INDIA EXIM BANK
International Economic Research
Annual Award

India Exim Bank

INVERTED DUTY STRUCTURE AND EFFECTIVE RATE OF PROTECTION:

THEORETICAL AND EMPIRICAL ANALYSES

OCCASIONAL PAPER NO. 213

Export-Import Bank of India

Occasional Paper No 213

INVERTED DUTY STRUCTURE AND EFFECTIVE RATE OF PROTECTION: THEORETICAL AND EMPIRICAL ANALYSES

This study is based on the doctoral dissertation **"Inverted Duty Structure and Effective Rate of Protection: Theoretical and Empirical Analyses"** selected as the award-winning entry for the India Exim Bank International Economic Research Award 2021. This dissertation was written by Dr. Kanika Pathania. Dr. Pathania received her Ph.D. degree in Economics from Delhi School of Economics, University of Delhi, New Delhi, under the supervision of Prof. Aditya Bhattacharjea, and Prof. Uday Bhanu Sinha, Delhi School of Economics, University of Delhi, New Delhi.

October 2022

Contents

List of Figures

List of Tables

Executive Summary

Even after three decades of India's trade and investment liberalization, one crucial bottleneck on the way to industrial performance is the country's tariff structure. Recently, sections of Indian industry have been expressing concerns about the impact of an **'inverted duty structure' (hereafter IDS) resulting from changes in the country's** trade policy. In simple terms, IDS is a situation in which the tariffs on the import of raw materials/intermediate inputs for a product exceed the tariffs imposed on the import of the final product. The typical complaint raised by Indian industrialists is that customs duties on the import of some products, have fallen below the duties on the intermediate inputs required for their production. This has squeezed the profitability of the final goods producers by keeping their input costs high while exposing them to more intense foreign competition for their outputs. Cases of IDS continue to persist. However, the questions that arise are – do industries really need to worry about IDS? Is it required on the part of the government to re-examine their tariff policies?

The traditional trade theory explains that when countries start integrating at different levels of production, then instead of looking at the nominal rates, one should consider looking at what is referred to as the ***effective rate of protection (i.e., ERP)***. The concept of ERP, due to Corden (1971) and Balassa (1965), shows how protection of downstream industries can be eroded or even reversed by tariff inversion (IDS). If ERP for an industry remains positive despite IDS, then the latter may not affect that industry too adversely, because the tariff structure is still giving it protection. But it is a different matter if ERP for a sector is negative due to IDS.

Against this backdrop, this study is the first attempt to study whether there exists any rationale for the existence of inverted duty structure under imperfectly competitive market environment? In other words, are there any specific conditions which make tariff rates supporting IDS an optimal policy solution while maximizing a country's social welfare? If yes, do these conditions hold only if the industries under consideration are positively protected (i.e., ERP > 0)? Or, does IDS always imply negative ERP? This study attempts to answer these questions both theoretically and empirically. Despite being in news for about 15 years or so i.e., the period during which India entered into multiple FTAs,[1] the issue of IDS has not been concretely studied, nor has its association with the concept of ERP even been analysed explicitly in the literature.

The first chapter of the thesis outlines a theoretical model with two countries (home and foreign) and two vertically related goods (a final good and an intermediate input), where the domestic government and firms interact in a three-stage game. The purpose is to examine the determinants of tariff structure in an open economy, while specifically trying to derive the conditions under which IDS turns out to be an optimal policy for a country's government. Depending upon various parametric configurations, this study shows that there do exist such optimal rates of input and output tariffs that could lead to IDS in an economy, and negative ERP as well. However, this does not imply that IDS always coincides with negative ERP. In fact, the results suggest that ERP for an industry may remain positive despite IDS, meaning thereby the latter may not adversely affect that industry because the tariff structure is still giving it protection. However, it is a completely different matter if the effective rate of protection for an industry turns out to be negative due to IDS.

The second theoretical chapter builds on the conclusion of the first chapter, by considering the effect of various types of domestic mergers in impacting

[1] FTAs are arrangements between two or more countries or trading blocs that primarily agree to reduce or eliminate customs tariff and non-tariff barriers on substantial trade between them. FTAs, normally cover trade in goods or trade in services. For example, some of India's major FTAs are India-ASEAN Free Trade Agreement that came into force on July 1st, 2015, South Asia Free Trade Agreement that came into force on January 1st, 2006, among others. Source: Indian Trade Portal, www.commerce.gov.in

a country's tariff structure. In particular, this study analyses how different forms of integration (merger), whether horizontal or vertical, affect optimal input and output tariffs, and hence, the existence of inverted duty structure and its association with negative ERP. It again employs a two-country model, but with more intermediate input and final goods producers in the home country. The analysis is suggestive of various important policy considerations. First of all, the case of vertical integration between one of the final output producers and an intermediate input producer within the home economy represents a win-win scenario as it leads to an increase in both social welfare and profit of integrated firms. Further, in such type of integration, IDS always turns out to be an optimal policy, while, unlike in the pre-integration case, duty inversion turns out to be a necessary but not sufficient condition for the existence of negative ERP. In the second case of horizontal integration at the intermediate input stage, the chapter finds that while profits of the integrated producers rise, social welfare decreases, vis-à-vis the pre-integration scenario. Moreover, horizontal integration at the intermediate input stage also leads to the existence of inverted duty structure (as an optimal tariff policy), and this duty inversion is necessary but not sufficient to ensure the existence of negative ERP. Thus, the second chapter makes it all the more imperative for the policy makers to consider (a) the necessity of deriving ERP, and (b) the interactions between trade and competition related policies before relooking or reformulating their tariff related policies to address the concerns raised by different Indian industrialists.

Finally, the third chapter attempts to verify some of the theoretical assertions from chapter 1 by offering a set of new estimates of ERP for 24 sectors of the Indian economy for the period 2000-2014. This has been done using the World Input-Output database that, unlike those used by earlier authors, enables one to construct a time series on ERP for each sector, using different tariff rates applied by India on imports from different countries. These estimations suggest many instances of IDS in various Indian industries, but none of them results in negative ERP. In particular, IDS exists in electronics and optical products, paper and paper products, computer, pharmaceuticals, machinery and equipment, and other transport equipment for the majority of the years under consideration. This study also shows statistically and econometrically

that ERPs are positively related to the degree of tariff escalation. Lastly, in some of the industries, and for some years under consideration, negative ERP does exist, but that is because of negative value added under free trade. Therefore, this chapter is one of its kind and tries to address the issue of whether and to what extent the Indian economy is suffering from the consequences of an IDS.

In a nutshell, the results of the study suggest that in line with the concerns raised by various Indian industrialists, duty inversion does exist in various sectors as suggested by the data. However, the question is – should governments be really concerned about IDS? The theoretical chapters developed in this study clearly suggest that under certain conditions, IDS turns out to be an optimal policy for the government of an economy. This implies that such types of tariff structures are (at times) required to maximize a country's social welfare. But, how does that impact the industries under consideration? IDS is harmful if it leads to negative protection. And the present study shows, both theoretically and empirically, that existence of IDS does not necessarily imply that ERP is negative. Therefore, governments as well as industries should really be concerned about ERP, and not IDS in specific sectors.

1. Background

In recent years, sections of Indian industry have been expressing concerns about the impact of an 'inverted duty structure' (hereafter IDS) resulting from changes in trade policy. In simple terms, IDS is a situation in which the tariffs on the import of raw materials/intermediate inputs for a product exceed the tariffs imposed on import of the final product. Thus, it is opposite of tariff escalation, in which case the pattern of custom duties is such that rates rise with the level of processing of the goods being purchased. The typical complaint raised by Indian industrialists is that customs duties on the import of some products, especially from countries with which India has signed preferential trade agreements (PTAs), have fallen below the duties on the intermediate inputs required for their production. This has squeezed the profitability of the downstream producers by keeping their input costs high while exposing them to more intense foreign competition for their outputs. For instance, spokespersons of copper alloy fabricators (Iyenger, 2015), Federation of Indian Export Organizations (FIEO) (PTI, 2016b), and toy manufacturers (BS Bureau, 2016), among others, have complained about IDS. A survey by the Federation of Indian Chambers of Commerce and Industry showed that industries such as machinery, electronics, cement, rubber, minerals and textiles suffer from duty inversion (FICCI, 2016).

The issue of IDS has also been recognized by Indian policy makers. In an interaction with the journalists of *The Economic Times*, the then Finance Minister Arun Jaitley said, 'I propose to reduce the rates of basic customs duty on certain inputs, raw materials, intermediates and components (in all 22 items) so as to minimize the impact of duty inversion and reduce the manufacturing cost in several sectors' (quoted in Seth, 2015). In the same year, one of the NITI Aayog members also highlighted the case of IDS in the

steel sector (The Hindu Bureau, 2015). Even the Steel Ministry officials made a case against IDS, pointing out that 'customs duties levied on key raw materials such as coking coal, iron ore and metal scrap are higher than those on the end product'. The ministry urged the Finance Ministry to raise the peak tariff on steel from 15 to 20 percent in the 2016 Budget in order to protect the domestic industry (PTI, 2016a). The Tariff Commission (Government of India) also acknowledged IDS as a 'major area of constraint for domestic industries'. Thus far, it has carried out 148 studies, which cover 252 products from 2012-13 to 2018-19. It recommended duty rationalisation for 154 products, some of which were implemented in the various Budgets.[2]

However, sections of Indian industry continue to complain about IDS. On the eve of the 2019-20 Union Budget, such complaints were voiced by the Engineering Exports Promotion Council (EEPC) (PTI, 2019) and FIEO again (FIEO, 2019). Many of these concerns specifically mentioned duty-free imports from PTA partner countries. Taking some of these issues into account, the Finance Minister, Ms. Nirmala Sitharaman, in her 2019 Budget speech, stated that 'On the Customs side, my proposals are driven with the objectives of securing our borders, achieving higher domestic value addition through the Make in India initiative, reducing import dependence, protection to MSME [Micro, Small and Medium Enterprises] sector, promoting clean energy, curbing non-essential imports, and correcting inversions' (GoI Budget Speech, 2019, Para. 133). However, following the budget speech, Mr. K. M. Mammen, chairman of Automotive Tyre Manufacturers' Association (ATMA), stated that, 'Tyre Industry was keenly looking to correction in inverted duty either by increasing import duty on finished goods (tyres) or reducing it on Natural Rubber (NR), the principal raw material.' (Kumar, 2019). Mr. Anil Agarwal, executive chairman of Vedanta Resources Ltd., called upon government 'to safeguard domestic industries such as aluminium, copper, iron ore and coal by raising import duties or correcting the inverted duty structure' (Agarwal, 2019).

[2] For the detailed list of corrections of duty inversion (as recommended by Tariff Commission) in various budgets, refer to GoI Tariff Commission (2020).

