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The pattern of effective protection and its impact on China's trade reforms

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THE PATTERN OF EFFECTIVE PROTECTION AND ITS IMPACT ON CHINA'S TRADE REFORMS

A DISSERTATION SUBMITTED TO THE GRADUATE DIVISION OF THE UNIVERSITY OF HAWAII IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

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By

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ABSTRACT

China's foreign trade has expanded dramatically in the past decade as the country is gradually opening its door to the outside world. Economic reform of foreign trade system was underway at the same time, although the system itself is still complicated, which combines trade planning and licensing with extensive tariffs. The purpose of this dissertation is to closely examine the economic structure and foreign trade system in China and makes use of a 106-sector input-output table of China in 1985 to estimate the effective rates of protection (ERPs) for 81 traded sectors. The effective rate of protection (ERP) represent the proportionate increase in domestic value added per unit of output over international value added as a result of protection. The theory of effective protection purports to indicate the direction of resources pulls among industrial sectors and magnitude or height of cost of protection.

Findings of this dissertation indicate that effective protection in China is heavy and diversified, which is not different from other large and heavily protected developing countries. The Chinese trade regime, as shown by the empirical results, is biased against export sectors and for import sectors, as well as against primary sectors and for manufactured sectors.

Simulations conducted by this dissertation indicate that tariff rates in the published schedule are very high.

Merely removing the administrative control of the government on imports (import quota and subsidies) and applying the current published tariff rates would result in a higher, albeit less diversified, average ERP for all the industries. To reduce the high average ERP (i.e. to reduce the high cost of protection) and make it less diversified among industries, China needs to lower the tariff schedule while gradually reducing administrative control on imports.

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CHAPTER I

INTRODUCTION

1.1 Background

In the past ten years, China has experienced a period of vigorous economic growth and rapid foreign trade expansion, thanks to the new economic and political policies introduced and carried out by the Chinese government beginning in 1978. The economic reform of China consists of two types of transition. One is from a nearly autarkic economy to a relatively open economy. The other transition is from a centrally planned economy to a partially market-oriented economy.[1] Correspondingly, the important policies

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[1] There have been for a long time two clear dichotomies in the Chinese Marxian economists' dictionary. One is "socialism" vs "capitalism", and the other is "planned economy" vs "market economy." Under the 1953-78 regime, the Chinese leaders and most Chinese economists strictly equated a planned economy with socialism and a market economy with capitalism. Based on this judgment, out-of-plan activities and markets had been steadily squeezed in order to uphold the principles of socialism. Since 1979, the Chinese Marxist leaders still declared adherence to the socialist line, but gave some new explanations to the relationship between the above concepts in order to meet the changing economic conditions. The distinction between the concepts has become blurred. Now it is agreed that the market economy is not a unique characteristic of capitalism, nor is the planned economy that of socialism. An ambiguous new concept called "socialist commodity economy" has therefore been created, where market coexists with plans, but the planned economy is only supplemented by market regulations (Liu 1988).

of "opening to the outside world" (duiwai kaifang)[2] and "enlivening the domestic economy" (duinei gaohuo) have been introduced. While it is still premature to predict how far the transitions will go and how completely those policies will be implemented, unprecedented progress has been achieved so far. For the Chinese government, the central elements of the new polices are to change the traditional, centrally-planned managerial system by introducing new incentive measures and applying more economic levers (jingji ganggan), to improving allocative efficiency and to modernize the economy.

The open-door policy has been a key element in the package of economic reforms under the name of the "Four Modernizations" (i.e., modernization of industry, agriculture, science and technology, and defence).[3] It

---

[2] This policy is often referred to as the open-door policy. According to World Bank (1988) classifications, China's post-1979 open-door policy can only be regarded as an "inward-looking" strategy with the characteristics of "high protection, using administrative restrictions on imports and/or high tariffs." The name, open-door policy, and its content described by the World Bank above might appear paradoxical. However, the mixed results achieved by China in the past decade have been already very impressive since China moved from an extreme position of nearly complete autarky during three decades prior to the economic reform to a policy regime that is partially open.

[3] The "Four Modernizations" program was initiated by the late Premier Zhou Enlai and submitted to the Fourth National People's Congress in 1975. However, it was not implemented until December 1978, when the Third Plenum of the Eleventh Central Committee of the Chinese Communist Party was held.

represents a rather remarkable change of stance from the inward-looking development strategy previously practiced. The new policy includes many different aspects such as the use of foreign investment, technological exchange, information flow, the establishment of the special economic zones and opening of many coastal areas,[4] and yet foreign trade has occupied a key position in the party's blueprint and remained the most important linkage between the many different aspects of the modernization program. Two reasons for this importance of foreign trade stand out. On the one hand, the introduction of advanced technology from industrialized countries, which is vital to economic reform, can not be accomplished effectively without the sustained importation of equipment and other goods and services.

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[4] In the past decade, the Chinese government has set up a series of open areas in the east and southeast part of the country. In 1980, the provinces of Guangdong and Fujian were allowed by the central government flexibility and autonomy toward foreign trade and investment. In 1980 and 1981, four special economic zones were established in Shenzhen, Shantou, Zhuhai and Xiamen. In 1984, the fourteen coastal cities were opened, followed by the Changjiang (Yangtze River) Delta, Zhujiang(Pearl River) Delta and the Triangle Area in southern Fujian Province. Since 1985, the Shandong and Liaodong Peninsula have been opened for foreign investment. Finally in 1988, the Island of Hainan became a full province and the largest special economic zone in China. There were even plans to establish a larger open area in the provinces of Guangdong, Fujian and Jiangsu for economic experiment and reform. At the same time, an extensive Coastal Area Economic Development Strategy was formulated in early 1989. However, the reform process has suffered some big setbacks since 1989 following the democratic movement in China. In spite of this, it is assumed and argued elsewhere in this study that the trade reforms in China will continue, albeit at a slower pace.

Therefore it is therefore important to maintain a normal channel of imports (especially from the Western countries). On the other hand, exports have been seen as the ultimate means to finance all the modernization programs associated with the open-door policy. For instance, the foreign exchange earned through exports is needed to guarantee the repayment of international loans and imports of technology and other goods and services. However, to increase exports effectively and to maintain steady imports, a policy framework that promotes efficient use of resources in trade and production must be established. The traditional foreign trade system of China has not worked effectively in this regard. For this reason, the Chinese government introduced reform in the foreign trade systems as an integral part of the overall new economic policies.

The trade reforms began in 1979 and expanded in subsequent years. Initial steps taken from 1979 to 1984 included decentralization of trade decision-making power within the foreign trade system, granting export bonuses to well-performing trade corporations and enterprises, and increasing channels of imports. These measures were followed by the reintroduction of a tariff system, the reduction of import restrictions, a substantial change in the role and importance of foreign trade planning, the introduction of trade agency and contract responsibility systems, and the establishment of export incentive

mechanisms. The purpose of these reforms is to subject the production and marketing of trade enterprises increasingly to market forces, to establish a competitive mechanism, and to enhance the role and function of economic levers relative to administrative intervention in conducting foreign trade.

Since the implementation of these reforms, a primary set of economic levers and a partially decentralized foreign trade system are now established in China. So, without full monopoly power in foreign trade, the Chinese government cannot easily increase or decrease exports and imports without first setting down appropriate economic policies. But any economic policies have their influence and repercussions on other aspects of the economy. The real effect of these policies may deviate from their original goals. Therefore, an in-depth analysis of economic policies is important and necessary.

Throughout the process of trade reform in China, one of the most important policies has been to establish a rational tariff system in order to rely increasingly on the tariff levers, along with other economic measures, to direct foreign trade. Such work began in 1980 and was finalized in 1985 when a carefully designed tariff code was promulgated. Since 1980, administrative control of import price has gradually given way to control of import tariffs and domestic taxes. For example, in 1981, the imported goods that are priced on a cost-plus basis (c.i.f. price plus

tariff plus domestic taxes) accounted for only 20 percent of the total imports. In 1985, around 50% of all imports were so priced and the percentage rose to 80% in 1989[5]. Now the question is: What is the real effect of the tariff system, together with the newly reformed domestic tax system, on the entire economy? Do the current economic and trade policies yield strong incentives to those industrial sectors that are designated by the government as priorities? These are the questions that concern us. It is for this reason that the concept of the effective rate of protection (ERP) is to be introduced.

1.2 Thesis Objectives

The purpose of this study is to build the appropriate methods to evaluate the incentive structure and the pattern of effective protection in China, and to use the empirical results to assess the policy effectiveness of the government. To achieve these targets, the effective rates of protection (ERPs) are estimated. By establishing the ranking indices of the ERPs for eighty one traded sectors based on a detailed input-output table,[6] the pattern of effective protection and resource pulls can be assessed.

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[5] See World Bank (1988, p.113), Taylor (1989, p.157) and Qin (1990, pp.12-13).

[6] The input-output table used by this thesis is the 106 × 106 table of 1985, prepared by the Chinese State Planning Commission Information Center. Details of these tables will be discussed in Chapter IV.

It is worth noting that the long-term economic strategy of the Chinese government has not changed since the foundation of the People's Republic four decades ago. Industrialization and modernization of the economy are still the basic strategic goals. Now the Chinese government has two goals. One is to continue its basic strategy of industrialization. The other is to promote production efficiency of the economy. Largely due to the failure of the highly centralized command system the government practiced in the past, it has now changed its way of approach. The policies of "opening to the outside world" and "enlivening the domestic economy" are not only necessary for efficiency improvement, but also seen by the government as alternative means to fulfilling the original goals. We will not justify the intention of the government, or the pros and cons of the government basic strategy. We will instead evaluate the effectiveness of the policies that the government has chosen, and see what the real effects are and whether the two goals, namely industrialization and economic efficiency improvement can be achieved at the same time.

In sum, the objectives of the study are to apply and quantify the concept of effective rates of protection (ERPs) in order to evaluate the structure of protection in the Chinese economy. Specifically, this thesis aims to accomplish the following: first, develop appropriate techniques to estimate the ERPs; second, adapt the

estimating formula to fit the Chinese setting; third, make use of reliable data to calculate the ERPs; and finally, interpret the results. The study will in turn evaluate the effects and policy implications of the results for current Chinese trade reforms. The study also includes an examination of certain sectors as case studies. Emphasis will be given specifically to agriculture, energy and labor-intensive manufacturing (LIM). A comparison of effective protection to exportable and nonexportable industries will also be made. As far as we know, this is the first systematic analysis of the pattern of effective protection in China.[7]

1.3 The ERP Concept

The basic argument of the ERP literature is that if tariffs are not uniform for imports and are not imposed only on final goods but also on intermediate goods, then the nominal tariff rates do not give an accurate indication of how the tariff structure influences the domestic economy. The concept of ERPs is therefore developed to capture the joint effects of final good and intermediate input protection on the processing activity and to examine the

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[7] Taylor's work (1989) on China's domestic resource cost (DRC) will be evaluated in Chapter II. What he does is to use the concept of DRC to evaluate the structure of efficiency use of resources in China based on a 24 × 24 input-output of 1981.

corresponding effect on the allocation of resources.[8] It is believed that ERPs are more meaningful than nominal rates of protection or implicit tariff rates (which represents the excess of the domestic price of a good over its international price) since the former are rates of protection with respect to value-added. As defined, the ERPs represent the proportionate increase in domestic value added per unit of output over free trade value added per unit of output as a result of tariff protection.

1.4 Application and Limitations

ERP estimation techniques were derived under partial equilibrium assumptions. Balassa (1971, 1982) has shown that ERPs can serve not only to indicate the incentives provided by protection to particular industries, but also to measure the cost of protection. Under conditions of constant costs, no input substitution and the absence of "above-normal" profits and wages, the value added in an industry will equal the cost of production. Therefore, ERP, as defined above, indicates the excess of domestic over foreign processing costs, which in turn can be used to measure the cost of protection of an economy. The higher the ERP, the higher the cost of protection to the economy.

However, there are also some limitations to the application of the ERP theory. The main problems are

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[8] See, for example, Balassa (1982) p.13.

limited predictive power and lack of general equilibrium perspectives. With the development of computable general equilibrium (CGE) and other general equilibrium models, the application and usefulness of ERPs has further weakened. While ERP theory purports to indicate the direction of resource reallocation among industrial sectors, we cannot be sure on purely theoretical grounds that resources actually move in the direction indicated by the ERPs. In the case of China, the biggest limit and difficulty of such studies stems from the long tradition of central control and administrative management. Some trade restrictions are hard to quantify. These problems are recognized by the study and some of them will be dealt with appropriately.

1.5 Organization of the Thesis

The rest of the thesis is organized as follows. Chapter II reviews the literature on trade policies, structure of protection, incentive mechanisms, and measurement of protection and relative efficiency of industrial sectors. The elaboration of the concept of ERPs, the derivation of estimating formulas, and development of an analytical framework, are presented in detail in that chapter. At the end, an analytical frame work is established to apply the ERP theory to China. In Chapter III we discuss the decade-long evolution of trade reforms in China in order to provide the necessary background

information for the study. Within that chapter, the role of tariffs in China's foreign trade and price structure will be examined.

Chapter IV examines the database and estimates all the components for the calculation of the ERPs. Since the study made use of a detailed input-output table, and underwent a careful and complete examination of China's tariff and tax system, the preparatory work in that chapter is thorough.

Chapter V reports and evaluates the results of the ERP estimation. By presenting three different simulations, we will discuss in detail the effect of these results on China's trade reform. Finally, a synthesis of the study and concluding remarks will be made in Chapter VI.

CHAPTER II

LITERATURE REVIEW AND ANALYTICAL FRAMEWORK

2.1 Introduction

"Effective protection" is an amorphous term used to measure the combined effect of a set of policy instruments on output value or value added of industrial sector. It takes into account tariffs, quantitative restrictions, sales taxes, compensatory rebates, tax rebates, tax exemptions, and so on.[1] These tools are part of the overall trade policy of a country but have often been adopted haphazardly by governments in the developing countries. Haphazard adoption and sometimes contradictory utilization of these policy tools give mixed incentive signals to the producers and leads to a complicated structure of protection and significant disparities in the economic costs of different industrial activities. Given the complicated nature of the protective structure in the developing countries[2], it becomes difficult to make a simple and direct evaluation of the incentives provided by the trade regimes. Trade theorists have attempted to refer to the input-output structure and direct price comparisons where data are

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[1] The list of policy instruments, which determine the structure of protection, is particularly long for some developing countries. See, for example, Naqvi et al (1983).

[2] See, for examples, Balassa (1971, 1982), Corden (1971, 1975, 1984), Weiss (1988), and Krueger (1984b).

allowable in order to measure the structure of protection embodied in the trade regimes. For that purpose, the concept of effective rates of protection (ERPs) has been widely used to conduct empirical work.[3]

This chapter starts in section 2.2 with a brief introduction to trade policies and the cost of protection in developing countries. It provides the basic theoretical justifications for protecting domestic industries and imposing other trade restrictions in developing countries.[4] Estimation techniques for ERPs are elaborated upon in section 2.3. Treatment of non-traded inputs and substitution problem are discussed in section 2.4. Applications and limitations of the ERP theory will be discussed in section 2.5. Further evaluation of ERP theory is presented in section 2.6. Finally, section 2.7 illustrates the analytical framework established in this chapter and examines the study of ERP in China.

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[3] For example, the estimations of ERPs are conducted for the Philippines by Tan (1979), for Brazil, Chile, Mexico, West Malaysia and Pakistan by Balassa et al (1971), for Pakistan by Naqvi et al (1983), and for the six semi-industrialized economies: Argentina, Columbia, Israel, Korea and Taiwan by Balassa (1982). Recently, Greenaway and Milner (1990) measured the ERPs and domestic resource costs (DRCs) for Madagascar.

[4] A seminal analysis of trade policies in developing countries may be found in Krueger (1984b).

2.2 Trade Policies and the Cost of Protection

The trade policies adopted in developing countries have a profound influence on economic development. The character of these policies covers a wide spectrum and provides researchers with ample scope for the analysis of policy effects.[5] Various degrees of protection and alternative incentive systems other than those emanating from a pure market mechanism are usual results of trade policies practiced in developing countries. These policies generally leads to resource reallocation, income redistribution, and change of overall welfare. Economic evaluation of trade policies is different when the national instead of worldwide welfare is considered.[6] That is why trade policies, entailing a departure from a neutral state of free trade[7], have been persistently pursued by governments in many developing countries in the name of maximizing domestic welfare. Certain economic targets may be optimally achieved by using appropriate trade policies as a second-best choice given existing distortions elsewhere in the economy. But the purpose of the discussions below is to suggest that

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[5] Krueger (1984b) p.520.

[6] See, for example, Harberger (1978).

[7] A neutral state of affairs of free trade means that there is no significant discriminating among activities or between foreign and domestic markets. See, for example, Balassa (1982).

caution be used when justifying the trade policies adopted in the developing countries.[8]

In the following three sub-sections, we will summarize the pros and cons of a free trade policy, and common justifications for trade intervention under various circumstances.[9] Some of the justifications, such as inequality between developing and developed countries, are out-dated, and some of them, such as the infant industry case, are subject to strict conditions. Finally, we will turn to a discussion of the measurement and cost of protection.

2.2.1 Optimality of Free Trade

The analysis of the gains from free trade dates back to the Scottish economist Adam Smith (absolute advantage) and British economist David Ricardo (comparative advantage). Free trade and specialization are basic principles of the comparative advantage theory. Neoclassical economics advanced the theory of international trade by employing different production possibility frontiers and consumer indifference curves for different countries to derive the

---

[8] See Krueger (1984b).

[9] Some of the economic justifications for interventionist policies are applicable to developed countries too. What distinguishes the protectionist policies in the developing countries from those in the developed countries is the magnitude of protection and the degree of intervention in various markets. See Krueger (1984b).

gains from free trade. A modern theory of international trade was envisaged by Ohlin and developed by Heckscher. This theory explores the differences in factor endowments to generate gains from free trade. The standard Heckscher-Ohlin theorem states that, given the assumptions of constant returns to scale, identical production functions, identical technology, identical individual preferences and equal access to the world market for two countries, each country will export the commodity that intensively uses its abundant factor. As a result, world welfare will be improved.[10] The Heckscher-Ohlin theorem was analyzed geometrically by Lancaster (1957).

In terms of traditional welfare economics and the notion of Pareto-optimality, free trade is considered to be optimal because: (1) it would maximize a country's welfare under a laissez-faire regime with the assumption of a small country case; (2) it can maximize the world welfare when every country opens for free trade; and (3) it can maximize welfare even under far less restrictive assumptions than those required for purely competitive market economies.

Gains from free trade also can be derived from the estimation of cost of protection. Cost of protection is the cost of departing from the neutral state of affairs of trade. This will be further discussed later.

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[10] Refer to Chacholiades (1978) for a detailed elaboration of development of international trade theory.

2.2.2. Objection to Free Trade

Rationales given for interventionist trade policies, especially for the developing countries, are based on the proposition that the assumptions underlying the case for free trade are violated. Arguments built on infant-industry concerns, the terms of trade effect, factor market imperfections, dynamic external economies, productivity changes over time, uncertainty and flexibility have been advocated by economists at different times. We start with the case of infant industry.

The infant-industry argument is the oldest and best known argument against free trade. The distinction between classical and modern infant industry arguments was analyzed by Grubel (1966). Baldwin (1969) listed four traditional infant-industry arguments on which exceptions to the case for free trade were based. These four arguments are that (a) the acquisition of knowledge involves costs, but that knowledge is not appropriated exclusively by the individual firm that invests in it; (b) costs associated with on-the-job training cannot be recouped by the training firm; (c) the existence of static and reversible externalities result in higher initial costs; and (d) imperfect information leads to systematic overestimation of investment costs or of the unpleasantness of working in particular industries. For each of these cases, however, Baldwin argued that temporary protection by means of an import duty on the product of the

industry is not necessarily the best means to achieve the goal of more efficient resource allocation.

Krueger(1982) empirically tested the infant industry argument for the country of Turkey. The test was simple and straightforward: input per unit of output must fall more rapidly in more protected industries in order for protection to be justified. In the Turkish case, she showed that there was no such tendency. However, the result was empirical and could not prove that there were no infant industries in general.[11] Theoretically, for the infant industry argument to be valid, several conditions must be met: (a) the protected industries, if developed, must experience a sufficient decrease in production costs in order to cover the initial excess cost; (b) some of the decrease in costs would have to consist of externalities generated by firms in the industry or the entire industry (since externality is one of the causes of infant industry); (c) the protection should be temporary[12].

Terms of trade deterioration is another argument which rejects the law of comparative advantage in international trade. The debate over terms of trade between developing and developed countries in the 1950s and 1960s was intense,

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[11] Krueger (1982) p.1151.

[12] Krueger (1984b) pp.523-524.

although it might have been more emotional than rational[13]. The deterioration of the terms of trade may in principle come from two sources: export pessimism and export instability. Prebisch (1950) spoke out against developing countries being exploited and controlled by developed countries. But many of his arguments have not been verified since the late 1960s as some of the newly industrialized economies emerged. After many years, these debates and disagreements have been narrowed and the analysis of export instability stands out as the focal point of many current studies.[14]

Balanced growth of the economy is yet another rationale given for intervention. Balanced growth is an economic development strategy that stresses the importance of developing all the industrial sectors, and unbalanced growth results from specialization in the industries in which a country has a comparative advantage. In a balanced growth strategy, among other things, interdependence effect and forward and backward linkages of industries may be

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[13] Comment of Krueger (1984a) p.135.

[14] The work in this area is substantial. Much of the discussion has been based on the implicit premise that fluctuations in one or more aspects of exports of developing countries have adversely affected their potential gains from the international economy, and therefore their growth prospects. Although different aspects were specified, the studies generally agreed that export instability is higher for developing countries than for developed countries. For more detail, refer to Krueger (1984b), Brundell, Horn and Parnes (1975), Massell(1970), and Binkley (1987).

substantially beneficial. An unbalanced growth strategy could not take advantage of any of these benefits.[15] However, empirical results of studies on this subject may not lend support to the balanced growth strategy. Krueger (1984a) compared the economic performance of inward-oriented countries and outward-oriented countries and found out that the latter's performance was much better. Similar results were obtained by Balassa (1986), Lal(1987) and summarized by Bhagwati (1988). Balassa found that income fluctuation was lower in the outward-oriented countries(OOCs) than in the inward-oriented countries(IOCs) in 1973-78 and 1978-83 in the face of external shocks. James, Naya and Meier (1987) extensively analyzed the Asian developing economies (including both OOCs and IOCs) and reached the same conclusions.

Other arguments for rejecting free trade and the principle of comparative advantage have been critically analyzed by Scitovsky (1959), Sheahan (1958), Streeten (1959), and especially Chenery in his seminal paper (1961). All these arguments may provide some justifications for the interventionist policies . But the debate is not over.

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[15] See, for example, Scitovsky (1959), Sheahan (1958), and Streeten (1959).

Even Chenery's evaluation of the debate was cautious and ambiguous[16].

2.2.3 Measurement and Cost of Protection

As mentioned earlier, protectionist trade policies are widely practiced in developing countries. The effect of the structure of protection needs to be carefully studied. Nominal rates of protection are a natural measurement of the height of protection.[17] But since nominal rates of protection only apply to final products and fail to take into account the negative effect of protection on inputs, they were considered inappropriate to evaluate movement of resources between economic activities. ERPs can do a better

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[16] For example, in her article reevaluating the theory of comparative advantage, Krueger(1984a) pointed out that, while economists who appeal for protection in developing countries widely used Chenery's initial arguments as the reasons for departure from free trade, "on the grounds that they possessed the dynamic characteristics that warranted intervention"(p.137), others who appeal for free trade also find resource from Chenery's work.

[17] Corden (1975) defines the nominal rate of protection as either (a) the proportional difference between the domestic (P) and foreign (P^*) prices of a good, $(P-P^*)/P^*$, or (b) the proportional increase in the domestic price of a good that finally results from a protectionist regime. We use definition (a) in our study, which is eventually the same concept as the implicit tariff rate. In the rest of this thesis, we will treat the two concepts as the same, unless otherwise specified.

job to measure the height of protection by taking into consideration the entire tariff schedule.[18]

Early studies of the cost of protection measured the static gains from trade in terms of the familiar welfare triangle associated with complete or partial trade liberalization.[19] Recently, several models have been developed to examine the general equilibrium effects of trade liberalization.[20] Since these models do not take into account directly unproductive, profit-seeking (DUP) activities caused by protectionism, such as rent-seeking and lobbying[21], their estimated cost of protection was too low. If the welfare cost of protection is defined to consist of

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[18] A close concept to that of the ERPs is the domestic resource cost (DRC). While ERPs employ market prices, DRCs utilize the shadow prices. If factor markets functioned well, DRC estimates would be identical with ERP estimates plus one, since the ERP measure essentially gives the excess domestic value added as a fraction of international vale added while the DRC measure gives total value added as a fraction of international value added. Divergences arise when shadow prices differ substantially from market prices. In this case, ERP measurement (subject to qualifications) is the appropriate measure for predicting resource pulls, while the DRC measure is suitable for estimating the costs of trade restrictions and for appropriately evaluating alternative investment or trade patterns. See Krueger (1972, pp.48-49, 1984b, pp.539-540).

[19] Harberger estimated that the cost of protection in Chile amounted to no more than 2.5% of the national income. See Harberger (1959) p.135.

[20] Whalley (1984) estimated a global net gain, from trade liberalization, of about 0.3 percent of world GDP in 1977, and the maximum for any region or country is 0.5 percent.

[21] See, for example, Krueger (1974) and Bhagwati (1982).

the conventional production cost, plus an inefficiency cost and possibly a monopoly cost, the result could be high. For example, Bergsman (1974) found that the costs of protection as a proportion of GNP, consisting of the conventional allocative inefficiency costs (A), the X-inefficiency combined with monopoly cost(X), and the total costs (T=X+A) were as follows (Table 2.1) for four developing countries:

Table 2.1
Cost of Protection for Four Countries
(as a percent of GNP)

	A	X	T
Brazil	0.3	6.8	7.1
Mexico	0.3	2.2	2.5
Pakistan	0.5	5.4	5.9
Philippines	1.0	2.6	3.6

Source: Bergsman (1974).

The existence of protection cost clearly reminds us of the cost of practicing protective trade policies in developing countries. Although the overall effect of the structure of protection also depends on other factors and varies from country to country, its cost must be taken into consideration when an alternative policy is to be formulated.

2.3 Theory of Effective Rate of Protection

The theory of ERPs has developed very rapidly since the first theoretical work done by Johnson (1965) and Corden

(1966) and the pioneering empirical work of Balassa (1965) and Basevi (1966). This theoretical work is fully elaborated upon by Corden in his seminal book, *The Theory of Protection* (1971). Empirical work has been done by many researchers, especially Balassa and associates (1971), and Balassa et al (1982). The recent summary and commentary literature on this subject includes Jones and Neary (1984), Bhagwati and Srinivasan (1983), Tower (1984) and Krueger (1984b).

2.3.1 Assumptions and Definitions

Typically, there are five assumptions for the application of ERP theory. The first assumption is constant return to scale. The assumption is important because it allows us to consider value-added per unit of output without being concerned with the absolute level of output. In other words, given the technology and the price structure, value-added per unit of output is invariant to the scale of operation, and we do not worry about how a change in the tariff structure may affect the level output in the industry under consideration. For China, there is no particular reason that prevents us from assuming a constant return to scale production function in general.

The second assumption is fixed production coefficients. The production coefficients give the amount of an input required per unit of output. This assumption means that

inputs are always combined in the same proportions, regardless of factor prices or scale of output. It implies that the elasticity of substitution among inputs is zero and the isoquants have "corners". The importance of the assumption is to help us abstract from changes that could be brought out by changes in the relative price factors. If the production functions allow for substitution in production, then any change in factor prices would be expected to affect observed value-added. Since our estimation of the ERPs is based on the Chinese input-output table and the input-output table itself is compiled by assuming a technology of fixed coefficients, the criteria of fixed technological coefficients is met by our study.

The third assumption is that production and trade of protected industries remain. This assumption states that production and trade take place in the protected industries both before and after the tariff. It is necessary to ensure that calculated rates do measure an increase in value-added due to the tariffs. In China, production of all the tradable goods and trade of most of them remained even though widespread tariff rates are imposed, except for few traded sectors where volume of trade is zero.

The fourth assumption is infinite elasticities of foreign demand for our exports, supply of our imports, and domestic supply of non-traded inputs. These assumptions eliminate the possibility of price changes other than those

associated with the imposition of tariffs. With perfectly elastic foreign demand for our exports, we need not worry about our attempts to sell more (or less) causing prices to fall (or rise). Perfectly elastic foreign supply of imports means that domestic producers do not have to be concerned about input price changes due to shifts in demand. Foreign trade only occupies a comparatively small proportion of China's total GNP, and so does its share in total world trade. A typical "large country" case in terms of economic structure notwithstanding, China acts however as a small country case in international trade area in the sense that it dose not influence the world market prices of most of its traded goods. In some fields such as certain agricultural, textile and non-metal goods, the change of China's production and consumption of these goods does have an effect on their prices in the long run. But overall the influence is small compared to the total volume of trade in China and around the world. Infinite elasticity of supply of domestic non-tradable goods may not exist in the case of China. But this assumption can be relaxed because we employ the so-called Corden method, which allows for different elasticities of non-tradable input supply, to calculate the ERPs.

The final assumption is use of implicit rate of tariff.[22] Implicit tariff rate for an industry or sector represents the difference between domestic prices and free-traded world prices. That difference could include not only tariffs, but also domestic taxes, and other trade restrictions or subsidies. It permits us to interpret ERPs as the increase in the value-added that is associated with the entire trade regime.

The definition of ERP is not unambiguous. Based on the above assumptions, there are two broad definitions so far in the ERP literature.[23] One is the Corden-Anderson-Naya definition[24], which defines ERPs as the proportional increments in value-added per unit level of an activity brought about by the tariff structure over its free trade value-added. The other is the Corden-Leith definition[25], which defines ERPs as the proportional change (due to the tariff structure) in the "price" of value-added (with the

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[22] Implicit rate of tariff for an industry or sector represents the difference between domestic prices and free-traded world prices.

[23] See, for example, Bhagwati and Srinivasan (1983), pp.127-129.

[24] This definition refers to Corden (1966) and Anderson and Naya (1969).

[25] This definition refers to Corden (1969) and Leith (1968).

assumption that such a "price" can be defined meaningfully).[26] However, in the special case of a separable production function where the intermediates are used in fixed proportion to output, both definitions amount to the same thing.

