

1. Executive Summary

1. It has long been realized in price policy formulation that the farmers typically respond to relative prices than just the prices received or prices paid. The concept of terms of trade between agriculture and non-agriculture, representing the relative prices, was added as one of the factors for consideration while fixing the minimum support prices by Government of India since 1980.
2. The concept of terms of trade in the context of domestic economy arises between the sectors and in our case it is between agriculture and non-agriculture, being calculated as the ratio between the combined indices of prices received to the combined index of prices paid by the farming community for different items purchased. This index is considered as the measure of relative performance of sectors and crucial to growth, income distribution, and consequently patterns of demand, savings, and investment.
3. The first comprehensive methodology for calculation of terms of trade for use by the Ministry of Agriculture in 1995 was developed by the Task Force on Terms of Trade under the Chairmanship of Prof. A. S. Kahlon. There have been concerns among the farming community that the terms of trade are being calculated based on the outmoded methodology and do not reflect ground realities. The Ministry of Agriculture recognized the need for revising and updating the methodology as two decades have passed since then and the pattern of trade between agriculture and non-agriculture has been undergoing transformation due to dramatic changes in the composition of agriculture sector with the spikes in the shares of fruits and vegetables, farm forestry, animal husbandry and fishery, besides dramatic shifts in

consumption patterns that have been moving away from cereals to high value products.

4. The Ministry of Agriculture has therefore constituted a Working Group in 2012 under the chairmanship of Prof. S. Mahendra Dev to recommend a new methodology by looking in detail into the issues arising out of the changes in the product mix, cropping patterns, consumption patterns, increasing international trade and consequent changes in the pattern of trade between agriculture and non-agriculture.
5. The Working Group has since then deliberated on the related issues by co-opting members from National Statistical Organisation, Central Statistical Organisation and few scholars having hands-on expertise on this work. The Group has in all conducted eight meetings in different locations and discussed the wide gamut of issues involved in developing methodology for constructing a new index.
6. The Working Group discussed on the different concept of terms of trade and has decided to calculate only the index of terms of trade or net barter terms of trade as the ratio between the index of prices received and index of prices paid. The earlier indices of terms of trade including that of the Kahlon Task Force of 1995 confine themselves to covering the items sold by agriculture like grain crops, pulses, oilseeds, commercial crops, livestock and dairy products and forest products. However, it was felt that there is an anomaly and inconsistency in leaving out the services sold by agriculture for non-agricultural labour in numerator, as the agricultural labour population is included in the agricultural population for purposes of calculation of index of prices paid for final consumption, in the denominator. Therefore, the Working Group has decided to include the labour services sold by agriculture to non-agriculture in the list of items sold by agriculture to non-agriculture. The

index of prices paid by agriculture to non-agriculture will continue to be the same, as that in the Kahlon Task Force, as the combined index of prices paid for final consumption, intermediate consumption and capital formation. Slight refinement has been done in case of agricultural sector by splitting index of prices paid for final consumption into two indices, one for farmers and other for agricultural labourers. Finally, a composite index of prices paid for final consumption for agriculture sector has been computed. The Group has also decided not to calculate the income terms of trade, as it can give erroneous results in the sectoral context in India.

7. The base period for the current constructed index of terms of trade with the triennium ending 1990-91 has become too obsolete to capture the changing pattern of trade between agriculture and non-agriculture and there is a need to shift to a recent base period for this purpose. Since agricultural production is subject to vagaries of weather, care has to be exercised in this most important decision while constructing an index. An abnormally high or low price level in the base can make comparisons redundant. Another dimension to this is the need to have comparability across other indices maintained in price behavior. The indices of prices paid for agricultural labour and wholesale price indices have been moving to the new base of 2011-12. Also, 2009-10 happened to be a severe drought year. The Working Group, keeping in view these aspects into consideration, has decided to take the triennium ending 2011-12 (2009-10, 2010-11 and 2011-12) as the new base for the calculation of the new index of terms of trade.
8. The agricultural population is taken to include farmers and agricultural labourers and this has corrected the inconsistency in the earlier methodologies in constructing the index of terms of trade with the numerator having only the items sold by farmers and denominators having the

agricultural labourers. Therefore, the Working Group recommends construction of the indices of terms of trade separately for farmers and aggregate agriculture separately, with the latter containing both farmers and agricultural labourers.