In the recent 2021 budget, Finance Minister also assured that 'The thrust now has to be on easy access to raw material and exports of value added products.' (Government of India (GoI) Budget Speech 2021, Para 177). Specifically, she reduced the duties on import of input for various industries (like Chemicals, Iron and Steel), with specific focus on Naphtha (reduced to 2.5% to correct inversion) (GoI Budget Speech 2021, Para 182).

Thus, many policy makers and industrialists have persistently raised various concerns related to the issue of duty inversion. *When and how did this problem arise?* – The report of the Chelliah Committee on Tax Reforms, which provided the framework for the reforms of the 1990s, actually recommended tariff *escalation* (TE), 'with inputs or products at lower stages of processing having lower tariffs than the final products. For average tariffs, this was achieved by 1996-97 and 1997-98' (Singh, 2017, pp. 131-132). The 2002-03 Budget 'expressed a vision that by the year 2004-05, there would be only two basic rates of customs duties, namely, 10 per cent covering generally raw materials, intermediates and components and 20 per cent covering generally final products' (Singh, 2017, p. 131). This would have institutionalized an escalated rather than inverted duty structure. 'However, compared to the late 1990s, the tariffs on unprocessed products did not decrease much but those on semi-processed and processed manufactured products decreased significantly. This led to a reduction in effective protection: In fact, one of the concerns of some industries in India is that the tariffs on their inputs are higher than the tariffs on the finished products. This is one of the areas of tariff reform that remains incomplete' (Singh, 2017, p. 132).

Duty inversion has thus become a serious issue in the last 15 years, the period during which India entered into multiple PTAs. However, no concrete study has been done to theoretically find out the reasons explaining the existence of IDS. More so, no study has been conducted to verify its industry-wise prevalence and consequences in the Indian economy.[3] In particular, there has been no recent attempt to estimate effective rates of protection

[3] Singh (2017) illustrates his arguments with WTO data on basic tariff rates adjusted for exemptions, covering the period upto 2014-15, for the three broad commodity groups. These rates do not take into account the impact of PTAs. Moreover, Indian exporters do not benefit from protection of their industries because they must compete at world prices, while they are squeezed by tariffs on their inputs. This explains why exporters' organisations have been especially vocal about IDS.

(ERPs), which (unlike nominal tariffs) also take into account the effects of import duties on both inputs and outputs of a sector. The concept of ERP refers to the protection of a process as distinct from the nominal tariffs on output (Bhagwati and Desai, 1970). Corden (1966), in his pioneering work, explained the conceptual framework for ERP. Conceptually, it is defined as the percentage excess of the domestic value added due to the imposition of tariffs and other protective measures on the product and its inputs, over value added in the absence of such measure. ERPs were traditionally used mainly to demonstrate how final goods producing industries benefit disproportionately from tariff escalation. But the concept of ERP can also show how protection of downstream industries can be eroded or even reversed by tariff inversion (IDS), making it relevant for this study. Corden (1971) explained the cases where ERP for an industry remains positive despite IDS, then in that case the latter may not affect that industry too adversely, because the tariff structure is still giving it protection. This may be because the difference between input and output tariffs is small, or because the inputs that are subject to high tariffs make up a small proportion of the industry's costs. Further Corden (1971) also explained the cases, where we have negative effective protection but not duty inversion, which may be due to high tariffs on the downstream sector. But it is a different matter if ERP for a sector is negative due to IDS. Even if it appears to be protected by a tariff on imports that compete with its output, a negative ERP shows that it may be better off under free trade. This may be due to the cost-raising effect of high tariffs on inputs that make up a substantial proportion of a sector's cost.

However, ERP analysis had fallen out of favour because trade theorists showed that it fails to predict the effects of a tariff structure on inter-sectoral factor allocation in general equilibrium with more than two sectors or even with two sectors if there is substitutability between primary factors and traded intermediate inputs (Bhagwati & Srinivasan, 1973; Ethier, 1972). A strong assumption of separability must be imposed on the production function in order to avoid this problem. However, this analysis is not amed at deriving general equilibrium results about resource allocation between sectors. In their pioneering study, Bhagwati and Desai (1970, p. 338), who were well aware of these theoretical limitations, argued that ERPs do give a rough idea of

the relative incentives given to various sectors by the foreign trade regime. Making a forceful case for the practical relevance of ERP estimation despite its theoretical shortcomings, Greenaway and Milner (2003, p. 9) pointed out that 'By highlighting potential inconsistencies or unintended effects, for example … where high nominal protection of one producer tends to disprotect other producers for which the protected product is an important input, one is able to provide a framework or basis for policy reforms'. ERPs also show how trade policy affects the value added, that is, the reward to factors employed in each sector. This might provide some insight into the political economy of trade policy. In particular, if some factors are specific to a particular sector, then even without imposing separability on the production function, changes in ERP correspond to the relative changes in returns to the specific factors (Jones & Neary, 1984, p. 33).

In this backdrop, the thesis assesses the following three main objectives:

1. To examine if there exists any economic rationale behind inverted duty structures, and to explore the specific conditions (if any) that make tariff rates supporting negative ERP and IDS as optimal policy solutions while maximizing social welfare under imperfect competition. The association between IDS and negative ERP is also (theoretically) examined.

2. To investigate the interaction between a country's tariff policies and competition policies, particularly focusing on two main forms of integration viz. horizontal and vertical integration. Further, to analyse the impact of the two forms of integration on the tariff-imposing country's ERP and IDS, and find out which amongst the two entails higher social welfare, leads to higher effective protection and lower chances of inverted duty structure.

3. To empirically estimate the rate of effective protective for various Indian industries, using a unique dataset that has not previously been used for this purpose, and to identify cases of inverted duty structure. Further, the co-existence of negative ERP and IDS is also examined based on the estimates for the period 2000-2014, and assess whether their relationship has changed during the chosen period.

2. Duty Inversion and Effective Protection - A Theoretical Study

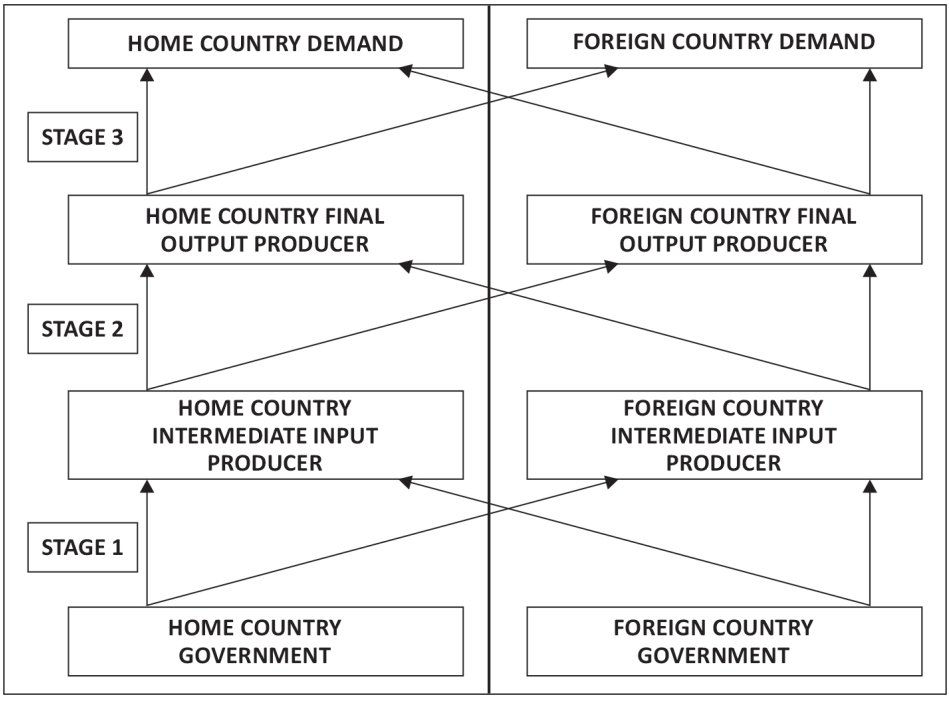
This chapter of the study sets forth the foundation to theoretically define the rate of effective protection in a vertical industry model with imperfect competition. The questions analysed in this chapter are – 'Is there any economic rationale behind the existence of Duty Inversion?', 'Are there any specific conditions which make tariff rates supporting negative ERP and IDS an optimal policy solution while maximizing social welfare?', 'What is the relation between IDS and negative ERP? Do they always co-exist?' The primary aim is to identify the role of various parameters that play a crucial role in determining the policy implications of the imposition of import tariffs on intermediate inputs and final goods. In particular, the objective is to examine whether the imposition of inverted tariffs becomes a welfare-improving policy intervention for a country's government.

The review of the literature in this context, suggests that 'trade under vertical structure' has been analysed theoretically in the form of a stage game, where, in stage 1, the government decides about the optimal tariff policies, followed by stage 2, in which input producers decide their quantities and, finally, in stage 3, final output producers decide about the profit-maximizing level of outputs to be supplied to various consumers. The game structure of this chapter closely follows the work done by Bernhofen (1997), Ishikawa and Spencer (1999), and McCorriston and Sheldon (2009). It is also in line with studies on the impact of domestic trade protection in vertically related markets (like Spencer and Jones (1991) and Wang et al. (2011)). In the latter set of models, the authors have assumed that the key intermediate product is being produced only by the foreign country producers and there are differences in the cost of production. This chapter borrows from this strand of literature. However, it assumes that the intermediate input is being produced

and traded by both the countries (be it home or foreign), and no country entirely depends on the other country for its supply of final/intermediate good. The chapter also incorporates the role of labour, not only for producing the intermediate good but for transforming that into final output as well. Further to this, unlike the existing studies, the role of 'no arbitrage condition' has been strictly incorporated while defining the final solution set. Thus, this study is an extension with a wider set of objectives focusing on ERP and IDS in the absence of any arbitrage possibilities.

The primary objectives of the chapter have been answered theoretically by setting up a two-country partial equilibrium model with an oligopolistic market structure involving two vertically-related stages of production (i.e., an intermediate good and a final good). **Figure 2.1** provides a schematic representation of the three-stage game set up in this model. In the first stage,

Figure 2.1: Schematic Representation of Model Structure and Three Stages of Decision



Source: Author's Representation

the government of an economy decides on the optimal tariff policies. In the second stage, the home and foreign intermediate input firms play in quantities and hence, given their demand functions, equilibrium input prices are determined in the market. In the last stage, the final output producers decide on the quantities of output to be produced and sold in different markets. The study uses the standard backward induction method to solve for the subgame perfect Nash equilibrium of the game. Thus, the game structure enables to understand how tariff rates play a crucially important role in influencing decision making of different economic agents of a country.