2.3.2 The Algebra of ERP

Based on the assumptions stated earlier, one is able to derive the estimating formulas for the ERPs. First of all, we define the free trade value-added as the following:

$$(2\text{-}1) \qquad V_{wj} = 1 - \sum_{i=1}^{n} a_{ij}$$

where:

V_{wj}: free trade or international value added of product j, where the subscript w denotes the case of world market.

a_{ij}: traded input i per unit of production of j.

When the tariffs are imposed on both products and inputs, the domestic market value-added can be derived as the following

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[26] According to Corden (1971, pp.28-40), there exists a value-added product, which is produced by primary factors, i.e., by labor, capital and natural resources. ERP is thus defined as the proportional increase in the effective price of the value-added product resulting from the tariffs.

$$(2\text{-}2) \qquad V_{dj} = (1+T_j) - \sum_{i=1}^{n} a_{ij}(1+T_i)$$

where

V_{dj}: domestic value-added of product j;

T_j: implicit tariff rate on product j;

T_i: implicit tariff rate on input i, which is used for production of good j[27];

Finally we define the ERP for product j as

$$(2\text{-}3) \qquad ERP_j = \frac{V_{dj}-V_{wj}}{V_{wj}} = \frac{T_j-\sum_{i=1}^{n} a_{ij}T_i}{1-\sum_{i=1}^{n} a_{ij}}$$

The numerator in the above formula is the net domestic over international value-added and the denominator is the international value-added; all are expressed with input-output coefficients with tariffs. The relationship between the ERP on j and its tariff T_j depends on the relationship between the latter and the accumulated tariffs on inputs i. To show that explicitly, let us rewrite (2-3) as the following:

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[27] T_{ij} would be more accurate to represent the implicit tariff on input i as it is used for production of j. However, we drop the subscript j because $T_{ia}=T_{ib}$ for $a \neq b$. It means that the tariff rate of inputs remains the same no matter which industry (a or b) uses it.

$$(2\text{-}4) \qquad ERP_j = T_j + \frac{\sum_{i-1}^{n} a_{ij}(T_j - T_i)}{1 - \sum_{i-1}^{n} a_{ij}} = T_j + \frac{(T_j - \frac{\sum_{i-1}^{n} a_{ij}T_i}{\sum_{i-1}^{n} a_{ij}}) \sum_{i-1}^{n} a_{ij}}{1 - \sum_{i-1}^{n} a_{ij}}$$

or

$$(2\text{-}5) \qquad ERP_j = T_j + \frac{(T_j - \bar{T}_j) \sum_{i-1}^{n} a_{ij}}{1 - \sum_{i-1}^{n} a_{ij}} \qquad where \quad \bar{T}_j = \frac{\sum_{i-1}^{n} a_{ij}T_i}{\sum_{i-1}^{n} a_{ij}}$$

Here $j = 1, \cdots, n$ and $\bar{T}_j$ is the weighted average tariff rate of all inputs into the production of j. Equation (2-5) suggests that the ERP_j can differ from the implicit tariff rate T_j. ERP_j will be greater (smaller), the greater (smaller) is its own implicit tariff rate, or the smaller (greater) the weighted tariff on inputs. ERP_j can be less than T_j if $T_j < \bar{T}_j$. It also can be negative despite the positive implicit tariff and value-added. As reflected in equation (2-5), if unified tariff rates apply to both the product and all the inputs, then $ERP_j = T_j = T_i$. If all inputs enter duty free, ERP_j can attain a maximum of T_j/V_{wj}.

Empirical study of ERPs makes use of actual input-output table for estimation. Formula (2-3) requires the knowledge of a_{ij}, but usually it is not observable, rather it is the tariff-inclusive input coefficients that are

observed. Thus a_{ij} must be estimated from the tariff-inclusive input-output table.

By assuming fixed post-tariff input-output coefficients, one can estimate a_{ij} through the following equations:

$$(2\text{-}6) \qquad x_j = \frac{x_j^p}{1+T_j} \qquad\qquad x_{ij} = \frac{x_{ij}^p}{1+T_i}$$

where:

X_j: free trade output value of product j;

X_j^p: post-tariff output value of product j;

X_{ij}: free trade input i in the production of j;

X_{ij}^p: post-tariff input i in the production of j.

Therefore:

$$(2\text{-}7) \qquad a_{ij} = \frac{x_{ij}}{x_j} = \frac{x_{ij}^p}{x_j^p}\frac{1+T_j}{1+T_i} = a_{ij}^p\frac{1+T_j}{1+T_i}$$

Substitute (2-7) into (2-2), one obtains:

$$(2\text{-}8) \qquad ERP_j = \frac{V_{dj}}{V_{wj}} - 1 = \frac{1+T_j - \sum_{i=1}^{n} a_{ij}(1+T_i)}{1-\sum_{i=1}^{n} a_{ij}} - 1 = \frac{1-\sum_{i=1}^{n} a_{ij}^p}{\frac{1}{1+T_j} - \sum_{i=1}^{n}\frac{a_{ij}^p}{1+T_i}} - 1$$

In equation (2-8), the numerator is the protected or domestic value-added. The denominator is the unprotected or free trade value added, which is derived by deflating output and inputs with their respective tariff rates.

So far we have demonstrated the derivation of ERPs under partial equilibrium framework. As the ERP theory has evolved from the partial equilibrium into the general equilibrium framework, some of the assumptions will be relaxed. The general equilibrium analysis and other analytical methods of protection will be discussed briefly in section 2.5. Now we turn to another problem, namely existence of non-traded goods (inputs) and substitution between inputs, which complicate the estimation of ERPs.

2.4 Complications: Existence of Non-traded Inputs and the Substitution Problem

2.4.1. The Treatment of Non-Traded Goods

The existence of non-trade inputs may have significant effects on calculation of ERPs. Although there are no tariffs imposed directly on non-traded inputs, production of these inputs involves inputs from other non-traded and traded inputs. The latter therefore directly join the production of non-traded inputs. In addition to that, traded inputs can also indirectly join the production of the above non-traded inputs. For example, suppose there are three non-traded inputs X_1, X_2 and X_3, and two traded inputs Y_1 and Y_2. Production of X_1 requires the inputs of X_2 and Y_1, and production of X_2 in turn needs inputs of X_3 and Y_2. In this way, the traded input Y_2 indirectly joins the production of non-traded input X_1. This process of inter-industry linkages can continue until all direct plus

indirect inputs of traded sectors in the production of non-traded input are counted. Usually, the input-output table, including the 1985 table of China used in this study, does not provide the total, or direct plus indirect, input-output coefficients for us. However, it is easy to derive the direct plus indirect input coefficient matrix from the direct input coefficient matrix. Here we will show how to obtain it by referring to the 106 sector input-output table of China.

Let B be denoted as a 106 × 106 matrix of direct plus indirect input coefficients, with b_{ij} the ith input (direct plus indirect) in production of product j. Further define A as a 106 × 106 direct input coefficient matrix, with a_{ij} the ith direct input in production of product j. Then we have the following relationship between b_{ij} and a_{ij}:

$$(2\text{-}9) \quad b_{ij} = a_{ij} + \sum_{k=1}^{106} b_{ik}a_{kj}$$

To be expressed in terms of matrices, the equation (2-9) can be written as the following:

$$(2\text{-}10) \quad B = A + BA$$

One can solve the matrix B from the equation (2-10) by following the steps below.

(2-11) $$B - BA = A$$
$$B(I - A) = A$$

Therefore:

(2-12) $$B = A(I - A)^{-1}$$
$$= (I - A)^{-1} - (I - A)^{-1} + A(I - A)^{-1}$$
$$= (I - A)^{-1} - (I - A)(I - A)^{-1}$$
$$= (I - A)^{-1} - I$$

where I is a 106 × 106 identity matrix.

Practically, the derivation of the inverse matrix can be obtained in any computing or spreadsheet programs if the matrices can be handled and the memory is large enough to deal with the 106 × 106 matrix. We have done it on SHAZAM (version 6.1).

Now we come back to the treatment of non-traded inputs in estimating ERPs. There are three methods for analyzing the effects of non-traded goods. The so-called sophisticated Corden method is to treat non-trade inputs the same way as primary inputs, and meanwhile it takes into account the indirect traded inputs in the production of non-traded goods.[28] The Balassa method, on the other hand, is to treat the non-traded inputs just the same way as traded inputs by assuming that the supply of these non-traded

[28] The original Corden Method fails to take into account the indirect trade inputs when making the calculation of ERPs. See, for example, Corden (1974), pp.158-160. We will now refer the sophisticated Corden Method just as Corden Method.

inputs is infinitely elastic and that their tariff rates are zero.[29]

A third alternative for treating the non-traded goods is the Scott method.[30] This approach treats all non-traded inputs as traded inputs which have had their prices raised by a uniform tariff equivalent to the devaluation of the exchange rate. Under the assumption of constant input-output coefficients, the measure can be valid only if the relative prices of the non-traded inputs are unaffected as a result of protection structure. Otherwise, it cannot be applied, since it neglects the indirect protection effect of a protection structure.[31]

These three methods are mainly based on partial equilibrium analysis. The general equilibrium treatment of the non-traded inputs is found in many works, including Ray (1973) and Schweinberger (1975). Since analysis of exchange rate adjustments is beyond the consideration of this study, we have not made use of the Scott method. For the Balassa and Corden methods, we present their ultimate formulas for comparison. We start with the Balassa method. Now the input i splits into traded input t and non-traded input h. Other terms are defined as follows:

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[29] See Balassa (1971, 1982).

[30] See Little, Scitovsky and Scott (1970), Appendix to Chapter 5.

[31] See, for example, Corden (1974) pp.162-163, Balassa (1982) p.15.

a_{tj}^P: direct (tariff-inclusive) input-output coefficient for traded input t in domestic production of final good j;

a_{hj}^P: direct (tariff-inclusive)input-output coefficient for non-traded input h in domestic production of final good j;

r_{th}: direct plus indirect input-output coefficient for traded inputs used in producing non-traded goods in domestic prices;

r_{vh}: direct plus indirect input-output coefficient for value-added embodied in the production of non-traded goods in domestic prices;

T_j: implicit tariff rate for output j;

T_t: implicit tariff rate for traded input t.

Now the formula of the Balassa method is the following:

$$(2\text{-}13)\quad ERP_j = \frac{1 - \sum_{t=1}^{m} a_{tj}^P - \sum_{h=m+1}^{n} a_{hj}^P}{\frac{1}{1+T_j} - \sum_{t=1}^{m} \frac{a_{tj}^P}{1+T_t} - \left(\sum_{t=1}^{m}\sum_{h=m+1}^{n} \frac{a_{hj}^P r_{th}}{1+T_t} + \sum_{v=1}^{w}\sum_{h=m+1}^{n} a_{hj}^P r_{vh}\right)} -$$

The numerator is domestic, post-tariff value-added, where the cost of m tradable inputs (per unit of output j) has been subtracted from output value. Since, under the Balassa method, non-traded inputs are treated the same way as the traded inputs (with zero tariff rate), the accumulated cost of n-m non-traded inputs in production of

final good j has therefore been subtracted from the output value to obtain the domestic value-added, too.

The denominator is the free trade value-added. The first term in the denominator is value of domestic product j deflated by its tariff rate. The second term is the cost of all traded inputs deflated by their tariffs. The combination in the bracket consists of two terms. The first one is the accumulated direct plus indirect tradeable inputs in production of non-traded inputs, deflated by its implicit tariff rates on traded inputs. The second term in the bracket is the accumulated elements of elements in production of non-traded inputs. Together, it means that in order for the cost of non-traded inputs in production of final good j to be adjusted to international value, part of it (traded input elements) must be deflated by tariff rates and part of it (value-added elements) are not.

The formula for the Corden method is slightly different and defined as the following:

$$(2\text{-}14)\quad ERP_j = \frac{1 - \sum_{t=1}^{m} a_{tj}^{p} - \sum_{t=1}^{m}\sum_{h=m+1}^{n} a_{hj}^{p} r_{th}}{\frac{1}{1+T_j} - \sum_{t=1}^{m} \frac{a_{tj}^{p}}{1+T_t} - \sum_{t=1}^{m}\sum_{h=m+1}^{n} \frac{a_{hj}^{p} r_{th}}{1+T_t}} - 1$$

Again the numerator is domestic and tariff-inclusive value added, where the cost of traded inputs t (per unit of output j) has been subtracted from the output value first. Unlike the Balassa method, the Corden method treats non-traded

inputs the same as primary inputs. Therefore, out of the cost of non-traded inputs in production of final good j, only the elements related to the direct plus indirect traded inputs in production of non-traded inputs, in addition to the share of traded input in production of j, are subtracted from the output value. The denominator is the free trade value-added. The first term in the denominator is value of domestic product j deflated by its implicit tariff rate. The second term is the cost (per unit of output of good j) of all tradeable inputs deflated by their tariffs. The third term is the elements of direct plus indirect traded inputs in the share of non-traded inputs (for producing j), deflated by the input tariff rates.

As mentioned earlier, the difference between the Balassa and Corden methods lies theoretically in the different assumptions each of them makes. Empirically, the two estimations are closely related.[32]

We have chosen the Corden method for this study. The reasons for such choice are the following. First, we assumed that the input-output coefficients are constant in China. As has shown by Ray (1973) in a model encompassing two factors, if the input-output coefficients for non-traded inputs are constant, the Corden method will correctly indicate the impact of protective measures on output, value

[32] In Appendix I, we will show algebraically how these two measure differ from each other.

added, and factor allocation.[33] Second, in contrast with the Balassa method, which assumes infinitely elastic supply curves of non-traded inputs, the Corden method allows for positive elastic supply curves of such inputs. The latter is a more appropriate assumption for the case of China. Third, given the high rank correlation between the two measures[34], it is not necessary to report both sets of calculations since it provides little further information. Ultimately, the choice is a bit arbitrary because the Balassa method requires the knowledge of r_{vh}, the direct plus indirect value-added elements in production of non-traded inputs h, which is available to us immediately.

2.4.2. The Substitution Problem

The assumption of fixed input-output coefficients can be removed in order to introduce substitution between products and inputs. Substitution may exist (a) between different traded inputs; (b) between non-traded and traded inputs; and (c) between these inputs and the products. Generally speaking, the substitution possibilities increase

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[33] See, for example, Balassa (1982), p.15.

[34] As indicated by Balassa (1982, p.15), in the case of the five semi-industrialized economies (Argentina, Colombia, Korea, Singapore and Taiwan) for which both Balassa and sophisticated Corden effective rates have been estimated, the Spearman rank correlation coefficient between the two sets of rates ranges from 0.97 in Columbia to 0.99 in Argentina and in Korea. In other words, despite the differences, the two measures are highly correlated.

effective rates of protection, and the higher the elasticity of substitution, the higher the relevant effective rate of protection by a given set of tariff rates and initial input-output coefficients. Work on this subject includes Bhagwati and Srinivasan (1973), Grubel and Lloyd (1971), Leith (1968), and Taylor and Black (1974).

There is no doubt that including substitution into the study of ERPs helps mitigate the limitations of the partial equilibrium analysis. Many researchers[35] have conducted the study of ERPs directly based on the general equilibrium framework. Others employed the general equilibrium methodology when addressing the problem of non-traded inputs and substitution, as discussed in the above. Alternative definitions other than those we mentioned earlier have also been developed.[36] Given the limited availability of data

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[35] See, for example, Bhagwati and Srinivasan (1973), Corden (1974), de Melo (1978), Tower (1984), Hartigan (1985), Dervis, de Melo and Robinson (1982)

[36] For example, Tower (1984), with an eye on project evaluation and the role of ERPs in the framework of general equilibrium, defines the concept of ERPs as a measure of the tax or subsidy incentives to value-added. In fact, Tower does not provide a new formula fundamentally different from the traditional estimation of ERPs, but he does explore the way to treat the results of ERPs alternatively. He is more concerned with the derivation of optimal second best taxes and subsidies to value-added and their relations with the estimated ERPs. Hartigan (1985) has given yet another formula for ERP estimation as the following:

$$ERP_j = \frac{\sum_i (1+S_i^b) W_i^b V_{ij} X_j^b}{\sum_i (1+S_i^f) (W_i^f - q_i) V_{ij} X_j^b}$$

and the complicated nature of the problem, the substitution problem will not be considered by this study. Instead we assume that the input-output coefficients remain constant for this study. However, when making such assumptions, it is important to be explicit about the limitations of excluding substitution problem.

2.5 Limitations of Partial Equilibrium Estimation of ERPs

Criticism of the partial equilibrium theory, and even the concept of ERPs can be found in Jones and Neary (1984), Dixit (1985), Ethier (1972, 1977), and Ray (1980). The limitations exist on both theoretical and empirical fronts.

2.5.1 Theoretical Limitations

The main theoretical problems for the use of ERPs are summarized below. Possible solutions to them are also discussed.

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where
X_j^b: the level of output of sector j
S_i^b: income subsidy for factor i under protection
S_i^f: income subsidy for factor i under free trade;
V_{ij}: the value-added free trade input-output coefficient;
W_i^b: wage rate for factor i under protection;
W_i^f: wage rate for factor i under free trade;
q_i: the rent to the immobile factor of type i.

This formula measures the increase in the utilities for particular factors or aggregate of factors, a slightly different approach.

(a) Predictive power of the ERPs. The direction of relative resource pulls is the main target that the ERPs are used to predict. However, Ramaswami and Srinivasan(1971) found by a counter-example that it does not work even with only two final goods. For a given tariff structure in their study, in an economy with one set of factor endowments, outputs and resources are pulled in a direction opposite to that in another economy with a different set of factor endowments. To remedy this, economists either impose some restrictive assumptions on the production function (such as zero substitution and separability between primary factors and material products in the production function[37]) or develop an alternative formula for the ERPs. However, the restrictive assumptions themselves create some problems for the use of ERPs, namely, the lack of general equilibrium considerations.

(b) Partial vs. general equilibrium. Although the ERPs have general equilibrium sense in their application in analyzing resource pulls, the main elements of the measures are derived by the partial equilibrium method. With the development of the computable general equilibrium (CGE) model, the application and usefulness of the ERPs derived

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[37] See Corden (1971), Ethier (1972), and Bhagwati and Srinivasan (1973).

from partial equilibrium are weakened.[38] To develop from partial equilibrium to general equilibrium, substitution is reintroduced into the production function, as stated earlier. However, without retaining other assumption (such as separability), the predictive ability of the ERPs are still limited.

(c) Nominal rates of protection vs. ERPs. In traditional international economics, nominal rates of protection are often used to represent the magnitude of protection to an industry. Now the nominal rates of protection are thought to be inaccurate because they fail to take into account the tariffs on inputs to a final good. ERPs have therefore been created to replace the nominal rates of protection to play a better role in measuring the real protection. But the ERPs do not seem to fit very well into the role that is supposed to be played by the nominal rates of protection in traditional international economics. Corden noticed that for the ERPs, like other measures, any simple conclusions coming out of "pure" models can be shown not to hold in general.[39]

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[38] Dervis, de Malo and Robinson (1982) comment: "A general equilibrium model makes the use of ERPs completely redundant, because it accurately generates the impact on resource allocation of any change in trade policy that can be handled within the framework of the (CGE) model." (p.274).

[39] Corden (1984) p.82.

2.5.2. Empirical Problems

In his literature review of the ERPs, Corden summarized the empirical difficulties encountered in estimation by researchers. The difficulties also represented differences in figures produced by researchers for the protection structure of the same country in a similar time period. I list the findings of Corden here.[40]

(a) When quotas dominate the protection structure, comparisons between domestic and world market prices must be made in order to obtain the implicit tariff rates, which must be the starting point for any calculations. This is not an easy task. Comparison of such kind for some sectors has to be made for China.

(b) Even when tariffs alone are used, there may be much tariff redundancy[41], also necessitating price comparison.

(c) Available input-output tables in most countries are rarely sufficiently disaggregated for the purpose of calculating ERPs. This study will make use of a 106 × 106 Chinese input-output table[42], which is large enough for estimating ERPs.

(d) All effective rate calculation involves tariff averaging of some kind. The averaging per se causes some

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[40] Corden (1975) pp.61-64.

[41] Tariff redundancy refers to a situation in which the domestic price of a good exceeds its border price plus nominal tariff.

[42] Detail of this will be discussed in Chapter IV.

practical problems. We will discuss in detail how we average the tariff rates for each sector in Chapter IV.

(e) The treatment of non-traded inputs has been shown to make a considerable difference on results. However, the effects these of non-traded inputs will be taken into account by this study.

2.6 The Theory of Effective Protection: A Further Evaluation

The merit of ERP measurement is obvious: it takes into account the negative effect of tariff of inputs on the final using industries. By estimating ERPs, one can evaluate the effect of protection on the basis of value-added in stead of the free-trade prices. The ranking of industries according to ERPs can indicate the direction where the resource pulls would move, given that the underlying assumptions are satisfied. The ERP theory has been used again and again, and applied to many developing countries. The study of this thesis follows that trend. There are at least three reasons that we deem it viable to continue to apply the ERP theory to a large developing country like China, where no such has ever been done.

First, the theory of ERPs is regarded by Harberger as one of the four major developments in economic theory that have contributed to the changes that occurred in the

economics profession's view of the development process during the past few decades. He writes[43]:

"Empirical studies...have shown first how high, typically, the effective rates of protection are, and second how heavy are the burdens, in terms of the resulting inefficiency, that many developing countries have, as it were, imposed upon themselves."

Second, ERP allows a single figure to sum up the net result of various trade and other taxes and subsidies affecting any particular activity. It makes it possible to describe complicated systems of trade and other interventions in many countries.

Third, whereas the general equilibrium analysis is severely limited by the data availability, ERP estimation shows its strength.

2.7. Analytical Framework and Study of ERPs on China

From this chapter, we now have on the analytical framework for this study. Formula (2-14) will later be used to estimate ERPs for China. The major work of next two chapters is to provide background information on China and to derive the implicit tariff rates that are used in formula (2-14). As we will see, using tariffs and domestic taxes as effective tools to direct trade flows has been the general trend of China's trade reforms in the 1980s. A careful study of China's trade policies and derivation of the

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[43] The comment of Harberger appears in Tower (1984) p.125.

implicit tariff rates taking into account quantitative results of these polices would make the estimated ERPs more meaningful, realistic and accurate to reflect the pattern of effective protection in China. For China in particular, data limitation and lack of information on the social accounting matrix (SAM) make it difficult to apply the CGE and other general equilibrium models. This will make the use of ERPs more appealing in serving the primary purpose of evaluating the structure of effective protection in China. So far, work on this area that directly uses quantitative measures to determine the pattern of protection and its economic effects in China is sparse.[44] This study hopes to fill the gap.

[44] We have mentioned the work done by Taylor (1989). The concept used by Taylor is the DRC. Its purpose of measuring the DRC is to determine the relative efficiency of different industries in China. The input-output table employed by Taylor is a 24 sector table of 1981, which is much smaller than the one used in this study.

CHAPTER III

EVOLUTION OF CHINA'S ECONOMIC AND TRADE REFORMS

Since 1978, a series of trade reforms, characterized by decentralizing the decision making power of the traditional trade system, have been carried out by the Chinese government. The trade reforms are an integrated part of the even larger economic reform in the country. New both administrative and economic measures have been created and developed to cope with the changed economic situation as the reform continues. The effectiveness of these new policies deserves further analysis that is now provided in the study.

This chapter presents an in-depth description of the institutional reform of the trade system, and an evaluation of the emerging trade policy environment around China. It provides necessary background information and justification of estimating the effective rates of protection (ERPs), as reviewed in chapter II, for China. Before that, a short review of the Chinese economy and foreign trade is given with the focus on the 1980's.

3.1 The Chinese Economy and Foreign Trade in the 1980's

The People's Republic of China was founded on October 1, 1949. Although many similarities remained, China may differ from other developing countries in five characteristics: (a) it is the most populous country in the

world, with a total of more than 1.1 billion at the end of 1989 (Table 3.1); (b) it is also the largest developing country in terms of land area, with a total of about 9.6 million square kilometers territory; (c) it has a long history of over two thousand years as a united country and a tradition of centralized rule through an educated elite; (d) it has been a socialist country since 1949 with a one-party system and communist rule; and (e) it was a centrally planned economy that remained in place for three decades until the late 1970's when sweeping economic reforms took place. Yet in some respects China resembles many of the other developing countries; i.e., it is a low-income, land-scarce economy with a low per capita gross national product (GNP) and high person/land ratio.[1]

China is mainly an agrarian country. Of the total labor force, about 60% are employed in the agricultural sectors (Figure 3.1). China also has a large industrial base. Nearly half of the national income[2] was generated by

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[1] Of the total area of 960,000 square kilometers in China, the share of arable land only accounted for about 10% in recent years.

[2] The difference between the Chinese concept of national income and that of gross national product (GNP) in market economies is discussed by Taylor (1988). Traditionally, China has followed the example of other socialist countries, and calculated its national accounts according to the System of Material Product Balance (MPS). Under MPS, national income is defined as the value of net material product. The two concepts (Chinese national income and the Western GNP) are similar in that both are value-added measures of national output. They differ in several important ways, however. Firstly, net material product

Table 3.1

Basic Economic Indicators of China: 1979-89

Year	Population /a (million)	Per Capita GNP (Yuan)	Growth Rate o Real GNP /b (%)	Exchange Rates /c. (Yuan/US$)	Foreign Exchange Reserves (US$ billion)
1979	972.50	411	7.6	1.555	2.15
1980	987.05	483	7.8	1.498	2.26
1981	992.80	481	4.5	1.705	4.77
1982	1,008.20	515	8.7	1.893	11.13
1983	1,020.20	569	10.3	1.976	14.34
1984	1,029.90	676	14.6	2.330	14.42
1985	1,050.44	815	12.7	2.937	11.91
1986	1,057.21	917	8.3	3.453	10.51
1987	1,080.73	1,046	11.0	3.722	15.24
1988	1,096.14	1,276	10.9	3.722	17.55
1989	1,111.91	1,420	3.6	3.766	17.02

Yuan: Unit of Chinese currency Renminbi

Notes: a. As of the end of the year;
b. Calculations of the growth rates are based on the comparable prices over time;
c. Average annual rate.

Source: Statistical Yearbook of China, 1985-90.

Table 3.2

Growth Rates of China's Foreign Trade and National Income: 1953-1988

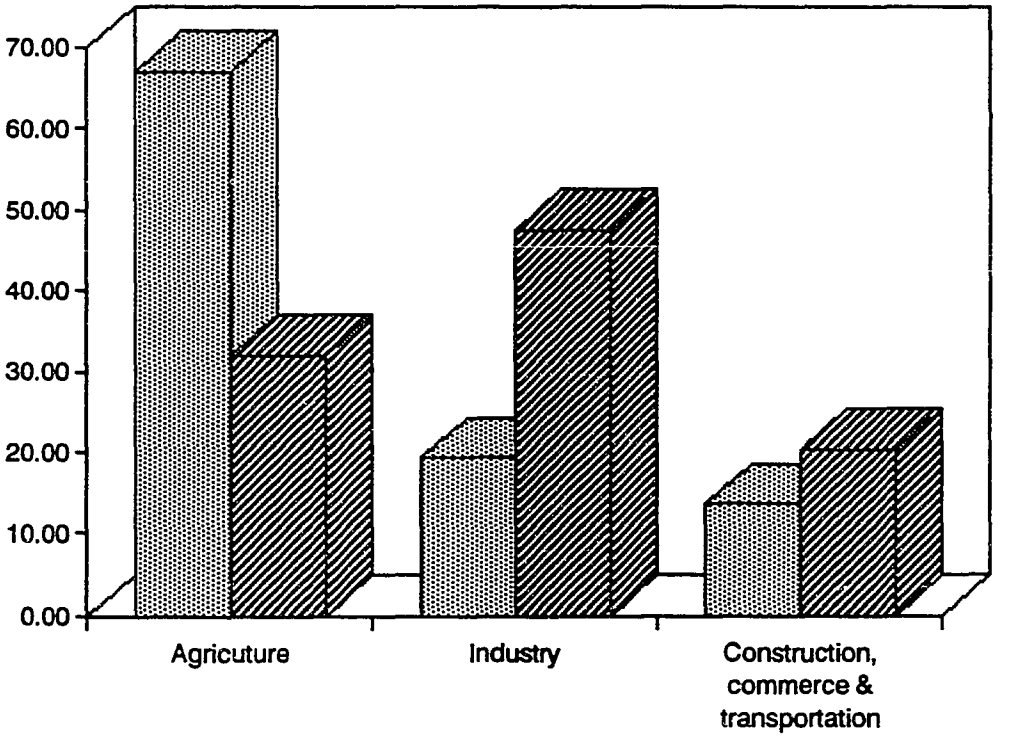
Period	Foreign Trade (%)	National Income (%)
1953-59	12.3	10.6
1960-71	0.9	3.9
1972-78	23.0	5.3
1979-88	17.6	9.2

Source: Statistical Yearbook of China, 1989.

Figure 3.1

Sectoral Composition of Labor Force and National Income in China: 1989

(percent)



Source: Statistical Yearbook of China, 1990.

the industry in recent years (Figure 3.1).[3] The economy has grown vigorously since 1978, when the Chinese government launched its sweeping economic reforms. From 1979 to 1989, per capita GNP increased from RMB[4]¥411 to RMB¥1420 at current prices (Table 3.1). During the same period, the annual growth rate of real GNP was 9.2 per cent.[5] So far, the most far-reaching reforms have occurred in the rural sector with the introduction of the household responsibility system, under which households are the principal production and decision-making units in agriculture and related rural

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excludes the output of service sectors such as education, public health, banking, insurance, personal transport, and government activities. Secondly, net material product omits depreciation as a component of value-added, whereas GNP includes it. Finally, net factor income from abroad is included in GNP, but is left out of net material product (Taylor 1988, pp.2-3). In recent years, the GNP data have also been published by China for international comparison. In the rest of this chapter, whenever national income is used, it will refer to the Chinese concept. However, other concepts such as GNP are still the same as that in Western economics.

[3] To be comparable with the structure of the national income, the total labor force shown in Figure 3-1 only consists of material production departments, i.e., agriculture, industry, construction, commerce and transportation. The total amount of labor employed in these five departments accounts for 90% of the overall labor force (see *Statistical Yearbook of China*, 1990), the remaining are employed in the so-called non-material production departments.

[4] Renminbi (RMB) is the name of the Chinese currency with Yuan (RMB¥) as the basic unit. E.g., the official exchange rate of RMB in 1989 was on the average, US$1 = RMB¥ 3.766.