9. The identification of representative prices for the construction of terms of trade index is the key in satisfactory development of the index and is a challenge in view of the data limitations in regard to both items sold by agriculture as well as those for items purchased by agriculture from non-agriculture. Though it is tempting to use farm harvest prices for the items sold by agriculture, there are severe limitations with time lag, collection procedures adopted. Several experts also expressed limitation of using farm harvest prices as the farming community has been increasingly availing the wholesale prices by selling all-round the year, unlike in the past. The Group therefore has used wholesale prices in the construction of a new index. The rural retail prices for items purchased by agriculture sector were used for final consumption. But for computing indices for intermediate consumption and capital formation, wholesale price indices (WPI) were taken.
10. The value of output of different field crops, pulses, oilseeds, commercial crops, horticultural crops, forestry produce, products of dairy, poultry and livestock for the triennium ending 2011-12 is taken as each individual item's share in the total as its weight. The Group held wide consultations on whether the total value of output or just the marketed output has to be taken. In view of the lack of marketed surplus ratios for many products, data quality problems, it has been decided to take the total value of output instead of the marketed portion. The monthly per capita consumer expenditure (MPCE) for 2011-12 from the 68th round of National Sample Survey was taken for different items which were purchased from non-

agricultural sectors and for which rural retail price data were available. The weights for items covered under intermediate consumption were calculated by taking their value from National Accounts Statistics for the triennium ending 2011-12. However, the value of hired labour was taken as compensation to hired labour in unorganized sector as reported in Factor Income Statement of National Accounts Statistics (NAS). The weights for items covered under capital formation, goods for construction and machinery in Gross Capital Formation(GCF) for triennium ending 2011-12 assigned based on the economy as a whole for the construction sector items and based on the wholesale price index for machinery. This is considered to be the best possible approach given the non-availability of exact data. The total expenditure obtained by following the above procedure for different items purchased by the agriculture sector is aggregated and the share of each group viz., items purchased for final consumption, intermediate consumption and capital formation is taken as its weight to calculate the combined index of prices paid.

11. The index of terms of trade between agriculture and non-agriculture has been improving since 2004-05 and especially after 2006-07. After reaching the highest level in 2010-11 has stagnated after that. The following conclusions can be drawn from the index of terms of trade for farmers, the period 2004-05 to 2013-14 calculated using the methodology developed by the Working Group:

a) The index of terms of trade for farmers increased significantly over the period 2004-05 to 2013-14. It increased from 87.82 in 2004-05 to 102.95 in 2010-11. In other words, the index increased by 17 percentage points over this period. It shows that farmers have benefited a lot during this

period by the increase in terms of trade. If we take 2004-06 as 100, it increased by 19 percent during the same period.

- b) The calculations revealed that the index of terms of trade was less than 100 in 8 out of 10 years. It does not mean that the terms of trade were against farmers. This is because we have taken latest base triennium ending 2011-12. If we take triennial average of the index 2004-05 to 2006-07 as 100, the index of terms of trade was above 100 for all the subsequent years. The index shows that it increased from 100 for 2004-06 to 119 in 2010-11 and declined to 110 in 2013-14 but still much above the base triennial index.
- c) What are the reasons for increase in terms of trade for farmers during the period 2004-05 to 2010-11? Factors such as significant increase in minimum support prices, rise in global agricultural prices were responsible for rise in terms of trade for farmers. Food inflation was high during this period as compared to non-food articles. The increase in terms of trade for farmers is also reflected further in substantial increase in private investment.
- d) The terms of trade for farmers peaked in 2010-11 and showed lower index around 97 to 95 during 2011-12 to 2013-14, respectively. Compared to the base triennium ending 2011-12 as 100, the terms of trade for farmers declined in 2012-13 and 2013-14. However, compared to the period 2004-05 to 2007-08, the index of terms of trade was substantially higher during 2012-13 and 2013-14.

e) What could be the reasons for the lower index during 2012-13 and 2013-14 as compared to the base TE 2011-12? There could be slowdown in some of the favourable factors such as global prices during this period. Minimum support prices increased substantially although there was some moderation in rice and wheat prices towards end of that decade. The intermediate consumption/farm inputs also grew faster during this period with steep increases in wages, diesel, and other such items. Index of prices received increased from 107.82 in 2011-12 to 130.71 in 2013-14. On the other hand, index of intermediate consumption rose from 111.98 to 144.38 during the same period. The prices of inputs grew faster than those of output during this period.

