Ecological Economics 135 (2017) 55–65

Contents lists available at ScienceDirect

Ecological Economics

journal homepage: www.elsevier.com/locate/ecolecon

How Social Footprints of Nations Can Assist in Achieving the Sustainable Development Goals

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ARTICLE INFO

Article history:
Received 25 August 2016
Received in revised form 22 November 2016
Accepted 15 December 2016
Available online 30 January 2017

Keywords:
social sustainability
input-output table
international trade
social footprint

ABSTRACT

Our study illustrates how consumer social risk footprints can assist in achieving the Sustainable Development Goals (SDGs). Combining the Social Hotspots Database (SHDB) and the Eora global multi-regional input-output table, we use input-output analysis to calculate a consumer social risk footprint (SF) of nations' imports. For our SFs, we select four indicators related to five of the UN's SDGs: gender equality (SDG 5 also 8.5 & 8.8); mother and child health (SDG 3, especially 3.1 & 3.2); governance (SDG 16, especially 16.5 & 16.6); and access to clean water (SDG 6, especially 6.1 & 6.2). After examining results for all four indicators we focus on gender equality to fully convey the value and limitations of using this method of analysis.

Our study compares producer (domestic) social risk and consumer social risk footprints resulting from international trade patterns. Generally, developed countries show higher social risk footprints while developing countries show higher domestic social risks with the exceptions of UK and Ireland in the developed-world, and China and India in the developing-world. Details of the SFs associated with exported products worldwide reveal that Pakistan, Yemen and Iran have some of the highest SF risk, while Australia, Canada and Denmark are among the lowest. These results are important for the UN in developing partnerships to address the Sustainable Development Goals and for organisations such as the World Bank, Trade Unions and NGOs' work towards a fairer world.

1. Introduction

In reporting the success of the Millennium Development Goals (MDGs) Ban Ki-Moon, while commending world leaders on some 'remarkable gains', acknowledged that inequalities persisted and success was not uniform. The MDG final report cited gender inequality as a significant gap in the program's success. Women are still more likely to be poor than men, less likely to participate in decision-making, and earn 24% less than men globally. In some countries the ratio of women to men in poor households has increased considerably. In particular, it cited: pregnancy and childbirth (Foreword, UN, 2015) and access to clean water as needing attention, with water scarcity affecting 40% of the global population. Realising 'gender equality and empowerment of women', says the report, must be integrated throughout the Sustainable Development Goals (SDGs) (UN, 2015, p. 31).

Following global consultation, the UN launched the 2015 SDGs. The SDGs build on the legacy of the MDGs, but are: more globally collaborative; rooted in human rights standards; inclusive; offer an opportunity for civil society engagement; provide the business sector with a greater role; and aim to inspire the world.[1]

The MDGs were focused on countries and not aligned with global policy initiatives impacting on human rights (e.g. the UN Guiding Principles on Business and Human Rights). The SDGs provide a vision of humanity's progress that can inspire citizen actions as well as policymaking and business within and between countries. They connect with instruments such as the Paris agreement (United Nations Treaty Collection, 2015) and the UN Guiding Principles (United Nations Human Rights Office of the High Commissioner, 2011) and breathe new life into the UN Human Rights Declaration (United Nations, 2015). They have greater scope and accommodate more stakeholders, thus providing opportunities to discuss how trade relationships can impact the attainment of SDGs.

Previous studies have demonstrated that developed economies' social footprints are often driven by imports while developing economies'

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[1] http://www.theguardian.com/global-development-professionals-network/2015/sep/26/7-reasons-sdgs-will-be-better-than-the-mdgs

http://dx.doi.org/10.1016/j.ecolecon.2016.12.003
0921-8009/

own activities contribute significantly to their social footprints, sometimes in addition to their imports (Simas et al., 2014; Alsamawi et al., 2014). We consider a social footprint to be the measurement of the negative social impacts associated with the supply chain activities required to deliver a product, fulfil an organization's mission or a country's needs.

Our study illustrates how social footprint calculations can be used to inform SDG related programs. We use a selection of indicators related closely to the SDGs (see section 1.3 in Appendix for details of the relevance of our indicators to SDGs) to illustrate the power of a combined Social Hotspots Database (SHDB) (Benoît-Norris and Norris, 2015), a resource that assigns risk levels by impact category, subcategory for each country and sector (Methods section, Appendix), and Eora database of the global economy. We then focus on gender equality to show the in-depth intelligence provided by this high-level combination of data sources.

Our work benefits from increased data collection by governments worldwide and bodies like the UN, World Bank, NGOs, Trade Unions. Our work contributes to building 'a world that counts'; where it is increasingly difficult to say 'we didn't know' (Melamed, 2014, p. 3). It sheds light on important SDG indicators and illuminates their relationship to global supply chains.

Using a multiregional input-output (MRIO) database (Databases, Appendix), we produce a quantitative, consistent and reliable measure of the social footprint (SF) of nations. Selection of indicators that make up our SF was influenced by the UN's final report on the MDGs (UN, 2015), that stated *gender equality* and *empowerment of women* must be central to the SDGs. Having singled out these two areas of concern as SF priorities we next examined the indicators supported by the SHDB. We identified four SHDB indicators that either directly addressed or contributed to our areas of concern: gender equality; mother/child wellbeing; governance; and access to clean water. These became the components of our social footprint and were subjected to the footprint calculus.

