 2021. The values are reported in USD PPP, and international prices are constant to the base year 2017.

Table 4. GDP per capita ratio, and health and education per capita expenditure ratios—OECD/Brazil.

GDP per capita ratio	3 times
Health expenditure per capita ratio	5.7 times
Expenditure per student ratio	3.45 times
Difference between expenditure per student and GDP per capita ratios	3pp (26–23%)
Difference between health expenditure per capita and GDP per capita ratios	3.6pp (7.76–4.17%)

Source: Own elaboration of data from above-mentioned sources.

Table 5. Brazilian public expenditure on health and education, and health and education expenditure gaps.

	Brazilian expenditure in 2019	Private-public gap	Gap based on average expenditure of OECD countries	Gap based on 2nd quartile of OECD countries	Gap based on 1st quartile of OECD countries
Education	378.4	279	573.2	456.6	300.9
Health	216.6	666.0	736.4	676.9	267.8

Source: System of National Accounts, IBGE (2019), and OECD (2021) (*Education at a Glance* and *Health at a Glance*).

The calculation of spending deficits in reais was made using data from 2019 to be compatible with the investigation into macroeconomic impacts presented in the next section since this exercise used data from the 2019 IOT, the most recent available.

perspective, Brazil’s expenditure on public health as a share of its GDP is little over half of the OECD’s average (3.8 vs. 6.2%). It is possible to conclude that, if the situation in education reveals, at best, a lack of strategy (i.e., no decision to seek future convergence with OECD countries), the situation in health care reveals a complete lack of priority (i.e., no decision to allocate to the sector a fraction of the national wealth that is at least comparable to that of the OECD). The tables below summarize these data (Tables 2–4).

Table 5 below shows the estimated deficits in Brazilian reais according to different scenarios. When it comes to health service provision, it is worth noting that the distances between public spending and private spending in Brazil and the distances from the second quartile of OECD countries are roughly the same. In both cases, Brazil would need to triple public spending on health to close the gap relative to the private sector or to match the level of per capita public spending on health by Slovenia. As for education, Brazil would need to double spending on public education to match the expenditure level of the private sector. Such an increase would bring the per capita public spending on education in Brazil up to the level of the first quartile of the OECD, giving it a value close to Greece’s. In other words, the well-being (here measured in access to healthcare and education services) of the richest quarter of the population in Brazil, those who use private healthcare and education services, is equivalent on average to the level of well-being provided

publicly to the inhabitants of countries with values equivalent to the median and first quartile of OECD spending.¹¹

These four comparisons (private-public, and with the average, second, and first quartiles of the OECD) measure as accurately as possible the underspend on public social services in Brazil. The size of the spending deficits, which results from decades of underspending, will make it extremely hard to overcome them in the short term. Therefore, a consistent, timely, and sustained catching-up strategy for the health and education public systems is required. To provide further support for such a strategy, in the next sections, we turn our attention to the expected economic and socio-environmental benefits of increasing spending on such services. To estimate such benefits, we arbitrarily chose a value of BRL 1 billion for the extra spending on public education and health. For the sake of comparison, we also simulated the effect of a similar expansion in private spending on such services. This exercise provided relevant information for policy makers to calibrate the pace of the above-mentioned catching-up strategy.

Estimating the macroeconomic impacts of health and education shocks

Methodology and data sources

The macroeconomic impacts and level of emissions were estimated using environmentally extended input-output (EEIO) modeling. This method of analysis consists of matching environmentally related vectors (greenhouse gas emissions, local pollutants, and energy consumption, among others) with input-output tables. The logic of EEIO analysis is similar to that of the traditional input-output (IO) one, where we calculate the value of gross output needed for each economic activity to meet an exogenous or partially exogenous shock in final demand.¹² The only difference between EEIO and IO analysis is that in the former we assume that environmental phenomena (pollution, energy consumption, natural resource extraction, etc.) are directly related to output levels (Leontief 1970).

Here, we extended the functionality of the traditional model to include the impacts of the production of goods and services needed to meet the final demand shock on greenhouse gas emissions. Algebraically, the emissions from a certain level of output can be estimated as the product of the diagonal matrix of emission intensity (GHG emissions/per unit of

¹¹This is a comparison between averages, but the distribution of service quality in the private sector, in the Brazilian case, tends to be more unequal than such distribution in the public network of countries at the median and in the first quartile of per capita public spending on education and health in the OECD.

¹²The final demand vector is composed of six components: (i) household consumption, (ii) government consumption, (iii) non-profit institutions serving household consumption, (iv) gross fixed capital formation, (v) changes in inventories, and (vi) exports.