12. The following conclusions can be drawn from the index of terms of trade between agriculture and non-agriculture sector:

- a) The index of terms of trade for agriculture sector rose much faster than that for farmers over the period 2004-05 to 2013-14. The terms of trade rose from 81.56 in 2004-05 to 102.89 in 2010-11. The index increased by 26 percent for agriculture sector as compared to 17 percent for farm sector during the same period. It shows agriculture sector benefited much more than non-agriculture sector.
- b) Index of terms of trade based on the triennial average of the index 2004-05 to 2006-07 as base indicates that terms of trade rose from 100 in 2004-07 to 126.4 in 2010-11. It is indeed a substantial rise in terms of trade for agriculture as compared to non-agriculture.
- c) The reasons for rise in terms of trade for agriculture sector are same as those for farmers. In addition, rise in wages for agricultural labourers for non-agricultural activities during this period have contributed for the higher

increase in terms of trade for agriculture as compared to those for farmers.

d) In contrast to the terms of trade for farmers, the terms of trade for agricultural sector increased slightly in 2012-13 and declined marginally in 2013-14 compared to the base TE 2011-12. In other words, the terms of trade for agriculture sector in 2012-13 and 2013-14 was more or less similar to that of the base year TE 2011-12. However, it may be noted that still terms of trade were more than 21 per cent higher than the base triennial average 2004-05 to 2006-07. It shows that agriculture sector terms of trade were still favourable even during the period 2011-12 to 2013-14 compared to mid-2000s.

13. It was found that the index developed by the Group shows the same level of improvement in the agriculture terms of trade as that is the one developed using GDP deflators. However, the index, calculated using the ratio of wholesale price index in agriculture to that in wholesale price index in manufacturing, rose much higher (101.0 in 2005-06 to 153.9 in 2013-14) compared to the Group index. It is because this kind of calculation has a limitation in that the whole range of services (that account for 60% of GDP) does not figure in the index calculated using wholesale price indices, whereas the Working Group calculations factored in many services like health, education, transport, and communications. Therefore, index worked out by the Group is the real terms of trade conceptually as it takes into account final consumption, intermediate and capital formation.

14. To sum up, the terms of trade for farmers and agriculture sector rose significantly during the period 2004-05 to 2013-14. The terms of trade for agriculture rose much faster than that of farmers. The Terms of Trade for farmers declined in 2012-13 and 2013-14 as compared to the base

triennium ending 2011-12. In the case of agriculture sector, the terms of trade were more or less same during the base TE 2011-12 and 2012-13 and 2013-14. Higher Terms of Trade along with increase in productivity are important for raising income of farmers and agricultural sector.

15. Before concluding, the Working Group wants to mention again the fact that profitability in farming does not depend only on making relative prices favourable by improvements in terms of trade. Non-price interventions are equally important in reducing the cost of cultivation, while improvements in agricultural productivity through investments in irrigation, research for cutting edge technologies and other crucial infrastructure to the farming sector are crucial in fetching higher returns to the farming community. There has to be a balance between both the price and non-price interventions so that all sections of the society viz., agricultural producers, consumers and other net buyers of food are benefitted.

16. To conclude, the Working Group has undertaken a detailed exercise to examine the existing methodologies and sorted out few of the inconsistencies in them, updated the whole exercise to a recent and representative base, identified many more items that are traded between agriculture and non-agriculture, selected the appropriate and representative prices, and improved the weighting diagrams. The index of terms of trade so calculated reflects the reality of improving terms of trade in the last decade. The new methodology can serve as a guide to calculation of terms of trade indices on annual basis for price policy formulation and related interventions of the government.