Using the criterion of backward induction to solve for Subgame Perfect Nash Equilibrium, the chapter first solves for the equilibrium quantity and prices in final goods' market, followed by the equilibrium solution in input markets and finally solve for the rate of optimal tariffs that determine maximum social welfare in each of the two countries. The main findings are as follows:

1. The optimal tariffs on final output (in any country) depend positively on its own market size and labour cost, and negatively on foreign country's market size and labour cost. However, intermediate input tariffs depend positively on market size (of both the trading partners) and negatively on their wage cost. One of the plausible ways in which the signs can be interpreted is the following:

   As the home country's labour cost rises, consumer surplus falls because a higher cost of production leads to higher prices in the market, due to which quantity demanded falls. Producer surplus also falls, because of a similar reason – for them, the cost of their input rises. On the whole, the rise in tariffs when cost of labour increases in a country, ensures that the welfare is maximum. However, when looked at the impact on tariff on intermediate inputs, the results show that with a rise in home labour cost, it is optimal for the government to decrease this tariff rate.

   Similarly, with a rise in the foreign wage cost, consumer surplus falls, because consumers consume both domestic and foreign goods. The surplus for the domestic producers rises, because they become relatively more efficient as far as their productions of final and intermediate goods are concerned. Tariff revenue also declines. In this case, it becomes

optimal for the government to reduce both the tariff rates on final and intermediate good so as to ensure that welfare is maximized.

2. The measure of ERP is sensitive to the wages paid by the home country in comparison to foreign country. Since ERP is defined in terms of value addition in any industry, the finding in this analysis indicates that *as wages at home fall relative to foreign wages, home country's rate of effective protection also falls*. The reason could be because ERP depends on value added, which, in turn, gets affected by the wage payment (cost minimisation/profit maximisation). Thus, the measure of ERP and hence, the extent of effective protection doesn't just depend on the rate of tariffs, but also on the domestic vis-à-vis foreign cost of production, of which, labour cost assumes an important role.

   To explain the results more intuitively, this study then specifically emphasizes on two different cases – one, where it is assumed that the wages paid to labour are equal across the two countries (or what we refer to as 'nominal wage equality') and two, when the countries are assumed to pay different wages to their labour (or the case of 'differential wages'). In addition, in both the cases, two different measures of ERP have been defined, namely ERP_1 and ERP_2. ERP_1 represents a situation when the foreign country doesn't impose tariffs on its imports of both final good and intermediate input while calculating value added by home country final output producer under free trade. On the contrary, ERP2 assumes that the foreign country imposes optimal tariffs on its imports of both the goods under the same scenario.

3. The results from each of the two special analyses (as described above) show that, depending on parameter configurations, *there do exist such optimal rates of input and output tariffs that could lead to IDS in an economy, and negative ERP as well*. However, IDS does not necessarily imply negative ERP, thereby implying that the former may not (always) negatively affect the final good industry because the tariff structure is still giving it some protection. This is a very important policy finding, as it clearly indicates that the governments, while imposing tariffs, should rather be concerned about the level of protection accorded to its sector and not only about IDS. Nevertheless, it is indeed a matter of concern if

ERP for an industry becomes negative due to the existence of inverted duty structure. In such a case, the industry may fare better under free trade than under a restricted trade regime.

4. In the nominal wage equality case where the two countries pay similar wages to their labour, if the wages are low and home country is relatively small in size, vis-à-vis the other, then the likelihood of IDS leading to negative ERP is higher in the former. A similar implication (but with different critical parameter values) also holds in the case of differential wages when it is assumed that wages in the home country are not much higher, but its market size is relatively smaller than in the foreign country. In that case, *duty inversion might lead to negative protection*. These findings make it imperative to conclude that a country's tariff structure cannot be considered in isolation, rather it crucially depends on the relative size of the country, vis-à-vis its trade partner, apart from the two countries' cost structure.

   In addition, the model suggests that the consequences of difference in the relative sizes depend upon the measure of ERP that is considered. If the partner economy chooses free trade while calculating value added under free trade, then even a comparatively lesser difference between the two countries' market sizes ensures that IDS is a necessary condition for negative ERP. This situation can arise regardless of whether the tariff-imposing country (whose domestic market is being assessed) is bigger or smaller than the partner country provided the difference between the two market sizes is not very large. This contrasts with the scenario when the partner country opts for restricted trade and imposes (positive) optimal tariffs even when the country under consideration, chooses free trade. In such a case, for duty inversion to coincide with negative ERP, the latter should represent a smaller market in comparison to the foreign country. When analysed in the presence of differential wages, the findings suggest that duty inversion leads to negative ERP if the country (under consideration) is a low-wage economy and also has a smaller market size, vis-à-vis the partner. Once again, this relative size depends on which measure of ERP has been analysed. However, unlike the case of

nominal wage equalization, in case of differential wages, *an inverted duty structure is a necessary condition for negative effective protection*.

5. The study also analyses two special cases to check how the results obtained deviate depending upon the specific features of the two trading partners in the world market. In the first case, it assumes that there exists demand for final good only in the home country. Thus, in the absence of any demand for final output in foreign country, both imports and imports tariff on final good take the value equal to zero. The analysis shows that this situation is characterized with *existence of IDS, and ERP always takes a positive value*. The only difference between this and the general case is the range in which ERP varies. This case, therefore, highlights the role of foreign demand in this model. As another possibility, it was assumed that there exists demand for final output in the foreign country, but the latter now chooses not to impose any tariffs on its imports of either intermediate input or final output. In this case also, the study reaches the same conclusion as in general cases that IDS do not necessarily imply negative ERP.

To conclude, the analyses suggest two broad policy findings:

a) Various Indian industrialists have been making claims that IDS is negatively hampering their growth, but there does exist optimal tariff rates that support IDS. Thus, from the point of view of the entire economy, under certain circumstances, IDS could turn out to be a welfare improving policy outcome. Moreover, existence of IDS does not always necessarily imply negative value addition. Even in the presence of IDS, the output producing firms could be better off than they would have been in free trade situations. Therefore, *the debate should be around negative protection and not IDS*.

b) Moreover, while imposing tariffs, a country's government should be aware about the size of its economy with respect to its trading partner. The two-country framework in this study suggests that if a country is relatively small in market size, then IDS will necessarily lead to negative protection. Thus, in that case, government should try to offset duty

inversion, for example by providing drawbacks of duty paid on imported intermediate inputs. In addition, the study also highlights the crucial role played by other domestic variables such as wages in determination of tariff structures and effective rate of protection, which should be considered while trying to correct for the issue of duty inversion/negative protection within an economy.

As no researcher has thus far explored interrelations of IDS and effective rate of protection in an oligopolistic market set up, this study makes a novel contribution to the vast and expanding literature on trade and tariffs.

3. Horizontal and Vertical Mergers, and Effective Rate of Protection Under Optimal Tariffs

This chapter of the study further builds on the vertical structure of the previous chapter's setting and introduces a greater number of representative firms in an industry to analyse the role of industrial structure on a country's optimal tariff policies. In the globalised world today, the very nature of the competition policies and the associated benefits and costs cannot be studied without considering their impact on a country's tariff policies. With an evolving literature on trade and imperfect competition, researchers have started modelling the connections between the two using theoretical models from the Industrial Organisation (IO) literature. Most of the existing studies analyse the impact of tariff rates on a country's competition related policies. While some of these studies consider only a single stage of production, others have considered models with both the upstream and downstream stages. The former only looks at the role of horizontal mergers, while the latter also looks at the case of what are referred to as vertical mergers when firms, at different stages of a value chain, merge with each other. Thus, the roles of both horizontal and vertical merger related policies have been analysed in the literature.

However, not many studies have been undertaken so far to assess the feedback of such forms of domestic integration on a country's tariff structure. As is well established in the trade theory literature, the structure of markets in the home and foreign countries plays a crucially important role in determining the type of trade they engage in and therefore, also guide formulation of their optimal tariff policies. The consideration of this so-called feedback effect is not only important for the policy makers or regulators, but is also important for the industry lobbies and firms to make an optimal decision to integrate with other firms in the market. The present chapter aims to contribute to

this strand of literature (which is scanty), by assessing the role of competition policies in determining the tariff structure in an economy. This chapter is an extension of Chapter 2 with more number of firms both at the upstream and downstream levels to incorporate the role of the two types of mergers. In particular, this chapter investigates the welfare effects of horizontal and vertical mergers to find out how the two forms of integration impact both optimal input and output tariff, the link between the two rates and hence, the effective protection that the government in any country provides to its final good industry. To the best of author's knowledge, these questions have not been addressed explicitly in the literature so far and will help in deriving important policy recommendations for both the regulators and social planners of an economy. Broadly, the three research questions analysed in this chapter are:

A. How do the optimal tariff rates imposed on imports of intermediate input and final output change if firms in a country vertically integrate with each other? What is the impact of vertical integration on the tariff-imposing country's ERP and IDS?

   For this question, it is assumed that vertical integration takes place between one of the home country's final good producers and an intermediate input producer. Further, it is also assumed that the vertically integrated firm does not participate in the input market, which means that the integrated firm will neither buy nor sell any input in the market.[4]

B. How do the optimal rates of tariffs and their impact on ERP and IDS change when instead of vertical integration, horizontal integration happens in the home country, either between two final good producers or between two intermediate input producers?

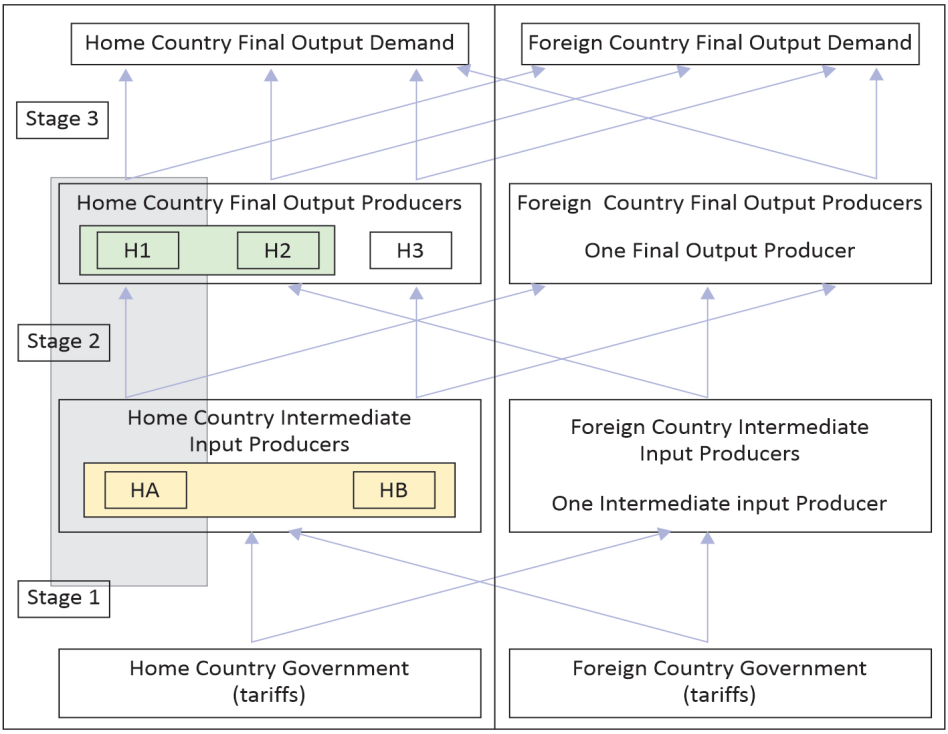
C. How do the two cases of integration - vertical and horizontal - differ in terms of their impact on optimal rates of tariffs, ERP and existence of inverted duty structure? Which (amongst the three - no integration, vertical/horizontal integration) entails higher social welfare (or leads to a

[4] Salinger (1988) also studied such a setup, where market foreclosure (i.e., an increase in the price of intermediate input post-merger) results as an outcome of the assumptions he made.

higher rise in social welfare), leads to higher effective protection to final good producers?