Table 6. Values of \hat{x} and the respective outputs of the model (X).

Assuming \hat{x} equals	Output (X) equals
GHG emissions/gross output	Total emissions
Value added/gross output	Total value added
Jobs/gross output	Total jobs created
Formal jobs/gross output	Total formal jobs
Wage mass/gross output	Total wage mass
Gross operating surplus/gross output	Total gross operating surplus
Net taxes on production/gross output	Total net taxes on production
Social contribution/gross output	Total social contribution

gross output), \hat{e} , by the Leontief inverse matrix (L) times the final demand vector (DF), as in Equation (3):

$$E = \hat{e} * L * DF \tag{3}$$

The official Brazilian input-output Tables (IOTs) are published by the IBGE with a time lapse of 5 years and the latest version was issued in 2015. One of the problems of working with outdated IOTs is that the technical coefficient of the matrix changes over time. These changes may not be substantial from one year to the next but may be sizeable over a period of eight years. That is to say, the latest IOTs from the IBGE may not be a good representation of today’s interindustry relationships. To mitigate this problem, we chose to work with the most recent information available, the IOTs for 2019 (at constant prices based on the year 2010) estimated by Passoni and Freitas (2022) into which we integrated the vectors of greenhouse gas (GHG) emissions developed by Alvarenga Junior, Costa, and Young (2021). Monetary values were subsequently expressed in 2019 reais, for which we used the GDP implicit deflator.

The GHG emission vectors were constructed by drawing on the Greenhouse Gas Emissions and Removals Estimation System (SEEG, in the Portuguese acronym) data of the Climate Observatory. This database provides GHG emissions in five major categories (energy, industrial processes, agriculture, waste, land use, and forestry) which were allocated to the 127 products and 67 economic activities of the IOTs.

This study estimated the impacts of a shock of 1 billion reais in the final demands for public health and education services on value-added, employment, formal (registered) employment, wage mass, gross operating surplus, taxes, and social contributions. The estimation of these impacts was done in a similar way to the calculation of emissions presented in Equation (1). However, the variable \hat{e} was replaced by a variable of interest \hat{x} (Equation 4), which could take any of the values expressed in Table 6. The output value of the model (X) changed according to the value assumed by \hat{x} .

$$X = \hat{x} * L * DF \tag{4}$$

Table 7. Impacts on selected variables of a final demand expansion of BRL 1 billion in health and education spending—Brazil, 2019.

Results	Public health	Public education	Private health	Private education
Final demand shock (BRL million)	R\$ 1000	R\$ 1000	R\$ 1000	R\$ 1000
Value added (BRL million)	R\$ 1272	R\$ 1410	R\$ 1102	R\$ 1289
Wages (BRL million)	R\$ 719	R\$ 849	R\$ 454	R\$ 711
Average salary	R\$ 2750	R\$ 3274	R\$ 1850	R\$ 2037
Gross operating surplus (BRL million)	R\$ 369	R\$ 348	R\$ 542	R\$ 393
Social contribution (BRL million)	R\$ 135	R\$ 180	R\$ 86	R\$ 154
Total taxes (BRL million)	R\$ 146	R\$ 190	R\$ 105	R\$ 183
Total jobs created	21,802	21,605	20,453	29,093
Formal jobs created	15,153	15,608	9768	13,723
Jobs directly created	10,311	11,431	10,939	19,677
Jobs indirectly created	4657	2109	5201	2660
Jobs induced	6834	8064	4314	6755
GHG emissions	191,837	176,253	123,382	166,119

Simulating the impacts of increasing spending on public health and education

As mentioned earlier, the results presented in this section are intended to support decision-making on the allocation of public resources by showing the impacts, in terms of income, employment, taxes, and GHG emissions generated, of a BRL 1 billion expansion in the final demand for public health and education services (second and third columns of Table 7). It is important to highlight that the linearity of the model allows for a simple projection of the macroeconomic and emissions impacts of spending increases beyond this level. To do so, it is only necessary to multiply the results shown in Table 7 by the factor that represents how much higher the desired spending is relative to the proposed spending parameter in this article. That is, if the political consensus points to a 10 billion reais increase in spending on public health and education next year, the impacts of this decision can be known simply by multiplying the values in columns 2 and 3 by 10, except for the average wage value.¹³

The results shown in Table 7 reveal that, for each billion reais spent on public health, BRL 1.27 billion in value added (VA) is generated, along with a total of 21.8 thousand jobs, of which 15.2 thousand are formal jobs, at an average monthly wage of BRL 2750. In turn, for each billion reais spent on public education, BRL 1.4 billion in VA is generated, along with 21.6 thousand jobs, of which 15.6 thousand are formal. The average wage in this case tends to be higher: BRL 3254 per month.