[5] The growth rate of GNP is derived from *Statistical Yearbook of China* (1990, p.33).

activities. Although reforms in the urban industrial and commercial sectors have proceeded at a slower pace, due to hinderance by the enterprise and price reforms, the open-door policy still has been maintained.[6] The increases in international trade and contacts have been dramatic, contributing to greater efficiency and higher rates of growth in the Chinese economy. From 1979 to 1989, China's total foreign trade increased from US$29.34 billion to US$111.68 billion (Figure 3.2). Since China is a large developing country with a huge domestic market, exports represented less than 13% of GNP in 1989. However, due to the fast growth in foreign trade, the share of exports in GNP has more than doubled between 1979 and 1989 (Figure 3.3). Performance in foreign trade will be further discussed in the following sections.

3.2 Overview of China's Foreign Trade

Some basic economic statistics are provided in this section to show that: (a) the decade-long economic reform

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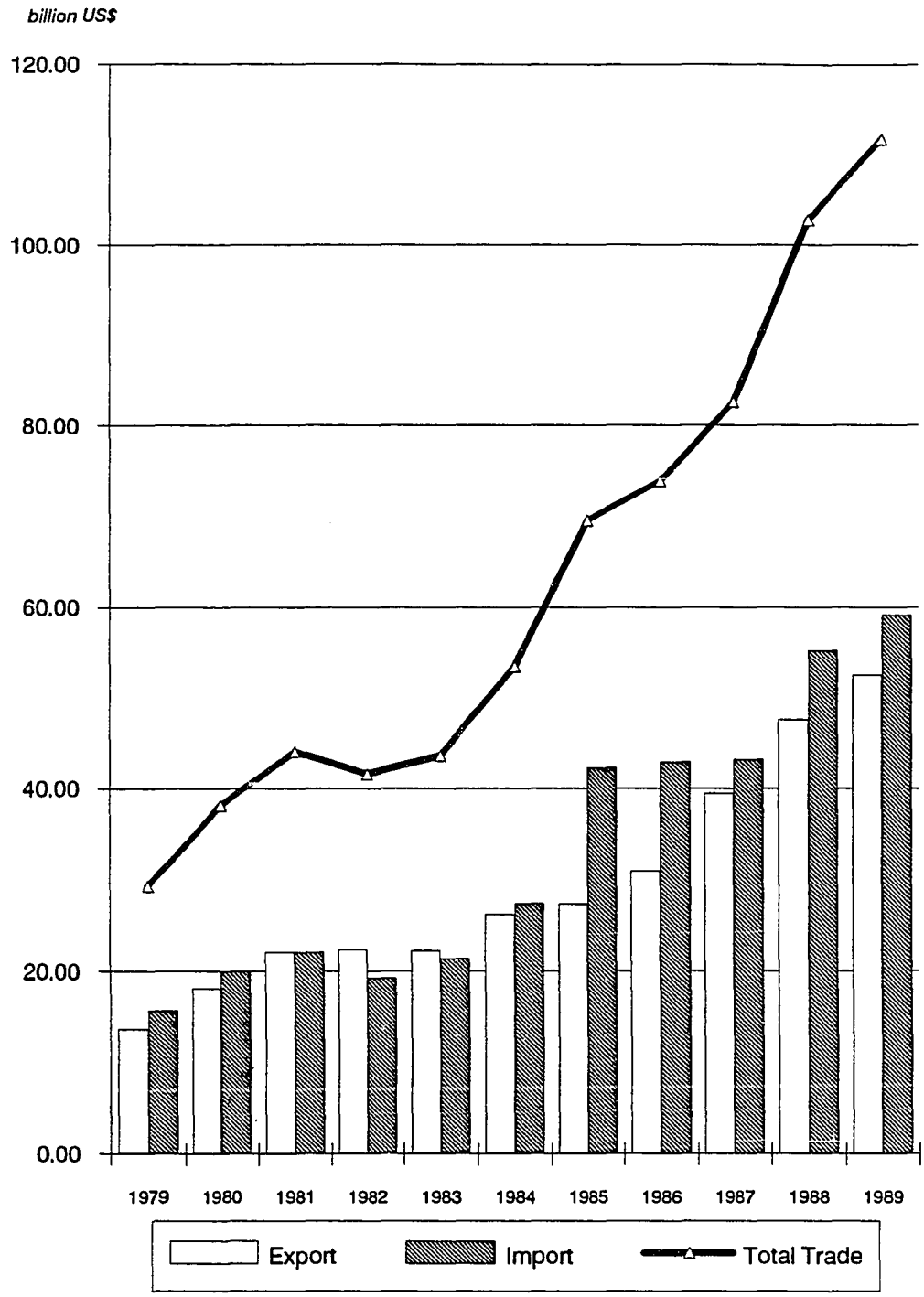
[6] Due to the failures in implementing the enterprise and especially price reforms, the Chinese economy has had some serious problems since mid-1988. These problems are further exacerbated because of the lack and failure of reform on the political front. Price hiking, shortage of supply and contradiction of economic reform with the traditional economic system outraged of the people toward the increasing "official corruption" (guandao), triggering the wide-sweeping democratic movement and street demonstration in April-June, 1989. Details of the price reform, its contribution to social unrest and the agitation for democracy, and the future prospects are discussed by Wiemer (1990).

Figure 3.2

Volume of China's Foreign Trade: 1979-1989

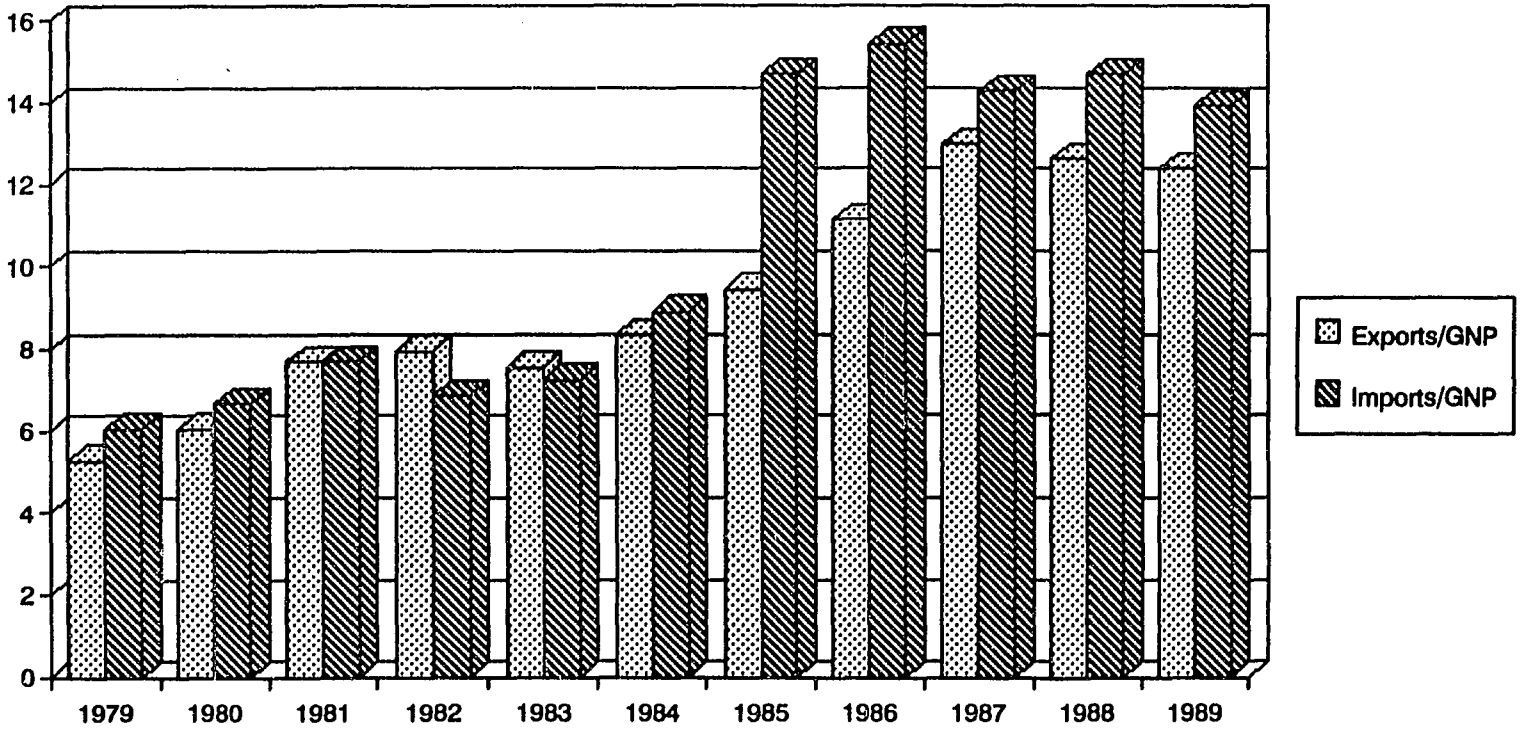


Source: Statistical Yearbook of China, 1990

Figure 3.3

Share of China's Exports and Imports in GNP: 1979-1989

(Percent)



Source: Statistical Yearbook of China, 1990.

and new trade policies have triggered vigorous growth of China's foreign trade; (b) China is not particularly different from other large low-income developing countries in several respects. In terms of trade composition, China exports primary and labor-intensive manufactured goods in exchange for imports of industrial and capital goods and advanced technology. In terms of direction of trade, China maintains a trade deficit with the industrialized countries and a surplus with other developing countries.[7] Detail of these will be discussed in the following sections. But the similarities end there. Policy issues are quite different. Due to its traditional characteristic of central planning, China has undertaken unprecedented trade reforms in the past decade. An examination of the reforms and new policies is necessary in order to analyze the pattern of effective protection in China.

To better evaluate China's foreign trade, we divide the history of the People's Republic into four periods[8]:

- Lean-to-socialist-bloc period: 1949-59;
- Self-reliance period: 1960-71
- Expansion period: 1972-78
- Ten-year-economic-reform period: 1979-89

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[7] This pattern is shown by using the Chinese statistics. The difference in accounting framework used by China and other Western countries regarding Sino-Western trade will be discussed in the footnote to section 3.2.3.

[8] See, for example, Tsao (1988).

3.2.1 Volume of the Trade

China's foreign trade is characterized by sharp contrasts among the four above-mentioned periods (Table 3.2). The 1950's saw the rapidly growing foreign trade in China. The continuous and massive military and economic aid from the Soviet Union and the Eastern European socialist countries played a major role in this. It was a lean-to-socialist-bloc period, partly due to the fact that the trade controls and embargo by the United States and its allies denied any equipment and technology to China.[9] During this period, foreign trade rose slightly faster than the already rapidly growing national income.[10]

The trend of fast foreign trade growth reversed in the 1960's following the Sino-Soviet split on ideological, diplomatic and political fronts. While the national income was still growing, though at a much lower pace, foreign trade stagnated and total volume of trade was below the 1959 level for the most of the period (Table 3.3). At the same time, the Chinese government adopted a self-reliance policy that persisted until early 1970's. China was in isolation

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[9] In December 1950 the U.S. government imposed a total embargo on U.S. trade and payment transactions with the People's Republic of China. In May 1951 the United Nations General Assembly adopted a resolution recommending that every country impose an embargo on shipments of military weapons and strategic materials to areas under the control of China and the Democratic People's Republic of Korea (North Korea).

[10] See Table 3.2.

Table 3.3
Exports and Imports of China: 1950-89
(US $ billion)

Year	Exports	Imports	Trade Balance
1950	0.55	0.58	-0.03
1951	0.76	1.20	-0.44
1952	0.82	1.12	-0.30
1953	1.02	1.35	-0.33
1954	1.15	1.29	-0.14
1955	1.41	1.73	-0.32
1956	1.65	1.56	0.09
1957	1.60	1.51	0.09
1958	1.98	1.89	0.09
1959	2.26	2.12	0.14
1960	1.86	1.95	-0.09
1961	1.49	1.45	0.04
1962	1.49	1.17	0.32
1963	1.65	1.27	0.38
1964	1.92	1.55	0.37
1965	2.23	2.02	0.21
1966	2.37	2.25	0.12
1967	2.14	2.02	0.12
1968	2.10	1.94	0.16
1969	2.20	1.83	0.37
1970	2.26	2.33	-0.07
1971	2.64	2.21	0.43
1972	3.44	2.86	0.58
1973	5.82	5.16	0.66
1974	6.95	7.62	-0.67
1975	7.26	7.49	-0.23
1976	6.86	6.58	0.28
1977	7.59	7.21	0.38
1978	9.75	10.89	-1.14
1979	13.66	15.68	-2.02
1980	18.12	20.02	-1.90
1981	22.01	22.02	-0.01
1982	22.32	19.29	3.03
1983	22.23	21.39	0.84
1984	26.14	27.41	-1.27
1985	27.35	42.25	--14.90
1986	30.94	42.91	--11.97
1987	39.44	43.21	--3.77
1988	47.54	55.25	--7.71
1989	52.54	59.14	--6.60

Source: Statistical Yearbook of China 1990, p.641.

from the outside world, where the international trade system was dominated by advanced capitalist countries.

The rapid growth rate of foreign trade resumed in the early 1970's when China began to break its isolation and turn to the Western countries. Bilateral trade between China and Japan, the European Economic Community (EEC).[11] and to a lesser extent the United States, expanded quickly. Total trade grew at a record average rate of 20.7% during 1972-78; meanwhile the growth rate of national income was only 5.5% per anum. This was largely explained by two factors: (a) China was no longer isolated from the outside world. Large quantities of modern equipment poured into the Chinese market. (b) China lost no time to reap the benefit of the world oil price hike by quickly expanding its exports of petroleum and oil products (Table 3.4). By this, it managed to maintain the overall trade balance.

Due mainly to the world economic recession and political turmoil within China, growth in foreign trade halted for a short time around 1975-76. It has surged again since 1978, the year in which China started to launch the economic reform program. From 1979 to 1988, the overall

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[11] The European Economic Community (EEC) consisted of the Federal Republic of Germany, France, Italy, Belgium, the Netherlands and Luxembourg. The name was changed to European Community (EC) in 1976 and added as members the United Kingdom, Denmark and Ireland in 1977, Greece in 1981, Spain and Portugal in 1986.

Table 3.4
China's Exports of Crude Oil & Oil Products: 1962-1989
(million metric tons)

Year	Crude Oil	Oil Products	Year	Crude Oil	Oil Products
1962	0.06	0.03	1976	8.50	1.94
1963	0.07	0.01	1977	9.11	1.96
1964	0.09	0.04	1978	11.31	2.17
1965	0.20	0.10	1979	13.43	3.03
1966	0.20	0.20	1980	13.31	4.20
1967	0.16	0.14	1981	13.75	4.59
1968	0.13	0.11	1982	15.20	5.27
1969	0.11	0.14	1983	15.19	5.12
1970	0.19	0.19	1984	22.01	5.70
1971	0.26	0.37	1985	30.03	6.21
1972	0.64	0.89	1986	28.50	5.46
1973	1.83	1.16	1987	27.23	4.94
1974	5.07	1.47	1988	26.05	4.79
1975	9.88	2.10	1989	24.39	4.74

Source: Statistical Yearbook of China, 1981-1990.

Table 3.5
China's Grain Trade: 1953-1988
(Million tons)

Year	Export	Import	Net Export	Year	Export	Import	Net Export
1953	1.83	0.01	1.82	1971	2.62	3.17	-0.55
1954	1.71	0.03	1.68	1972	2.93	4.76	-1.83
1955	2.23	0.18	2.05	1973	3.89	8.13	-4.24
1956	2.65	0.15	2.50	1974	3.64	8.12	-4.48
1957	2.09	0.17	1.92	1975	2.81	3.74	-0.93
1958	2.88	0.22	2.66	1976	1.76	2.37	-0.61
1959	4.16	0.00	4.16	1977	1.66	7.34	-5.68
1960	2.72	0.07	2.65	1978	1.88	8.83	-6.95
1961	1.36	5.80	-4.44	1979	1.65	12.35	-10.70
1962	1.03	4.92	-3.89	1980	1.62	13.42	-11.80
1963	1.49	5.95	-4.46	1981	1.26	14.81	-13.55
1964	1.82	6.57	-4.75	1982	1.25	16.11	-14.86
1965	2.41	6.41	-4.00	1983	1.96	13.44	-11.48
1966	2.89	6.44	-3.55	1984	3.19	10.41	-7.22
1967	2.99	4.70	-1.71	1985	9.32	6.00	3.32
1968	2.60	4.60	-2.00	1986	9.42	7.73	1.69
1969	2.24	3.79	-1.55	1987	7.37	16.28	-8.91
1970	2.12	5.36	-3.24	1988	7.18	15.33	-8.15

Source: Statistical Yearbook of China, 1981-1989.

trade grew at a high annual rate of 17.6%, accompanied by an impressive annual growth rate of 9.2% of national income during the same period. Given the fluctuation and occasional setbacks and stagnation of the world economy and trade in the 1980's, the performance of China's economy in the last period is the best out of all the four periods. It certainly deserves further study to assess its influence on the economy.

3.2.2 Composition of Trade

The principal imported items of China in the 1950's were complete plants, machinery and consumer goods. Agricultural products were the main exports. Trade imbalance was closed by credits provided by the Soviet Union and its allies.

In the 1960's, due mainly to the chronic decline of agricultural production (natural calamity and government policy mistakes contributed to this failure), grain imports increased quickly[12] (Table 3.5). Exports of manufactured goods therefore increased to pay for the imports.[13] In the

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[12] Although China has relied heavily on agricultural products for its exports, grain remains the exception. Chinese grain production shows a high fluctuation and large quantities of grain imports have often taken place for almost all the periods (refer to Table 3.5).

[13] At this stage, China had to balance its trade due to the lack of international credits and the prevailing self-reliance policy.

expansion period of the 1970's, China started to import complete sets of modern equipment from the Western countries. The imports were balanced by the expanded exports of petroleum[14] and textiles. Limited bi-lateral credits were also available from Japan and the EEC.

During the ten-year-economic-reform period, both imports and exports increased quickly although the growth rate varied year by year. At the current stage, China's exports are dominated by primary and labor products (Table 3.6). However, the heavy industrial products also represent a substantial portion of the exports. Heavy industrial and capital goods were the bulk of the total imports[15] (Table 3.7).

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[14] See Table 3.4.

[15] Many economists suggest that China should gradually reduce its export of resource-intensive products and encourage the export of labor-intensive products. By using the constant-market-share (CMS) analysis, Tyers, Phillips and Findley (1988) found that the potential expansion ability of China's textile exports is much stronger than its Asian competitor -- Indonesia, Malaysia, the Philippines and Thailand in almost all the main markets in the world. As for agriculture, Anderson and Tyers (1987) noticed that in the recent years, Chinese food trade showed a rising surplus (refer to Table 2.5 and 2.6). However, they predicted that Chinese agriculture is likely to become a relative smaller part of the economy as it grows, and net food imports is possible. As for the crude oil, the main constraint for expanded export is the increased domestic demand. All these recommended that China adjust the policies to cope with the likely changing economic pattern and take advantage of its abundant factors -- labor force and comparatively well-established basic industrial bases.

Table 3.6
Commodity Composition of China's Export: 1981-1989
(percent)

Item	1981	1982	1983	1984	1985	1986	1987	1988	1989
Primary goods	46.6	45.0	43.3	45.7	50.6	36.4	33.6	30.4	28.7
of which:									
Animals chiefly for food	13.3	13.0	12.8	12.4	13.9	14.4	12.1	12.4	11.7
Beverages and tobacco	0.3	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.6
Non-food and raw materials	8.9	7.4	8.5	9.3	9.7	9.4	9.3	9.0	8.0
Mineral fuels, lubricants and other related materials	23.7	23.8	21.0	23.1	26.1	11.9	11.5	8.3	8.2
Animal and vegetable oils, fats and waxes	0.4	0.4	0.5	0.6	0.5	0.4	0.2	0.2	0.2
Manufactured goods	53.4	55.0	56.7	54.3	49.4	63.6	66.5	69.7	71.3
of which:									
Chemical and related products	6.1	55.0	56.7	5.2	5.0	5.6	5.7	6.1	6.1
Products of light and textile industries rubber, minerals and related products	21.4	5.4	5.6	19.3	16.4	19.0	21.7	22.1	20.7
Machinery and transp. equipment	4.9	19.2	19.7	5.7	2.8	3.5	4.4	5.8	7.4
Miscellaneous products	16.9	5.7	5.5	18.0	12.8	16.0	15.9	17.4	20.5
Products n.e.s.	4.1	16.6	17.1	6.1	12.5	19.4	18.7	18.3	16.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Statistical Yearbook of China, 1981-1990.

Table 3.7
Commodity Composition of China's Imports: 1981-1989
(percent)

Item	1981	1982	1983	1984	1985	1986	1987	1988	1989
Primary goods	36.5	39.6	27.2	19.0	12.5	13.2	16.0	18.2	19.9
of which:									
Animals chiefly for food	16.4	21.8	14.6	8.5	3.7	3.8	5.7	6.3	7.1
Beverages and tobacco	1.0	0.7	0.2	0.4	0.5	0.4	0.6	0.6	0.3
Non-food and raw materials	18.2	15.6	11.6	9.3	7.7	7.3	7.7	9.2	8.2
Mineral fuels, lubricants and other related materials	0.4	1.0	0.5	0.5	0.4	1.2	1.3	1.4	2.8
Animal and vegetable oils, fats and waxe	0.5	0.5	0.4	0.3	0.3	0.5	0.8	0.7	1.5
Manufactured goods	63.5	60.4	72.8	81.0	87.5	86.8	84.0	81.8	80.1
of which:									
Chemical and related products	11.9	15.2	14.9	15.5	10.6	8.8	11.6	16.5	12.8
Products of light and textile industries rubber, minerals and related products	18.3	20.3	29.4	26.7	28.2	26.1	22.5	18.8	20.9
Machinery and transp. equipment	26.7	16.6	18.6	26.4	38.4	39.1	33.8	30.2	30.8
Miscellaneous products	2.5	2.5	3.6	4.3	4.5	4.4	4.4	3.6	3.5
Products n.e.s.	4.1	5.8	6.3	8.1	5.8	8.5	11.8	12.6	12.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Statistical Yearbook of China, 1981-1990.

3.2.3 Direction of Trade

As shown by Table 3.8, China's direction of trade has had a dramatic change in the past four decades. Socialist countries dominated foreign trade in the 1950's, their share accounting for 65.3% of the total volume. However their importance declined in the 1960's and the share of the socialist countries in China's foreign trade declined to 24.6%. During the same period, the share of Hong Kong, Macao and other Asian countries, and the Western countries as well (except for the United States) increased.

During the expansion period of the 1970's (1972-78), while the share of the socialist countries in China's total trade decreased further, that of Japan, EEC and the United States[16] showed a sharp increase. At the current stage, Hong Kong and Macao, Japan, EEC, the United States[17] and

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[16] Sino-US trade started to pick up, following China's resumption of its U.N. seat in 1971 and a historic visit to Bejing by President Nixon in 1972.

[17] It is worth noticing that the accounting frameworks of the U.S. and China are different with regard to bilateral trade. While the US considers the indirect trade through Hong Kong as part of the bilateral trade, China excludes it. The International Monetary Fund has maintained for years the difference between the Chinese exports to the US (reported by China) and the US imports from China (reported by the US). The same discrepancy can be found also in bilateral trade between Germany and other countries. As for Sino-American trade, that difference has been growing lager and larger in recent years, prompting the US to list China as the second largest country, next only to Japan, that maintains a trade surplus with the US. We will address this problem again in Chapter V. In the rest of the study, we will use the Chinese data (which shows a trade deficit with the US) unless it is otherwise specified.

Table 3.8
Estimated Shares of China's Foreign Trade by Country Groups: 1950-88
(percent)

Period	Socialist Countries	Industrial Countries	Developing Countries
1950-59	65.3	5.8	28.9
1960-71	24.6	29.3	56.1
1972-78	12.2	49.2	38.6
1979-88	6.0	53.3	40.7

Note: The fourth period may not be exactly comparable with the first three periods due to the different sources. It does, however, show the general trend of China's direction of tra

Source: 1950-1981 were compiled from official statistics of China, reproduced in Tsai (1988) 1982-1988 are from IMF: Direction of Trade Statistics Yearbook, 1989.

Table 3.9
Leading Trade Partners of China in Selected Years
(percent)

	1981			1985			1989		
Partners	Total	Export	Import	Total	Export	Import	Total	Export	Import
Hong Kong and Macao	15.8	25.9	5.8	17.5	27.1	11.3	33.1	43.4	24.0
Japan	25.4	22.1	28.6	30.5	22.3	35.7	16.6	15.8	17.3
EC	10.8	11.6	10.0	12.1	8.4	14.5	12.3	9.1	15.1
United States	14.4	7.0	21.6	10.8	8.5	12.2	9.9	7.7	11.9
ASEAN	4.5	6.5	2.6	5.6	10.3	2.7	5.9	5.8	5.9
Subtotal	70.9	73.1	68.6	76.5	76.5	76.4	77.8	81.9	74.2
Total World	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: IMF: Direction of Trade Statistics 1988, pp.136-138; 1990, pp 134-136.

the ASEAN[18] countries are the five main trade partners of China. These took up about 80% of the total trade in 1989 (Table 3.9).

3.2.4 Recent Developments in China's Balance of Payments

Various components of the balance of payments are important indicators of international economic performance of a country. China's balance of payments in recent years experienced a major change, indicating some instability at the current stage.

From 1980 to 1984, China ran a current account surplus. The surplus peaked in 1982 at $6.22 billion before declining to $2.51 billion. In 1985, while imports increased to $42.5 billion from $27.4 billion in 1984 -- jumping by 54%, and as a result, current account had a huge deficit of $11.4 billion. From 1985 to 1989, while exports grew steadily, imports stagnated for three years before going up again in 1988 and 1989. During the same period, current account had a deficit for each year, except for 1987 (Table 3.10).

The statistics above show that the growth of imports has fluctuated more than that of exports, indicating that influences due to policy are large. The imports therefore play an important role in determining the change of current

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[18] Association of South East Asian Nations (ASEAN) consists of Indonesia, Malaysia, Singapore, the Philippines and Thailand, joined by Brunei in 1986.

Table 3.10
China's Balance of Payments: 1982-1989
(US $ billion)

	1982	1983	1984	1985	1986	1987	1988	1989
A. Current account	6.22	4.49	2.51	-11.42	-7.03	3.00	-3.80	-4.32
Trade balance	4.25	1.99	0.01	-13.12	-9.14	-1.66	-5.32	-5.62
Balance of other goods and services	1.09	1.99	2.05	1.46	1.73	1.74	1.09	0.92
B. Direct investment and other Long-term Capital	0.41	1.17	1.61	4.39	7.54	5.75	7.14	5.24
C. Other short-term capital	-0.2	-0.52	-1.37	2.27	-2.30	0.21	0.06	-1.52
D. Net errors and omissions	0.29	-0.35	-0.89	0.03	-0.26	-1.48	-1.02	0.12
E. Counterpart items	0.03	0.02	-0.02	0.05	0.04	-0.01	0.01	0.00
F. Total change in reserves (- = increase)	-6.36	-4.80	-1.84	4.67	2.01	-4.77	-2.38	0.48

Source: IMF: Balance of Payments Statistics, 1990, p.142.

account. To explain the fluctuation in imports, we need to consider three factors. First, the Chinese government traditionally gives heavy subsidies to certain imports, such as grain, chemical fertilizer and pesticides. The policy has been maintained for years. Second, the tariffs collected by the government are usually lower than the published tariff schedule. Third, the government has maintained restrictions for some other importable goods through the trade planning and import licensing system. The first two factors tend to increase the total imports and the third one tends to reduce it. The ultimate imports would depend on the relative importance of each of the three factors. In Chapter V, we will present three scenarios to simulate possible government policy frameworks and assess their effects. Now we turn to the analysis of China's foreign trade reform in the following section.

3.3 Evolution of China's Foreign Trade Reform: 1979-88

The present foreign trade system of China is in many aspects different from the pre-1978 regime. Administrative and mandatory trade planning has been gradually replaced by guidance planning and macroeconomic management. Review of the evolution of the institutional reform is necessary for determining the current trade policy environment in China. For this regard, a World Bank report (1988) contains some important analysis and documentation of China's trade

reforms. We refer to it at various places in this section and its work will be well acknowledged. The hypothesis of this study is that, as the economic reform continues in China, economic levers as tariffs and taxes will play a larger role in China's economy and foreign trade.

3.3.1 A Historical Perspective

The pre-1978 foreign trade system of China was established in the early 1950's, which was by and large a duplicate of the Soviet model. It was unchanged in the following three decades, during which the centralization of decision-making power was further strengthened. The system was characterized by three key features.

(a) Centralized administrative management system. For the first few years of the People's Republic, trade was conducted by a strict licensing system. However, from about 1952 onwards, this was replaced by a centralized administrative management system under the Ministry of Foreign Trade (MFT). The MFT had been granted the power to govern all trade activities through its centralized Foreign Trade Corporations (FTCs), organized along product lines. There were, at that time, 12 FTCs[19], all labelled "China

[19] The product lines covered by these 12 corporations were technology, machinery, minerals and metals, chemicals, instruments, cereals, oils and foodstuffs, textiles, light industrial products, arts and crafts, native products and animal by-products, medicines and health-care products, and packaging.

National (Product) Import and Export Corporation." These FTCs had (and still have) their head offices in Beijing, with branch offices in capitals of most provinces. Also at the local level were Foreign Trade Bureaus (FTBs), which were, in fact, provincial offices of the MFT. The enterprises that produced the goods for exports or consumed the imported products were supervised and controlled either by the FTCs and their subsidiaries or by the FTBs.[20] There were, therefore, two parallel organizations, both of which were superiors of the individual enterprises and reported directly or indirectly to the MFT.[21]

(b) Mandatory foreign trade planning. This was another characteristic of the traditional trade regime. Annual foreign trade plans dominated all trading activity. Local authorities, industries and especially enterprises were in general not permitted to participate in foreign trade directly. The import-export mix, including even the domestic supply sources of exports and the foreign supplies of imports, was determined by the MFT in cooperation with the State Planning Commission (SPC) and formulated as

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[20] The FTBs were the local branches of the MFT as well as part of the provincial governments. They supervised the production of all export enterprises except for the provincial FTCs, which were organized by specialized product lines and were financially independent. However, the provincial FTCs are technically under the jurisdiction of the FTBs of each province, although in practice they reported directly to the FTCs headquarters in Beijing.

[21] See the World Bank (1988) pp.96-97.

imperative plan for the obligatory implementation. It was up to the FTCs to carry out the annual plan. Conducting trade beyond the plan was almost impossible. All exports were procured by FTCs at the fixed state procurement prices and formed a part of the overall plan of individual enterprises. On the import side, FTCs would be provided with a foreign exchange allocation according to trade plan amounts, and the imported products they procured would then be sold on the domestic market, at the fixed domestic prices. Direct contact between the domestic production enterprises supplying the exports and their foreign customers as well as that between domestic users of imports and foreign suppliers were therefore suspended.