This study follows the same model structure as discussed in the previous chapter with more number of final good producers and intermediate input suppliers in the home country. More specifically, it assumes the case of two countries – Home (H) and Foreign (F), each producing two products – a final output and an intermediate input. However, unlike the previous setup, it is now assumed that in the home country, there are three final output producers (H1, H2 and H3) and two intermediate input producers (HA and HB), while on the other hand, the foreign country (F) has only one final output producer and one intermediate input producer. The game structure remains the same as before, however, the schematic representation changes as shown in **Figure 3.1**.

Figure 3.1: Diagrammatic Representation of the Model Structure, Three Stages of Decision, and Possible Merger Scenarios



Source: Author's Representation

The diagram explains the basic framework. The baseline case or the benchmark scenario is the one, where no pair of firms in any of the two countries is integrated and is referred to as the 'Pre-Integration Case', which is solved first to find out the optimal tariff rates and the rates of effective protection. Then, the possibility of existence of an inverted duty structure was also assessed. This case is an extension of the previous chapter by increasing the number of firms in H country at both levels of production. Thereafter, the study considers the case of vertical integration where one of the final output producers (say, H1) in home country, vertically integrates with a home country intermediate input producing firm A (hence, the post-integration case) and names the new merged firm as 'HA1'. The solution attained in this case is then compared to the no-integration case to analyse how tariff rates (nominal or effective) and possibility of duty inversion change with the change in structure of firms in a trading economy. The vertical integration case is highlighted by the grey coloured solid block in **Figure 3.1**. In this type of integration, it is assumed that integrated firm HA1 does not participate in the input market, which means HA1 will neither buy nor sell anything in the input market. This means that the integrated firm will fulfil its input requirement from its own input unit.

Thereafter, the study proceeds to analyse two different cases of horizontal integration. It starts off with the horizontal integration between the two final output producers H1 and H2 in the home country, and names the newly integrated firm as H12 (post horizontal integration). The horizontal integration case between final output producers is highlighted by green coloured solid block in **Figure 3.1**. Like in the case of vertical integration, the results from both pre- and post-integration cases are compared and analysed to see how protection and duty inversion change with more concentrated markets.

Next, the case of horizontal integration at the level of two intermediate input producers in the home country (viz. HA and HB) has been considered. In line with the previous cases, the integrated firm was named as HAB. This type of horizontal integration is represented by yellow coloured solid block in **Figure 3.1**. Lastly, this study makes an attempt to analyse social welfare implications of both horizontal and vertical integration and also examine whether these integrations are privately profitable for players.

Solving the stage game using the method of backward induction, the following results were obtained:

1. In the pre-integration case with 3 final output producers and 2 intermediate input producers in the home country and one-one each in foreign country, the findings suggest *that the existence of IDS does not necessarily imply negative effective protection*. This means that duty inversion can occur even when positive level of protection is accorded to the final output industry in a country, and IDS is not a necessary condition for the existence of negative ERP. If the qualitative outcomes of the pre-integration case are compared with those observed in Chapter 2 (with one firm in each sector in both the countries), then the basic result between ERP and IDS remains the same, i.e., IDS does not necessarily imply negative ERP. However, examining the input and output tariffs shows that while the former necessarily falls when switched from Chapter 2 to Chapter 3 with a higher number of intermediate input firms, the values of the latter may rise or fall depending upon certain parametric values. These outcomes highlight how even the number of firms in a market matter in defining and determining the extent of IDS and the magnitude of ERP in a trading economy.

2. Next, considering the case of vertical integration between one of the final output producers and an intermediate input producer within the home economy, the study argues that this type of integration is a win-win case as it leads to an increase in both social welfare and profit of integrated firms. Total Social Welfare, defined as the summation of consumer surplus, producer surplus and tariff revenue, increases because of two reasons – one, the elimination of double marginalisation and second, the strategic effect on output. Vertical mergers internalise some of the vertical externality that gets created by reducing dead weight loss associated with double marginalisation, and hence, raised the total welfare. Profit of the integrated firm also rises because of a fall in the cost of production of final goods and the strategic effect on the final output.

   Further, in such type of integration, IDS is always optimal. Unlike in the pre-integration case, IDS is a necessary but not sufficient condition for the existence of negative ERP. Moreover, the magnitude of IDS is more, and that of negative ERP is less (for most values) with vertical integration.

3. Thereafter, the case of horizontal integration at the final output stage was considered, i.e., when two final output producers integrate among themselves. It is observed that such a type of merger does not lead to higher profits for the integrated final good firms, nor does it lead to higher social welfare for the home economy as a whole. As reviewed from the literature, under Cournot competition, with the horizontal merger of two firms, the profit of an integrated player is more likely to increase if the markets are concentrated than fragmented. In set up here, the horizontally merged firm only accounts for one-half of the total market share within each market (i.e., 2 firms out of 4 firms are getting merged). However, as shown by Salant, Switzer and Reynolds (1983), for a merger to be profitable, it should involve a sufficiently large number of firms, say around 80% of the market share. And, hence, the social welfare (in the set up here) decreases because horizontal integration at the final output stage means the market power of firms increases, thereby leading to a higher deadweight loss for the economy.

4. In the case of horizontal integration at the intermediate input stage, it is found that while profits of the integrated producers rose, social welfare reduced, vis-à-vis the pre-integration case. In this case, it is thus, privately profitable to horizontally integrate because it leads to a more concentrated market. Social welfare decreases because the integration at the intermediate stage reduces competition between different input suppliers and thus, leads to an increase in their market power. This, in turn, enables them to charge higher prices thereby raising the cost of producing final output within the home economy.[5] Because of higher price of output, the consumer surplus falls. Producer Surplus, which

[5] Mergers that are at the same time profit – increasing and welfare reducing only occurs in imperfectly competitive markets: mergers among competing firms with market power tend to reduce competition and thus have anti-competitive price effects. However, this does not imply that mergers are necessarily welfare reducing because a merger may have efficiency gains as well, which have not featured in the model. It has been assumed that the cost remains the same both before and after integration. "Efficiency gains may stem from (1) production reshuffling among the plants that belong to the merged firm so that relatively efficient plants that were underutilized before the merger turn out larger volumes, or production is adjusted to local demand with the effect that transport costs are reduced., (2) scale economies at a single plant (even if other plants use the same technology) (3) synergies by pooling certain functions, and (4) larger innovative capacity leading to future efficiency gains." (Belleflamme and Peitz (2015, p.373)). The assumptions here rule out these effects.

is comprised of the profit of final output producers and intermediate input producers also falls. The former falls because of increased cost and increase price, as a result of which these producers supply less quantity, vis-à-vis the pre-integration case. Thus, their profits reduce and this fall in profit of final output producer is more than the increase in profit of intermediate input producer, which, in turn, reduces the total producer surplus. Thus, the overall welfare falls. Like in the vertical integration case, with this type of integration (at intermediate input stage) as well, the basic result remained the same, i.e., IDS is always optimal and it is a necessary but not sufficient condition for the existence of negative ERP. However, the magnitude of negative protection is now higher compared to the vertical integration case.

5. Finally, this study makes an attempt to rank different types of integration based on their contribution to different components of welfare, and their impact on the optimal tariff structure of the home country. The analyses showed that, from the point of view of the economy and welfare of firms, vertical integration is better than no integration or horizontal integration at the input level, as it leads to an increase in social welfare and a fall in negative rate of effective protection.

With growing interlinkages between trade and competition policies, given the intra-industry type of trade that is dominating the world trade today, this chapter produced a series of important policy inputs that should be considered while addressing the debate of IDS and negative effective protection.

4. Empirical Estimates of Inverted Duty Structure and Effective Rate of Protection - The Case of India

In chapters 2 and 3, the study looks at the optimal tariffs supporting IDS and negative ERP in a theoretical framework. However, as stated by Saha (2019), "Trade policy in India has been the subject of strong political economy arguments. The interaction between the manufacturing industry and the government has been a topic of wide debate with a seemingly likely impact on India's stance in multilateral forums". Until 1990, the role of domestic industries interactions for trade policies was very limited. However, since about 2000, bodies like CII [Confederation of Indian Industry] and FICCI [Federation of Indian Chambers of Commerce and Industry] have become active to combine the interest of domestic producers in determining negotiating positions by communicating with Ministry of Commerce and Industry (Narlikar, 2006; Baru, 2009).

Therefore, in this chapter, this study empirically analyses three rates of tariffs viz., nominal tariffs on imports of final goods, input tariffs imposed on imports of intermediate goods, and ERPs calculated on the basis of both input and output tariffs to indicate the level of actual protection accorded to 24 Indian industries. It utilizes data from the World Input-Output tables (WIOD), which is an initiative on the part of the European Commission, and details information on both domestic and foreign value added for a set of 43

countries, including India.[6] The tariff data was used from World Integrated Trade Solution, commonly referred to as WITS, a World Bank database that provides commodity and country-wise data on import tariffs.[7] The time period chosen for the study (based on availability of latest information) is 2000-2014. The study also compares nominal and effective protection within sectors, to assess the allegations of IDS as raised by various sections of the Indian industries. Despite being familiar with the limitations of the concept of ERP, Bhagwati and Desai (1970) also argued that the effective rate of protection provides a reasonable approximation of the relative trade related incentives that various sectors have.

Based on the nature of WIOD data, the study modifies Corden's measure of ERP (in any sector j) as follows

$$ERP_j = \frac{VA_{Tj} - VA_{FTj}}{VA_{FTj}} \quad (4.1)$$

where, VA_{Tj} refers to value added under restricted trade at basic prices,[8] and VA_{FTj} refers to value added under free trade at basic prices. Value added at basic price is defined as the value of output at basic prices minus intermediate

[6] There are two key advantages of using WIOD database over National Input-Output Table (IOT). The first is its availability as a time series for the period 1995-2014, whereas national IOT used by the earlier researchers are available only for a few disconnected years, with the most recent being for 2007. Hence, they cannot be directly used to compute ERP values for the years other than their reported years unless it is assumed that input-output coefficients remained unchanged in the intervening period. The second difference between the world input-output tables and national IOTs concerns the use tables. Unlike in the national tables, in WIOD the use of products is also broken down according to their origin. Thus, WIOD distinguishes imports by sector and country of origin, which is crucial when different tariff rates are imposed on imports from different countries. Given that the Indian economy is globalizing at a rapid rate, its structure of production and trade has also changed in the past two decades. WIOD allows us to take such changes into account.