Since these services could be provided by both the public and private sectors, we estimated the same variables (outputs) for the case where an increase in expenditure of BRL1 billion was carried out in private health and education. This exercise is useful for comparing the economic, social,

¹³Larger shocks will cause the wage and employment level to vary in the same proportion, keeping the average wage constant. In other words, when we multiply the shock from Table 7 by 10, the resulting wage and employment level will be multiplied by the same factor (10), keeping the average wage unchanged.

and environmental benefits of spending on publicly provided social services against those of private provision.

It is immediately noticeable that the VA from expanding private provision would be lower when compared to the same expansion of public provision. In fact, an increase of BRL 1 billion in private health expenditure would result in BRL 1.1 billion in VA, which is about 13.3% lower than the amount that would be generated by an equal shock in public health. Meanwhile, the VA generated from a shock in private education would be 8.6% lower than a shock of the same amount in public education.

It is also worth noting that job creation resulting from the increase in public health spending would be higher, with a higher degree of formalization and higher average wages. The difference in formal job creation in each case is significant. For each billion spent on public health, 5385 more formal jobs would be created at an average wage 48.6% higher than for each billion spent on private health.

The scenario of total job creation is reversed for education. In this case, the total of jobs created by the private shock is 34% higher. Nevertheless, the shock in public education delivers a higher number of *formal* jobs (15,608 in the public sector compared to 13,723 in the private sector), a higher degree of formalization,¹⁴ and 37.8% higher average wages.

Total social contributions and taxes collected would also be higher in the case of increased spending on public social services. This is largely because spending on public health and education results in higher average wages and greater participation of wages in generated income when compared to equal increases in spending on private health and education. Additionally, greater formalization of jobs in the public sector ensures a greater collection of social contributions. Such a benefit deserves to be highlighted, as social contributions are the main source of financing for the Brazilian social security system, which is, in turn, one of the pillars of the redistributive function of the State.

Finally, absolute values for greenhouse gas emissions are likely to be higher in the public shock. However, the numbers need to be carefully analyzed, as the reasons for these higher emissions are justifiable from a social and economic point of view. First, the higher emissions resulting from increased spending on public health and education are due to the higher wage mass generated compared to shocks in private social services. As the model presented in this article endogenizes consumption, the higher the wages, the higher the consumption of goods and services induced by this income and the production necessary to meet it. With higher production

¹⁴Out of the total jobs (direct, indirect, and induced) that would be generated from spending one billion on private education, about 42.2% would be formal jobs (with a signed work contract), while for public education this number would be 72.2%.

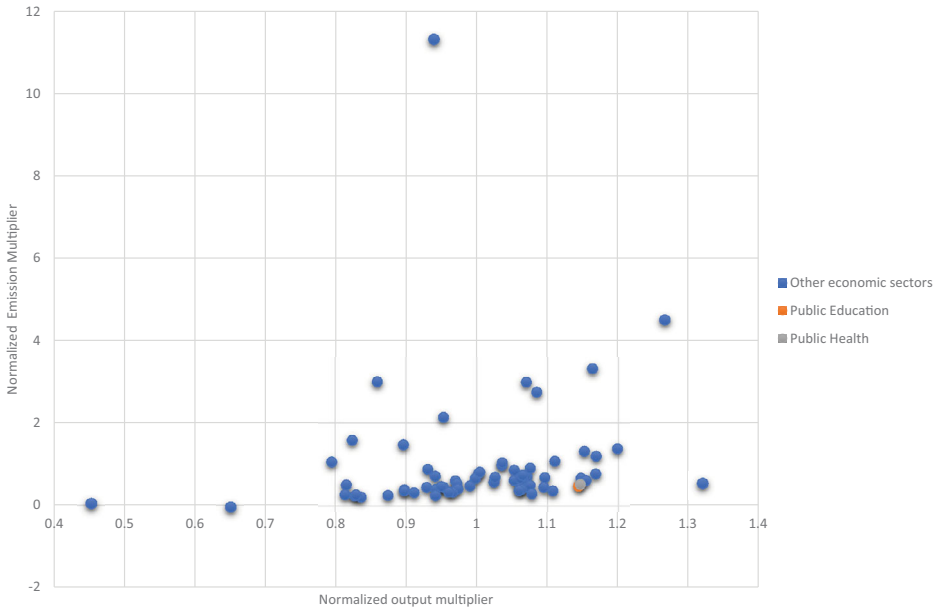


Figure 1. Multipliers of economic activity and emissions, per economic sector—Brazil, 2019.

levels come higher GHG emissions, at least in the short term. However, examination of the emissions per wage ratio, tells us that the expenditure shock in public health produces 266.7 tCO₂e per million of wages, compared to 271 tCO₂e in the private health shock. As for the education services, the public shock generates 207.6 tCO₂e per million wage while the private shock results in 233.6 tCO₂e per million. In short, public social services, especially education, create fewer emissions per unit of wage.