2. Results

We first present results for the producer social risk (equation 7) and the consumer social risk footprint (equation 6) for a range of countries and group these into a broad typology. Gender equality then becomes our focus. In choosing this to illustrate the power of the combined SHDB/Eora database we demonstrate the usefulness of the footprint calculus in tracking the SDGs' progress. We use the gender equality indicator to show three more detailed findings: ranking of countries by net importers and net exporters of gender inequality risk; a map of global flows of gender inequality risk embodied in international trade; details of trading partners and commodities shown in the map.

To help interpret our results we review how the footprint concept applies to the social risk metric. Equations 6 and 7 define two social risk measures. Social risk is essentially a quantification (via the weight vector **w**) of the original qualitative SHDB risk rating, re-classified from GTAP to Eora sectors. It characterises social risks within a country and within an economic sector. By allocating social risk to countries, the SHDB follows a territorial perspective, equivalent to carbon emissions inventories submitted under the UNFCCC. By allocating risk to producing sectors, the SHDB follows a producer perspective. In contrast, the social risk footprint characterises entire supply chains, involving many sectors and many regions. Its supply-chain scope is equivalent to that of the carbon footprint of products and countries (Wiedmann, 2009). Owing to the Leontief calculus, the risk contained in these supply chains is attributed to economic actors who finally demand certain commodities in certain countries.

Recall equation 3: Here, **qx** represents the territorial or producer perspective, where **q** contains territorially delineated data, and producers' total output **x** determines the magnitude of risk. In contrast, **my** represents the supply-chain or consumer perspective, where **m** contains supply-chain risk of products, and consumers' final demand **y** drives risk (Kanemoto et al., 2012).

Producer and consumer perspectives entail entirely different policy responses to the same problem (Munksgaard and Pedersen, 2001; Peters and Hertwich, 2008a). In analogy with the carbon emissions indicator, producer perspective information supports supply-side policies such as cleaner production incentives. A consumer perspective supports demand-side approaches such as selective procurement and awareness-raising of fair-trade campaigns (Peters and Hertwich, 2008b; Barrett et al., 2013). A consumer perspective and footprint calculus is also needed to analyse the issue of outsourcing of a domestic problem by substituting domestic production with imports from overseas (Peters, 2010; Hoekstra et al., 2016; Malik and Lan, 2016). These perspectives are complementary, and hence we will present both views in the following subsection.

2.1. The social risk footprints of nations

Resulting from international trade patterns, a broad typology of social risk profiles with differences between producer social risk (dotted diamonds) and consumer social risk footprint (solid diamonds) is illustrated (Fig. 1).

2.1.1. Medium to high domestic risk, all indicators

Countries in the bottom row of the 3 × 3 panel display medium to high domestic risk on all indicators. These include African nations (Ethiopia, Morocco, Algeria, Zambia), South America (Paraguay, Bolivia, Peru) and South Asian (Bangladesh, Cambodia, Papua New Guinea). In Africa for example this likely reflects a general high domestic social risk to women and negative attitudes towards gender equality, reported by the UN, as well as low access to clean water (UN Economic Commission for Africa, 2009, p. 2); and particularly in Ethiopia, high mother and child mortality (UN Economic Commission for Africa, 2015).

Our results for the three South America countries are explained, for example, by the fact that Paraguay is the lowest-ranked country in closing the gap (World Economic Forum, Global Gender Gap Report, 2015). While Peru is the worst performing country in women's health and Bolivia has a high maternal mortality rate (200 per 100,000 live births).

The South Asia inclusions in this group of countries with medium to high domestic risk illustrates, for example Bangladesh and Cambodia's maternal mortality rates of 170 per 100,000 live births (World Economic Forum, 2015) and their overall low human development and gender equality rankings (Papua New Guinea 33rd out of 34 countries, Bangladesh 29th, Cambodia 27th (UN ESCAP, 2015).

The reports cited above illuminate the situation depicted in Fig. 1, showing the social *footprint* is considerably lower in social risk than their domestic social risk. This is because the above nations source imports from countries with lower risk, which calls for supply-side measures, for example improving internal access to clean water through water purification. Additionally countries may be locked into risky export activities to meet debt-repayments or because transnational corporations, seeking ever-cheaper workforces, have no interest in improving conditions (Muradian and Martinez-Alier, 2001).

2.1.2. Equal domestic and footprint risk, all indicators

Countries shown in the 3 × 3 panel's central row are on a par with their trade partners. These include Brazil, Argentina, and Chile, possibly reflecting in the case of Brazil, that 84% of the population was urbanised by 2010, fostering land policy and gender equity reforms (van Haeften, 2010). In Argentina we find government created jobs and a social safety net including minimum wage, unemployment benefits and fairer access to pensions and universal child allowance (Garriga et al., 2015). Between 2004 and 2012 these measures led to increased employment and a 15% fall in income inequality. In Chile's case over 70% of the population is urbanised and 70% of the working-age population hold upper-