(c) Centralized accounting system. FTCs and finally the MFT were responsible for all benefits and losses of the enterprises. At this time, enterprises were entirely indifferent to whether they were producing for export or for domestic market. In general, production for exports did not generate additional benefits for the individual enterprises. Their performance was still to be judged by the extent to which their physical output plan was fulfilled rather than actual sales of their products in the international market.[22] This kind of "centralized revenue and expenditures, centralized responsibility of profits and losses" (tongshou tongzhi, tongfu yingkui) policy also made

[22] Tsang and Woo (1987) p.406.

the exchange rate of Chinese currency renminbi (RMB) insignificant in determining the trade flows of China, though many believed that the currency was overvalued. However, the overvaluation of RMB made it possible for the MFT (the accounts of individual FTCs were totaled within the overall MFT budget) to make profits on imports and use them to cover losses on exports.

The system did enable China: (a) to avoid balance of trade deficits; (b) to isolate the domestic market from any instability in the world market; and (c) to control the level and composition of imports and exports, and thus to protect the infant industries in China. However, the shortcomings were also obvious with such a centralized system, which were realized by the Chinese policymakers.

(a) Trade channel was inefficient and the system impeded effective technology transfer.

(b) The system was over-centralized and slow to respond to changes in local conditions, and to new export opportunities.

(c) The system was lacking in autonomy, material incentives and competition pressure for the trade enterprises.

In short, the traditional system could not cope with the need to expand trade quickly nor with the new international trade situation initiated by the open-door policy facing China.

3.3.2 Reform of China's Foreign Trade System: 1979-84

Since 1979, the Chinese government has experimented with some institutional reforms in trade administration. The initial stage of the experiments was from 1979 to 1984. The reforms involved decentralization measures, which included: (a) diversifying trade administration and decentralizing the decision-making power so as to allow more such power to local authorities, industries and even some production enterprises; (b) merging FTCs with productive and commercial enterprises to form industry-trade complexes to negotiate, conduct trade with foreign customers; (c) transforming FTCs from mere administrative units carrying out directives of the superior organs into independent economic entities with much greater autonomy, material incentives and pressure to improve efficiency. Along with these measures, the State adopted an internal foreign exchange settlement rate (RMB¥2.8/US$), which was 87% higher than the official exchange rate (RMB¥1.5/US$) and which reflected more accurately the real cost of exports during 1981-84. More flexible policies were also adopted in the newly established special economic zones and other open areas.

Several new institutions were created during this period, although some were short-lived. The major new institutions were: (a) the Foreign Investment Control Commission (FICC), which was established to regulate all

foreign investments in China; (b) the State Import and Export Commission (SIEC) that was charged with making policies on new trading arrangements and technology imports policy; (c) the General Administration of Customs (GAC), with particular responsibility for formulating policies for preferential customs treatment; and (d) the China International Trust and Investment Corporation (CITIC), primarily designed to bring together foreign and local partners in joint ventures. In March 1982, the FICC and SIEC were combined with the MFT and the old Ministry of Foreign Relations to form the new Ministry of Foreign Economic Relations and Trade (MOFERT). CITIC and GAC continues to report directly to the State Council.

While effective in improving the external balance by expanding the exports, the adoption of these measures led to deterioration of the internal balance[23]. Since the central control remained paramount and the decentralization of trading power was not accompanied by the establishment of the financial responsibility system, the government was obliged to pay huge subsidies to exports. The FTCs competed to export products, regardless of the high foreign exchange conversion costs, so that their export plans would be

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[23] Internal balance refer to the balance of RMB account in foreign trade. Since the government offered an internal settlement rate, which was higher than the official exchange rate, as an incentive to export industries, its fiscal deficit due to foreign trade financing had risen.

fulfilled.[24] Considering these new problems, further and more complete trade reforms were due to come.

3.3.3 Reforms of China's Foreign Trade System: 1984-88

A comprehensive program formulated by MOFERT was approved by the State Council in September 1984. This program was based on a larger and more completed resolution of economic reform adopted by the State Council at the same time.[25] There were five basic elements of reform of the trade system identified by MOFERT[26]:

(a) Separating central policy for trade from its day-to-day management. This would leave MOFERT free to concentrate on such areas as drawing up regulations, formulating long term plans, advising on the appropriateness of economic levers related to trade, conducting negotiations

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[24] Since the central government assumed all the financial responsibility for export loss, and fulfillment of the trade plans in terms of quantity of exports were the only target of the FTCs, competition for the procurement therefore arose. Fulfilling the quantitative trade plan, where the government were responsible for the profit and losses, could entitle the FTCs enormous benefits. Unless the FTCs were required to take the financial responsibility and still fulfill the trade plans, the results of huge loss could not be avoided.

[25] At the historical Third Plenum of the Twelfth Central Committee of the CPC held in 1984, an important resolution, called "Decision of the CPC Central Committee on Reform of the Economic Structures" was adopted by the CPC, and approved by the National People's Congress in 1984. The resolution signaled the deepening of the economic reform.

[26] See MOFERT: *Almanac of China's Foreign Economic Relations and Trade*, 1985, pp.388-398.

with foreign countries, and conducting research and training.

(b) Simplifying administration and transferring power to lower administrative levels and bringing into full play the managing initiative of various foreign trade enterprises. This meant that the foreign trade enterprises will conduct independently the import and export business, keeping their own accounts and assuming responsibility for their own profits and losses. It also involved the abolition of the monopoly power of national FTCs, and granting trading rights to certain enterprises.

(c) Adopting an import and export agency system and improving operations and management of foreign trade. This was one of the most important and crucial changes of the reform. Trade corporations could serve as agents of the production and commercial enterprises that supplied exports or demanded imports. For export commodities, its application would vary from commodity to commodity, with the agency system adopted for manufactured exports, but with direct purchase to be continued for agricultural and handicraft products.

(d) Reforming the foreign trade planning system and simplifying the contents. This would be done by relying more on guidance plans than on command plans.

(e) Reforming the foreign trade financial system. This required the elimination of the state's responsibility for

profits and losses in trade. The FTCs should pay taxes instead of turning over profits to the state.

There were two other major events in 1984 that came together with MOFERT's above-mentioned reforms, which aim to form a new blueprint. First, from 1984 onwards, the informal arrangement for sharing foreign exchange between central government and other provincial authorities was formalized, with most provincial authorities given the right to retain 25% of their foreign exchange earnings for their own use. From 1985 onwards, enterprises were allowed to use half of the retained foreign exchange for their own account.[27] Second, provisional regulations for issuing import licenses were issued in January 1984. These regulations defined import rights, and were a blueprint for decentralization. Imports were classified as restricted and unrestricted. In general, the state now no longer imposes any imperative plan for the procurement of exports and allotment of imports. The licensing system therefore has emerged as a new administrative lever for the Chinese government. More important, the licensing system permitted a group of institutions to import unrestricted items without reference to MOFERT.

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[27] The foreign exchange retention (FER) system was officially established in 1979, which divided the foreign exchanges between the state and FTCs plus exporting enterprises. However, the state only set up a special account at the Bank of China (BOC) to deposit the retained foreign exchange that belonged to the FTCs and exporting enterprises, and did not permit them to be used until 1985.

The immediate result of the decentralization was a boom in import. In 1978, as already noted, there were only 12 FTCs, albeit with branch offices. By the end of 1984, there were over 1000 separate entities directly conducting foreign trade. Replacing the imperative import plan with the licensing system was another cause for imports to take off. Unfortunately, as indicated at the earlier section on recent developments in China's balance of payments, the trade account and current account had turned from surplus to deficit in 1985, and 1986 too. The Chinese government therefore felt compelled to tighten controls in 1985. As a result, imports were curtailed by the government.

Balance of payments was improved in 1987 after the Chinese government re-centralized some decision-making rights in 1986, at the costs of huge setback in imports. However, trade reforms continued in 1987 when the State Council approved the reform plan prepared by MOFERT. The most important step taken by the government according to the new reform plan was to introduce the foreign trade contracting responsibility system[28] (waimao chenbaozhi)

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[28] The foreign trade contracting responsibility system works as the following: firstly, the local provinces, autonomous regions, municipalities directly under the Central Government, municipalities directly under central planning and various corporations that are assigned export task by the state, obtain contracts from the government with quota including foreign exchange earnings of exports, foreign exchanges submitting to the state and economic efficiency. It is then up to contractors other than the state to find out export products by procuring from or signing subcontracts with the trade enterprises. For the

into various trade corporations and enterprises. This was seen as the spread and deepening of the overall economic reform in the country. Other measures that were adopted included: (a) improving the financial responsibility system by enlarging the scope of experiments; (b) improving the foreign exchange retention system according to the degree of production processing, with the higher retention ratio given to the higher processing activities; (c) enlarging the industry-trade complexes; (d) enlarging the trade agency system; and (e) improving the trade administrative management.

These measures were further strengthened in 1988 when there was a full-scale application of the contract responsibility system. And in addition, the government experimented in three sectors (light industry, handcraft and garment) the full financial responsibility system. The trade enterprises in these three sectors now will take full responsibility for their profits and losses, retain the main part of the export earnings and submit the smaller portion to the state.

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foreign exchange earnings within the contracting quota, the larger part is submitted to the state and the smaller one is retained by the local authorities, trade corporations and enterprises; for the above-quota earnings, the latter can retain the major part to themselves and submit the minor part to the state.

3.3.4 Current Trade System in China

As mentioned before, China's trade system has experienced a substantial change in the past decade. Although the foreign trade plan remains at the center of the trade system in China, as it has since the mid-1950's, its structure is by no means the same as that of the pre-1978 era. In this section, we will discuss the role of the foreign trade plan in China's foreign trade system, as well as the formulation and implementation of the export and import plans.

There are three key roles of the foreign trade plan in regard to its functions within the macroeconomic framework

(a) It acts as an instrument of protection in that it attempts to exclude requests for foreign imports when there is a local substitute available, regardless of price and quality. In this sense, the foreign trade plan acts as a part of the import quota regime.

(b) On the export side, it attempts to overcome the anti-export bias in the trade system by mandating certain exports.

(c) From the point of view of the central planners, the foreign trade plan has the critical role of attempting to balance imports and exports, domestic supply of and demand for critical commodities, and foreign supply of and domestic demand for scarce consumer goods.

Foreign trade plans consist of plans of imports and exports. However, the formulation and implementation of import and export plans are quite different.

The process for the export plan begins with branch offices of FTCs and other trading organizations, which are solicited by MOFERT to provide quantitative estimates of goods available for procurement in the following year. These estimates are fed upwards to MOFERT and SPC. When all estimates of export supply are assembled, MOFERT and SPC go through an elaborate procedure, in combination with the import plan, and derive a final export plan. Then comes the separation of the export plan into command and guidance plans. At the present, in sharp contrast to pre-1978, the responsibility for implementation of the export plan for most commodities rests firmly with the provinces and various FTCs. Once the export plans have been agreed upon and distributed, it is up to the provincial FTBs and provincial branches of FTCs to go out and find export markets and contracts to fulfill the plan, except for a few selected commodities. It is even more so since the foreign trade contracting responsibility system was introduced in 1987. The serious problem of the export system is that, for the vast majority of producers, the FTCs at various levels remain the sole outlet to the outside world. The "air-lock" created by the traditional trade system that separate the producers and consumers has not been broken. Therefore,

despite the apparently wide-ranging reforms that have been announced and carried out in the trade sector, there exists an export system that retains many features of the pre-1978 system, albeit at a much less centralized level.

Trade reform in China has progressed further in the area of imports than that of exports. Currently, there are four essential components in the import plan: (a) a command plan system for seven key materials, a steady supply of which is considered essential; (b) a system of foreign exchange allocation for the import component of priority involvement projects; (c) a system of foreign exchange allocation for other priority imports of raw materials, spare parts and equipment; and (d) an import licensing system to control noncentrally funded imports. This last one is growing in importance and will be discussed further. The sequence for imports considered by the state is the following: command plan ⇒ priority imports ⇒ other priority imports ⇒ other imports.

The fact that the plan still dominates China's foreign trade contradicts with the initial goals set down by the policymakers to subject the enterprises increasingly to international competition, and to make a larger role of the economic levers. However, there is no doubt that the role of the foreign trade plan has changed in many ways in recent years. Together with other progress, there have been three

major changes in China's foreign trade system in recent years and their importance is growing:

First, within the foreign trade plan, the role of the mandatory or command plan has been changed. These are being replaced by guidance plans. The so-called command plan of the foreign trade system is that the government specifies the quantity and volume of each traded good and requires that the FTCs fulfill the plan. For the guidance plan, the government only sets a target of total value of foreign trade for all the traded goods for each FTC or FTB. It is up to the latter to go out to procure the exportable goods and sell to the international market. Before 1979, the number of commodities that were under the command plan was so huge that as many as 3,000 exportable goods were specified by the government and 90% of imports were governed by these plans also. The number of exportable goods and importable goods under the command plans were reduced to 112 and 17 in 1988, respectively.[29] In terms of trade plan implementation, the contracting responsibility has been developed. In terms of trade plan financing, financial responsibility has been experimented with. In terms of incentives, the foreign exchange retention system has been established.

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[29] See *Guojia jiwei tizhi gaige he fagui si* (Bureau of the Structural Reform, Law and Regulations of the State Planning Commission, 1989, pp.578-580) for detail.

Second, since 1979, the foreign trade plan has covered a smaller proportion of trade. Channels of foreign trade have substantially increased and the local authorities, trade corporations and some enterprises have assumed greater power in decision making.

Finally, some new administrative and economic levers other than trade plans have firmly emerged and their importance is growing.

The major problems of current reform of China's trade system are, (a) it is influenced by the overall economic reform, and also political reform in this country and the overall progress of trade reform cannot by-pass the latter; and (b) the trade reform has not yet directly targeted the enterprises, which are the basic units of production and foreign trade and of vital importance to any successful reform. It is the trend that the traditional system will gradually give way to the new system that makes the estimation of the ERPs in China feasible.

Based on our hypothesis that as the economic reform grows, China will finally rely on economic levers such as tariffs, taxes, exchange rates, border prices, domestic resource efficiency and comparative production costs to formulate trade policies, we intend to evaluate a couple of the available economic levers and their effects on the economic structure in this study. The results may be of vital importance to future policy formulations. The

following section will discuss the emerging trade policy environment in China in the past ten years. The emphasis is given to the role of newly-emerged administrative and economic levers, namely the licensing and tax systems of foreign trade, so as to lay the foundation for critical analysis of ERPs in China.

3.4 Emerging Trade Policy Environment

As mentioned earlier, as part of the reform of the pre-1978 trade system, the Chinese government has been developing new policy instruments other than the ones traditionally used. Collectively these instruments will play an important role in defining the new trade policy environment in China and will significantly affect the economic benefits the country can derive from foreign trade.[30]

Like many other large developing countries, China has had many restrictions on foreign trade. In recent years, in addition to the foreign trade plans, the Chinese government has been placing increasing reliance on two instruments to restrict the exports and imports: taxes (tariffs) and licensing. It also used several export promotion measures. All these instruments will be discussed in the following sections.

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[30] See World Bank (1988) p.133.

3.4.1 Licensing System: An Emerging Administrative Lever

Licensing was used to control the trade of China in the early 1950's but soon was replaced by the centralized trade planning.

• The Import Licensing System

Import licensing was re-introduced for a small number of products in 1980. In 1981, 21 commodities were subject to import licenses. The first step to initialize the current system came on January 10, 1984, when the State Council issued the "Provisional Regulations on the Issuing of Import Licenses of the People's Republic of China." Following that declaration, on May 15, 1984, MOFERT and GAC jointly issued the "Rules for the Implementation of the Interim Regulations on Licensing System for Import Commodities of the People's Republic of China," which formally established the new system.

At present, all imports into China are classified in two categories: restricted and unrestricted, with import licensing applying to restricted goods. The restricted list has been changing. From 1984 to 1986, there were 53 commodities on the restricted list.[31] As of January 1987,

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[31] On December 1, 1987 the State Council approved the "Circular of the Ministry of Foreign Economic Relations and Trade, and General Administration of Customs on the Adjustment of Types of Commodities on Import Licenses and Licensees", which listed the current restricted import goods.

the number was reduced to 42, which accounted for about one third of total imports. However, since mid-1988, the number has risen to 53 again.[32]

The restricted list reveals two mixed objectives: control of the balance of payments directly through quantitative restrictions and protection for domestic producers. No matter what the objectives are, the standard judgement is that any quantitative restriction may result in directly unproductive, profit-seeking (DUP) activities.[33] The DUP activities produce zero goods and services but employ part of them to redistribute the current economic revenues to the advantage of some special interest groups.[34]

• The Export Licensing System

Export licensing as now practiced in China began in 1980.[35] The number of commodities subject to licensing has

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[32] The change reflects the uncertainty of the government policy. It has a tendency to prefer the quantitative measures to tariff rate adjustment whenever an imbalance arises.

[33] We have no difficulty in finding these kind of activities in China, such as the infamous "Hainan incident" of autumn 1984, in which the Hainan government financed capital construction projects with the profits from imported motor vehicles and other consumer durable goods, using retained foreign exchange.

[34] See Krueger (1974) and Bhagwati (1982).

[35] On June 3, 1980, the Chinese State Council approved and published the "Interim Procedures of the State Import-Export Commission and the Ministry of Foreign Trade of the

been changing also. There were 152 items on the list in January 1986, 235 items in November 1986, and 212 items in January 1987. As of December 1987, there were 257 items on the list.[36] The number was down to 173 in 1988. Most of the restricted exportable goods are primary goods.

To restrict exports via licensing, the Chinese government has two objectives: (a) Since China is a major world supplier of a number of commodities, particularly primary products, the government intends to restrict them from over-exporting for the benefit of the whole; (b) The government seems to continue the practice of isolating the domestic market from the world market by siphoning off the profit created by higher prices of certain commodities in the world market. However, just like the import licensing, export licensing provides a possibility of windfall gains (legal or illegal) to those who can secure the licenses and sell the restricted quantities at the higher world prices -- unless the licenses are auctioned or sold by tender.

Under some restricted conditions, licensing (quota) and trade taxes will produce the same domestic outcome for a

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People's Republic of China Concerning the System of Export Licensing".

[36] The State Council approved and published on December 31, 1987 the "Circular of the Ministry of Foreign Economic Relations and Trade on the Adjustment of the List of Commodities Under Export Licensing Administration, the Regions Requiring Licenses and the Units of Issuing Licenses", which listed the name of products subject of export licensing and was effective on January 1, 1988.

country that imposes them.[37] However, if the domestic market is already distorted, the imposition of a quota may affect the buyer or seller's degree of monopoly, and hence, supply or demand curve, differently than it would under a tariff.[38] Furthermore, the distribution of the generated revenue is quite different between the two instruments. DUP activities, which are a direct result of the licensing system -- a quantitative restriction, may further distort the domestic market. China, while introducing the licensing system as a way gradually to replace the foreign trade plan, has also practiced trade taxing as important policy instruments in recent years. The Time is ripe for exploring in this field.

3.4.2 Import and Export Taxes: An Emerging Economic Lever

Taxes on imports (tariffs) are much more important and wide ranging than export taxes in China. They serve different purposes. While export taxes serve as supplementary ways of export restriction, the tariff is to protect and promote domestic production. This effect deserves additional study.

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[37] For an analysis of tariff-quota equivalence, refer to Bhagwati (1965).

[38] See Bhagwati (1978) and Krueger (1984).

• Taxes on Imports

The first custom tariff system of China was established in May 1951. Until 1983, 22 revisions were made to the original tariff schedule, mostly to increase the average rates of import duties and to raise revenue.[39] Since 1979, with the launching of the open door policy and the administrative decentralization of trade, the Chinese government began to use taxes on foreign trade as economic levers. The new tariff system was established when two tariff laws were approved in May 1985: "Regulations for Import and Export Tariffs of the People's Republic China" and "Import and Export Customs Tariffs of the People's Republic of China." The former established the rules and regulations governing the formulation and tax rates as well as the administration of the system. The latter established the new schedule for import tariffs and export taxes.[40]

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[39] The initial policy objective of the customs tariff system was to protect domestic industry from foreign competition. The tariff became irrelevant for this purpose when the planning system took over control of China foreign trade in the late 1950's. Since then, the practical role of these duties has been to raise revenues (World Bank 1988).

[40] Since their promulgation on March 7, 1985, the regulations were amended on September 12, 1987 by the State Council. However, the import and export tariffs imposed since March 10, 1985 remain unchanged.

Today, all imports into China are subject to customs tariffs.[41] In addition, selected imports are also subject to import surcharge, grouped into 14 tariff codes.[42] These surcharges will be taken into considerations when the implicit tariff rates (ITRs) are calculated.

Now, the customs tariff code has two schedules: minimum and regular rates. The minimum schedule has a range of 0 to 150 percent and applies to all the trade partners that have trade agreements with China. The general schedule has a range of zero to 180 percent and applies to other trade partners. The former accounts for over 90% of China's total trade. The tariff rates (minimum) and import surcharges combine to result in import duties of 0-200 percent. The maximum import duty applies to motor vehicles, which are subject to a surcharge of 80 percent. Zero duties apply to essential imports, such as live animals and plants, trains, pharmaceutical products, salts, printed matter, a few precision instruments, and some precious metals).

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[41] The complete schedule of the Chines customs tariffs can be seen in numerous publications. The one used in this study is the Official Chinese Customs Guide 1985/1986, prepared by the General Office of the Customs General Administration of the People's Republic of China. See the bibliography for complete references.

[42] The "Circular of the State Council on the Levy of Import Regulatory Taxes on Certain Import Items", which listed the names and rates of the commodities that are subject to import surcharges, went into effective on June 26, 1985. The surcharges are imposed in addition to the regular tariffs. See Appendix II for the list of the items that are subject to surcharge.

The World Bank report[43] summarized the structure of China's import duties by depicting the frequency distributions of duties by major category. In general, the manufacturing sector has higher duties than the agricultural and mining sectors. Manufacturing also has the widest range of duties. Within this sector, the duties are lower for intermediate and capital goods. For over two-thirds of these items the rates fall between 0-40 percent. Within the intermediate goods category, heavy intermediates or goods at the lower stages of processing tend to have lower rates. Within the capital goods category, parts and components tend to have lower rates. In contrast, duties for consumer goods are generally higher -- about two-thirds of them have duty rates above 50 percent -- and more widely dispersed. Among consumer goods, essentials such as cereals, flour, and vegetable oils enter at low duty rates, while nonessentials or items viewed as luxuries, such as some processed foods, textile articles, and household articles, carry substantially higher rates. Luxury consumer durable goods, such as household appliances, carry the highest rates.

The import tariffs and surcharges form the basis upon which to calculate the implicit tariff rates for some sectors. The importance of the implicit tariff rates will be discussed in following chapters. As mentioned earlier, protection and industrial production promotion are the aims

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[43] World Bank (1988) p.148.

of the tariff system. Such use of tariff system represents a significant progress compared with tight administrative and quantitative restrictions used previously to achieve the same target. As the overall economic reform deepens, the importance of this policy instrument is steadily increased. It is time for the Chinese government to consider the effects and repercussions of such a tariff system on the whole economy. In the following chapters, we will turn to this field, as well as that of comparative advantage of industrial sectors, for further elaboration.

• Export Taxes

The export tax applies to a few commodities only. The taxable items cover roughly 5 - 7 percent of the total value of Chinese exports.[44] The list of taxable commodities and associated export tax rates are given in Appendix II. The taxable items fall into two groups. The first group consists of primary products of which China is a major supplier in the world market. It includes minerals such as antimony, tin and tungsten, as well as agricultural and fishery products in which China has a substantial presence, particularly in the Japanese market. The government restricts exports of these products in order to avoid adverse effects on terms of trade. The second group

[44] See World Bank (1988), p.164.

includes some important materials such as metals and coal, for which the domestic demand is large.

3.4.3 Export Promotion Policies in Recent Years

The Chinese government's basic objective regarding exports is to raise the volume of exports in order to enable the country to import the technology, machinery and equipment, raw materials and other inputs needed for economic development. As discussed earlier, the government, under the traditional monopoly trade system in the pre-1978 era, managed to maintain external and internal balances of foreign trade by making profits from imports as a whole to finance the losses of exports. Currently, when the trade system has been partially decentralized and foreign trade financial responsibility, under which trade corporations and enterprises assume their own responsibility for profits and losses, has begun to be established, exports may become less attractive for domestic producers. It is hard to believe that the current export structure is optimal. The fact is many trade enterprises are still obliged to fulfill certain export tasks, otherwise they would rather choose the profitable domestic market, where the demand is usually high, for sale of their products . Furthermore, one characteristic of the current licensing system and tax

system for trade is anti-exports bias.[45] Therefore, unless new sources of exports are explored, or the current export structure is properly adjusted, or new measures are taken, the current export growth will be difficult to sustain under the decentralized trade system.

Since the exports are so important to China's modernization program, China has developed a set of specific instruments and institutions designed to encourage the production and marketing of exports. The principal incentive mechanisms affecting exports involve use of the following instruments[46]: (a) foreign exchange retention rights; (b) bonuses under the export plans; (c) export procurement prices; and (d) an export production base system. These instruments, which have recently undergone changes, are complemented by other, more widely known incentive mechanisms, such as import duties, domestic tax exemptions[47], and production and financing for exports.

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[45] We will discuss in Chapter V whether the pattern of effective protection is also anti-export.

[46] A detailed study of these instruments is found in the World Bank report (1988, pp.166-185). The report summarizes the functions of these policy instruments and suggested further options for export promotion.

[47] The principal exemptions permitted in the system apply to: (a) imports used in the production of exports; (b) capital goods imported to further the national objective of the "technical transformation" of industry; and (c) imports (mostly unrestricted capital and intermediate goods needed for productive activities) for the four special economic zones, for economic and technical development zones in the fourteen open coastal cities, for Sino-foreign joint ventures, and for Sino-foreign cooperative enterprises.

3.5 Summary

China's trade system has undergone great changes in the past ten years, and so have China's trade policies. Now the consensus among the Chinese, economists and the decision makers alike[48], is that a more rational policy framework is needed. Exactly what the new policy framework should be is not certain. We need a systematic analysis of the effects of current policies first. For that reason, we introduce at the beginning of this study the concept of effective rate of protection (ERP). A successful estimation of the ERPs for different economic sectors will not only summarize and quantify the tariffs, taxes and other restrictions, but also provide a ranking index of the incentive structure in the economy and enable us to assess alternative policies. This chapter has provided background information about the Chinese trade reforms and new trade policies. It lays the foundation for us to calculate ERPs and evaluate the pattern of effective protection in China.

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[48] See, for example, Li (1988) and Qiu (1988).

CHAPTER IV

INPUT-OUTPUT TABLES, TAXES AND IMPLICIT TARIFF RATES

4.1 Introduction

Having reviewed the literature on the study of ERPs and the evolution of China's foreign trade reform, we now turn to examining the database used in this study and calculate the implicit tariff rate for each traded sector. This chapter will focus on the following: (a) the input-output table; (b) the tariff schedule; and (c) domestic taxes. All these will be involved in the derivation of the implicit tariff rate, an important component in the estimation formula of the effective rate of protection (ERP).[1]

The database of this study comes from various sources. Among other things, the following sources must be given a special acknowledgement:

- The input-output table of China in 1985, prepared by the State Planning Commission Information Center in 1990. Details of the table will be discussed in section 4.2.

- *Shuishou yu caiwu shouce* (Handbook of Taxes and Finance), published by the Economics and Management Publishing House of China in 1986. This handbook includes most of the tax information, regulations, laws and other official documents as of 1985.

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[1] The input-output coefficient is another nontrivial input in the estimation of ERP.

• *1985 Gongye pucha ziliao* (Industrial Census Data in 1985), published by the Chinese Statistical Bureau in 1988. This unique industrial survey was organized by the Chinese State Council and included every aspect of China's industries. For the present study, the census provides necessary information on industrial production and domestic taxes surrendered to the central government by each industrial sector in 1985.

• *Statistical Yearbook of China*, various issues, published by the Chinese State Statistical Bureau each year since 1981. Publication of this yearbook has been a great success since its first issue in 1981. It has remained one of the most frequently cited references for China study.

Other numerous sources will be footnoted when they are refereed to. The rest of this chapter is organized in the following way. Section 4.2 presents a detailed illustration of the 1985 input-output table of China used in this thesis. Chinese indirect taxes, such as customs duties (guan shui), product taxes (chanpin shui), value-added taxes (zengzhi shui), business turnover taxes (yinye shui) and urban maintenance and construction taxes (chenshi weihu yu jianshe shui) are discussed and estimated for different sectors in section 4.3. Type I (de jure) and Type II (de facto) implicit tariff rates based the above indirect taxes will be calculated in section 4.4. In section 4.5, some adjustments are made for certain sectors due to heavy government

regulations and import licensing in order to calculate Type III (adjusted) implicit tariff rate. Finally, section 4.6 gives a summary of all we have done.

4.2. The Chinese Input-Output Table

4.2.1. Overview of Chinese Input-Output Analysis

Polenske (1990, 1986) and Taylor (1989) give nice and in-depth summaries of the input-output research activities in China. Though considered as a late starter in this area, China did accomplish some research of input-output analysis during the early 1960s, with emphasis on regional and enterprise tables. The work came to a complete halt for most of the time during the early period of the Great Proletarian Cultural Revolution (1966-76).

The first national input-output table was compiled for 1973, involving 61 products and organized in physical terms. In the early 1980's, a national input-output table was estimated for 1979, including 21 sectors organized in value terms. All this work has led to accumulation of valuable experience and has paved the way for further research on this area.[2]

The long expected value term input-output table of 1981 was published in 1988. This table has been widely used by researchers to analyze price reforms, inter-sectoral

[2] See Polenske (1986), and Wu and Zhang (1984) for detail.

resource flows and trade patterns of China.[3] Based on the original design and format of this table, a revised table was made for 1983, and again for 1985, by the State Price Institute of the Chinese State Price Bureau. Some necessary adjustments and changes have been made to conform to the new times.[4] Apart from the national I-O table, many provinces have prepared regional tables for various years.

Recently, the Chinese government has finished the compilation of a complete 118 sector input-output table for the fiscal year 1987, for which each of the 29 provinces, autonomous regions and municipal cities prepared their own as a prerequisite. This large-scale compilation was launched by the State Council in late 1987. The State Statistical Bureau of China was in charge of the work. It had been completed by early 1989. The table is so far the largest of its kind. Out of the 118 sectors, 101 of them are material sectors (5 agricultural sectors, 83 industrial sectors, 6 sectors of transportation and communications, 1 sector of construction and 5 sectors of commerce and catering) and 17 of them are non-material sectors.[5]

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[3] See, for example, Tabata (1988) and Nakagane (1989).