Another factor behind the higher emissions of public services is their greater backward linkage. Public health and education backward linkages amount to 2.98 and 2.99, respectively, while for the private sector, these values are 2.85 and 2.81. Higher backward linkage translates into a greater power of public services to pull production from other sectors of the economy, resulting in higher production from a unitary shock in their final demands. However, as all economic sectors shown in the Brazilian IOTs have non-negative emissions, higher production tends to result in higher absolute emission levels.

Besides comparing the benefits of public and private provision of social services, in line with the allocative welfare approach discussed in Section 2, it is also important to put them into perspective with other sectors of the economy. [Figure 1](#) presents the capacity of each sector to pull production from the other sectors (x-axis), which we call the “economic activity multiplier” for its capacity to pull emissions from other sectors (y-axis), referred to as the “emissions multiplier.” Since the values have been standardized,

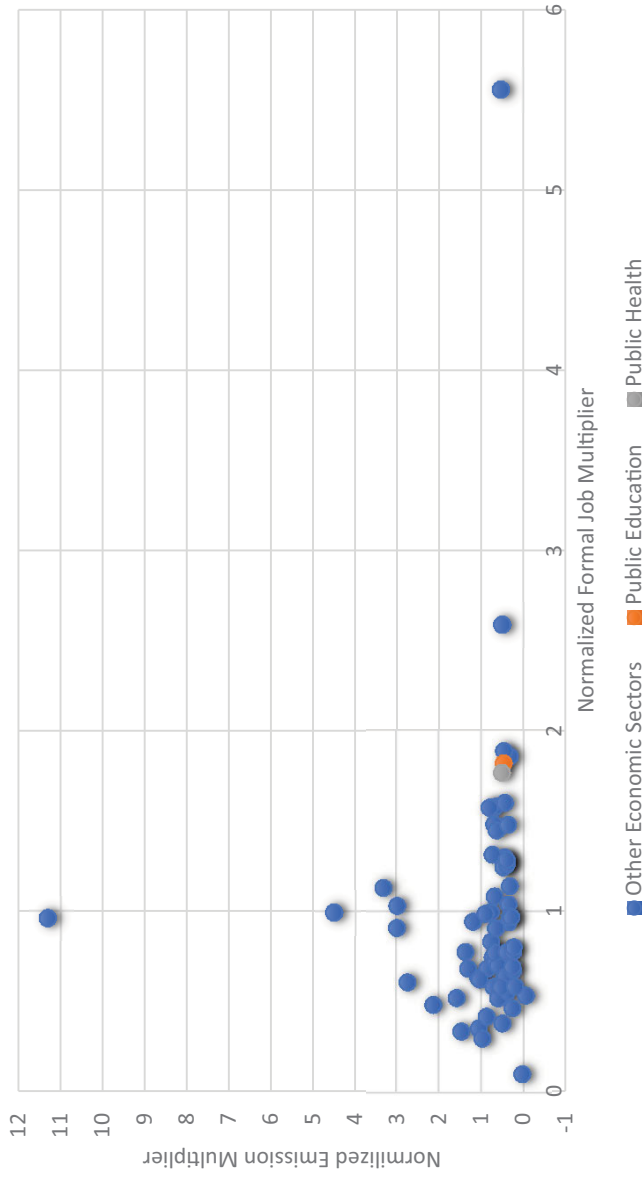


Figure 2. Multipliers of formal employment and emissions, per economic sector.

the multipliers have mean values equal to 1.¹⁵ Sectors with economic activity multipliers above 1 have the capacity to stimulate economic activity greater than the average for the economy, while sectors with emissions multipliers below the unity have production processes with carbon footprints smaller than the average. In the transition to a low-carbon economy, which requires that all sectors decarbonize, these sectors stand out as potential frontliners.