[7] The data are available in terms of ISIC Rev. 3, which was then concorded with ISIC Rev. 4 used in WIOD.

[8] The basic price is the amount receivable by a producer from the purchaser for a unit of a good or service produced as output minus any tax payable, and plus any subsidy receivable, on that unit as a consequence of its production or sale; it excludes any transport charges invoiced separately by the producer. (Source: OECD). On the contrary, purchaser's price refers to the price paid by the consumers to the suppliers of the good. In other words, basic prices imply that all the costs are borne by the producers and purchaser's price is the price at which the buyers purchase goods from the producer.

consumption at purchasers' price (Source: Eurostat).[9] can be algebraically represented as follows (based on Corden's approach, modified in view of data availability):

$$VA_{Tj} = VO_j - \sum_i (IC_{ij}) \quad (4.2)$$

where, VO_j refers to value of output of sector j at basic prices, and IC_{ij} refers to intermediate consumption of good i in production of output j at purchaser' price.

Data on VO and IC in WIOD have been reported in domestic prices, which would reflect the import tariffs imposed on the import of the final output and intermediate input. In order to find the counterfactual (i.e., value added under free trade, or VAFT), the study deflates the ex-post value of output and intermediate inputs by the rate of tariff charged on each product. The value of, VA_{FTj} thus, can be represented as follows:

$$VA_{FTj} = \frac{VO_j}{(1+t_j)} - \sum_i \frac{IC_{ij}}{(1+t_i)} \quad (4.3)$$

Here, t_j refers to ad valorem tariff on import of final output j and t_i refers to ad valorem tariff on imports of intermediate consumption.

The methodology adopted in the study raises some conceptual issues. Based on Corden (1971) and the available data, the study treats domestic prices of tradable goods as free trade prices plus the tariff. Further, the earlier authors who estimated ERPs for India had to deal with complications that distorted this simple relationship, such as QRs/NTBs, canalisation of imports, export subsidies, price controls, and administered pricing of tradable goods produced

[9] Since the available data gives the value of intermediate consumption at a basic price, the value for the same has to be calculated at purchasers' price. The difference between the basic prices and purchaser prices arise because of the two cost components, namely international transport margin (or ITM) and net indirect taxes (or NIT). Therefore, to calculate value added at purchaser prices, intermediate consumption (which is at basic prices), NIT and ITM are added from the value of output at purchasers' price. Algebraically, IC (purchasers' price) = IC (basic price) + +, where refers to net taxes on product i, which, in turn, is equal to taxes minus subsidies and refers to ITMs where it includes all automotive trade, wholesale trade, retail trade and transport margins.

by the public sector. Since most of these distortions had been phased out by the beginning of the present study's time period (under consideration), these have not been considered for estimation. However, a more serious issue is that this method of calculating the counterfactual VAFT only deflates the price components of VO and IC to the level of world prices, leaving the quantities of inputs and outputs unchanged at the level they would be in the original situation of restricted trade. This method, thus, gives what Guisinger (1969) called value added at world prices (VAWP), which equals VAFT only under certain restrictive conditions. As there is no acceptable way of dealing with this problem, the study uses VAWP as a proxy for VAFT.

Rewriting the value of ERP in terms of equation (4.2) and (4.3), yields

$$\mathrm{ERP_j} = \frac{\mathrm{Equation(4.2)} - \mathrm{Equation(4.3)}}{\mathrm{Equation(4.3)}}$$

$$\mathrm{ERP_j} = \frac{(\mathrm{VO_j} - \sum(\mathrm{IC_{ij}})) - (\frac{\mathrm{VO_j}}{(1+\mathrm{t_j})} - \sum_i \frac{\mathrm{IC_{ij}}}{(1+\mathrm{t_j})})}{\frac{\mathrm{VO_j}}{(1+\mathrm{t_j})} - \sum_i \frac{\mathrm{IC_{ij}}}{(1+\mathrm{t_i})}} \tag{4.4}$$

Solving equation (4.4) thus generates the final expression for calculating ERP based on the availability of the WIOD data,

$$\mathrm{ERP_j} = \frac{\frac{\mathrm{t_j\ VO_j}}{(1+\mathrm{t_j})} - \sum_i \frac{\mathrm{t_i\ IC_{ij}}}{(1+\mathrm{t_i})}}{\frac{\mathrm{VO_j}}{(1+\mathrm{t_j})} - \sum_i \frac{\mathrm{IC_{ij}}}{(1+\mathrm{t_i})}} \tag{4.5}$$

Equation (4.5) is just a reformulation of Corden's measure, and directly uses the values of inputs and outputs, rather than input-output coefficients (as in the Corden's formula).

Another methodological issue that needs attention relates to the divergence of opinion on the treatment of non-traded inputs while calculating the measure

of ERP.[10] Balassa (1965) argued that non-traded inputs could be treated as if they were traded inputs in infinitely elastic supply with zero tariffs. In such circumstances, their price would be insensitive to protection.[11] In contrast, Corden (1966) argued that value added in non-traded inputs should be aggregated with all other value added. In effect then, non-traded inputs enjoy the same level of protection as primary factors. As evaluated by Bhagwati and Srinivasan (1993, pp.32-33), Corden (1966) alleged that the Balassa method estimates "would bias the measures away from the correct resource allocation predictions. On the other hand, in Corden's model, the non-traded input is just a proxy for a primary factor which is not traded itself; hence the analysis does not really come to grips with the problem in any essential way." Thus, there is no conclusive theoretical guideline for the treatment of non-traded goods while measuring effective rate of protection. Like Bhagwati and Desai, this study has employed both the methods, as a kind of sensitivity analysis. It assumes that the true value of ERP lies between these two measures defined by Corden and Balassa.

Depending upon the treatment of non-traded inputs and the study's methodology for computing ERP, the following points can be inferred:

1. In cases when Balassa's technique is used, average input tariffs will always be relatively less, vis-à-vis that of the tariffs determined using Corden's measure. This is because the study is referring to import weighted tariffs and while Balassa considers non-traded input as equivalent to traded inputs with zero tariffs, Corden assumes that non-traded inputs constitute a part of value added only and hence, he doesn't deduct them from the value of output while computing value added.

[10] Non-traded: 'These are goods (and above all, services) where no significant part of domestic consumption is imported or of production is exported so that they do not have their prices set in the world market. They may be conceivably or physically tradeable, but because of transport costs or for other reasons are not actually traded.' (Corden 1971, p.99).

[11] However, in such a case, even the value of non-traded inputs will get affected by exchange rate fluctuations. On the contrary, in case of Corden methodology, any change in exchange rate will not impact the value of non-traded inputs. It is important to note that in the analyses that follows, the effect of exchange rate fluctuations in impacting the rate of effective protection is not considered. The possible indirect effect of protection of traded inputs used to produce non-traded inputs, which would affect their prices, is also ignored.

2. The measure of value added under free trade using Corden's treatment of non-traded goods will always be higher than when Balassa's technique is employed.

3. Following 1 and 2, the measure of ERP defined using Corden's technique should always be less than ERP determined using Balassa's technique, provided that both value added under free trade and under restricted trade are positive.

After computing these two estimates of ERP, the study checks if IDS exists in any of the industries under consideration. Since one product may employ more than one input in its production, and both inputs as well as final goods are imported from different countries which might be subject to different tariffs, the study calculates import weighted average input and output tariffs to verify the existence/non-existence of IDS.[12]

Based on the ERP calculations for the 24 industries under consideration, the following observations are in order:

1. Overall effective protection has declined and so have the rates of nominal tariffs during the 15 years' period under consideration, thus highlighting the effect of trade liberalising policies being implemented by the government of India. Tariff rates on agricultural and allied activities have increased overtime while those on non-agricultural commodities have fallen significantly. This is primarily because in the recent years, more preferential trade agreements have been signed and more relaxations have been done for non-agricultural than for agricultural commodities, many of which are categorized as sensitive items. Moreover, imports of

[12] The study computes a measure of duty inversion for each sector by comparing weighted averages of its input and output tariffs. The formula for the latter is the used above (see n 12), while for input tariffs it is:

$$Avt_{ij} = \frac{\sum_{ik} (t_{ijk} * M_{ijk})}{\sum_{ik} M_{ijk}}$$

where i is input, j is output, k is country, and M_{ijk} is the import of input i from country k required in production of output j.12 IDS will be observed whenever $Av_{tij} > t_j$.

many agricultural commodities are still restricted by high levels of non-tariff barriers. Taking this into consideration, one may conclude that the estimated measure of ERP on agriculture and allied activities does not truly represent the actual level of protection accorded to domestic firms in this industry.

2. During the initial 3-4 years (i.e., early 2000s), the rates of effective protection have been quite high for most of the industries. This has been mainly because of higher output tariffs leading to higher ERP. However, after that ERP experienced a decline, with the fall in the rates of nominal tariffs, though ERP remained above NRP for most of the cases. Here, it is worth noting that for some of the industries, the study observes different values for Corden and Balassa measures. This is because of the difference in the treatment of non-traded inputs, but the values tend to converge to each other over time.

3. Thirdly, the findings indicate that in sectors such as paper and paper products, chemical and chemical products, pharmaceuticals, computer, electronics and optical products, machinery and equipment, IDS existed for most of the years under consideration. However, none of these industries experienced a negative ERP during those years.

4. Out of the industry-year observations raised in point (3), the instance of negative ERP arises only in those sectors and in those industries where there is negative value added under free trade (VAFT) – a situation in which the industry would not survive under free trade. However, the study did not find a case of negative ERP, which arises in a situation in which input tariffs raise costs so much that, despite being protected on the output side, the industry would be better off under free trade. Nevertheless, finding of negative VAFT should not be generalised because the study found such instances only for a few industries in a few years during 2000-14, so this does not imply that these industries are structurally uncompetitive at world prices. Finally, the study showed statistically and econometrically that, in line with theoretical expectations, both positive and negative rates of effective protection are

positively related to the degree of tariff escalation.[13] **Figures 4.1** and **4.2** show this relationship between Corden's and Balassa's measure of ERP and tariff escalation, simultaneously, while **Table 4.1** presents estimation results from a simple regression of ERP on tariff escalation.