[4] See, for example, Taylor (1989) p.145. The information is also based personal interview with Wang Haibo, the director of the Institute of Industrial Economics, the Chinese Academy of Social Sciences, in April 1989 and with Wu Jiapei, chief economist, the State Information Center in May 1989.

[5] The detail of the classification will be further discussed.

However, the table has not yet been released to the public.[6] Based on the same format as the 1987 national input-output table, the State Information Center completed compilation of a table in 1990 for 1985. The 1985 input-output table is due to be published in 1991. Though containing only 106 sectors, the methodology and format of the 1985 input-output table is essentially the same as that for 1987 (based on information obtained from the State Information Center). Since the 1985 input-output table occupies a rather special and important position in estimating the ERPs, it will be discussed in greater detail in the following section. Table 4.1 lists the main national input-output tables officially compiled by the Chinese government (many of them are not available to the public).

4.2.2 The 1985 Input-Output Table of China

The compilation of the 1985 input-output table by the State Information Center[7] was based on the same format as that of 1987. Obviously the 1987 input-output table is more complete, since it is independently compiled and based a

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[6] At least one province, Liaoning, has published its 1987 I-O table. We also have our access to the 1987 I-O table of another province, Guangdong, which is not published.

[7] From this point on, unless otherwise noted, we always refer to the 1985 input-output table prepared by the State Information Center, which is due to be published in 1991, with the collaboration of the Institute of Developing Economies (IDE), Tokyo, Japan.

Table 4.1
Chinese National Input-Output Tables

Year	Type	Numbers of Products or Sectors	Compiler	Comments
1973	Physical Term	61	Institute of Systems Science, Chinese Academy of Social Sciences	MPS. First national table
1979	Physical Term Value Term	61 21	Industry Economics Research Institute of Academia Sinica	MPS
1981	Physical Term Value Term	146 26	State Planning Commission, State Statistical Bureau	MPS. Value table for 6 and 24 sectors
1981	Value Term	1,189	Price Research Institute, State Statistical Bureau	MPS
1983	Physical Term Value Term	146 26	State Planning Commission, State Statistical Bureau	MPS
1983	Value Term	755	Price Research Institute, State Price Bureau	MPS.
1985	Value Term	200	Price Research Institute, State Price Bureau	MPS.
1985*	Value Term	106	State Planning Commision Information Center	SNA
1987	Value Term	118	State Statistical Bureau	SNA, with 118 sectors (101 materials and 17 services)

* Used in this study.

MPS: Material Production System
SNA: System of National Accounting

Source: Taylor (1989), p.145 and Polenske (1986); also see text.

nation-wide survey, while the 1985 table is mainly an estimated one. However, the latter did take advantage of the results of the *1985 Industrial Census Data of China*, in addition to the ordinarily existing statistics of the administration. As mentioned before, the 1987 input-output table has not yet been released to the public. It will not be available for some time.

There are many new features embodied in the 1985 input-output table. First of all, the biggest difference in the 1987 and 1985 input-output tables, compared to previous ones, is that they are for the first time compiled and estimated using the United Nations System of National Accounts (SNA) methodology, instead of the traditional material production system (MPS) framework as used before and typically employed in socialist countries. In addition to the treatment of joint products and intermediate products, the 1985 I-O table also incorporates a large number of service-sector activities, such as banking, insurance, passenger transport, education, public utilities and government work, which were ignored in previous input-output tables.[8] This represents a great improvement over the previous tables.

Secondly, the 1985 table contains 106 endogenous economic sectors, making it much larger than any of the

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[8] In Chinese economic jargon, these service activities are called non-material sectors or tertiary industries (di san chan ye).

previous input-output tables prepared in value terms. Out of the 106 sectors, 90 of them are material sectors (5 agricultural sectors, 76 industrial sectors, 1 sector of construction, 2 sectors of commerce and catering, and 6 sectors of cargo transportation, post and telecommunications) and 16 are non-material sectors. For our purpose of calculating the ERPs, we classify the 106 sectors into 81 traded sectors and 25 non-traded sectors (Table 4.2). In addition to that, there are 6 final demand items (personal consumption, public consumption, fixed assets accumulation, inventory accumulation, net exports, etc.) and four value-added items (depreciation, wages, taxes and welfare).

A third feature of the 1985 input-output table is the separate list of exports and imports, and revaluation of their values to reflect domestic prices. Exports are expressed in terms of domestic producer prices.[9] Imports are revalued through the appropriate adjustment of tariff rates and other fees to become actual domestic users' price for producers. Included in the table are also the tariffs

[9] This feature is very useful in making a price comparison between the domestic market and the international market for certain sectors (where product homogeneity is a reasonable assumption) when the actual price received at the border is compared with the actual producer price at home. In our study, we will refer to this comparison for some economic sectors where the domestic market is largely insulated from the international market. The tariff system may not be a binding constraint for these sectors if the government heavily intervened with the price determination for their products.

Table 4.2

List and Classification of the 106 Economic Sectors of the 1985 I-O Table

I-O Code	Sector	Type
	Traded Sector:	
1	Farming	A
2	Forestry	A
3	Animal husbandry	A
4	Side-line production	A
5	Fisheries	A
6	Coal mining and dressing	I
7	Petroleum & natural gas extraction	I
8	Mining & dressing of ferrous metals	I
9	Mining & dressing of non-ferrous metals	I
10	Mining & dressing of building & other non-metal minerals	I
11	Salt	I
12	Timber and bamboo	I
13	Production & supply of running water	I
14	Grain & edible oil processing	I
15	Slaughtering and meat products	I
16	Egg and dairy products	I
17	Aquatic products	I
18	Sugar milling and refining	I
19	Other food manufacture	I
20	Liquors, wines and alcohol manufacture	I
21	Other beverage manufactures	I
22	Tobacco manufactures	I
23	Forages, manufactured	I
24	Cotton textiles	I
25	Woollen textiles	I
26	Knit goods	I
27	Hemp, silk & other textiles	I
28	Sewing & Tailoring	I
29	Leather, fur & the related manufactures	I
30	Sawlog processing & man-made board manufactures	I
31	Furniture & other wood manufactures	I
32	Paper making and manufactures	I
33	Printing	I
34	Articles of culture, education, sports & art	I
35	Power generation, steam & hot water	I
36	Petroleum refineries	I
37	Coking	I
38	Coal gas & coal-related products	I
39	Basic chemical materials	I
40	Chemical fertilizers & pesticides	I
41	Organic chemical manufactures	I
42	Chemical manufactures for daily use	I
43	Synthetic chemical materials and chemicals, n.e.s.	I

Table 4.2 (continued)
List and Classification of the 106 Economic Sectors of the 1985 I-O Table

I-O Code	Sector	Type
44	Medical & pharmaceutical products	I
45	Chemical fibre	I
46	Rubber manufactures used for production	I
47	Rubber manufactures for daily use	I
48	Plastic manufactures used for production	I
49	Plastic manufactures for daily use	I
50	Cement	I
51	Cement & asbestos products	I
52	Brick, tile, lime & light building materials	I
53	Glass & glass products	I
54	Ceramics	I
55	Fireproof materials	I
56	Non-metal manufactures, n.e.s.	I
57	Smelting & pressing of ferrous metals	I
58	Smelting & pressing of non-ferrous metals	I
59	Metal manufactures used for production	I
60	Metal manufactures for daily use	I
61	Boiler and motor manufactures	I
62	Machine building for metal processing	I
63	Special equipment for industrial use	I
64	Machine building for the agricultural sectors	I
65	Daily used machinery	I
66	Special equipment, n.e.s.	I
67	Machinery, n.e.s.	I
68	Railway transport equipment	I
69	Motor vehicles	I
70	Ship building	I
71	Aircraft & other transport equipment	I
72	Electric machinery	I
73	Electric appliance for household use	I
74	Electric equipment & machinery, n.e.s.	I
75	Electronic computers	I
76	Electronic equipment for daily use	I
77	Other electronic & telecommunications equipment	I
78	Instrument, meters & other measuring equipment	I
79	Machines and equipment repairs	I
80	Other manufactures used for production	I
81	Other manufactures for household use	I
	Non-Traded Sector:	
82	Construction	B
83	Railway freight transport	T
84	Highway freight transport	T

Table 4.2 (continued)
List and Classifications of the 106 Economic Sectors of the 1985 I-O Table

I-O Code	Sector	Type
85	Waterway freight transport	T
86	Air freight transport	T
87	Pipeline transport	T
88	Posts and telecommunications	T
89	Railway passenger transport	N
90	Highway passenger transport	N
91	Waterway passenger transport	N
92	Air passenger transport	N
93	Commerce	C
94	Catering	C
95	Real estate	N
96	Public utilities	N
97	Services for residents	N
98	Public health	N
99	Sports	N
100	Social welfare	N
101	Education	N
102	Culture, arts, radio & T.V. broadcasting	N
103	Scientific researches	N
104	Polytechnic services	N
105	Banking and Insurance	N
106	Government organizations	N

A: agricultural sector
I: industrial sector
B: construction
T: transportation and posts;
C: commerce and catering;
N: non-material activities

Source: State Planning Commission Information Center: 1985 Input-Output Table, also see text.

actually collected by each sector. We report all three items in Table 4.3. All the inter-industry input values are expressed in terms of domestic producer prices, where the importable inputs are inclusive of tariffs.

Finally, the 1985 input-output table also features a new classification of economic sectors. Before 1985, the classification scheme of China's economic sectors in the national statistics was in line with the administrative structure at the time. For example, included in agriculture (in line with the ministry of agriculture) were also the industrial products produced by township enterprises, as long as they did not belong to urban cities. Further examples are sectors such as chemicals and metallurgy which included mining as well as manufacturing[10], since mining was also under the jurisdiction of the line ministries. That is changed under the new Classification Scheme of National Economic Sectors, effective in 1985. It is more realistic to evaluate the effective protection under the new scheme, for the sectors are now classified by the main products they contain instead of the jurisdictional structure.

Due to the new features just discussed, some of the severe limitations of the previous tables are overcome.[11]

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[10] See, for example, Taylor (1989, p.148).

[11] In evaluating the 1981 national input-output table of China, Taylor (1989, pp.148-53) lists four limitations: the lack of the service sectors, administrative

Table 4.3
China's Exports and Imports by Traded Sector: 1985
(Domestic producers' price, Yuan 10,000)

I-O Code	Sector	Exports	Imports	Collected Tariffs
1	Farming	747,701	279,782	1,972
2	Forestry	6,053	51,269	5,354
3	Animal husbandry	242,597	118,755	8,858
4	Side-line production	82,375	23,503	2,204
5	Fisheries	79,831	1,741	241
6	Coal mining and dressing	67,364	20,509	1,908
7	Petroleum & natural gas extraction	602,600	648	48
8	Mining & dressing of ferrous metals	1	96,500	0
9	Mining & dressing of non-ferrous metals	61,363	42,915	713
10	Mining & dressing of building & other non-metal minera	72,131	25,669	3,685
11	Salt	0	0	0
12	Timber and bamboo	2,246	250,954	4,462
13	Production & supply of running water	0	0	0
14	Grain & edible oil processing	71,039	54,320	3,615
15	Slaughtering and meat products	213,061	48,589	4,138
16	Egg and dairy products	12,014	10,634	1,834
17	Aquatic products	25,906	15,244	2,845
18	Sugar milling and refining	17,425	96,136	13,260
19	Other food manufacture	201,548	50,036	8,854
20	Liquors, wines and alcohol manufacture	29,418	4,567	1,867
21	Other beverage manufactures	33,460	7,742	1,342
22	Tobacco manufactures	20,660	91,348	36,547
23	Forages, manufactured	147,133	35,594	1,190
24	Cotton textiles	468,847	183,193	45,495
25	Woollen textiles	20,567	52,795	11,296
26	Knit goods	244,454	22,852	7,552
27	Hemp, silk & other textiles	247,295	83,270	20,268
28	Sewing & Tailoring	656,969	505,538	124,431
29	Leather, fur & the related manufactures	162,923	53,892	7,893
30	Sawlog processing & man-made board manufactures	1,125	89,572	6,272
31	Furniture & other wood manufactures	44,678	18,001	4,300
32	Paper making and manufactures	43,243	213,813	18,941
33	Printing	0	2,388	628
34	Articles of culture, education, sports & art	458,115	150,454	39,237
35	Power generation, steam & hot water	818	17,271	270
36	Petroleum refineries	368,357	13,072	772
37	Coking	7,473	411	32
38	Coal gas & coal-related products	0	0	0
39	Basic chemical materials	101,279	106,090	11,510
40	Chemical fertilizers & pesticides	4,612	479,561	14,780
41	Organic chemical manufactures	10,207	398,330	52,107
42	Chemical manufactures for daily use	32,825	45,700	9,829
43	Synthetic chemical materials and chemicals, n.e.s.	58,735	825,059	150,164

Table 4.3 (continued)
China's Exports and Imports by Traded Sector: 1985
(Domestic producers' price, Yuan 10,000)

I-O Code	Sector	Exports	Imports	Collected Tariffs
44	Medical & pharmaceutical products	138,406	37,557	3,556
45	Chemical fibre	42	289,742	62,136
46	Rubber manufactures used for production	14,945	5,558	1,058
47	Rubber manufactures for daily use	36,857	0	0
48	Plastic manufactures used for production	0	3,627	627
49	Plastic manufactures for daily use	32,180	23,022	4,022
50	Cement	1,546	53,653	7,352
51	Cement & asbestos products	0	0	0
52	Brick, tile, lime & light building materials	4,861	2,717	790
53	Glass & glass products	10,241	43,786	9,120
54	Ceramics	66,067	11,077	3,277
55	Fireproof materials	931	2,642	242
56	Non-metal manufactures, n.e.s.	3,116	1,516	216
57	Smelting & pressing of ferrous metals	30,124	2,260,599	133,977
58	Smelting & pressing of non-ferrous metals	74,218	517,454	27,997
59	Metal manufactures used for production	57,948	109,460	13,062
60	Metal manufactures for daily use	62,157	18,503	5,003
61	Boiler and motor manufactures	6,870	60,334	4,834
62	Machine building for metal processing	7,643	100,657	9,655
63	Special equipment for industrial use	31,514	1,451,222	125,300
64	Machine building for the agricultural sectors	2,766	29,485	2,484
65	Daily used machinery	105,100	182,576	34,777
66	Special equipment, n.e.s.	14,417	378,617	42,517
67	Machinery, n.e.s.	294,704	484,894	72,779
68	Railway transport equipment	1,505	43,894	1,394
69	Motor vehicles	2,947	1,156,480	325,078
70	Ship building	68,114	400,663	11,254
71	Aircraft & other transport equipment	5,266	86,748	36,448
72	Electric machinery	9,660	42,461	4,259
73	Electric appliance for household use	8,597	135,925	39,326
74	Electric equipment & machinery, n.e.s.	32,919	150,061	16,863
75	Electronic computers	429	248,065	26,756
76	Electronic equipment for daily use	74,731	666,173	194,880
77	Other electronic & telecommunications equipment	24,975	574,666	89,060
78	Instrument, meters & other measuring equipment	9,987	294,454	17,007
79	Machines and equipment repairs	0	0	0
80	Other manufactures used for production	0	0	0
81	Other manufactures for household use	982	7,024	1,824

Source: State Planning Commission Information Center: 1985 Input-Output Table; also see text

However, the 1985 input-output table is not without limitations. Although these limitations are considered minor compared to those of the previous tables, it is still important to understand them. The first limitation lies in the accuracy and validity of the Chinese statistics. This is a broad issue which is not only encountered in using the input-output table for this study, but also for other research. Chinese statistics are not necessarily inaccurate. The Chinese authorities have improved their work substantially through learning-by-doing since they started to publish statistical books in the early 1980s. Plus, there is not much we can do to alter the vast amount of basic data if any inaccuracy arises. Methodologies and accounting systems may be another problem. However, one of good aspects of the effective protection theory is that it summarizes all the distortions (theoretically) existing in the trade regimes and tax system. Any country which falls short of complete state control and engages in international trade can be a candidate for an effective protection theory study and the resource movements within the country will be explained, to various degrees, by the effective protection measurements if they are correctly estimated. Finally, the 1985 input-output table is an estimated table, based on

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classification of the sectors, imports that valued at the general customs instead of actual domestic prices, and lack of industry surveys. The first three limitations are overcome in the new 1985 input-output table.

routine government statistics and information from previous input-output tables. Lack of detailed enterprise surveys may cause an underestimation of the inter-industry relations among the sectors. That problem was partially remedied when the results of the *1985 Industry Census Data of China* were used for the estimation.[12] These limitations should be understood.

Next, we will discuss the tax system in China, to see what taxes the domestic producers and importers are facing.

4.3 Indirect Taxes in China

In this section, we will discuss all the taxes to which the importable inputs are subject so as to derive the implicit tariff rates for each of the sectors. In the past four decades, China's tax system has undergone a great change. As a milestone of the new tax system, the Chinese have carried out a "tax for profit" (li qai shui) policy since 1984 and fundamentally changed the role of taxes in guiding the economy. It has since then introduced or consolidated a series of tax measures to establish the new indirect, and direct, tax system, as a way to reform its planning system. Among others, the consolidated industrial and commercial taxes have given way to product taxes, value-

[12] Unlike the 1985 input-output table, the nation-wide survey of 1987 was specially designed for the compilation of that year's input-output table. It will certainly improve the accuracy of the data.

added taxes, business turnover taxes and urban maintenance and construction taxes, as well as salt taxes and import and export taxes.

It is worth noting that China has never officially made a distinction between direct and indirect taxes. Rather, the Communist government is against the distinction for political reasons. Instead, the Chinese tax system is broken down into turnover taxes, resources and property taxes, income taxes and others. Before the tax reform in 1984, Chinese producers could not pass the tax burden forward to the consumers as some of the producers do in a market-oriented economy[13], but rather they had to include it in the production cost. That has been changed since 1984. With more and more enterprises taking responsibilities for their own profits and losses, and having a freer hand in determining the prices of part of their products, China has created an indirect tax system without such a name. Among others, the turnover taxes (including the new taxes we mentioned above) are equivalent to a large degree to the indirect taxes of other countries. They are also the taxes to which the importable products are subject, along with the import tariffs. The protection of domestic industries includes import tariffs as well as domestic turnover taxes that importers have to pay. We will

[13] Whether or not the indirect taxes actually pass foreword in a market economy depends on elasticities in inputs and product market.

discuss each of the indirect taxes in turn and estimate the magnitude for each of the traded sectors, starting with import tariffs.

4.3.1 Import Tariffs

As mentioned earlier in Chapter III, the customs tariffs had changed little in China since the early 1950s until the early 1980s. With the importance of trade taxes growing, the government took big steps to adjust import and export taxes between 1980 and 1985. Finally in 1985 the State Council approved and the National People's Congress -- the Chinese legislature -- promulgated the *Customs Import and Export Tariffs of the People's Republic of China*. It is basically an import tariff schedule with only a few commodities subject to export taxes.

The estimation of ERPs (based on the 106 × 106 input-output table of 1985) involves several steps of grouping and making averages of the tariff rates.

The current tariff code of China consists of 21 categories, 99 subcategories ("chapters") and a total of about 2,100 commodities. It has two schedules: minimum rate and general rate. The former has a range from 0 to 150 percent and the latter a range from 0 to 180 percent. The minimum tariff schedule applies to imports originating in countries with which China has signed trade treaties (or agreements) with reciprocal favorable tariff clauses.

Because imports originating from these countries accounted for over 90 percent of China's total imports in 1985[14], we will use only the minimum tariff schedule for our estimation. In addition to the regular tariff schedule, 14 importing commodities are subject to a surcharge rate, ranging from 30 to 80 percent. Out of the approximately 2100 listed commodities, only 31 are subject to export taxes, ranging from 10 to 60 percent.

To group them into 106 sectors and calculate the average tariffs for each sector is the first step in the estimation of ERPs. There are two ways to obtain the average tariffs, unweighted and weighted. Because of substantial variation of the value of imports, unweighted averages of tariff rates are misleading. However, we cannot fully rely on the second method either, due to lack of detailed breakdowns of imports according to the tariff codes. In other words, it is impossible to determine the magnitude for each of the 2100 commodities which are subject to import tariffs. However, the data provided by the Chinese General Customs and other sources is not bad. We have the individual import value of around 85 commodities from the Chinese General Customs Statistics and of 300 commodities (which are overlapping) from the 1985 *Almanac of*

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[14] See, for example, World Bank (1988), p.145.

Foreign Economic Relations and Trade[15], which combined account for around 80 percent of the total imports of China in 1985. Apart from those commodities, we have to give some arbitrary or equal weights to many imported commodities. Therefore, the procedure for this work, the calculation of which is heavy and tedious, involves the following steps.

First, each of the commodities that is on the import tariff schedule is allocated to its corresponding industrial sector. Then we use the following formula to derive the average tariff rate for each sector.

$$(4\text{-}1) \qquad T_{aj} = \sum_{c=1}^{s} \frac{m_{cj}}{M_j} t_{cj} = \sum_{c=1}^{s} w_{cj} t_{cj}$$

where:

T_{aj}: the average de jure tariff for sector j;

m_{cj}: value of imports of commodity c of sector j;

M_j: total value of imports of sector j;

t_{cj}: nominal tariff rate of commodity c in sector j;

w_{cj}: weight of commodity c in deriving the average tariff rate for sector j.

s: the total number of commodities in sector j.

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[15] The Almanac is published by the Ministry of Foreign Economic Relations and Trade (MOFERT). We note the difference of scope between the statistics of the General Customs and the almanac of the MOFERT. However, they together account for around 80 percent of total imports.

As mentioned above, apart from the most important import items, we give an equal share (w_{cj}) to each of the remaining commodities in that category.

The purpose of deriving the average tariff rate for each sector is to estimate the price raising effect of the tariff system. What we obtain through formulae (4-1) is still a de jure tariff rate.[16] Table 4.4 reports the results.

Another way to get the average tariff is to express the actual customs collections as a percentage of the total imports. The formula is given by:

$$(4\text{-}2) \qquad T_{pj} = \frac{TR_j}{M_j}$$

where:

T_{pj}: the average de facto tariff for sector j;

TR_j: total customs collections from product j;

This is called the de facto tariff rate. The results are reported in Table 4.5.

Arguments can be advanced for reliance on both measures. A priori one might expect producers to price up to the limit offered by the nominal tariff, which supports a

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[16] That is why we use T_{aj} to express the *de jure* tariff rate for sector j in equation (4-1). It is necessary to make a distinction between the *de jure* and *de facto* tariff rates used in this study. While the former refer to the published tariff schedule, the latter are the tariffs actually collected by the government. In 1985, the difference between these two rates was substantial.

Table 4.4

Average De Jure Tariff Rates of Traded Sectors in China in 1985

(percent)

I - O Code	Sector	without surcharge	with surcharge
1	Farming	1.9	1.9
2	Forestry	20.0	20.0
3	Animal husbandry	15.5	15.5
4	Side-line production	31.5	31.5
5	Fisheries	40.8	40.8
6	Coal mining and dressing	15.0	15.0
7	Petroleum & natural gas extraction	5.4	5.4
8	Mining & dressing of ferrous metals	0.0	0.0
9	Mining & dressing of non-ferrous metals	1.5	1.5
10	Mining & dressing of building & other non-metal mine	27.8	27.8
11	Salt	0.0	0.0
12	Timber and bamboo	7.5	7.5
13	Production & supply of running water	0.0	0.0
14	Grain & edible oil processing	16.5	16.5
15	Slaughtering and meat products	13.5	13.5
16	Egg and dairy products	52.8	52.8
17	Aquatic products	41.3	41.3
18	Sugar milling and refining	42.0	42.0
19	Other food manufacture	58.8	58.8
20	Liquors, wines and alcohol manufacture	92.7	92.7
21	Other beverage manufactures	67.0	67.0
22	Tobacco manufactures	100.0	100.0
23	Forages, manufactured	11.0	11.0
24	Cotton textiles	55.5	55.5
25	Woollen textiles	80.0	80.0
26	Knit goods	92.3	92.3
27	Hemp, silk & other textiles	61.5	61.5
28	Sewing & Tailoring	86.3	86.3
29	Leather, fur & the related manufactures	60.6	60.6
30	Sawlog processing & man-made board manufactures	21.6	21.6
31	Furniture & other wood manufactures	67.0	67.0
32	Paper making and manufactures	20.5	20.5
33	Printing	38.0	38.0
34	Articles of culture, education, sports & art	57.6	57.6
35	Power generation, steam & hot water	3.0	3.0
36	Petroleum refineries	12.7	12.7
37	Coking	20.3	20.3
38	Coal gas & coal-related products	27.5	27.5
39	Basic chemical materials	23.9	23.9
40	Chemical fertilizers & pesticides	6.2	6.2
41	Organic chemical manufactures	24.3	24.3
42	Chemical manufactures for daily use	43.0	43.0
43	Synthetic chemical materials and chemicals, n.e.s.	36.3	36.3

Table 4.4 (continued)

Average De Jure Tariff Rates of Traded Sectors in China in 1985

(percent)

I - O Code	Sector	without surcharge	with surcharge
44	Medical & pharmaceutical products	21.0	21.0
45	Chemical fibre	52.0	67.2
46	Rubber manufactures used for production	34.9	34.9
47	Rubber manufactures for daily use	47.1	47.1
48	Plastic manufactures used for production	53.8	53.8
49	Plastic manufactures for daily use	80.0	80.0
50	Cement	20.0	20.0
51	Cement & asbestos products	32.7	32.7
52	Brick, tile, lime & light building materials	44.3	44.3
53	Glass & glass products	47.2	47.2
54	Ceramics	70.0	70.0
55	Fireproof materials	25.0	25.0
56	Non-metal manufactures, n.e.s.	42.0	42.0
57	Smelting & pressing of ferrous metals	11.7	11.7
58	Smelting & pressing of non-ferrous metals	12.3	12.3
59	Metal manufactures used for production	25.2	25.2
60	Metal manufactures for daily use	68.8	68.8
61	Boiler and motor manufactures	16.6	16.6
62	Machine building for metal processing	18.4	18.4
63	Special equipment for industrial use	18.6	18.6
64	Machine building for the agricultural sectors	19.1	19.1
65	Daily used machinery	57.5	57.5
66	Special equipment, n.e.s.	29.0	40.5
67	Machinery, n.e.s.	30.5	30.5
68	Railway transport equipment	8.0	8.0
69	Motor vehicles	50.3	74.8
70	Ship building	10.9	10.9
71	Aircraft & other transport equipment	99.3	114.7
72	Electric machinery	19.7	19.7
73	Electric appliance for household use	69.7	69.7
74	Electric equipment & machinery, n.e.s.	29.9	29.9
75	Electronic computers	20.7	30.6
76	Electronic equipment for daily use	74.6	125.5
77	Other electronic & telecommunications equipment	21.2	22.0
78	Instrument, meters & other measuring equipment	19.2	19.2
79	Machines and equipment repairs	0.0	0.0
80	Other manufactures used for production	6.0	6.0
81	Other manufactures for household use	62.5	62.5

Source: State Planning Commission Information Center: 1985 Input-Output Table; also see text

Table 4.5
Average De Facto Tarrif Rates of Traded Sectors in China in 1985

I - O Code	Sector	Tariff Rate (%)	Imports (Yuan 10,000)
1	Farming	0.7	277,809
2	Forestry	11.7	45,915
3	Animal husbandry	8.1	109,898
4	Side-line production	10.4	21,299
5	Fisheries	16.0	1,500
6	Coal mining and dressing	10.3	18,601
7	Petroleum & natural gas extraction	8.1	600
8	Mining & dressing of ferrous metals	0.0	96,500
9	Mining & dressing of non-ferrous metals	1.7	42,202
10	Mining & dressing of building & other non-metal miner	16.8	21,985
11	Salt	0.0	0
12	Timber and bamboo	1.8	246,492
13	Production & supply of running water	0.0	0
14	Grain & edible oil processing	7.1	50,705
15	Slaughtering and meat products	9.3	44,451
16	Egg and dairy products	20.8	8,800
17	Aquatic products	22.9	12,400
18	Sugar milling and refining	16.0	82,876
19	Other food manufacture	21.5	41,182
20	Liquors, wines and alcohol manufacture	69.2	2,700
21	Other beverage manufactures	21.0	6,400
22	Tobacco manufactures	66.7	54,801
23	Forages, manufactured	3.5	34,404
24	Cotton textiles	33.0	137,698
25	Woollen textiles	27.2	41,499
26	Knit goods	49.4	15,300
27	Hemp, silk & other textiles	32.2	63,002
28	Sewing & Tailoring	32.7	381,107
29	Leather, fur & the related manufactures	17.2	45,999
30	Sawlog processing & man-made board manufactures	7.5	83,299
31	Furniture & other wood manufactures	31.4	13,700
32	Paper making and manufactures	9.7	194,871
33	Printing	35.7	1,760
34	Articles of culture, education, sports & art	35.3	111,217
35	Power generation, steam & hot water	1.6	17,000
36	Petroleum refineries	6.3	12,299
37	Coking	8.4	380
38	Coal gas & coal-related products	0.0	0
39	Basic chemical materials	12.2	94,580
40	Chemical fertilizers & pesticides	3.2	464,781
41	Organic chemical manufactures	15.1	346,223
42	Chemical manufactures for daily use	27.4	35,871
43	Synthetic chemical materials and chemicals, n.e.s.	22.3	674,895
44	Medical & pharmaceutical products	10.5	34,000

Table 4.5 (continued)
Average De Facto Tarrif Rates of Traded Sectors In China in 1985

I - O Code	Sector	Tariff Rate (%)	Imports (Yuan 10,000)
45	Chemical fibre	27.3	227,605
46	Rubber manufactures used for production	23.5	4,500
47	Rubber manufactures for daily use	0.0	0
48	Plastic manufactures used for production	20.9	3,000
49	Plastic manufactures for daily use	21.2	19,000
50	Cement	15.9	46,300
51	Cement & asbestos products	0.0	0
52	Brick, tile, lime & light building materials	41.0	1,927
53	Glass & glass products	26.3	34,665
54	Ceramics	42.0	7,800
55	Fireproof materials	10.1	2,400
56	Non-metal manufactures, n.e.s.	16.6	1,300
57	Smelting & pressing of ferrous metals	6.3	2,126,622
58	Smelting & pressing of non-ferrous metals	5.7	489,457
59	Metal manufactures used for production	13.6	96,398
60	Metal manufactures for daily use	37.1	13,500
61	Boiler and motor manufactures	8.7	55,500
62	Machine building for metal processing	10.6	91,002
63	Special equipment for industrial use	9.5	1,325,922
64	Machine building for the agricultural sectors	9.2	27,001
65	Daily used machinery	23.5	147,799
66	Special equipment, n.e.s.	12.7	336,100
67	Machinery, n.e.s.	17.7	412,114
68	Railway transport equipment	3.3	42,500
69	Motor vehicles	39.1	831,402
70	Ship building	2.9	389,409
71	Aircraft & other transport equipment	72.5	50,300
72	Electric machinery	11.2	38,201
73	Electric appliance for household use	40.7	96,600
74	Electric equipment & machinery, n.e.s.	12.7	133,198
75	Electronic computers	12.1	221,309
76	Electronic equipment for daily use	41.4	471,293
77	Other electronic & telecommunications equipment	18.3	485,606
78	Instrument, meters & other measuring equipment	6.1	277,446
79	Machines and equipment repairs	0.0	0
80	Other manufactures used for production	0.0	0
81	Other manufactures for household use	35.1	5,200

Source: Chinese State Information Center: 1985 Input-Output Table; also see text.

case for relying on de jure tariffs[17]. However, since a country like China has numerous import tariff exemptions such as audio-video equipment for teaching and research, or remission of duties for joint-ventures and certain provinces, or return of duties for some re-export commodities, the de jure tariff may overstate the potential for raising prices. By the contrast, since the de facto tariff rates take into consideration the exemptions and remissions of duties they may be argued to be superior. Nevertheless, the argument in favor of the de jure case is by no means less important given that the government policy regarding the duty exemptions and remissions varies from year to year while the tariff schedule (which represents the upper limit of the tax burden for importable goods) is relatively stable. The 1985 input-output table provides information about the actual tariffs (from which we derived our de facto tariff rates) collected by each sector. Therefore, we will calculate both the de jure and de facto tariff rates. They will be used, along with the de jure and de facto domestic tax rates for the same reasons, to calculate the ERPs to evaluate the protection pattern in China.