Regarding the public services analyzed here, it is noted that despite presenting higher absolute emissions than private social services, their economic activity¹⁶ multipliers exceed the Brazilian economy's average, while their emissions multipliers are below the national average (Figure 1). In fact, the social services sectors (both public and private provision) are among those with the lowest emissions multipliers. However, public social services have a greater capacity to multiply economic activity than the private ones.

Figure 2 is analogous to the previous one but presents the relationship between the capacity of each sector to create formal jobs and its capacity to emit pollutants throughout its production process. Again, one should notice that public health and education services perform better than the average, presenting a capacity to generate more formal jobs and lower emissions than the national average. In addition, it is worth noting that public health and education services have considerably higher formal job multipliers than the private ones.

Conclusion

In this article, sensing the enormous potential of public social services to promote sustainable well-being, we sought to evaluate, on the one hand, the magnitude of unmet social needs in Brazil in terms of additional public spending on education and health, and on the other, the benefits associated with meeting these needs.

Our estimation of the size of unmet social needs revealed enormous gaps between the status quo of Brazilian service provision and the set of references analyzed here—references that included the private service sector in addition to the public service sector of other countries, including the modest scenario of the first quartile of OECD countries. There are significant gaps between what is spent on public health and education in Brazil and what should be spent (i) to match the staff-to-user ratio of public provision with private provision of these services, or (ii) to bring the country closer

¹⁵As the values of the multipliers are standardized, they are not directly comparable to those found by Castro, Mostafa, and Herculano (2011).

¹⁶Here we use gross output value as a metric.

to the per capita spending on health and education of OECD countries—notably those representing the average, first, and second quartiles of these. Unsurprisingly, the gaps found in spending are astronomical, reflecting the country's historical underspend in these areas—i.e., the absence of priority for these services, whether in the public budgets or in the various development projects of the past. This absence is manifested in the glaring lack of infrastructure, equipment, inputs, professional staff, and development of effective management, in short, in the notorious gridlock of the public health and education systems in the country, the use of which has generally not been considered an option by the Brazilian middle class.

While the challenges of closing these gaps are considerable from any aspect, thinking about the issue exclusively from a cost perspective leaves no room for debates that go beyond the discussion of 'fiscal spac'. For one, although it is evident that this is a central discussion, an exclusive focus on costs obscures the broader perception of the economic, social, and environmental benefits of these expenditures. Also, an exclusive focus on costs contributes to blocking the urgent task of politically defining the flow of medium- and long-term spending and financial planning to carry it out. The latter should include, in addition to the expected additional revenue, a tax reform that increases the revenue base by including very high incomes and taxation that is progressive. In other words, the task of defining the size of the ambition and the speed at which it needs to be achieved is once again postponed.

The assessment of the benefits, as presented in this article, reveals that increasing the spending on these areas offers major opportunities for promoting sustainable development, which policy makers should account for when deciding how to allocate the public budget. We have highlighted the greater capacity for galvanizing the economy and generating formal employment, as well as lowering the carbon footprint of public education and health services when compared to the economy's average. Additionally, in comparison with private social services, public services perform better in terms of average wages, tax and contributions collection, and formalization of employment, as well as in terms of income and formal employment multipliers and greenhouse gas emissions per unit of wage. It is true that public services are outperformed by private ones when it comes to restraining absolute emissions; but these result from the former's greater inter-industry linkages and wage mass, features that are desirable from an economic and social standpoint.

Nonetheless, the higher absolute GHG emissions of public services should not be disregarded. Rather, it is fundamentally important for the public sector to be able to decarbonize the supply chain of health and education services. This can be done, for example, through cross-cutting

measures based on investments in energy efficiency and the transition to low-carbon and renewable energy sources, or by specific measures. In the latter case, the importance of a green public procurement policy stands out: one that considers not only the market price of goods and services but also the environmental costs throughout the lifetime cycle (Delgado, Eguino, and Lopes 2021).

In any case, it is evident that achieving an acceptable level of public provision of these services demands a plan to reduce the gaps identified, guarantee access to quality education and health services, and by increasing the importance of public education and health services within the productive structure, contribute to promoting sustainable development. The magnitude of this plan and the speed of its execution will depend on political choices regarding the priority given to these areas within the public budget and how this budget should be financed to meet them. Our aim in this article was to provide the support that would enable well-informed decisions to be taken, firstly, by estimating how far Brazilian public services lagged behind justifiable benchmarks for spending on education and health; and secondly, by demonstrating that investments in these areas would represent an opportunity to be seized, an opportunity that could lead the country toward a more equitable and sustainable future. Such a future would bring not only the benefits of universal access to fundamental social services of high quality but would also create low-carbon income and employment through the provision of these.

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