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Unintended consequence of trade on regional dietary patterns in rural India

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ABSTRACT

This paper investigates how trade liberalisation has contributed to a dietary shift from one dominated by traditional staples to one high in animal products, a trend that is associated with both improved intake in micronutrients, and higher rates of obesity and other diet-related diseases in developing countries. In the context of India's trade liberalisation in 1991, we examine whether the difference in consumption of cereals and animal products across rural regions before and after the reforms can be attributed to their differential degree of exposure to tariff reductions. The estimates reveal that trade reforms have a negative impact on cereal consumption through reducing edible oil prices and a positive effect on the consumption of animal products through enhancing consumer tastes towards these foods. These findings provide evidence for the role of trade in supporting dietary diversity and highlight the need for complementary policies to enhance the coherence between trade policy and nutrition actions.

1. Introduction

Many developing countries consider international trade of great importance for achieving economic growth. In recent years, increasing attention has been paid to the effect of trade policy on population health. One key pathway identified in the literature is the unintended relationship between changes in trade policy and the outcome on diets and thus nutrition (Blouin, Chopra, & van der Hoeven, 2009; Hawkes, Blouin, Henson, Drager, & Dube, 2010). In the developing world, there has been a dietary shift from one dominated by traditional staples to one high in animal products and other non-cereal food. Some studies claim that the adoption of a non-traditional diet is partly driven by trade liberalisation (Kearney, 2010; Pingali & Khwaja, 2004; Thow & Hawkes, 2009). However, the role played by trade reforms in this dietary transition, which we refer to as the trade-diet link, has been little researched in literature. The issue is further complicated by the fact that trade impacts on dietary patterns may not only pass through standard economic factors, such as income and food prices, but also tastes for different types of food. Nonetheless, little is known of the linkage between trade reforms and food tastes.

The decline in cereal consumption is the key feature of the dietary transition as cereals are the traditional preferred food and the major source of nutrients in many developing countries. This trend signals that diet has become more diversified than before, which contributes to a lower incidence of micronutrient deficiencies and hence improves health outcomes such as lower risk of maternal and infant mortality at birth and higher resistance to infections (Rashid, Smith, & Rahman, 2011). Another important characteristic of the transition is the rise in consumption of animal products. This trend has led to growing health concerns due to its association with obesity and diet-related non-communicable diseases (Kearney, 2010; Popkin, Adair, & Ng, 2012). These two trends are apparent in the developing world. For instance, many researchers have documented a shift in Indian dietary pattern away from cereals to animal products and other foods (Rao, 2000; Shetty, 2002; Mittal, 2007; Oldiges, 2012). According to the Food and Agricultural Organisation (FAO), the calorie intake from cereals in India decreased from 1556 kcal to 1461 kcal from 1989 to 1998 while that of animal products and edible oils increased from 337 kcal to 400 kcal. In light of the nutritional and health implications, this paper addresses the identified gap in the literature by investigating how changes in trade impact the consumption of cereals and animal products.[1]

This paper utilises an exogeneous trade policy shift in India to identify the trade-diet link. Specifically, in 1991, an extensive trade liberalisation policy was launched in India in which tariff barriers were progressively reduced over the next few years. Unlike many

[1] Apart from these two trends, dietary transition in developing countries is also characterised by the rise in consumption of processed food. However, it is not feasible to investigate the trade impact on Indian processed food demand due to data limitations.

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other trade reforms, this liberalisation was sudden and largely externally imposed (Topalova, 2007). This implies that Indian households were unlikely to have expected these trade policy changes and adjusted their food consumption in advance. This ensures that any trade-diet links identified are therefore the outcome of trade liberalisation rather than changes driven by the anticipation of policy changes. Given its unanticipated nature, coupled with the dietary changes in recent decades, the Indian trade liberalisation in 1991 provides a clean, relevant and hence unique context for examining the role of trade in the dietary transition.

Our identification strategy builds on the work of Topalova (2007) which establishes a causal link between the Indian trade liberalisation and changes in poverty through exploring regional heterogeneity in the exposure to trade reforms. Under the liberalisation, each Indian region experienced different levels of reduction in trade protection because they had different pre-reform industrial compositions and tariffs for different industries were not cut uniformly. The overall tariff at a regional level can therefore be measured by the interaction term between the tariffs faced by industries and the share of a region's worker employed in these industries in 1991 (Topalova, 2007). Apart from poverty, this approach has been employed to identify the unintended impact of Indian trade liberalisation on development outcomes such as school attendance among children and relative female survival rate (Chakraborty, 2015; Edmonds, Pavcnik, & Topalova, 2010). This paper extends this approach to establish the trade-diet link in the context of rural India. Note that under this approach, we cannot evaluate the overall impact of tariffs on Indian diet. Rather, we investigate whether the changes in regional food consumption can be attributed to the reduction of trade protection at regional level.