In mid-1985, the Chinese government started to impose a surcharge rate on 30 importable commodities in addition to

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[17] See, for example, Greenaway and Milner (1990, p.808).

their regular duties. We take that into consideration by changing formula (4-1) to:

$$(4\text{-}3) \qquad T_{aj} = \sum_{c=1}^{s} w_{cj}(t_{cj} + s_{cj})$$

T_{aj} now stands for combined taxes on imports; s_{cj} is the surcharge rate of commodity c in sector j if it is subject to such taxes. The results are also reported in Table 4.4.

4.3.2 Domestic Indirect Taxes

In the past five or six years starting from 1984, the Industrial and Commercial Tax has undergone a complete transformation so far as domestic enterprises and importable products are concerned. With the adoption of the "replacing profit delivery with taxes" policy in 1984 and as more and more enterprises become responsible for their own profits and losses, the tax system has an important role to play. Under the new indirect tax system introduced in 1984, which for the present applies only to products produced by domestic enterprises and importable products (not to those of the joint-ventures and solely-owned business of foreigners[18]), the Industrial and Commercial Tax is replaced by four new taxes, in addition to the Salt Tax which has been retained. We evaluate and estimate each of them in the following sub-sections.

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[18] These joint-ventures continue for the present to pay the old Consolidated Industrial and Commercial Tax.

• Product Tax (chanpin shui)

This tax is payable by state enterprises, collective enterprises, individually-owned enterprises and all other units and individuals engaged in the production or importation of taxable products. The product tax originated from the industrial and commercial tax and became separate in 1984 when the State Council passed the *Regulations of Product Tax (Draft Resolution)* on September 18 of that year. According to its *Schedule of Product Tax Rates*, the taxable products fall into 24 categories and 260 tax items, covering almost all industrial products and some agricultural (farming, forestry, animal husbandry, sideline production and fisheries) products.[19] Tax is calculated on the basis of the sale price of the various items, and tax rates vary from 3 percent to 60 percent.

The product tax is the most important domestic tax levied on both imported and domestically produced goods. Before we calculate the average product tax for each sector, it is important to understand the Chinese price system. Generally speaking, there are three prices for most industrial goods: the ex-factory price (or producers' price), the wholesale price of the commercial department and the retail price. The ex-factory or producers' price consists of the cost of the product plus product tax, value-

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[19] *Shuishou yu caiwu shouce* (Handbook of Taxes and Finance, 1986), pp.31-32.

added tax and urban city maintenance and construction tax (these two taxes will be discussed later). The wholesale price is the ex-factory or producers' price plus all the related fees incurred and necessary profits retained during the commercial transaction. Finally, the retail price is the wholesale price plus circulation fee and the profits of the retailers. All the prices might be distorted or "irrational" in the first place in China when the cost of the production is incorrectly assessed. However, the taxes, fees and retailers' profits just mentioned are the ways that prices are marked up in China. What is important for our study is to note that the so-called producers' price, which is used in the Chinese input-output table to calculate the intermediate inputs, includes the indirect taxes we discussed above and will discuss below. That will influence our formulas of estimating domestic taxes and effective rates of protection (ERPs), for each of the sectors.

In estimating the de jure product tax rate for each sector, the official *Schedule of Product Tax Rates* is used, and it is weighted by the relative value of production of each item. The formula is the following:

$$(4\text{-}4) \qquad D_{1j} = \sum_{c=1}^{s} \frac{q_{cj}}{Q_j} d_{cj}$$

where:

D_{1j}: domestic product tax rate for sector j[20];

q_{cj}: value of commodity c in sector j;

Q_j: value of total output in sector j;

d_{cj}: product tax rate on commodity c in sector j;

s: total number of taxable products in sector j.

The weights used in formula (4-4) are derived from official Chinese statistics. The results of calculation of the average product tax for each sector are reported in column 3 of Table 4.6. It turns out to be an de jure rate. For the same reasons argued for the tariff rate and due to the various forms of tax credits, exemptions and other special treatment that the Chinese government has given to an array of products, de facto estimation is also necessary. That will be done at the end of this section.

• Value-added Tax (zengzhi shui)

The value-added tax was introduced as early as 1979. It was actually put into action on a trial basis for 345 enterprises in the machinery industry in several large cities in September 1980. It was expanded to other enterprises of the machine building industries in 1981. In

[20] The salt tax which will be discussed below is also included in D_{1j}.

Table 4.6
Average De Jure Domestic Indirect Tax Rates in China in 1985
(percent)

I-O Code	Sector	D1	D2	D3	D4
1	Farming	0.9	0.9	0.9	0.9
2	Forestry	1.8	1.8	1.8	1.8
3	Animal husbandry	2.0	2.0	2.0	2.0
4	Side-line production	0.0	0.0	0.0	0.0
5	Fisheries	6.5	6.5	6.5	6.6
6	Coal mining and dressing	3.0	3.0	3.0	3.1
7	Petroleum & natural gas extraction	13.9	13.9	13.9	14.6
8	Mining & dressing of ferrous metals	3.0	3.0	3.0	3.1
9	Mining & dressing of non-ferrous metals	3.0	3.0	3.0	3.1
10	Mining & dressing of building & other non-metal min	6.5	6.5	6.5	6.8
11	Salt	15.1	15.1	15.1	15.7
12	Timber and bamboo	10.0	10.0	10.0	10.4
13	Production & supply of running water	5.0	5.0	5.0	5.3
14	Grain & edible oil processing	5.6	5.6	5.6	5.9
15	Slaughtering and meat products	5.0	5.0	5.0	5.3
16	Egg and dairy products	5.0	5.0	5.0	5.3
17	Aquatic products	5.0	5.0	5.0	5.3
18	Sugar milling and refining	17.3	17.3	17.3	18.1
19	Other food manufacture	5.8	5.8	5.8	6.1
20	Liquors, wines and alcohol manufacture	31.9	31.9	31.9	33.5
21	Other beverage manufactures	11.9	11.9	11.9	12.5
22	Tobacco manufactures	50.9	50.9	50.9	53.9
23	Forages, manufactured	5.0	5.0	5.0	5.3
24	Cotton textiles	7.5	7.5	7.5	8.0
25	Woollen textiles	16.2	16.2	16.2	17.1
26	Knit goods	11.8	11.8	11.8	12.5
27	Hemp, silk & other textiles	10.2	10.4	10.4	11.0
28	Sewing & Tailoring	5.0	5.0	5.0	5.3
29	Leather, fur & the related manufactures	8.3	8.3	8.3	8.8
30	Sawlog processing & man-made board manufactur	4.3	4.3	4.3	4.6
31	Furniture & other wood manufactures	5.0	5.0	5.0	5.3
32	Paper making and manufactures	10.0	10.0	10.0	10.6
33	Printing	5.0	5.0	5.0	5.3
34	Articles of culture, education, sports & art	7.0	7.0	7.0	7.4
35	Power generation, steam & hot water	14.9	14.9	14.9	15.8
36	Petroleum refineries	21.6	21.6	21.6	22.9
37	Coking	6.5	6.5	6.5	6.9
38	Coal gas & coal-related products	3.7	3.7	3.7	3.9
39	Basic chemical materials	11.3	11.3	11.3	12.0
40	Chemical fertilizers & pesticides	6.3	6.3	6.3	6.6
41	Organic chemical manufactures	13.7	13.7	13.7	14.5
42	Chemical manufactures for daily use	9.8	9.8	9.8	10.4
43	Synthetic chemical materials and chemicals, n.e.s.	13.2	13.2	13.2	14.0
44	Medical & pharmaceutical products	5.0	9.4	9.4	9.9

Table 4.6 (continued)
Average De Jure Domestic Indirect Tax Rates in China in 1985
(percent)

I-O Code	Sector	D1	D2	D3	D4
45	Chemical fibre	9.7	9.7	9.7	10.3
46	Rubber manufactures used for production	13.8	13.8	13.8	14.6
47	Rubber manufactures for daily use	19.0	19.0	19.0	20.1
48	Plastic manufactures used for production	5.0	5.0	5.0	5.3
49	Plastic manufactures for daily use	5.0	5.0	5.0	5.3
50	Cement	6.1	6.1	6.1	6.4
51	Cement & asbestos products	5.0	5.0	5.0	5.3
52	Brick, tile, lime & light building materials	9.1	9.1	9.1	9.7
53	Glass & glass products	9.6	9.6	9.6	10.2
54	Ceramics	7.8	7.8	7.8	8.2
55	Fireproof materials	5.0	5.0	5.0	5.3
56	Non-metal manufactures, n.e.s.	8.9	8.9	8.9	9.3
57	Smelting & pressing of ferrous metals	4.1	5.7	5.7	6.1
58	Smelting & pressing of non-ferrous metals	8.6	8.6	8.6	9.1
59	Metal manufactures used for production	7.5	7.5	7.5	8.0
60	Metal manufactures for daily use	8.1	8.1	8.1	8.6
61	Boiler and motor manufactures	5.0	14.0	14.0	14.8
62	Machine building for metal processing	5.0	14.0	14.0	14.8
63	Special equipment for industrial use	5.0	14.0	14.0	14.8
64	Machine building for the agricultural sectors	5.0	6.0	6.0	6.4
65	Daily used machinery	17.5	17.5	17.5	18.6
66	Special equipment, n.e.s.	5.0	5.0	5.0	5.3
67	Machinery, n.e.s.	5.0	5.9	5.9	6.2
68	Railway transport equipment	5.0	5.0	5.0	5.3
69	Motor vehicles	5.0	14.0	14.0	14.8
70	Ship building	5.0	10.0	10.0	10.6
71	Aircraft & other transport equipment	5.0	5.0	5.0	5.3
72	Electric machinery	5.0	5.0	5.0	5.3
73	Electric appliance for household use	13.3	13.3	13.3	14.1
74	Electric equipment & machinery, n.e.s.	11.3	11.3	11.3	12.0
75	Electronic computers	10.0	10.0	10.0	10.7
76	Electronic equipment for daily use	16.4	16.4	16.4	17.5
77	Other electronic & telecommunications equipment	5.0	5.0	5.0	5.4
78	Instrument, meters & other measuring equipment	5.0	5.0	5.0	5.3
79	Machines and equipment repairs	5.0	5.0	5.0	5.3
80	Other manufactures used for production	5.0	5.0	5.0	5.3
81	Other manufactures for household use	7.5	7.5	7.5	7.9

D1: Domestic product tax;
D2: D1 plus value-added tax;
D3: D2 plus the business turnover tax;
D4: D3 plus the urban maintenance and construction tax.

Souce: Modified and estimated from the Handbook of Taxes and Finance (1987). See text for th estimation technigues.

1982, the *Provisional Regulations of Value-added Tax* were adopted and the tax was expanded to several other products. Now the tax has been generally adopted following the passing of the *Regulations of Value-added Tax in the People's Republic of China* in 1984. The Chinese value-added tax is applied selectively to a limited range of products, notably those where the production structure tends to be complex. Originally there were two kinds of taxable categories: specific items such as bicycles, cars, electric fans, motor boats and sewing machines, and general items such as agricultural machinery, bearings, other machinery, mechanical equipment, rolled steal and Western medicine. Now there are twelve categories of taxable goods, and the rates of taxation vary from 8 to 43 percent.[21]

The purpose of the value-added tax is to avoid multi-taxation of certain products where specialization of production exists. The tax base is the value added of the product where the cost of materials including taxes is excluded.

According to the regulations, product taxes will no longer be imposed on products which are subject to value-added taxes. To combine the product tax and value-added tax, we use the following formula:

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[21] *Shui shou yu caiwu shouce* (Handbook of Taxes and Finance, 1987), p.32.

$$(4\text{-}5) \qquad D_{2j} = \sum_{c=1}^{s} (\delta_c \frac{q_{cj}}{Q_j} d_{cj} + \gamma_c \frac{q_{cj}}{Q_j} v_{cj})$$

where:

D_{2j}: domestic product and value-added taxes combined;

d_{cj}: product tax rate for product c in sector j;

v_{cj}: value-added tax rate for product c in sector j;

δ_c: binary variable, equal to one if the product tax is effective and zero if the value-added tax is effective;

γ_c: binary variable, equal to one if the value-added tax is effective and zero if the product tax is effective.

The terms q_{cj} and Q_j are defined earlier. The results of combined product and value added tax are reported in column 4 of Table 4.5.

• Business Turnover Tax (yinye shui)

The third element in the new indirect tax system is referred to as business turnover tax. It was created in September 1984 when the "Regulations of the Business Turnover Tax of the People's Republic of China (Draft Resolution)" was enacted. It is payable by units and individuals engaged in commerce, construction and installation, materials supply, passenger transport, post and telecommunications, financial and insurance services, publishing, utilities and a number of other trades. It

applies at both wholesale and retail levels. However, industrial products are generally not subject to this tax. Rates of taxation range from 3 percent to 15 percent.

Since the ERPs are only calculated for traded sectors, which are subject to product or value-added taxes only, the business turnover tax will not be included in the estimation. Nevertheless, to complete the study of domestic indirect taxes for all sectors, we still report D_{3j}, a combination of product tax, value-added tax and the business turnover tax) in column 5 of Table 4.5.

• Salt Tax (yan shui)

The Salt Tax has a long history in China. For many centuries it has provided a reliable source of revenue for successive Chinese governments. It was retained as part of the new tax system in 1950 and has continued in force since that time. In 1984, a new *Regulations of Salt Tax of the People's Republic of China (Draft Resolution)* was passed and set the new rules for this old tax. It is levied upon producers, which are mainly state enterprises, and upon salt marketing agencies. It is a specific tax and rates vary considerably from one area of the country to another and depend on the kind of salt and type of producer.

Due to the variety of rates for different areas, it is hard to find a uniform, ad valorem rate for the sector of salt mining. We therefore use the de facto or actual salt

tax rate (derived from the *1985 Industrial Census Data*) for the salt mining sector. It is reported along with the product tax and value-added tax in columns 3 and 4 of Table 4.5.

• Urban Maintenance and Construction Tax (chengshi weihu yu jianshe shui)

The urban maintenance and construction tax is a new tax introduced along with the "tax for profit delivery" policy in 1984 and became effective on February 8 when the *Provisional Regulations of the Urban Maintenance and Construction Tax of the People's Republic of China* was passed. It is imposed upon business premises and accrues to the municipality where the property is located. The tax base is the amount of product tax, value-added or business turnover tax paid by the occupant. The tax rate is normally 7 percent in the cities, 5 percent in county towns and 1 percent in rural areas.[22] We estimate the tax rate for each of the economic sectors and report it in Table 4.7.

Since the tax base of the urban maintenance and construction tax is the product and other taxes paid by the occupants, we use the formula below to transform the tax into a rate which bears the same base as the product tax, value-added tax or business turnover tax.

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[22] *Shuishou yu caiwu shouce* (Handbook of Taxes and Finance, 1987), p.33.

Table 4.7
Urban Maintenance and Construction Tax Rates of All Sectors
(estimated)

I-O Code	Sector	Tax Rate (%)	I-O Code	Sector	Tax Rate (%)
1	Farming	1	29	Leather, fur & the related manufactures	6
2	Forestry	1	30	Sawlog processing & man-made board	6
3	Animal husbandry	1	31	Furniture & other wood manufactures	6
4	Side-line production	1	32	Paper making and manufactures	6
5	Fisheries	1	33	Printing	6
6	Coal mining and dressing	4	34	Articles of culture, education, sports & art	5
7	Petroleum & natural gas extraction	5	35	Power generation, steam & hot water	6
8	Mining & dressing of ferrous metals	4	36	Petroleum refineries	6
9	Mining & dressing of non-ferrous metals	4	37	Coking	6
10	Mining of building & other non-metal minerals	4	38	Coal gas & coal-related products	6
11	Salt	4	39	Basic chemical materials	6
12	Timber and bamboo	4	40	Chemical fertilizers & pesticides	5
13	Production & supply of running water	6	41	Organic chemical manufactures	6
14	Grain & edible oil processing	4	42	Chemical manufactures for daily use	6
15	Slaughtering and meat products	5	43	Synthetic chemical materials and chemicals, n.e.	6
16	Egg and dairy products	5	44	Medical & pharmaceutical products	6
17	Aquatic products	5	45	Chemical fibre	6
18	Sugar milling and refining	5	46	Rubber manufactures used for production	6
19	Other food manufacture	5	47	Rubber manufactures for daily use	6
20	Liquors, wines and alcohol manufacture	5	48	Plastic manufactures used for production	6
21	Other beverage manufactures	5	49	Plastic manufactures for daily use	6
22	Tobacco manufactures	6	50	Cement	6
23	Forages, manufactured	5	51	Cement & asbestos products	6
24	Cotton textiles	6	52	Brick, tile, lime & light building materials	6
25	Woollen textiles	6	53	Glass & glass products	6
26	Knit goods	6	54	Ceramics	5
27	Hemp, silk & other textiles	6	55	Fireproof materials	5
28	Sewing & Tailoring	5	56	Non-metal manufactures, n.e.s.	5

Table 4.7 (continued)
Urban Maintenance and Construction Tax Rates of All Sectors
(estimated)

I-O Code	Sector	Tax Rate (%)	I-O Code	Sector	Tax Rate (%)
57	Smelting & pressing of ferrous metals	6	82	Construction	5
58	Smelting & pressing of non-ferrous metals	6	83	Railway freight transport	5
59	Metal manufactures used for production	6	84	Highway freight transport	5
60	Metal manufactures for daily use	6	85	Waterway freight transport	5
61	Boiler and motor manufactures	6	86	Air freight transport	5
62	Machine building for metal processing	6	87	Pipeline transport	5
63	Special equipment for industrial use	6	88	Posts and telecommunications	5
64	Machine building for the agricultural sectors	6	89	Railway passenger transport	5
65	Daily used machinery	6	90	Highway passenger transport	6
66	Special equipment, n.e.s.	6	91	Waterway passenger transport	5
67	Machinery, n.e.s.	6	92	Air passenger transport	6
68	Railway transport equipment	6	93	Commerce	6
69	Motor vehicles	6	94	Catering	6
70	Ship building	6	95	Real estate	6
71	Aircraft & other transport equipment	6	96	Public utilities	7
72	Electric machinery	6	97	Services for residents	6
73	Electric appliance for household use	6	98	Public health	5
74	Electric equipment & machinery, n.e.s.	6	99	Sports	6
75	Electronic computers	7	100	Social welfare	5
76	Electronic equipment for daily use	7	101	Education	6
77	Other electronic & telecommunications equipm	7	102	Culture, arts, radio & T.V. broadcasting	5
78	Instrument, meters & other measuring equipme	6	103	Scientific researches	5
79	Machines and equipment repairs	6	104	Polytechnic services	5
80	Other manufactures used for production	5	105	Banking and Insurance	6
81	Other manufactures for household use	5	106	Government organizations	6

Note: The tax rate is based on the paid product tax, value-added tax and business turnover tax of each sector.

Source: Estimated from the Handbook of Taxes and Finance (1987).

(4-6) $U_j = u_j D_3 j$

where:

U_j: the urban maintenance and construction tax rate out of the value or value-added of the product;

u_j: the nominal urban maintenance and construction tax rate out of the product tax, value-added tax and business turnover tax, from Table 4.7;

D_{3j}: the product tax, value-added tax and business turnover tax combined, as defined earlier.

Using the following formula, we can combine all the taxes discussed above and report them on column 6 in Table 4.6.

(4-7) $D_4 j = D_{3j} + U_j$

where

D_{4j}: the total domestic indirect taxes combined.

D_{4j} is the final domestic tax rate that will be used in our estimation. Calculations will also be made of the <u>de facto</u> domestic tax rates, i.e., the taxes actually collected as a proportion of the total producers' price, given by:

(4-8) $$D_{pj} = \frac{TX_j}{Q_j}$$

where

D_{pj}: the actual or <u>de facto</u> domestic tax rate for sector j;

Table 4.8
Average De Facto Domestic Indirect Taxe Rates of Trade Sectors
(percent)

I-O Code	Sector	Tax Rate
1	Farming	0.9
2	Forestry	1.8
3	Animal husbandry	2.0
4	Side-line production	0.0
5	Fisheries	6.6
6	Coal mining and dressing	3.2
7	Petroleum & natural gas extraction	13.3
8	Mining & dressing of ferrous metals	3.2
9	Mining & dressing of non-ferrous metals	2.9
10	Mining & dressing of building & other non-metal miner	5.2
11	Salt	15.1
12	Timber and bamboo	7.8
13	Production & supply of running water	3.3
14	Grain & edible oil processing	0.6
15	Slaughtering and meat products	0.7
16	Egg and dairy products	4.3
17	Aquatic products	3.0
18	Sugar milling and refining	14.9
19	Other food manufacture	5.3
20	Liquors, wines and alcohol manufacture	17.6
21	Other beverage manufactures	3.6
22	Tobacco manufactures	55.7
23	Forages, manufactured	0.4
24	Cotton textiles	7.7
25	Woollen textiles	14.2
26	Knit goods	7.7
27	Hemp, silk & other textiles	4.6
28	Sewing & Tailoring	4.6
29	Leather, fur & the related manufactures	5.1
30	Sawlog processing & man-made board manufactures	4.2
31	Furniture & other wood manufactures	5.0
32	Paper making and manufactures	8.2
33	Printing	4.8
34	Articles of culture, education, sports & art	6.8
35	Power generation, steam & hot water	17.8
36	Petroleum refineries	20.4
37	Coking	5.8
38	Coal gas & coal-related products	2.4
39	Basic chemical materials	9.7
40	Chemical fertilizers & pesticides	5.1
41	Organic chemical manufactures	13.6
42	Chemical manufactures for daily use	9.7
43	Synthetic chemical materials and chemicals, n.e.s.	9.6

Table 4.8 (continued)
Average De Facto Domestic Indirect Taxe Rates of Trade Sectors
(percent)

I-O Code	Sector	Tax Rate
44	Medical & pharmaceutical products	6.9
45	Chemical fibre	7.3
46	Rubber manufactures used for production	13.3
47	Rubber manufactures for daily use	13.3
48	Plastic manufactures used for production	5.0
49	Plastic manufactures for daily use	5.0
50	Cement	6.1
51	Cement & asbestos products	3.9
52	Brick, tile, lime & light building materials	7.0
53	Glass & glass products	11.7
54	Ceramics	8.2
55	Fireproof materials	10.7
56	Non-metal manufactures, n.e.s.	6.3
57	Smelting & pressing of ferrous metals	10.0
58	Smelting & pressing of non-ferrous metals	7.2
59	Metal manufactures used for production	4.9
60	Metal manufactures for daily use	7.3
61	Boiler and motor manufactures	4.6
62	Machine building for metal processing	6.4
63	Special equipment for industrial use	5.6
64	Machine building for the agricultural sectors	2.7
65	Daily used machinery	15.6
66	Special equipment, n.e.s.	5.6
67	Machinery, n.e.s.	5.4
68	Railway transport equipment	5.0
69	Motor vehicles	5.3
70	Ship building	2.8
71	Aircraft & other transport equipment	2.5
72	Electric machinery	5.1
73	Electric appliance for household use	8.2
74	Electric equipment & machinery, n.e.s.	8.2
75	Electronic computers	4.1
76	Electronic equipment for daily use	4.4
77	Other electronic & telecommunications equipment	4.6
78	Instrument, meters & other measuring equipment	5.9
79	Machines and equipment repairs	3.1
80	Other manufactures used for production	4.5
81	Other manufactures for household use	4.5

Note: Ex Ante tax rates are employed here for sectors 1-5.

Source: Modified from the 1985 Industrial Census Data (1987).

TR_j: the taxes collected from sector j;

Q_j: value of output of sector j, as defined before.

The de facto domestic tax rate D_{pj} is used along with the de facto tariff rate derived earlier to give the second set of estimations of ERPs, in addition to the de jure solutions. The results will be compared and explained. Results of D_{pj} are shown in Table 4.8.

4.4. The Implicit Tariffs on Chinese Products

One of the most important components of the ERP estimation is the implicit tariff rate for each of the traded sectors. These rates are easily obtained after the average tariff rate and domestic tax rate for each sector are available. The results of these two items have already been shown on Table 4.4, Table 4.5, Table 4.6 and Table 4.8.

The formula for deriving the de jure implicit tariff rate, based on the published tax and tariff schedule, is:

$$T_{aj}^{m} = (1 + T_{aj})(1 + D_{4j}) - 1 \qquad (4\text{-}9)$$

Where:

T^{m}_{aj}: the de jure implicit tariff rate of product j;

T_{aj}: the average nominal tariff rate for sector j;

D_{4j}: the domestic tax rate (product tax, plus value-added tax and urban maintenance and construction tax) for traded sector j.

We call it the Type I implicit tariff rate. Since the importable inputs are subject to the same domestic indirect

taxes as the outputs, the same formula will be used to derive the implicit tariff rate of the input. It turns out that the implicit tariff rate is the same for the same sector when it is an input as when it is an output. The results of the Type I implicit tariff rate calculations are shown in Table 4.9.

With slight changes, the Type II implicit tariff rate, which is based on the collected taxes and tariffs, is defined as the following:

$$(4\text{-}10) \qquad T_{pj}^{m} = (1 + T_{pj})(1 + D_{pj}) - 1$$

Where:

T^{m}_{pj}: the de facto implicit tariff rate of product j;

T_{pj}: the de facto tariff rate for sector j;

D_{pj}: the de facto domestic tax rate (product tax, plus value-added tax and urban maintenance and construction tax) for traded sector j.

The results of the Type II implicit tariff rate calculations are reported in Table 4.10.

4.5 Adjustment of the Implicit Tariff Rates for Certain Economic Sectors

So far, we have derived two types of implicit tariff rate rates for the traded sectors. Type I rate is based on the published tariff schedule, weighted by the magnitude of imports, and domestic tax rates, weighted by the level of production. Type II rate is based on the actual tariffs and

Table 4.9
De Jure Implicit Tax Rates of Traded Sectors: 1985

I-O Code	Sector	Tariff Rate (%)	Domestic Tax Rate (%)	Implicit Tax Rate (%)
1	Farming	1.9	0.9	2.9
2	Forestry	20.0	1.8	22.2
3	Animal husbandry	15.5	2.0	17.7
4	Side-line production	31.5	0.0	31.5
5	Fisheries	40.8	6.6	50.0
6	Coal mining and dressing	15.0	3.1	18.6
7	Petroleum & natural gas extraction	5.4	14.6	20.8
8	Mining & dressing of ferrous metals	0.0	3.1	3.1
9	Mining & dressing of non-ferrous metals	1.5	3.1	4.6
10	Mining & dressing of building & other non-metal mine	27.8	6.8	36.5
11	Salt	0.0	15.7	15.7
12	Timber and bamboo	7.5	10.4	18.6
13	Production & supply of running water	0.0	5.3	5.3
14	Grain & edible oil processing	16.5	5.9	23.3
15	Slaughtering and meat products	13.5	5.3	19.4
16	Egg and dairy products	52.8	5.3	60.8
17	Aquatic products	41.3	5.3	48.7
18	Sugar milling and refining	42.0	18.1	67.8
19	Other food manufacture	58.8	6.1	68.5
20	Liquors, wines and alcohol manufacture	92.7	33.5	157.3
21	Other beverage manufactures	67.0	12.5	87.9
22	Tobacco manufactures	100.0	53.9	207.8
23	Forages, manufactured	11.0	5.3	16.8
24	Cotton textiles	55.5	8.0	67.8
25	Woollen textiles	80.0	17.1	110.9
26	Knit goods	92.3	12.5	116.4
27	Hemp, silk & other textiles	61.5	11.0	79.3
28	Sewing & Tailoring	86.3	5.3	96.0
29	Leather, fur & the related manufactures	60.6	8.8	74.7
30	Sawlog processing & man-made board manufactures	21.6	4.6	27.2
31	Furniture & other wood manufactures	67.0	5.3	75.9
32	Paper making and manufactures	20.5	10.6	33.3
33	Printing	38.0	5.3	45.3
34	Articles of culture, education, sports & art	57.6	7.4	69.2
35	Power generation, steam & hot water	3.0	15.8	19.2
36	Petroleum refineries	12.7	22.9	38.6
37	Coking	20.3	6.9	28.6
38	Coal gas & coal-related products	27.5	3.9	32.5
39	Basic chemical materials	23.9	12.0	38.7
40	Chemical fertilizers & pesticides	6.2	6.6	13.2
41	Organic chemical manufactures	24.3	14.5	42.3
42	Chemical manufactures for daily use	43.0	10.4	57.9
43	Synthetic chemical materials and chemicals, n.e.s.	36.3	14.0	55.3

Table 4.9 (continued)
De Jure Implicit Tax Rates of Traded Sectors: 1985

I-O Code	Sector	Tariff Rate (%)	Domestic Tax Rate (%)	Implicit Tax Rate (%)
44	Medical & pharmaceutical products	21.0	9.9	33.0
45	Chemical fibre	67.2	10.3	84.4
46	Rubber manufactures used for production	34.9	14.6	54.6
47	Rubber manufactures for daily use	47.1	20.1	76.8
48	Plastic manufactures used for production	53.8	5.3	61.9
49	Plastic manufactures for daily use	80.0	5.3	89.5
50	Cement	20.0	6.4	27.7
51	Cement & asbestos products	32.7	5.3	39.7
52	Brick, tile, lime & light building materials	44.3	9.7	58.3
53	Glass & glass products	47.2	10.2	62.2
54	Ceramics	70.0	8.2	83.9
55	Fireproof materials	25.0	5.3	31.6
56	Non-metal manufactures, n.e.s.	42.0	9.3	55.2
57	Smelting & pressing of ferrous metals	11.7	6.1	18.5
58	Smelting & pressing of non-ferrous metals	12.3	9.1	22.4
59	Metal manufactures used for production	25.2	8.0	35.2
60	Metal manufactures for daily use	68.8	8.6	83.4
61	Boiler and motor manufactures	16.6	14.8	34.0
62	Machine building for metal processing	18.4	14.8	36.0
63	Special equipment for industrial use	18.6	14.8	36.2
64	Machine building for the agricultural sectors	19.1	6.4	26.7
65	Daily used machinery	57.5	18.6	86.7
66	Special equipment, n.e.s.	40.5	5.3	48.0
67	Machinery, n.e.s.	30.5	6.2	38.7
68	Railway transport equipment	8.0	5.3	13.7
69	Motor vehicles	74.8	14.8	100.8
70	Ship building	10.9	10.6	22.6
71	Aircraft & other transport equipment	114.7	5.3	126.1
72	Electric machinery	19.7	5.3	26.1
73	Electric appliance for household use	69.7	14.1	93.7
74	Electric equipment & machinery, n.e.s.	29.9	12.0	45.5
75	Electronic computers	30.6	10.7	44.5
76	Electronic equipment for daily use	125.5	17.5	165.0
77	Other electronic & telecommunications equipment	22.0	5.4	28.6
78	Instrument, meters & other measuring equipment	19.2	5.3	25.5
79	Machines and equipment repairs	0.0	5.3	5.3
80	Other manufactures used for production	6.0	5.3	11.6
81	Other manufactures for household use	62.5	7.9	75.3

Source: Table 4.4 and 4.6.