Figure 4.1: Relationship between Corden ERP and Tariff Escalation

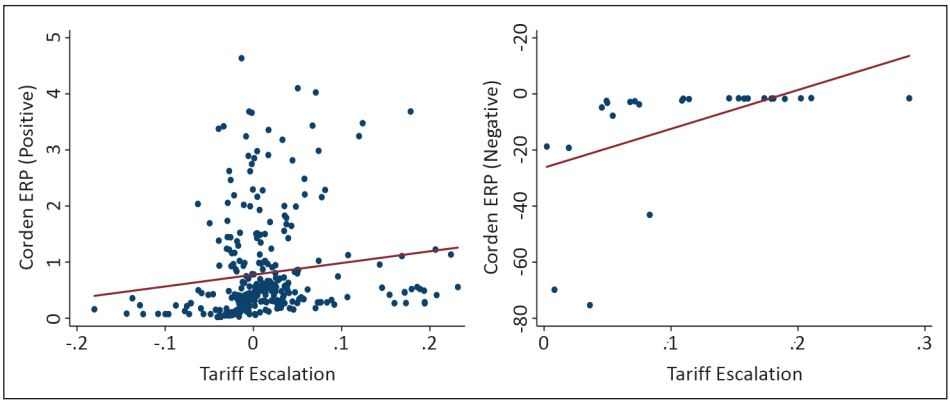
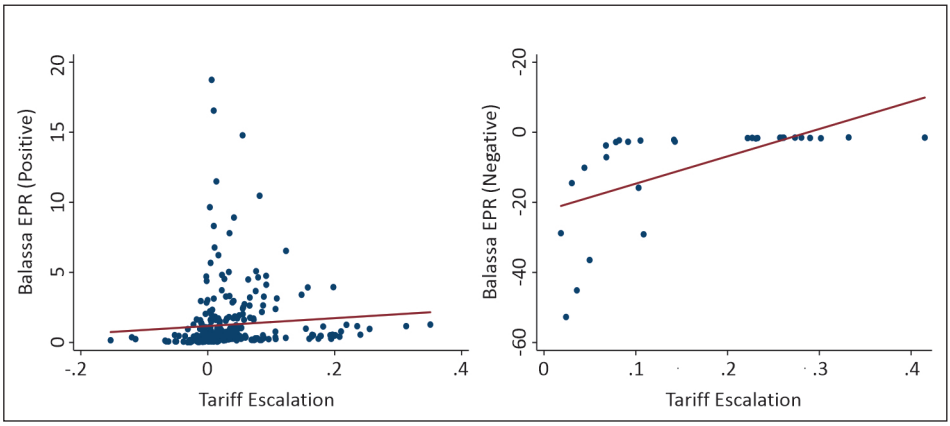


Figure 4.2: Relationship between Balassa ERP and Tariff Escalation



[13] The detailed analysis is shown in Appendix 4.1

Table 4.1: Regression Results

Variables	ERP
Tariff Escalation	5.4594*** (1.6307)
Constant	2.6900*** (0.2833)
Industry FE	Yes
Year FE	Yes
Observations	239
No. of industries	16
R-squared	0.3965

*Standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.10)*
Source: Author's calculations

There are, however, some limitations of this empirical exercise. First, the study has computed Value Added at World Prices (VAWP) as a proxy for the theoretically appropriate VAFT. VAWP does not allow for quantity adjustments in response to hypothetical tariff changes, but there is no feasible alternative. Second, it has used total value of output of each sector from the WIOD tables. To the extent that a sector exports some of its output, it does not benefit from protection of its domestic market, while its costs are raised by tariffs on its tradable inputs. Its ERP, as measured in this study, would therefore be over-estimated. However, exporters receive drawbacks of duties paid on inputs used for export production, while those located in Special Economic Zones can access duty-free imported inputs, and also sell a proportion of their output on the domestic market. There is no practical way to incorporate these details into the calculations that have been done in this study. Third, India has become one of the world's biggest users of anti-dumping and countervailing duties, which are superimposed on the MFN or concessional tariffs that the study obtained from the WITS database. Such 'contingent protection' measures are mainly imposed on intermediate inputs, so not taking them into account would result in an underestimate of their ERPs but an overestimate of the ERPs of the user industries. However, such measures are usually imposed as specific (per unit) duties, and would be hard to combine with the WITS tariffs, which are ad valorem or converted to ad valorem.

No earlier researcher has been able to get around these three limitations in the Indian context.[14] A final limitation is specific to the WIOD database that the study has employed to measure ERPs. The database defines sectors at a high level of aggregation, and hence, the study could not examine the consequences of IDS in the specific industries that have been complaining about it, as highlighted in the introductory section. It is possible that the study might find IDS associated with negative ERP in more narrowly defined activities.[15] But WIOD offers the advantages described above, which represent a major advance over all earlier contributions to the literature.

To conclude, in the absence of any recent research on ERP and IDS in the context of the Indian economy, the present study makes an important step forward, and shed light on the actual pattern of protection resulting from a complex duty structure with highly differentiated applied tariffs. This could at least encourage more informed debate on trade-policy reform.

[14] The impact of exchange rate changes on the rate of effective protection is also not considered. A hypothetical move from restricted trade to free trade will worsen the trade balance, which will induce a currency depreciation. This would raise the price of imports in local currency, offsetting the removal of the tariff. The ERP should thus be adjusted downward (Corden, 1971, ch.5). The possible indirect effect of protection of traded inputs used to produce non-traded inputs, which would affect their prices, is also ignored. None of the earlier studies on India have taken these general equilibrium complications into account as well.

[15] However, some of the cases that are extracted from news reports in Section I involve IDS within very narrowly defined industries that would be internal to even a highly disaggregated industrial classification. For example, secondary metal producers complained about the duties on the scrap metals they use as an input, while finished metal products like sheets, plates and tubes are imported duty-free. Note that these finished products themselves would be classified as intermediate inputs, and any user industries within the same classification that compete against imports which carry a positive duty would benefit from tariff escalation. So we can have inverted and escalated tariff duties within the same 'industry'. Moreover, the primary metal producers actually called for an increase in the duty on imported scrap, in order to raise the costs of their rivals who compete with them in the same industry but use a different technology. This case reminds us that the ERP concept applies to the effect of the tariff structure on a process rather than an industry. It also shows how there can be conflicting interests between firms located both vertically and horizontally with respect to each other in the same industry.

5. Conclusion

Policies to correct IDS appear simple in theory but are complicated in practice. Trade theorists would simply advocate across the board free trade, or uniform tariffs as a second-best alternative. Those with a development orientation would call for mild tariff escalation so as to encourage developing countries to move up the value chain into products that require a higher degree of processing. But correcting inversion would mean reducing tariffs on inputs, which would hurt the input producing industries, or raising tariffs on outputs, which would hurt user industries or final consumers. The real-world political economy problems would be hard to deal with. It has been three decades now since India announced its first set of economic reforms and started following the so-called Liberalisation Privatisation Globalisation model. Despite being an active member at the World Trade Organisation (WTO), and introducing various trade and investment liberalisation policies from time to time, the country's tariff structure has often been questioned by various researchers and academicians. The present study makes an attempt to address one of the most recent concerns raised by the Indian industrialists regarding the existence of inverted duty structure, and its consequences on their sales (both domestic and exports) as well as profitability. This is an important issue to understand, given the fact that unlike 1950s or so, more than two-thirds of the global trade involves trade in intermediate inputs, and the majority of it is guided by the so-called internationally fragmented value chains. In fact, many Indian Regional Trade Agreements have been concluded with countries (mostly from East and South East Asia) from whom it imports several final consumer goods, thus raising the potential for the existence of IDS. This rising likelihood of IDS and potential import threat perceptions from the country's regionalisation drive, was one of the quoted reasons as to why India opted out of the Regional Comprehensive Economic Partnership (RCEP) Agreement

(Nag et al. 2021). However, no theoretical study has been undertaken thus far to critically examine the welfare implications of such a tariff structure on a country's industrial performance both domestically as well as in the foreign market.

The present study provides a rationale for the existence of IDS in the presence of an oligopolistic market structure, where tariffs are determined endogenously by the governments of different countries. This implies that under certain conditions, duty inversion supports higher overall welfare of an economy. More so, it can become harmful for industries only when IDS eliminates protection accorded to them, which is not generally the case as suggested by the two theory chapters, and empirically verified by the third chapter of the study. Moreover, the theoretical assessments clearly highlight that these trade instruments (tariffs, in the present case) depend crucially on a country's size vis-à-vis the partner economy, and also the cost of labour (the only factor input assumed in the model). Even the magnitude of negative effective protection and the existence of duty inversion depend crucially on these domestic factors, relative to the foreign market.

Thus, despite the fact that the concept of effective protection has fallen out of favour in the past two decades or so, due to its limitation in the context of general equilibrium theory, in the present study, it still provides an appropriate tool to navigate the reasons of whether IDS implies negative ERP, or in general, to examine the extent of protection accorded to a country's industry. The important conclusion, therefore, is that governments as well as industries should really be concerned about the extent of effective protection, and not about the prevalence of IDS in specific sectors. Given the fact that re-examining a country's tariffs structure and revising its policies are fairly complicated in reality, the policy conclusions derived in this study might help in encouraging more informed trade policy debate and further research in this area.

References

Agarwal, A. (2019, July 8). Budget 2019: Result-oriented, well-balanced and pragmatic. *Live Mint.* Retrieved from https://www.livemint.com/budget/opinion/opinion-budget-2019-result-oriented-well-balanced-and-pragmatic-1562527126514.html

Balassa, B. (1965). Tariff protection in industrial countries: An evaluation. *Journal of Political Economy*, 73, 573-594.

Balassa, B. (1971). Effective protection in developing countries. In Bhagwati, J.N. et al. (Ed.), *Trade, balance of payments and growth: Papers in international economics* in honour of Charles P. Kindleberger. Amsterdam.

Baru, S. (2009). The influence of business and media on Indian foreign policy. *India Review*, 8(3), 266–285.

Belleflamme, P., & Peitz, M. (2015). *Industrial organization: markets and strategies*. UK: Cambridge University Press.

Bernhofen, D. M. (1997). Strategic trade policy in a vertically related industry. *Review of International Economics*, 5(3), 429-433.

Bhagwati, J., & Desai, P. (1970). *Planning for industrialization: A study of India's trade and industrial policies since 1950*. New Delhi: Oxford University Press.

Bhagwati, J. N., & Srinivasan, T. N. (1973). The general equilibrium theory of effective protection and resource allocation. *Journal of International Economics*, 3(3), 259-281.

Bhagwati, J. N., & Srinivasan, T. N. (1975). *Foreign trade regimes and economic development: India*. New York: NBER.

Bhagwati, J. N., & Srinivasan, T. N. (1993). *India's economic reforms*. New Delhi: Ministry of Finance, Government of India

Brander, J. A. (1981). Intra-industry trade in identical commodities. *Journal of international Economics*, 11(1), 1-14.

Brander, J. A., & Spencer, B. J. (1984). Trade warfare: tariffs and cartels. *Journal of international Economics*, 16(3-4), 227-242.

Brander, J. A., & Spencer, B. J. (1985). Export subsidies and international market share rivalry. *Journal of international Economics*, 18(1-2), 83-100.

Brander, J., & Krugman, P. (1983). A 'reciprocal dumping' model of international trade. *Journal of international economics*, 15(3-4), 313-321.

BS Bureau. (2016, August 22). Inverted duty structure hurting Indian toy manufacturers. Business Standard. Retrieved from https://www.business-standard.com/content/b2b-manufacturing-industry/inverted-duty-structure-hurting-indian-toy-manufacturers-116082200654_1.html

Corden, W. M. (1966). The structure of a tariff system and the effective protective rate. *Journal of Political Economy*, 74(3), 221-237.