With the measure of overall regional tariff, our analysis considers trade protection reduction in both agricultural and manufacturing sectors. Reforms in the former sector have a direct influence on dietary patterns through its price effect on food items. While tariff cuts in the latter sector does not affect prices of agricultural commodities directly, it may alter the relative prices between food and non-food and hence trigger changes in food consumption. Additionally, trade reforms in both sectors may increase income of workers and influence their interaction with foreign culture, leading to adjustments in their diet. These indirect impacts from the reforms in non-food industries are particularly important in the Indian trade liberalisation as manufacturing trade barriers were reduced in a much more radical scale than that in agricultural trade.

The empirical analysis is divided into 2 parts. The first section establishes the linkage between Indian trade liberalisation and the consumption of cereals and animal products. With control for endowment of cereal cropland, regional characteristics and time shocks, it is found that regions facing greater reductions in tariffs are likely to consume less cereals and more eggs, fish and meat. At sample mean, 1 percentage point tariff cut is correlated with a 0.03 percentage point increase in the food budget share on animal and a 0.07 percentage point decrease in that on cereals (relative to the national trend). These trade-food consumption links provide solid evidence for the role of trade reforms in facilitating diet diversification and hence driving some of the observed dietary shift in rural India.

The second part of the analysis uncovers the underlying mechanisms between trade reforms and the consumption of cereals and animal products, which are income, food prices and food tastes. Income and prices impose constraints on the amount of goods that can be obtained by a consumer while food tastes determine the utility that he/she will receive from the goods. We capture food tastes for cereals and animal products using the regional component of the food budget share equation which cannot be explained by prices, income and household characteristics. The estimates indicate that the Indian trade reforms are likely to have negatively affected cereal consumption by reducing the price for edible oils since they are regarded as a substitute for cereals. For animal product, the trade impact is channelled mainly through the enhancement in food tastes. Regions exposed to larger tariff declines appear to have stronger tastes for eggs, fish and meat, which in turn contributes to the relatively higher consumption of animal products.

The present paper contributes to an underdeveloped strand of the empirical literature on the linkage between trade and diet. For example, only a few studies have attempted to empirically relate trade policy changes to beverage consumption. Schram et al. (2015) and Baker et al. (2016) show that a reduction in trade and investment barriers may have increased sales of sugar-sweetened carbonated beverages in Vietnam and encouraged soft-drink production in Peru respectively.[2] We provide evidence for the unintended trade outcome on consumption of cereals and animal products, an area that has not been empirically addressed in the literature. It highlights the role of trade in encouraging diversification of diets from cereals towards animal products. To our knowledge, this paper is the first to identify the trade impact on food tastes. Our findings stress that apart from income and food prices, food tastes do play a key role behind the trade-diet link although the relative importance of these channels may vary from case to case.

The evidence on the dietary outcome of trade is of crucial importance to policymakers. In the 2014 Rome Declaration of Nutrition, governments from around the world acknowledged that *'trade policies are to be conductive to fostering food security and nutrition for all'* (FAO & WHO, 2014:2). Through investigating the exogenous Indian trade liberalisation in 1991, this paper offers evidence on the potential incoherence between trade policies and nutrition objectives. Our results reveal that while trade can promote good nutrition outcomes through enabling households to diversify their diets from cereals, it may also undermine the effectiveness of nutrition actions by encouraging higher consumption of animal products. This points to the need for complementary public policies to manage these unintended dietary outcomes of trade. Furthermore, the analysis on the mechanisms behind the trade-diet link provides policymakers a clearer picture on the channels through which trade can facilitate the diversification of diet and hence enable them to make better-informed policy decisions regarding achievement of nutrition targets.

The reminder of this paper is organised as follows. The next section reviews literature on the linkages between trade, diet and health. Section 3 provides the background of trade liberalisation in 1991. Section 4 describes the data and the diet diversity across Indian regions. Section 5 presents the empirical strategy and the results of the main specification. Section 6 investigates the importance of income, food prices and tastes as the channels behind the trade-diet link and Section 7 concludes.

2. Trade, diet and health: Review of related literature

Trade liberalisation has been widely recognised as a crucial factor in driving the dietary shift from one dominated by traditional staples to one higher in animal products. Different developing country examples have been employed to illustrate the potential linkage between trade policy and dietary changes. Thow (2009) demonstrates a trend towards reduced consumption of staples and an increase in consumption of meat and meat products, eggs and oils in China in the early 1990s when tariffs and non-tariff

[2] We are grateful to a referee for pointing us to this literature.