Table 4.10
De Facto Implicit Tax Rates of Traded Sectors: 1985

I-O Code	Sector	Nominal Tariff Rate (%)	Domestic Tax Rate (%)	Implicit Tax Rate (%)
1	Farming	0.7	0.9	1.7
2	Forestry	11.7	1.8	13.7
3	Animal husbandry	8.1	2.0	10.2
4	Side-line production	10.4	0.0	10.4
5	Fisheries	16.0	6.6	23.7
6	Coal mining and dressing	10.3	3.2	13.8
7	Petroleum & natural gas extraction	8.1	13.3	22.4
8	Mining & dressing of ferrous metals	0.0	3.2	3.2
9	Mining & dressing of non-ferrous metals	1.7	2.9	4.6
10	Mining & dressing of building & other non-metal mine	16.8	5.2	22.8
11	Salt	0.0	15.1	15.1
12	Timber and bamboo	1.8	7.8	9.8
13	Production & supply of running water	0.0	3.3	3.3
14	Grain & edible oil processing	7.1	0.6	7.7
15	Slaughtering and meat products	9.3	0.7	10.1
16	Egg and dairy products	20.8	4.3	26.0
17	Aquatic products	22.9	3.0	26.6
18	Sugar milling and refining	16.0	14.9	33.2
19	Other food manufacture	21.5	5.3	27.9
20	Liquors, wines and alcohol manufacture	69.2	17.6	99.0
21	Other beverage manufactures	21.0	3.6	25.3
22	Tobacco manufactures	66.7	55.7	159.6
23	Forages, manufactured	3.5	0.4	3.8
24	Cotton textiles	33.0	7.7	43.2
25	Woollen textiles	27.2	14.2	45.2
26	Knit goods	49.4	7.7	60.8
27	Hemp, silk & other textiles	32.2	4.6	38.3
28	Sewing & Tailoring	32.7	4.6	38.8
29	Leather, fur & the related manufactures	17.2	5.1	23.1
30	Sawlog processing & man-made board manufactures	7.5	4.2	12.1
31	Furniture & other wood manufactures	31.4	5.0	37.9
32	Paper making and manufactures	9.7	8.2	18.7
33	Printing	35.7	4.8	42.1
34	Articles of culture, education, sports & art	35.3	6.8	44.5
35	Power generation, steam & hot water	1.6	17.8	19.7
36	Petroleum refineries	6.3	20.4	28.0
37	Coking	8.4	5.8	14.6
38	Coal gas & coal-related products	0.0	2.4	2.4
39	Basic chemical materials	12.2	9.7	23.0
40	Chemical fertilizers & pesticides	3.2	5.1	8.5
41	Organic chemical manufactures	15.1	13.6	30.7
42	Chemical manufactures for daily use	27.4	9.7	39.8
43	Synthetic chemical materials and chemicals, n.e.s.	22.3	9.6	34.0

Table 4.10 (continued)
De Facto Implicit Tax Rates of Traded Sectors: 1985

I-O Code	Sector	Nominal Tariff Rate (%)	Domestic Tax Rate (%)	Implicit Tax Rate (%)
44	Medical & pharmaceutical products	10.5	6.9	18.1
45	Chemical fibre	27.3	7.3	36.7
46	Rubber manufactures used for production	23.5	13.3	40.0
47	Rubber manufactures for daily use	0.0	13.3	13.3
48	Plastic manufactures used for production	20.9	5.0	26.9
49	Plastic manufactures for daily use	21.2	5.0	27.2
50	Cement	15.9	6.1	22.9
51	Cement & asbestos products	0.0	3.9	3.9
52	Brick, tile, lime & light building materials	41.0	7.0	50.9
53	Glass & glass products	26.3	11.7	41.1
54	Ceramics	42.0	8.2	53.7
55	Fireproof materials	10.1	10.7	21.9
56	Non-metal manufactures, n.e.s.	16.6	6.3	24.0
57	Smelting & pressing of ferrous metals	6.3	10.0	16.9
58	Smelting & pressing of non-ferrous metals	5.7	7.2	13.4
59	Metal manufactures used for production	13.6	4.9	19.1
60	Metal manufactures for daily use	37.1	7.3	47.1
61	Boiler and motor manufactures	8.7	4.6	13.7
62	Machine building for metal processing	10.6	6.4	17.7
63	Special equipment for industrial use	9.5	5.6	15.5
64	Machine building for the agricultural sectors	9.2	2.7	12.1
65	Daily used machinery	23.5	15.6	42.8
66	Special equipment, n.e.s.	12.7	5.6	18.9
67	Machinery, n.e.s.	17.7	5.4	24.1
68	Railway transport equipment	3.3	5.0	8.5
69	Motor vehicles	39.1	5.3	46.5
70	Ship building	2.9	2.8	5.8
71	Aircraft & other transport equipment	72.5	2.5	76.8
72	Electric machinery	11.2	5.1	16.8
73	Electric appliance for household use	40.7	8.2	52.3
74	Electric equipment & machinery, n.e.s.	12.7	8.2	21.9
75	Electronic computers	12.1	4.1	16.7
76	Electronic equipment for daily use	41.4	4.4	47.6
77	Other electronic & telecommunications equipment	18.3	4.6	23.8
78	Instrument, meters & other measuring equipment	6.1	5.9	12.4
79	Machines and equipment repairs	0.0	3.1	3.1
80	Other manufactures used for production	0.0	4.5	4.5
81	Other manufactures for household use	35.1	4.5	41.1

Sources: Table 4.5 and 4.8.

domestic taxes collected for each sector. But that is not the end of it. In deriving the implicit tariff rates above, we failed to take into account two factors, which are of great importance in assessing the tariff and domestic tax system of a country. These two factors are:

- export tax rates, and
- administrative restrictions on imports.

To take these two factors into account, we need to adjust the implicit tariff rates for certain sectors. The first adjustment is with regard to the de jure implicit tariff rate: we have to take into account the export tax rate. To promote exports, the Chinese government rarely taxes exportable goods. It even exempts almost all domestic taxes if the good is actually exported. In 1985, only 30 commodities, belonging to 12 sectors, are taxed for exporting. Since the export tax has an opposite effect toward protection of the product, it appears as an item that will be subtracted from the implicit tariff rate derived earlier in formula (4-9). Comparison of the pre and post adjustment implicit tariff rates for the 12 sectors are shown in Table 4.11.

After the adjustment, we use the new implicit tariff rate to deflate the domestic price of output (unitary) and material input coefficients to derive world or unprotected value added.[23]

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[23] Please refer to equation (2-14) in Chapter II .

Table 4.11
Revised Implicit Tariff Rate for 12 Traded Sectors: De Jure
(per cent)

I-O Code	Traded Sector	Before Adjustmenmt	After Adjustmenmt
1	Farming	2.87	2.80
2	Forestry	22.21	22.21
3	Animal husbandry	17.73	17.73
4	Side-line production	31.53	21.36
5	Fisheries	49.99	40.40
6	Coal mining and dressing	18.59	-22.66
8	Ferrous metals mining & dressing	3.12	-7.19
9	Non-ferrous metals mining & dressing	4.65	4.31
15	Slaughtering and meat products	19.44	19.43
17	Acquatic products	48.68	45.14
18	Sugar milling and refining	67.76	53.59
57	Smelting and pressing of ferrous metals	18.49	17.37
58	Smelting and pressing of non-ferrous metals	22.44	22.30

Source: See text for estimation technigue, it takes into account export taxes.

The second adjustment involves direct comparison of domestic price of China and the international prices for certain sectors. This will bring us closer to the real implicit tariff structure of China. We will examine each of the sectors and make a realistic assessment of the potential price-raising effect of the trade regime and economic system. The result will be different from the above two measures, namely, Type I and Type II implicit tariff rates. For the purpose of clarification, we use ITR-I and ITR-II to represent the above mentioned two implicit tariff rates, and ITR-III to refer to the new one, or Type III. As mentioned before, the distinction between the three implicit tariff rates is not trivial at all. The first one, ITR-I, reveals the level of nominal protection domestic producers receive if the government exactly follows the tariff schedule without making any tax loopholes and imposing any restrictions on trade. The second one, ITR-II, is based on the tariffs and taxes the importers actually paid to the government, which takes into account any subsidies and tax or tariff credits. The third one, ITR-III, is trying to capture every aspect of the trade regime and tax and price administration system and transform them into implicit tariff rates. The calculation of the third one may not be perfect, but it will be as complete as possible.

The question arises here as to how China determines the price of importable goods. We will further discuss this

question in the next chapter. In answering this question, we provide some useful guidelines and findings for future reform of the trade system, and offer some insight on a current bone of contention between the West -- particularly the U.S. -- and China with regard to China's trade policy.

Before economic reform in the late 1970s, the Chinese market remained largely insulated from the world market. Almost all imports went through government planning. The prices of importable goods purchased on the international market and the prices of those products sold in the domestic market were not linked. The government reaped all the profit and took care of the losses for importing all goods. The insulation of the domestic market from the international market started to change after that. As mentioned in the introductory chapter of this study, imported goods that are priced on a cost-plus basis (c.i.f. price plus tariff plus domestic taxes) accounted for only 20% of total imports in 1981.[24] However, the major objective of the 1984 reform, and of the 1987 reform too, was to abandon the old method of finding an equivalent domestic price for imports in favor of the cost-plus approach. As a result, 50% of imports were priced on a cost-plus basis in 1985. The share rose to 80% in 1989.[25]

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[24] See, for example, Qin (1990, p.12).

[25] See World Bank (1988, p.113), Taylor (1989, p.157) and Qin (1990, p.13).

Since 1984, importable goods have been broadly categorized into three kinds. The distinction between the three categories are the following[26]:

• Category I: These importable goods are of key importance to the people's life and traded solely by the state. There are nine items of this kind: grain, steel, chemical fertilizer, timber, polyester and polyethylene, natural rubber, granulated sugar, crude oil and oil products. These importable goods are strictly controlled by the government. The government pays heavy subsidies for many of the items due to their lower domestic prices.

• Category II: These goods are imported in large volume and are in short supply on the domestic market. Huge price differences exist between the domestic market and the international market. They are solely traded by the state foreign trade corporations (FTCs). Currently there are eight items which fall into this category: wool, wood pulp, plywood, kraft and corrugated paper, agro-chemicals, some important chemical materials, junk ships and TV kinescope. Many of these items, like those in category I, are subsidized by the state.

• Category III: It includes other importable goods not mentioned above. For the importable good under this

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[26] See Guojia jiwei tizhi gaige he fagui si (the State Planning Commission, 1989, p.390).

category, importation is without restrictions, except for those subject to import licenses.

Parallel to the three categories, there is a list of commodities subject to import licenses. As of 1985, there were 53 such items. We list all the restricted importable items under categories I and II and import licensing (some of them are overlapping) in Table 4.12. After carefully examining each of the items, we follow the principles outlined below to figure out the actual implicit tariff rate for each of the traded sectors.

- Subsidization by the government apparently indicates that the domestic price of the importable is lower than the international price. For these sectors we use direct price comparison to figure out the implicit tariff rate.

- Requirement of import licenses is most likely the case when the domestic price of the importable is higher than the international price. We made a careful evaluation of the restricted list and found out which sectors' border prices are lower than domestic prices. For these sectors, we use the scheduled tariff rates plus domestic taxes to figure out the mark-ups on the c.i.f. price. These kinds of mark-ups are higher than the actual tariffs and taxes collected by the government.

- Direct comparison is also made for a number of other sectors where product homogeneity is obtained and the domestic price is lower than the international price.

Table 4.12
List of Restricted Import Commodities: 1985

No.	Name of the Commodities	I-O Code	Higher (+) or Lower (-) Than the Boder Price
I. Government Regulated Commodities			
1	Grain	1	-
2	Steel	57	-
3	Chemical fertilizer	40	-
4	Timber	12	-
5	Ruber	2	+
6	Granulated sugar	18	-
7	Crude oil	7	-
8	Petroleum products	36	-
9	Polyester, polyethelene glycol	45	+
10	Wool	3	-
11	Wood pulp	12	-
12	Plywood	30	+
13	Kraft and corrugated Paper	32	+
14	Agro-chemicals	40	-
15	Some important chemical materials	39	+
16	Disused ships	80	+
17	TV kinscope	77	+
II. Commodities Subject to Import Licenses			
1	Steel products	57	-
2	Steel billets	57	-
3	Scrap steel	57	-
4	Disused ships	80	+
5	Natural rubber	2	+
6	Timber	12	-
7	Plywood	30	+
8	Wool	3	-
9	Chemical fibre	45	+
10	Wood pulp	12	-
11(a)	Crude oil	9	-
11(b)	Oil refineries	36	-
12	Granulated sugar	18	-
13	Chemical fibre monomer	45	+
14	ABS resin	43	+
15	Synthetic glue	43	+
16	Polycarbonates	41	+
17	Sodium cyanide	39	+
18	Agro-chemicals	40	-
19	Tobacco products	22	+
20	Filter-tips	22	+
21	Diacetate acid fibre tow	45	+
22	Coffee	2	-

Table 4.12 (continued)
List of Restricted Import Commodities: 1985

No.	Name of the Commodities	I-O Code	Higher (+) or Lower (-) Than the Boder Price
23	Cobalt and cobalt salt	11	+
24	Automobile tyre	46	+
25	Demolition apparatus for civilian use	43	+
26	Chemical fabrics	27	+
27	Synthetic fibre garments	45	+
28	Crude drugs	1	-
29	Carbonated beverage	21	+
30	TV kinescope	76	+
31	Vehicles	69	+
32	Key parts of automobile	69	+
33	Hoisting truck	69	+
34	Civial aircraft	71	+
35	Open-end spinning frame	62	+
36	Electronic microscope	78	+
37	Electronic colour scanner	78	+
38	Laminagraphing apparatus	66	+
39	Electronic computer	75	+
40	Tape and videotape reproducer	76	+
41	Videotape recorder and player	76	+
42	Duplicating machine	76	+
43	Airconditioner	73	+
44	Refrigerators	73	+
45	Washing machines	73	+
46	Recorder	76	+
47	television set	76	+
48	Motorcycle	71	+
49	Key parts for motorcycle	71	+
50	Camera	65	+
51	Camera body	65	+
52	Watch	65	+
53	Assembling and processing equipmen	63,64,66	+

Note: Positive (+) represents a higher domestic producer's price than the internatio price, while negative sign (-) represents the opposite.

Source: For the regulated commodities, see the State Planning Commision (1989); f the licensed importable goods, see the annex to the "Provisional Regulatio of the People's Republic of China on the Licensing System for Imported G as of January 10, 1984), printed in the China Investment Guide (4th ed., 19 pp.520-523).

Altogether, there are 14 sectors for which a direct price comparison is made (Table 4.13).

• For other importable goods not mentioned above, we will use the actual tariffs and taxes collected by the government as a mark-up to derive the implicit tariff rate.

In Table 4.11, we not only list the names of items which are restricted, and the appropriate input-output code (sector) they belong to, but we also give a positive or negative sign to each of them, showing whether the domestic price is higher or lower than the international price.

For the direct price comparison of the 14 sectors, it is worth noting that the data for such a comparison is extremely sparse and assigning weights to each of the commodities within a sector is also approximate. The 1985 input-output table provides us with exports of each sector at domestic producer price.[27] At the same time, the exports of each sector evaluated as f.o.b price at the customs are provided by the general customs statistics. Hence we adopt the following formula to derive the direct price comparison of the above 10 sectors.

$$(4\text{-}11) \qquad T^{m}_{j} = \frac{EXP_{dj}}{EXP_{bj}} \times 100$$

where:

T^{m}_{j}: implicit tariff rate of sector j;

[27] The producer price is equivalent to the procurement price of exported goods in the domestic market.

Table 4.13

Actual Price Comparison and Type III Implicit Tax Rate of Certain Sectors

I-O Code	Sector	Export at Border price (Yuan 10,000)	Export at Domestic price (Yuan 10,000)	Implicit Tariff Rate (%)	Source of Comparison
1	Farming	800,896	747,701	-6.642	GC, I-O
3	Animal husbandry	255,717	242,597	-5.131	GC, I-O
6	Coal Mining and Dressing	93,001	67,364	-27.566	GC, I-O
7	Petroleum and natural gas extraction	1,538,631	602,600	-60.835	GC, I-O
8 - 9	Ferrous and non-ferrous metals mining & dressing	67,830	61,364	-9.533	GC, I-O
12	Logging and transport of timber and bamboo	2,816	2,246	-20.241	GC, I-O
18	Sugar milling and refining	10,522	17,425	65.601	GC, MOFERT
36	Petroleum Refineries	425,220	368,357	-13.373	GC, I-O
37	Coking	14,174	7,473	-47.277	GC, I-O
40	Chemical fertilizers and pesticides	6,666	4,612	-30.818	GC,ZJN
50	Cement	1,735	1,546	-10.893	GC, I-O
57	Smelting and pressing of ferrous metals	34,821	30,124	-13.489	GC, I-O
58	Smelting and pressing of non-ferrous metals	61,117	74,218	21.436	GC, I-O

Sources: I-O: The State Information Center: 1985 Input-Ouput Table; GC: General Customs Statistics of the PRC, January 1986; MOFERT: Almanac of Foreign Economic Relations and Trade, 1986; ZTN: Statistical Yearbook of China, 1987.

EXPdj: value of exports of sector i at the domestic producers' price;

EXPbj: value of exports of sector j evaluated at f.o.b. price at the border, converted in to yuan by using the average exchange rate of exports (2.9576 Yuan/$ in 1985).

The results of the price comparisons are reported in Table 4.13. In doing so, the homogeneity of the commodities is also acknowledged.[28]

4.6 Summary

We have now completed the chapter of analytical framework, estimating techniques and derivation of various components for the final estimation in Chapter V. It is worth noting that altogether three implicit tariff rates are derived for the traded sectors. Each of them has its own economic meaning. To derive the various ERPs based on the three implicit tariff rates will help us evaluate the outcomes of the future reform of the Chinese trade system. Policy implications derived from such analysis could be very useful for further trade reforms. For the convenience of further estimation, we summarize the three implicit tariff rates (labeled ITE-I, ITR-II and ITR-III) in Table 4.14.

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[28] Homogeneity means that the items of exports and imports are basically the same in terms of categories and quality. This explains why it is legitimate to use value of exports in different markets as an approximation for imports.

Table 4.14
Three Types of Implicit Tariff Rates for the Traded Sectors

(percent)

I-O Code	Sector	ITR-I	ITR-II	ITR-III
1	Farming	2.80	1.65	-6.64
2	Forestry	22.21	13.69	22.21
3	Animal husbandry	17.73	10.20	-5.13
4	Side-line production	21.36	10.35	10.35
5	Fisheries	40.40	23.66	23.66
6	Coal mining and dressing	-22.66	13.82	-27.57
7	Petroleum & natural gas extraction	20.78	22.43	-60.84
8	Mining & dressing of ferrous metals	-7.19	3.22	-9.53
9	Mining & dressing of non-ferrous metals	4.31	4.64	-9.53
10	Mining & dressing of building & other non-metal minera	36.47	22.78	22.78
11	Salt	15.70	15.10	15.70
12	Timber and bamboo	18.64	9.78	-20.24
13	Production & supply of running water	5.30	3.34	3.34
14	Grain & edible oil processing	23.32	7.72	7.72
15	Slaughtering and meat products	19.43	10.13	10.13
16	Egg and dairy products	60.81	25.99	25.99
17	Aquatic products	45.14	26.61	26.61
18	Sugar milling and refining	53.59	33.24	65.60
19	Other food manufacture	68.47	27.90	27.90
20	Liquors, wines and alcohol manufacture	157.31	99.00	99.00
21	Other beverage manufactures	87.87	25.28	87.87
22	Tobacco manufactures	207.82	159.58	207.82
23	Forages, manufactured	16.83	3.84	3.84
24	Cotton textiles	67.81	43.23	43.23
25	Woollen textiles	110.85	45.23	45.23
26	Knit goods	116.39	60.81	60.81
27	Hemp, silk & other textiles	79.30	38.26	79.30
28	Sewing & Tailoring	96.03	38.81	38.81
29	Leather, fur & the related manufactures	74.68	23.10	23.10
30	Sawlog processing & man-made board manufactures	27.15	12.06	27.15
31	Furniture & other wood manufactures	75.88	37.94	37.94
32	Paper making and manufactures	33.26	18.71	33.26
33	Printing	45.31	42.14	42.14
34	Articles of culture, education, sports & art	69.19	44.45	44.45
35	Power generation, steam & hot water	19.24	19.66	19.66
36	Petroleum refineries	38.60	27.97	-13.37
37	Coking	28.56	14.63	-47.28
38	Coal gas & coal-related products	32.50	2.45	2.45
39	Basic chemical materials	38.70	23.01	38.70
40	Chemical fertilizers & pesticides	13.25	8.46	-30.82
41	Organic chemical manufactures	42.29	30.71	42.29
42	Chemical manufactures for daily use	57.89	39.81	39.81
43	Synthetic chemical materials and chemicals, n.e.s.	55.31	34.02	55.31
44	Medical & pharmaceutical products	32.96	18.08	18.08

Table 4.14 (continued)
Three Types of Implicit Tariff Rates for the Traded Sectors
(percent)

I-O Code	Sector	ITR-I	ITR-II	ITR-III
45	Chemical fibre	84.40	36.65	84.40
46	Rubber manufactures used for production	54.58	39.96	54.58
47	Rubber manufactures for daily use	76.78	13.32	13.32
48	Plastic manufactures used for production	61.90	26.91	26.91
49	Plastic manufactures for daily use	89.54	27.19	27.19
50	Cement	27.70	22.93	-10.89
51	Cement & asbestos products	39.75	3.87	3.87
52	Brick, tile, lime & light building materials	58.28	50.91	50.91
53	Glass & glass products	62.23	41.06	41.06
54	Ceramics	83.87	53.70	53.70
55	Fireproof materials	31.56	21.91	21.91
56	Non-metal manufactures, n.e.s.	55.17	23.98	23.98
57	Smelting & pressing of ferrous metals	17.37	16.92	-13.49
58	Smelting & pressing of non-ferrous metals	22.30	13.37	21.44
59	Metal manufactures used for production	35.19	19.11	19.11
60	Metal manufactures for daily use	83.37	47.09	47.09
61	Boiler and motor manufactures	33.95	13.66	13.66
62	Machine building for metal processing	36.00	17.72	36.00
63	Special equipment for industrial use	36.20	15.55	36.20
64	Machine building for the agricultural sectors	26.69	12.09	26.69
65	Daily used machinery	86.73	42.76	86.73
66	Special equipment, n.e.s.	48.00	18.90	48.00
67	Machinery, n.e.s.	38.67	24.07	24.07
68	Railway transport equipment	13.68	8.47	8.47
69	Motor vehicles	100.77	46.51	100.77
70	Ship building	22.63	5.81	5.81
71	Aircraft & other transport equipment	126.08	76.77	126.08
72	Electric machinery	26.06	16.77	16.77
73	Electric appliance for household use	93.69	52.27	93.69
74	Electric equipment & machinery, n.e.s.	45.48	21.88	21.88
75	Electronic computers	44.54	16.66	44.54
76	Electronic equipment for daily use	164.96	47.59	164.96
77	Other electronic & telecommunications equipment	28.58	23.78	28.58
78	Instrument, meters & other measuring equipment	25.49	12.38	25.49
79	Machines and equipment repairs	5.30	3.12	3.12
80	Other manufactures used for production	11.57	4.47	11.57
81	Other manufactures for household use	75.30	41.11	41.11

Note: Type I , II and III implicit tariff rates (ITR-I, ITR-II and ITR-III) are based on the published tari and taxes, real tariffs and taxes, adjustment tariffs and taxes, respectively.

Sources: Table 4.10, 4.11, and 4.12.

Upon comparison of the three implicit tariff rates, one will discover that whereas ITE-I summarizes the price-raising effect of the trade regime through published tariff and tax schedules, ITR-II is based on the tariffs and taxes actually collected by the government for each sector. When one come up with the final and close-to-reality implicit tariff rate of each sector, he or she not only has to take into account the trade restrictions, but also needs to consider the trade subsidies of the government. This has been done by calculating ITR-III. The result ITR-III is a mixture of both ITR-I and ITR-II. It will ultimately influence calculation of ERP for each sector. We will discuss this further in the next chapter.

CHAPTER V

THE PATTERN OF EFFECTIVE PROTECTION IN CHINA: AN EVALUATION OF THE EMPIRICAL RESULTS

5.1 Introduction

Following the estimation techniques developed and the various components derived in the previous chapters, we will present in this chapter the empirical results of the effective rates of protection (ERPs). We will use the results to analyze and explain the pattern of effective protection resulting from the trade regime and tax system in China. The study will further employ the results to evaluate the current trade reforms in China, and to explain why the continuous effort of the Chinese government in relating the domestic price of importable goods to the international market leads to an unintended price increase of imports. The study will offer some insight regarding the mounting criticism of the West, and the United States in particular, regarding China's trade policy and give a reasonable explanation of the sources of the controversy. Finally the study will suggest and advise how the West could help the Chinese government to solve the problem and continue the trade reforms in the right direction.

The rest of this chapter is organized in the following way. Section 5.2 presents three simulations and reports the corresponding empirical results. Under each of the

simulations, the different government behavior will be assumed and the ERPs will be calculated separately. Comparison of the three simulating scenarios and discussion of their policy implications will be done in section 5.3. Section 5.4 presents a general picture of the structure of the effective protection in China. Certain groups of industries and some key sectors are also examined in this section. Section 5.6 explores the scope for further study.

5.2 ERPs: Simulations and Empirical Results

The actual estimation formula of ERPs used in this study is the one we developed in Chapter II. It is formula (2-14), and we rewrite it here to refresh our mind[1],

$$(5\text{-}1)\quad ERP_j = \frac{1 - \sum_{t=1}^{m} a_{tj}^{p} - \sum_{t=1}^{m}\sum_{h=m+1}^{n} a_{hj}^{p} r_{th}}{\frac{1}{1+T_j} - \sum_{t=1}^{m} \frac{a_{tj}^{p}}{1+T_t} - \sum_{t=1}^{m}\sum_{h=m+1}^{n} \frac{a_{hj}^{p} r_{th}}{1+T_t}} - 1$$

In Chapter IV, we already discussed and derived the actual value of each of the components in the above formula. The results of ERPs can be obtained by substituting those numbers into the formula. However, actual calculations of ERPs in this study are made under three different simulations. For this purpose, we derived three different

[1] For definitions of each of the terms in the formula, refer to section 2.4.1. of Chapter II.

implicit tariff rates in the last chapter. We assume different government behavior for these three simulations.

•Simulation I: De Jure ERP (ERP-I)

We assume in this simulation that the government had carried out the import policy by strictly following the well established tariff and tax schedules. There would be no tax credits, no trade restrictions. Although it is very unlikely that this would be the case in reality at the current stage, the World Bank (1988, 1991) has recommended a policy of using straight and transparent tax system for China and other developing countries. For this reason, we calculate the de jure effective rates of protection for 1985, namely ERP-I, under the above assumptions, and compare the results with that of other simulations (Table 5.1).