Corden, W. M. (1971). *The theory of protection*. Oxford: Clarendon Press.

Dixit, A. (1984). International trade policy for oligopolistic industries. *The Economic Journal*, 94(Supplement), 1-16.

Ethier, W. (1972). Input substitution and the concept of the effective rate of protection. *The Journal of Political Economy*, 80(1), 34-47.

Eurostat. (2008) *Eurostat Manual of Supply, Use and Input-Output Tables. Luxembourg*: Eurostat.

FICCI. (2016). *FICCI survey on inverted duty structure in Indian manufacturing sector*. Retrieved from http://ficci.in/Sedocument/20375/FICCI-INVERTED-DUTY-Report-2016.pdf.

FIEO. (2019, July 2). *FIEO's wish list for the Union Budget to chart higher growth trajectory for exports: Sharad Kumar Saraf, President, FIEO* (Press Release FIEO/PUB/PR/30/19). Retrieved from https://www.fieo.org/view_Press_ Releases_detail.php?lang=0&id=0,21&dcd=5580&did=15620628844nfru21m0hup7ve5fnnblth171

GoI. (2019). *Union Budget 2019-2020: Speech of Nirmala Sitharaman*. New Delhi: Government of India. Retrieved from https://www.indiabudget.gov.in/budget speech.php

GoI Tariff Commission (2020). *Role and Structure of the Tariff Commission*. (Volume 1). Tariff Commission, GoI, Lok Nayak Bhawan, New Delhi-IN. Retrieved from https://tc.nic.in/site/writereaddata/siteContent/20201026142244747 9Document%20on%20the%20Tariff%20Commission%20Volume%201.pdf

GoI. (2021). *Union Budget 2019-2020: Speech of Nirmala Sitharaman*. New Delhi: Government of India. Retrieved from https://www.indiabudget.gov.in/doc/ Budget_Speech.pdf

Greenaway, D., & Milner, C. (2003). *Effective protection, policy appraisal and trade policy reform* (University of Nottingham Research Paper No. 2003/06). Nottingham: University of Nottingham.

Guisinger, S. E. (1969). Negative value added and the theory of effective protection. *The Quarterly Journal of Economics*, 83(3), 415-433.

Ishikawa, J., & Lee, K. D. (1997). Backfiring tariffs in vertically related markets. *Journal of International Economics*, 42(3-4), 395-423.

Ishikawa, J., & Spencer, B. J. (1999). Rent-shifting export subsidies with an imported intermediate product. *Journal of International Economics*, 48(2), 199-232.

Iyenger, S.P. (2015, December 4). 5% inverted duty hits copper alloy fabricators hard. *The Hindu*. Retrieved from https://www.thehindubusinessline.com/markets/ commodities/5-inverted-duty-hits-copper-alloy-fabricators-hard/article7949202.ece

Jha, D. (2019, June 20). Secondary metals producers fear inverted duty structure could hurt. *Business Standard*. Retrieved from https://www.business-standard.com/ article/companies/secondary-metals-producers-fear-inverted-duty-structure-could-hurt-119061900301_1.html

Jones, R.W., & Neary, J.P. (1984). The positive theory of international trade. In R.W. Jones & P.B. Kenen (Eds.), *Handbook of international economics*, Volume1 (pp.1-62). Amsterdam: North-Holland.

Kawabata, Y. (2014). Optimum-welfare and maximum-revenue tariffs in vertically related markets. *Modern Economy*, 5(05), 589.

Kumar, K. (2019, July 5). Budget 2019: Tyre industry finds budget a mix bag. *The Economic Times*. Retrieved from https://economictimes.indiatimes.com/ industry/auto/tyres/budget-2019-tyre-industry-finds-budget-a-mixed-bag/articleshow/70094202.cms

McCorriston, S., & Sheldon, I. (2011). Tariff (de-) escalation with successive oligopoly. *Review of Development Economics*, 15(4), 587-600.

Nag, B., Chakraborty, D., and Aggarwal, S. (2021). *India's Act East Policy: RCEP Negotiations and Beyond* (No. EC-21-01). Indian Institute of Foreign Trade.

Narlikar, A. (2006). Peculiar chauvinism or strategic calculation? Explaining the negotiating strategy of a rising India. *International Affairs*, 82(1), 59–76.

PTI. (2016a, February 22). Budget 2016: Steel ministry for reviewing inverted duty structure, peak duty rate. *The Economic Times*. Retrieved from https://economictimes.indiatimes.com/news/economy/policy/budget-2016-steel-ministry-for-reviewing-inverted-duty-structure-peak-duty-rate/articleshow/ 51092249.cms?from=mdr

PTI. (2016b, January 19). Address inverted duty structure in Budget to boost exports. *The Economic Time*s. Retrieved from https://economictimes.indiatimes.com/ news/economy/policy/address-inverted-duty-structure-in-budget-to-boost-exports-fieo/articleshow/50643059.cms?from=mdr

PTI. (2019, April 23). EEPC seeks removal of inverted duty structure in imported copper. *Business Standard*. Retrieved from https://www.business-standard. com/article/pti-stories/eepc-seeks-removal-of-inverted-duty-structure-in-imported-119042301010_1.html

Pursell, G., & Roger, N. (1985). *Manual for incentive and comparative advantage studies*. World Bank: Mimeo.

Ramaswami, V. K., & Srinivasan, T. N. (1971). Tariff Structure and Resource Allocation in the Presence of Factor Substitution: A Contribution to the Theory of Effective Protection. In Bhagwati, J. N., Jones, R., Mundell, R., & Vanek, R. (Eds.), *Trade, Payments and Welfare: Essays in International Economics*, in honor of CP Kindelberger. Amsterdam: North-Holland Publishing Co.

Saha, A. (2019). Trade policy & lobbying effectiveness: Theory and evidence for India. *European Journal of Political Economy*, 56, 165-192.

Salant, S. W., Switzer, S., & Reynolds, R. J. (1983). Losses from horizontal merger: the effects of an exogenous change in industry structure on Cournot-Nash equilibrium. The Quarterly Journal of Economics, 98(2), 185-199.

Salinger, M. A. (1988). Vertical mergers and market foreclosure. *The Quarterly Journal of Economics*, 103(2), 345-356.

Seth, D. (2015, March 1). Budget 2015: FM Arun Jaitley proposes to rectify inverted duty structure for domestic units. *The Economic Times*. Retrieved from http://economictimes.indiatimes.com/news/economy/policy/budget-2015-fm-arun-jaitley-proposes-to-rectify-inverted-duty-structure-for-domestic-units/articleshow/46416455.cms

Singh, H.V. (2017). Trade-policy reform in India since 1991. In R. Mohan (Ed.), *India transformed: 25 years of economic reforms* (pp. 110-161). Gurgaon: Penguin Viking.

Spencer, B. J., & Jones, R. W. (1991). Vertical foreclosure and international trade policy. *The Review of Economic Studies*, 58(1), 153-170.

Spencer, B. J., & Jones, R. W. (1992). Trade and protection in vertically related markets. *Journal of International Economics*, 32(1-2), 31-55.

The Hindu Bureau. (2015, October 6). Case for inverted duty structure in steel sector: NITI Aayog member. *The Hindu*. Retrieved from https://www.thehindu businessline.com/economy/case-for-inverted-duty-structure-in-steel-sector-niti-aayog-member/article7730088.ece

Wang, K. C., Koo, H. W., & Chen, T. J. (2005). Strategic buying or selling? : The behavior of vertically-integrated firms in the intermediate goods market. *Journal of Economic Integration*, 366-382.

Wang, K. C. A., Koo, H. W., & Chen, T. J. (2011). Domestic trade protection in vertically-related markets. *Economic Modelling*, 28(4), 1595-1603.

World Bank (1989). *India: An industrializing economy in transition*. Washington DC: World Bank

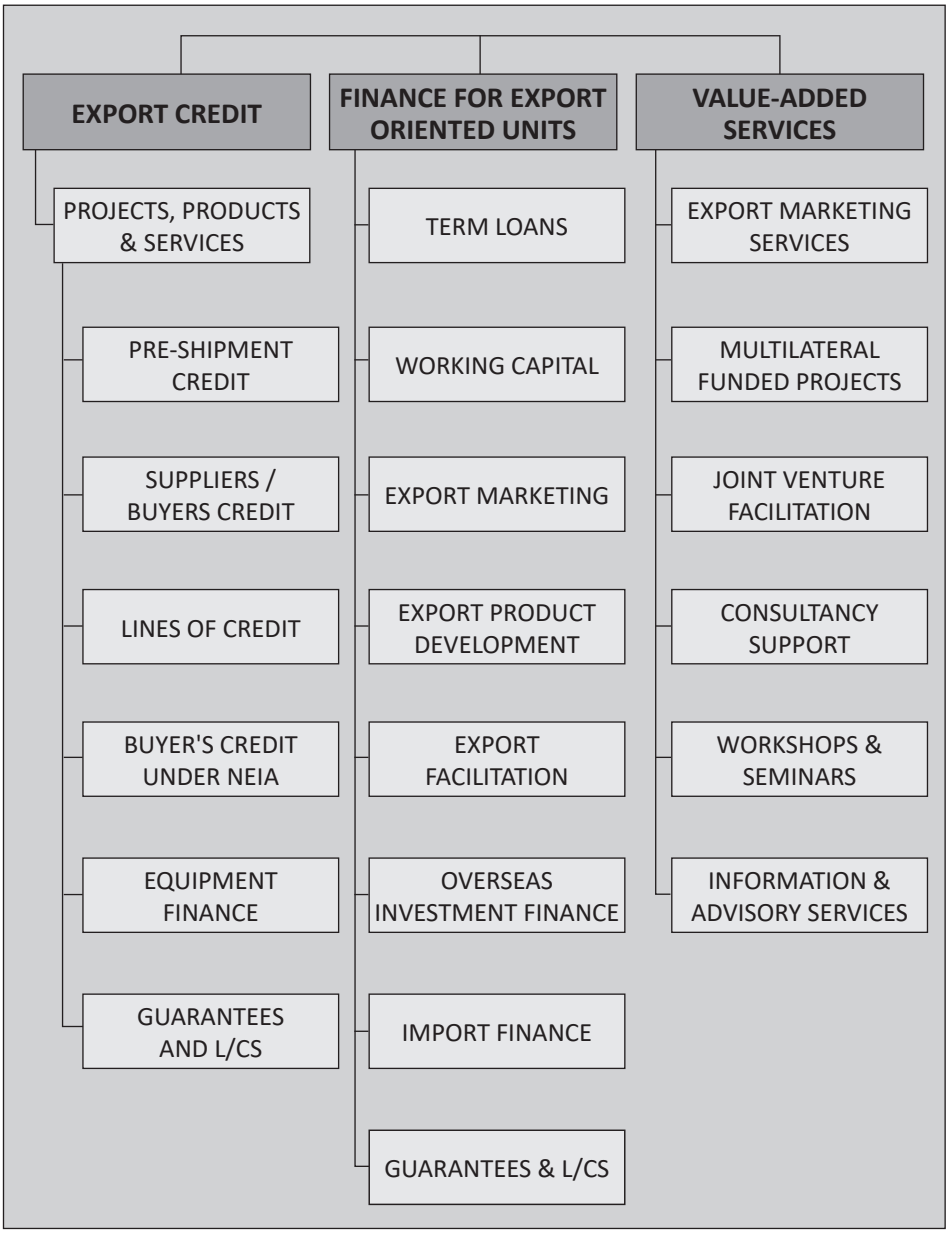
RECENT OCCASIONAL PAPERS

OP No.	Title
145.	West African Region: A Study of India's Trade and Investment Potential
146.	India's Trade and Investment Relations with LDCs (Least Developed Countries): Harnessing Synergies
147.	Indian Electronic Industry : Perspectives and Strategies
148.	Export Potential of Indian Plantation Sector: Prospects and Challenges
149.	Mercosur: A Study of India's Trade and Investment Potential
150.	Openness and Growth of the Indian Economy: An Empirical Analysis
151.	The Commonwealth: Promoting a Shared Vision on Trade and Investment
152.	Southern African Development Community (SADC): A Study of India's Trade and Investment Potential
153.	Strategic Development of MSMEs: Comparison of Policy Framework and Institutional Support Systems in India and Select Countries
154.	Indian Chemical Industry : Exploring Global Demand
155.	Technological Interventions In Indian Agriculture for Enhancement of Crop Productivity
156.	Exports of Services and Offshore Outsourcing: An Empirical Investigation in the Indian Context
157.	Indian Ocean Rim Association for Regional Co-operation (IOR-ARC): A Study of India's Trade and Investment Potential
158.	West Africa: A Study of India's Trade and Investment Potential
159.	The Effects of Financial Openness: An Assessment of the Indian Experience
160.	Comparison of Labour Laws: Select Countries
161.	India's Trade and Investment Relations with Cambodia, Lao PDR, Myanmar, Vietnam (CLMV): Enhancing Economic Cooperation
162.	Indian Horticulture-Imperatives to Enhance Trade from India
163.	India's Trade and Investment Relations with Gulf Cooperation Council (GCC): Strengthening Economic Ties
164.	India's Hi-Tech Exports: Potential Markets and Key Policy Interventions
165.	Outward Direct Investment from India: Trends, Objectives and Policy Perspectives
166.	East African Community (EAC): A Study of India's Trade and Investment Potential
167.	Trade Liberalization, Product Variety and Growth
168.	Research & Development in BRICS: An Insight
169.	Indian Capital Goods Industry: A Sector Study
170.	Bangladesh: A Study of India's Trade and Investment Potential
171.	Indian Electronic Goods Industry: Neutralizing Trade Deficit with China
172.	Indian Steel Industry: Export Prospects
173.	Value Addition Chains and Trade in Manufactured Commodities in South-East Asia
174.	Potential for Trade of Organic Products from India
175.	Multilateral Development Bank- Funded Project: Trends and Opportunities for Indian Exports

176. Indian Pharmaceutical Industry: Challenges and Prospects
177. Migration and Remittances in India
178. Technical Progress and Structural Change: The Roles of Demand and Supply in Economic Growth
179. Inter-linkages between Exports and Employment in India
180. India's Engagements with CLMV: Gateway to ASEAN Markets
181. Export Promotion From Rajasthan: Key Insights And Policy Suggestions
182. Potential for Enhancing Exports from Andhra Pradesh
183. The Internationalisation of Indian firms through outbound Foreign Direct Investment: Nature, determinants and developmental consequences
184. Financialization and its Implications on the Determination of Exchange rate of Emerging Market Economies
185. Export from Uttar Pradesh: Trends, Opportunities and Policy Perspectives
186. Essays on International Trade, Welfare and Inequality
187. Essays in Indian Trade Policy
188. Exchange Rate Dynamics and its Impact on India's Exports to USA and EU: An Assessment
189. Liberalisation, Wages and Sector Growth : General Equilibrium Analysis for India
190. Manufacturing in SADC: Moving Up the Value Chain
191. North Africa: Unlocking India's Trade and Investment Potential
192. Essays on Education and Institutions in Developing Countries
193. Project Exports From India: Strategy for Reenergizing and Reorienting
194. Packaging Sector: Potential And Way Forward
195. Realizing India's Trade & Investment Potential with South Korea
196. India & Central Asia: Reinitalizing Trade & Investment Relations
197. AfCFTA: Opportunities for India in Africa's Economic Integration
198. India-CLMV: Building Supply Chains in Asia
199. Self-Reliant India- Approach and Strategic Sectors to Focus
200. Essays in Trade and Development Economics
201. The Political Origin and Firm-level Consequences of Bank Proliferation in China
202. Building Infrastructure in CLMV: Opportunities for India
203. Building Value Chain: Opportunities for India and ASEAN
204. Essays in International Trade in Post Liberalization India
205. Indian Apparels - A Sector Study
206. India Engagements in FTAs: Looking Ahead
207. Indian Dairy Sector : Recent Trends and Prospects for Greater Export Orientation
208. Export Potential of India's Shrimps and Prawns
209. Empirical Studies in International Trade
210. Project Exports from India: Tapping Potential Amid Changing Dynamics
211. Essays on Finance and Development
212. Economic Impact of Russia-Ukraine Conflict An Indian Perspective

INDIA EXIM BANK'S MAJOR PROGRAMMES

Bank's Major Programmes



EXPORT-IMPORT BANK OF INDIA

HEAD OFFICE

Centre One Building, 21st Floor, World Trade Centre Complex, Cuffe Parade, Mumbai 400 005.
Phone: (91 22) 22172600 Fax : (91 22) 22182572
E-mail : ccg@eximbankindia.in Website: www.eximbankindia.in

LONDON BRANCH

5th Floor, 35 King Street, London EC2V 888 United Kingdom
Phone : (0044) 20 77969040 Fax : (0044) 20 76000936 E-Mail :eximlondon@eximbankindia.in

DOMESTIC OFFICES

Ahmedabad
Sakar II, 1st Floor,
Next to Ellisbridge Shopping Centre,
Ellisbridge P. O., Ahmedabad 380 006
Phone : (91 79) 26576852
Fax : (91 79) 26577696
E-mail : eximahro@eximbankindia.in

Bengaluru
Ramanashree Arcade, 4th Floor,
18, M. G. Road,
Bengaluru 560 001
Phone : (91 80) 25585755
Fax : (91 80) 25589107
E-mail : eximbro@eximbankindia.in

Chandigarh
C- 213, Elante offices, Plot No. 178-178A,
Industrial Area phase 1,
Chandigarh 160 002
Phone : (91 172) 4629171/73
Fax : (91 172) 4629175
E-mail : eximcro@eximbankindia.in

Chennai
Overseas Towers, 4th and 5th Floor,
756-L, Anna Salai, Chennai 600 002
Phone : (91 44) 28522830/31
Fax : (91 44) 28522832
E-mail : eximchro@eximbankindia.in

Guwahati
NEDFi House, 4th Floor, GS Road,
Dispur, Guwahati 781 006
Phone : (91 361) 2237607 /609
Fax : (91 361) 2237701
E-mail : eximgro@eximbankindia.in

Hyderabad
Golden Edifice, 2nd Floor,
6-3-639/640, Raj Bhavan Road,
Khairatabad Circle, Hyderabad 500 004
Phone : (91 40) 23307816
Fax : (91 40) 23317843
E-mail : eximhro@eximbankindia.in

Kolkata
Vanijya Bhawan, 4th Floor,
(International Trade Facilitation Centre),
1/1 Wood Street,
Kolkata 700 016
Phone : (91 33) 68261301
Fax : (91 33) 68261302
E-mail : eximkro@eximbankindia.in

Mumbai
8th Floor, Maker Chamber IV,
Nariman Point,
Mumbai 400 021
Phone : (91 22) 22861300
Fax : (91 22) 22182572
E-mail : eximmro@eximbankindia.in

New Delhi
Office Block, Tower 1, 7th Floor,
Adjacent Ring Road, Kidwai Nagar (E)
New Delhi - 110 023
Phone : (91 11) 61242600 / 24607700
Fax : (91 11) 20815029
E-mail : eximndo@eximbankindia.in

Pune
No. 402 & 402(B), 4th floor,
Signature Building, Bhamburda,
Bhandarkar Rd., Shivajinagar,
Pune - 411 004
Phone : (91 20) 26403000
Fax : (91 20) 25648846
E-mail : eximpro@eximbankindia.in

OVERSEAS OFFICES

Abidjan
5th Floor,
Azur Building,
18-Docteur Crozet Road,
Plateau,
Abidjan,
Côte d'Ivoi re
Phone : (225) 2720242951
Fax : (225) 2720242950
Email : eximabidjan@eximbankindia.in

Addis Ababa
House No. 46,
JakRose Estate Compound,
Woreda 07,
Bole Sub-city,
Addis Ababa,
Ethiopia.
Phone : (251) 118222296
Fax : (251) 116610170
Email : aaro@eximbankindia.in

Dhaka
Madhumita Plaza, 12th Floor,
Plot No. 11, Road No. 11, Block G,
Banani, Dhaka, Bangladesh - 1213.
Phone : (88) 01708520444
E-mail : eximdhaka@eximbankindia.in

Dubai
Level 5, Tenancy lB,
Gate Precinct Building No. 3,
Dubai International Financial Centre,
PO Box No. 506541, Dubai, UAE.
Phone : (971) 43637462
Fax : (971) 43637461
E-mail : eximdubai@eximbankindia.in

Johannesburg
2nd Floor, Sandton City Twin Towers East,
Sandhurst Ext. 3, Sandton 2196,
Johannesburg, South Africa.
Phone : (27) 113265103
Fax : (27) 117844511
E-mail : eximjro@eximbankindia.in

Singapore
20, Collyer Quay, #10-02,
Tung Centre, Singapore 049319.
Phone : (65) 65326464
Fax : (65) 65352131
E-mail : eximsingapore@eximbankindia.in

Washington D.C.
1750 Pennsylvania Avenue NW,
Suite 1202,
Washington D.C. 20006,
United States of America.
Phone : (1) 2022233238
Fax : (1) 2027858487
E-mail : eximwashington@eximbankindia.in

Yangon
House No. 54/A, Ground Floor,
Boyarnyunt Street, Dagon Township,
Yangon, Myanmar
Phone : (95) 1389520
E-mail : eximyangon@eximbankindia.in

India Exim Bank

Centre One Building, 21st Floor, World Trade Centre Complex, Cuffe Parade, Mumbai - 400005 Ph.: (91 22) 22172600 | Fax: (91 22) 22182572
E-mail: ccg@eximbankindia.in | Website: www.eximbankindia.in, www.eximmitra.in
Follow us on