•Simulation II: De Facto ERP (ERP-II)

We assume in the simulation that the government allowed for large amount of tariff and tax credits and concessions for imported goods. As a result, tariffs collected would be less than half of the amount that would be collected if the tariff schedule was used. This was exactly what the Chinese government did in 1985, together with trade restrictions for certain sectors that will be considered in another simulation. Under the Simulation II, a de facto effective

Table 5.1

Three Types of Effective Rates of Protection of All Traded Sectors: 1985

I-O Code	Sector	ERP-I (%)	ERP-II (%)	ERP-III (%)
1	Farming	0.27	-0.08	-4.39
2	Forestry	22.00	13.45	26.06
3	Animal husbandry	23.76	14.37	-7.30
4	Side-line production	21.38	9.56	10.81
5	Fisheries	48.67	28.98	31.58
6	Coal mining and dressing	-41.43	8.30	-43.69
7	Petroleum & natural gas extraction	17.34	22.76	-67.11
8	Mining & dressing of ferrous metals	-22.46	-6.65	-21.43
9	Mining & dressing of non-ferrous metals	-8.30	-4.27	-21.13
10	Mining of building & other non-metal minerals	33.90	21.21	24.16
11	Salt	11.77	13.22	16.03
12	Timber and bamboo	14.56	6.35	-28.58
13	Production & supply of running water	-5.26	-5.53	-4.96
14	Grain & edible oil processing	---	57.00	---
15	Slaughtering and meat products	17.16	3.77	937.39
16	Egg and dairy products	330.80	61.32	144.17
17	Aquatic products	57.37	33.31	36.92
18	Sugar milling and refining	643.83	164.63	---
19	Other food manufacture	558.30	68.44	80.61
20	Liquors, wines and alcohol manufacture	---	---	---
21	Other beverage manufactures	---	55.93	---
22	Tobacco manufactures	682.35	411.67	929.92
23	Forages, manufactured	63.51	-0.54	43.49
24	Cotton textiles	147.80	93.46	75.59
25	Woollen textiles	412.82	84.49	89.35
26	Knit goods	348.75	133.85	111.53
27	Hemp, silk & other textiles	1,146.42	132.44	---
28	Sewing & Tailoring	222.90	46.81	43.16
29	Leather, fur & the related manufactures	179.33	25.80	34.22
30	Sawlog processing & man-made board manufactur	26.99	3.01	97.12
31	Furniture & other wood manufactures	254.47	79.53	101.43
32	Paper making and manufactures	47.73	22.96	78.10
33	Printing	62.06	91.93	65.10
34	Articles of culture, education, sports & art	133.18	90.34	77.95
35	Power generation, steam & hot water	34.28	20.03	73.96
36	Petroleum refineries	57.62	33.29	1,083.55
37	Coking	629.43	9.96	-68.80
38	Coal gas & coal-related products	---	-41.68	---
39	Basic chemical materials	58.68	26.00	103.44
40	Chemical fertilizers & pesticides	-7.23	-10.64	-54.50
41	Organic chemical manufactures	56.81	42.21	153.07
42	Chemical manufactures for daily use	161.07	115.34	127.64
43	Synthetic chemical materials and chemicals, n.e.s.	97.85	52.12	346.24
44	Medical & pharmaceutical products	32.71	13.88	19.59

Table 5.1 (continued)
Three Types of Effective Rates of Protection of All Traded Sectors: 1985

I-O Code	Sector	ERP-I (%)	ERP-II (%)	ERP-III (%)
45	Chemical fibre	207.23	50.66	293.79
46	Rubber manufactures used for production	85.34	69.38	115.46
47	Rubber manufactures for daily use	232.34	-5.21	-8.88
48	Plastic manufactures used for production	90.29	17.97	5.86
49	Plastic manufactures for daily use	244.45	21.40	8.95
50	Cement	35.15	26.37	-28.82
51	Cement & asbestos products	61.33	-16.90	10.07
52	Brick, tile, lime & light building materials	110.44	94.39	137.04
53	Glass & glass products	102.56	64.87	77.23
54	Ceramics	188.90	94.82	130.81
55	Fireproof materials	31.57	20.89	37.81
56	Non-metal manufactures, n.e.s.	81.52	22.64	36.93
57	Smelting & pressing of ferrous metals	16.77	16.52	-20.85
58	Smelting & pressing of non-ferrous metals	25.83	10.62	59.18
59	Metal manufactures used for production	53.29	18.49	66.64
60	Metal manufactures for daily use	400.74	127.58	170.74
61	Boiler and motor manufactures	39.62	6.26	22.79
62	Machine building for metal processing	40.36	14.46	73.75
63	Special equipment for industrial use	44.17	9.62	97.29
64	Machine building for the agricultural sectors	15.52	-2.08	55.59
65	Daily used machinery	185.17	65.20	313.98
66	Special equipment, n.e.s.	67.52	14.14	123.02
67	Machinery, n.e.s.	51.68	28.99	53.56
68	Railway transport equipment	-4.28	-6.20	12.17
69	Motor vehicles	383.80	88.92	2,160.39
70	Ship building	10.36	-11.21	-2.41
71	Aircraft & other transport equipment	---	462.79	---
72	Electric machinery	18.40	11.62	32.25
73	Electric appliance for household use	786.46	189.92	---
74	Electric equipment & machinery, n.e.s.	71.97	23.73	26.31
75	Electronic computers	58.07	11.27	62.17
76	Electronic equipment for daily use	---	235.07	---
77	Other electronic & telecommunications equipment	21.11	23.86	32.92
78	Instrument, meters & other measuring equipment	17.70	3.72	32.69
79	Machines and equipment repairs	-21.29	-16.58	-15.06
80	Other manufactures used for production	-6.99	-10.44	8.37
81	Other manufactures for household use	136.77	65.16	50.65

--- Indicating that the international value-added is negative.

Source: see text for estimation technigue.

rate of protection, namely, ERP-II is calculated for 1985 and the results are reported in Table 5.1.

•Simulation III: Adjusted ERP (ERP-III)

We assume in this simulation that the government has a partially open policy for imports. This case is close to the reality of the trade and domestic policy framework in China in 1985. It takes into account, as accurately as possible, the effect of the trade restrictions imposed by the government. For some sectors, the domestic price is lower than the international price. For others, the real price raising effect is higher than the c.i.f. price plus the tariffs and domestic taxes collected by the government, partially due to the insulated domestic market and partially due to the system of licensing established by the government. These effects have been taken into account in the derivation of ERP-III. The results are reported in Table 5.1.

The reason that we run three simulations and make a distinction between the de jure and de facto ERPs is because of the different roles they play in analyzing resource movements. The de jure ERP is based on the current tariff and domestic tax system which exists in government documents, without referring to any exemptions, tax credits, administrative restrictions and other measures outside the tariff and tax codes. The de jure ERP reflects the

potential protection that each of the traded sectors would receive if those exemptions were removed. The de facto ERP, on the other hand, reflects the real protection that each of the traded sector obtains from the trade regime under its particular circumstances. It takes into account all the government subsidies that ERP-I omits and helps to explain the current pattern of incentive structure and resource movement. If the government continues to use tariff/tax plus non-tariff/tax measures to carry out macroeconomic policies, the results of the de facto ERP may be useful for predicting the future resources movement between sectors. Such an advantage of the de facto ERP notwithstanding, the measure fails to take into account the quantitative restrictions imposed by the trade regime. The restrictions are revealed in terms of government planning (a typical and dominant way of management in China before the economic reform, the role of which has undergone great changes since then) and import (export) licensing. To address this issue, a careful study of government policies is undertaken. The final implicit rate of protection (an important component for estimating the ERP) is obtained by directly comparing the domestic and international prices for some sectors and assuming the nominal tariff and tax rate for a number of other sectors.

5.3 Simulations, Trade Reforms and Government Policies

Before we evaluate the pattern of effective protection in China, the results of the three ERPs derived earlier under three different simulations need to be compared. The statistical results of the comparison are shown in Table 5.2. A comparison of the different results of the three ERPs reveals some interesting points and is important in explaining the effects of current Chinese policies on overall imports. If the government strictly follows its tariff codes and sets the price of imports based on the cost-plus approach, domestic producers will generally enjoy the highest protection. The unweighted average of ERP (ERP-I) for all the traded sectors is 139 percent under this scheme. If the government only imposes a mark-up reflecting the actual tariff and taxes that are collected, the protection to domestic producers will be low, with an unweighted average of ERP (ERP-II) of 49 percent. Lying in between is ERP-III, the effective rates that is likely to be received by domestic producers that average around 123 percent. However, comparing ERP-III with ERP-II, the variation of the former is larger than that of the latter. The standard deviation of the ERP-III is 316.47 and that of ERP-II is 212.81. Both the maximum and minimum numbers of ERP-III are larger in absolute terms than that of ERP-II.

The policy implications of the comparison are very important and may have a profound impact on China's trade

Table 5.2
Statistical Analysis of Different ITRs and ERPs : 1985
(percent)

Item	Mean	Stadard Deviation	Minimum	Maximum
ITR-I	49.95	39.16	-22.66	207.82
ERP-I	139.43	212.81	-41.43	1,146.42
ITR-II	26.90	23.12	1.65	159.58
ERP-II	48.56	79.62	-41.68	462.79
ITR-III	31.60	40.96	-60.84	207.82
ERP-III	123.23	316.47	-68.80	2,160.39

ITR-I: De Jure or Type I implicit tariff rate;
ERP-I: De Jure or Type I effective rate of protection;
ITR-II: De Facto or Type II implicit tariff rate;
ERP-II: De Facto or Type II effective rate of protection;
ITR-III: Adjusted or Type III implicit tariff rate;
ERP-III: Adjusted or Type Iil effective rate of protection

Source: Table 5.1.

reforms. We can draw the following conclusions from the above analysis:

First, Simulation I represents the case of China adopting a tariff-and-tax-only trade regime. This regime is particularly advocated by trade economists as for the developing countries. But compared to Simulation III, which is very close to the actual case of China in 1985, the average effective protection rate is higher. This result indicates that the official tariff schedule in China is very high, even compared with the real case in China, which is generally considered protective. However, the variation of ERP-I is smaller than that of ERP-III, indicating that the tax system under Simulation I is more transparent and uniform than that of Simulation III. Generally speaking, the smaller the variation of an incentive measure, the smaller the welfare loss will be.[2] Based on this, our suggestion is that China should move from Simulation III to Simulation I and gradually reduce the tariff rate at the same time.

Second, Simulation II represents the case where there are no non-tariff trade restrictions, and nominal tariff rates are lower than the official tariff schedule. Both the effective protection and its variation are much smaller than those of ERP-I and ERP-III. According to above analysis,

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[2] We will show in the following sections that a tax and tariff system as complicated as the case of China produces many biases in the economy.

Simulation II is the ideal policy choice in the future if the Chinese government is willing to continue its economic reform towards a market-oriented economy.

This result of comparison also will help us understand why the import policy has become more restrictive as seen by the West, particularly the U.S., in recent years. The U.S. accuses China of wrongdoing in exporting cheap goods while maintaining tight controls on imports.[3] If this is true, then why has the Chinese trade regime become more restrictive as the trade reforms continue?

As mentioned earlier, one of the objectives of the Chinese policy makers is to reduce the scope of trade planning (administrative control of the trade activities) and gradually increase the importance of tariffs and licensing in directing trade flows. As the general price reform evolves, albeit slowly, more and more Chines scholars advocate linking the domestic price with the international price, and they treat the latter as one of the bench marks the price reform. As we have already seen, since 1981, the

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[3] In US-China trade relations, the scope of measuring the transactions between the countries is different for the two sides. Recently the U.S. has accused China of continually running a huge trade surplus, second only to Japan, while not making its door open wide enough for American goods. The Chinese side, however, deems it unfair to count the entrepot trade through Hong Kong as part of its export to the U.S. Another reason why U.S. exports to China have stagnated, according to the Chinese government, is the slowing of transferring hi-tech products to China following the Chinese government's crackdown on Tiananman Square democratic movement in Beijing, in June 1989.

proportion of importable goods that is priced in the domestic market on the cost-plus basis has increased from 20% to 50% in 1985 and 80% in 1989. Although we are not sure to what extent the easing of trade planning, which may generally result in an increase of imports, is offset by the more frequent use of import licensing, which may impede the speed and magnitude of imports, the above trend has clearly shown that the trade system has been gradually moving from ERP-III to ERP-I. In other words, as the government gradually reduces its subsidy and tax credits to imports and moves toward relying on the published tariff schedule to price importable goods, the average effective protection to domestic producers has become higher, not lower. The real problem is not caused by the trade reform itself, which continues in the direction of departing from direct quantity controls and in favor of more frequent use of tariffs. The problem is that the tariff schedule itself is too high. Our suggestion is the Chinese government should not only reduce non-tariff measures but also reduce the tariff rates in general. As far as the current study goes, Simulation I should only be a transitional stage. China's trade reforms should continue and end up at resembling Simulation II.

5.4 The Pattern of Effective Protection in China

So far, we have presented and compared three simulations. If the assumptions resemble one way or another

the present or future cases in China, the policy implications are dynamic. An implicit assumption behind the analysis of different ERPs is that the input-output structure, as reflected in the 1985 table, will not be changed. Now we turn to the static aspect of the study and analyze the pattern of effective protection in China. The results may further enhance our conclusion that China should move from Simulation III to II so as to reduce the likely welfare loss from the complicated tax and trade regime. During this transitional period, Simulation I may be achieved, but it should be temporary because its average effective protection is even higher than that of Simulation III.

5.4.1 General Interpretation of the Empirical Results

The basic question is how to explain the ERP for the case of China. Generally speaking, a high ERP indicates that effective protection is high and investors are likely to move into that industry. This explanation is based on the assumption that prices (tariff and tax included) are allocators of resources. But prices have another role, too. That is, prices may indicate the height of economic rent for a particular sector. In explaining the pattern of effective protection China, we have to be aware that the ERPs of different sectors not only indicate the direction of possible resources pulls, but also represent the economic

rent in each sector. A high ERP may not necessarily benefit the producers because how the economic rent is divided between producers and rent takers (e.g., government officials) is not clear. No matter which case is true for China, the ERP remains as cost to the economy unless an infant industry case is evident.

Now, based on the results of adjusted ERP-III, which simulates the real case of 1985, the following general interpretations can be offered.

First, the results confirm the widely claimed theory that the ERPs are generally higher than the nominal protection rates or implicit tariff rates with a much wider variance in developing countries.[4] In fact, the variation of the ERPs of traded sectors in China is so large that it suggests that the structure of the effective protection is very complicated. This pattern may suggest the first bias of the economic structure, i.e., high and widely distributed protection to domestic industries in general. It is very likely to send a mixed signal to the various sectors in the economy and may result in misallocation of resources.

Second, effective protection is generally escalated in China. The lower 20 sectors that received the lowest realized ERPs are entirely agricultural and primary sectors (Table 5.3). Most of the upper 20 sectors that received the

[4] Refer to Table 5.2.

Table 5.3
The Twenty Least Protected Traded Sectors in China in 1985

I-O Code	Sector	ITR-III (%)	ERP-III (%)
37	Coking	-47.28	-68.80
7	Petroleum & natural gas extraction	-60.84	-67.11
40	Chemical fertilizers & pesticides	-30.82	-54.50
6	Coal mining and dressing	-27.57	-43.69
50	Cement	-10.89	-28.82
12	Timber and bamboo	-20.24	-28.58
8	Mining & dressing of ferrous metals	-9.53	-21.43
9	Mining & dressing of non-ferrous metals	-9.53	-21.13
57	Smelting & pressing of ferrous metals	-13.49	-20.85
79	Machines and equipment repairs	3.12	-15.06
47	Rubber manufactures for daily use	13.32	-8.88
3	Animal husbandry	-5.13	-7.30
13	Production & supply of running water	3.34	-4.96
1	Farming	-6.64	-4.39
70	Ship building	5.81	-2.41
48	Plastic manufactures used for production	26.91	5.86
80	Other manufactures used for production	11.57	8.37
49	Plastic manufactures for daily use	27.19	8.95
51	Cement & asbestos products	3.87	10.07
4	Side-line production	10.35	10.81

ITR-III: adjusted or Type III implicit triff rate;
ERP-III: adjusted or Type III effective rate of protection

Sources: Tables 4.14 and 5.1

higher realized ERPs are manufacturing industries at a higher processing stage (Table 5.4).

Third, it is worth noting that some sectors (plastic manufactures for production use and daily use) end up as a lower ERP than the implicit tariff rate, while others (rubber manufactures for daily use, ship building and machine repairs) turn the positive implicit tariff rate into a negative ERP. This suggests that the effective protection of their tradable inputs is higher than that of output. Another extreme example is petroleum refineries. While the implicit tariff is as low as -13.37 percent, the realized ERP for this sector turns out to be 1083.55 percent. The reason is that the input of petroleum refineries are concentrated highly on crude oil, where the implicit tariff rate and ERP are -60.84 percent and -67.11 percent, respectively. These phenomena suggest that the pattern of effective protection could be quite different from the pattern of nominal tariff and tax rates, and the structure of the economy should be evaluated based on the real incentives (as measured by ERP) each of the sectors receives. Significant deviations between the implicit tariff rates and ERPs for the sectors mentioned above reflect the inconsistency of the government policies. This is the second bias of the tax and tariff system suggested by this study.

Table 5.4
The Twenty Most Protected Traded Sectors in China in 1985

I-O Code	Sector	ITR-III (%)	ERP-III (%)
69	Motor vehicles	100.77	2,160.39
36	Petroleum refineries	-13.37	1,083.55
15	Slaughtering and meat products	19.00	937.39
22	Tobacco manufactures	207.82	929.92
43	Synthetic chemical materials and chemicals, n.e.s.	55.31	346.24
65	Daily used machinery	86.73	313.98
45	Chemical fibre	84.40	293.79
60	Metal manufactures for daily use	47.09	170.74
41	Organic chemical manufactures	42.29	153.07
16	Egg and dairy products	25.99	144.17
52	Brick, tile, lime & light building materials	50.91	137.04
54	Ceramics	53.70	130.81
42	Chemical manufactures for daily use	39.81	127.64
66	Special equipment, n.e.s.	48.00	123.02
46	Rubber manufactures used for production	54.58	115.46
26	Knit goods	60.81	111.53
39	Basic chemical materials	38.70	103.44
31	Furniture & other wood manufactures	37.94	101.43
63	Special equipment for industrial use	36.20	97.29
30	Sawlog processing & man-made board manufactures	27.15	97.12
25	Woollen textiles	45.23	89.35

ITR-III: adjusted or Type III implicit triff rate;
ERP-III: adjusted or Type III effective rate of protection

Sources: Tables 4.14 and 5.1

Finally, nine sectors (grain and edible oil, sugar milling and refining, liquors and alcohol, other beverages, hemp and silk, basic chemical materials, coal, gas and coke-related products, aircraft and other transportation, electric appliance and electronic equipment for daily use) have negative international value-added. The explanation of negative international value-added is straightforward if the case of infant industry is not involved.[5] This country (in this case China) would be better off if it imported the final products instead of assembling or producing them at home.

Further interpretations can be offered with regard to different groups of industries, such as primary sectors and manufactured sectors, exportable and nonexportable industries, import-competing industries and import-noncompeting industries. These will be done in the following section.

5.4.2 Examination of Certain Sectors

To elaborate on the second characteristic of the empirical results, i.e., the escalating effect of the effective protection structure, we first divide the traded sectors into two groups: agricultural and primary sectors,

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[5] As discussed in Chapter II, there is a strict definition of infant industry. A sector in a country may not be an infant industry merely because its government claims it to be one.

and manufacturing sectors. Table 5.5 shows the weighted ERPs[6] and the ranking index[7] for these two groups. According to this table, the manufacturing sectors have a much higher degree of protection than the agricultural and primary sectors. We exclude tobacco and petroleum refineries from the agricultural and primary sectors since, traditionally, every country has high protection for tobacco. We further explore the unique characteristics of petroleum refineries later. The above pattern suggests the second bias of the economic structure, i.e., penalizing the primary sectors in favor of the manufactured industries. According to protection theory, the flow of resources in an economy with the above pattern should be toward the manufacturing sectors at the sacrifice of the agricultural and primary sectors. This is the case in China. The design of such a protective structure is in agreement with the long-term industrialization policy of the Chinese government. But it may lead to a contradiction between the government long-term industrialization strategy and newly-launched open-door policy and modernization program. On the one hand, the government needs to transfer funds from agriculture to manufactured sectors in order to complete

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[6] The weights are the total output for each traded sector.

[7] The ranking index is established by assuming the ERP of agricultural and primary sectors to be 100. See Table 5-5.

Table 5.5
Type III ERPs of Primary and Manufactured Industries in 1985

Group of Industry	Adjusted ERP (%)	ERP Index*
Agriculture and Primary	27.45	100
Manufacture	122.65	447

* Agriculture and primary = 100

Note: Petroleum refineries and tabacco are not included in the group of agriculture and primary; Weights employed to calculate the ERP are value of output of each sector.

Source: Table 5.1

Table 5.6
Type III ERPs of Exportable and Nonexportable Industries in 1985

Group of Industris	ERP-III* (%)	ERP Index**
Exportables	35.52	100
Nonexportables	129.67	365
Import competing	217.81	613
Import noncompeting	105.15	296
All Sectors	122.48	345

* Rates are weighted by the value of output of each sector.
** Exportables = 100

Note: The weights (value of each sector's output) are drawn from the 1985 Inout-Output table.

Source: Table 5.1.

industrialization. On the other hand, the government has relied heavily on the agricultural and primary sectors for exports to earn foreign exchange badly needed for the modernization program. As indicated by the empirical results, these sectors received the lowest realized effective protection. The pattern of effective protection at the current stage is therefore against exports and the open door policy while in favor of the traditional strategy of industrialization. Our following policy suggestion is robust. If the government intends to maintain the open-door policy and change the anti-exports bias of the system, it has to lower the protective rate to manufacturing industries and revise its unique industrialization strategy.

Next we divide all the traded sectors into exportable sectors and nonexportable sectors. A sector is defined as exportable (nonexportable) in this study when total exports account for at least (less than) 15% of total output. Among the nontradable industries, we have import-competing sectors and import-noncompeting sectors.[8] A sector is defined as import-competing (noncompeting) one when the total imports of that sector account for at least (less than) 15% of total output. Table 5.6 presents the weighted ERPs and the ranking indexes for the different groups of sectors. As the table clearly shows, the exportable sectors generally enjoy

[8] The classification of exportable, nonexportable, import competing and import-noncompeting sectors will be provided in Appendix III.

a lower realized effective protection than the nonexportable sectors. This leads to the fourth bias of the pattern of effective protection, namely, it penalizes the exportable sectors and draws the producers' attention to the domestic market. However, it is interesting to see that the protection of import-competing industries is higher than that of the non import-competing industries. This might be a unique characteristic of China because of its unique price system. One interpretation of this pattern is that while some of the manufactured industries have a high effective protection rate, shortage of domestic supply (probably due to the rigid investment policy of the government) still prompts a large volume of imports. Another interpretation would be that even with heavy protection, the domestic industries of import-competing sectors are so inefficient or produce goods of such lower quality) that they are still unable to compete.

Now we will employ the calculated results to examine the performance of some sectors. We start with the agricultural sectors, followed by energy sector and labor-intensive manufacturing (LIM) sectors.

Agriculture. Agriculture consists of five sectors under the 1985 input-output table. These five agricultural sectors provided 12.4% of total exports in 1985, but the realized effective protection rate is low compared with other sectors. Agricultural prices have been deliberately

depressed in China by the government for as long as four decades in order to implement the long-term industrialization strategy. The industrial-agricultural price scissors (jian dao cha) has been more or less pronounced but has never disappeared or even deteriorated[9]. Anderson, Kym and Tyers (1987) argue that in the long run Chinese agriculture is unlikely to be a good candidate for net exporter. According to our results, if the agricultural sectors continue to have low protection since their prices are set low, returns to factors in these sectors will continue to be depressed. We cannot make any prediction about the future prospects of agricultural exports, but it is clear that the current regime is not favorable for agricultural sectors.

Energy. The energy sectors include, according to the 1985 input-output table, upper stream industries such as coal mining dressing and petroleum and natural gas extraction, and down stream industries such as coking, coal gas and petroleum refineries. With the notable exception of petroleum refineries (high ERP) and coal gas (negative international value added), the average (unweighted) ERP of -59.87 percent is a low level of effective protection for the energy sectors. As in the case of agriculture, the energy sectors in China deliver a large portion of total exports (crude oil is the largest commodity foreign exchange

[9] See, for example, Wiemer (1990).

earner) but receives low protection from the government. The high protection to the petroleum refineries is superficial because of artificially low domestic prices of petroleum, under which the demand of the refinery industry is not completely met. We showed elsewhere[10] that the domestic crude oil price in China has been lower than the international price. As the government continues its low energy price policy, production of energy will be discouraged and efforts at energy conservation will lead to nowhere. Since the regime does not favor the production of primary energy in China, there is little chance that China can maintain its net exports of energy without severely limiting domestic consumption.

Labor-intensive manufactures (LIM). This category consists of all the textile and garment sectors, rubber manufactures, glass manufactures, paper manufactures, ceramics, and metal and non-metal manufactures. These sectors provide a large portion of China's total exports (28% in 1985 and 40% in 1989)[11] and their effective protection rates are moderate (64 percent, compared to 123 percent for all sectors). LIM industries are probably the best candidate for China's future exports, as China reduces protection of capital-intensive, machine building and luxury

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[10] See Wu (1989), p.13.

[11] Refer to Table 3.6 in Chapter III.

goods manufactures, and the protective structure of China becomes less complicated and less dispersed.

The examination of the above sectors has strengthened our earlier conclusion that the current trade regime has an anti-export bias. All the three groups, namely, agriculture, energy and LIM industries, are large export earners at the current stage, but they only have received the lowest effective protection.

5.5. Scope of Further Study

The current study has its limitations. The relationships between the ERPs and resource flows in the economy, and between the ERPs and economic efficiency need to be explored. For the latter, if data are adequate, the domestic resource cost (DRC) for each of the traded sectors should be calculated on a comparable basis in order to present a detailed study of the relationship. However, the current study does provide a strong basis for further study. The tremendous work of estimating the effective protection rates for all the traded sectors based a highly disaggregated input-output table has never been done before. For that reason, the study is successful in achieving its goals.

CHAPTER VI

SUMMARY AND CONCLUSION

There are three main goals of this study: (1) to quantify the structure of effective protection in China by calculating the effective rate of protection (ERP) for each of the 81 trading sectors; (2) to explain the pattern of effective protection in China by employing the estimated results; and (3) to evaluate future trade pattern and provide some policy implications for future economic and trade reforms. Based on a careful study of Chins's tariff system and tax system, and examination of the government subsidies and quantitative restrictions, plus the employment of the quite disaggregated input-output table for 1985, we calculated three different ERPs, under different assumptions and for different purposes. We therefore have successfully achieved the first goal. Careful study of the empirical results also helps us achieve the second goal, namely, evaluation of the protection pattern. As for the last goal, we present three simulations of a policy framework in the future and make a brief assessment of its effects. Based on our study, further analysis is needed to give an in-depth examination of the relationship between the ERPs and resource flows, and between ERPs and economic efficiency.

Several conclusions can be inferred from the empirical results and our analysis of these results in previous

chapters. First, findings of the three types of ERPs indicate that:

(a) if China's trade and tax policies remain the status quo as of 1985 (Simulation III), i.e. if the government combines taxes and tariffs (actual collected amount is lower than the schedule) with subsidies and quantitative restrictions, then the ERPs of the economy would be generally high and distributed widely;

(b) if the government eliminates both subsidies and quantitative restrictions, and only relies on current tariffs and taxes to manage foreign trade (Simulation I), then the average ERP of the economy would increase but the deviation would be smaller than the ERP-III as mentioned above; and

c) if the government actually lowers the tariff schedule while removing the subsidies and quantitative restrictions (Simulation II), then both the average ERP and its standard deviation are the lowest among the three types of ERPs.

The evolution of China's trade reforms since 1985 provides a "stylized" fact that the Chinese government is moving from the status of 1985 (Simulation) to Simulation I. As we mentioned earlier, the share of imported goods that are priced on a cost-plus basis increased from 50% in 1985 to 80% in 1988. According to our study, the general protection would be increasing. The reason for this is that

the tax and tariff schedules are too complicated and the rates of items are too high. Now is a transit period. The Western countries often feel disgruntled and place blame on the Chinese government for controlling imports. Instead they should persuade the Chinese government to evaluate seriously the effect of the tariff schedule and to lower its magnitude, while still encouraging the trade reform that are going on now. (We must emphasize that our empirical results did not predict what the Chinese government will do to reformulate its trade policies. The conclusion that China's trade policy changes from Simulation III to I since 1985 is based on the stylized facts.)

As for the second conclusion, findings of this study show that the effective protection of the current trade regime is very heavy and widely diversified. This is the first bias embodied in the economic structure. The heavy and widely distributed ERPs may presage a huge loss of efficiency to the economy or mixed signals sent to the domestic producers because of overly heavy protection. This pattern may result in the domestic resources moving in the opposite direction to government desires because of the divergence between real effect (such as the one studied in this thesis) and nominal effect (immediately clear to the policy makers) of a policy. In terms of economic rent created by high ERP, bureaucracy and official corruption might result from the highly protective policies. The

Chinese policy makers should seriously think about the general magnitude and structure of the tariffs and domestic taxes while continuing the trade reforms. The current reform appears to be in the right direction because of its moving away from administrative control and towards tariff adjustment and direct linkage of domestic market price with the international market price for imports. However, the magnitude of scheduled taxes and tariffs should be lowered while trade reforms continue.

Third, this study suggests the second bias of the trade regime suggested is the deviation between the implicit tariff rates and the ERPs for quite a few sectors. It is once again indicative that the real effect of a policy would be different from its nominal effects.

Finally, this study further suggests the third and fourth biases of the trade and economic regime. The current protection structure seems to penalize the agricultural and primary sectors more than the manufacturing sectors. It also assumes higher effective protection of nonexportable industries, to the neglect of the exportable industries.

In sum, China is not different from other large and low-income developing countries in its way of protecting the economy and creating a complicated tax and tariff structure. It does differ from the other countries in its implementation of such policies. This thesis evaluates both the specific policies carried out in China and some general

trade problems concerning all developing countries. The findings and analysis of this study would add to our understanding of the nature of economic reform and development a centrally planned economy.

APPENDIX I

COMPARISON OF CORDEN AND BALASSA METHODS

We briefly discussed in Chapter II how the Corden Method and Balassa Method differ in treating the non-traded inputs. In this appendix, we will show the difference in estimating the effective rates of protection (ERPs) under these two methods in algebra.[1]

As mentioned earlier, theoretically Corden method regards non-traded inputs as primary factors while deducting the traded elements in production of the non-traded goods as the value-added of each product (sector) is calculated. Balassa method, on the other hand, treats non-traded inputs the same way as traded inputs with zero tariff rates and infinitely elastic supply curves. In order to show the difference between these two methods, we define the following terms:

V_{wj}: free-trade or world value-added for product j;

V_{dj}: domestic value-added of product j;

a_{tj}^{p}: direct (tariff-inclusive) input-output coefficient for traded input t in domestic production of final product j;

[1] Most of the formulas here are derived from Balassa (1982), pp.351-353.

a_{hj}^{P}: direct (tariff-inclusive) input-output coefficient for non-traded input h in domestic production of final product j;

r_{th}: direct plus indirect input-output coefficient for traded inputs used in producing non-traded goods in domestic prices;

r_{vh}: direct plus indirect input-output coefficient for value-added embodied in the production of non-traded goods in domestic prices;

T_j: implicit tariff rate of product j;

T_t: implicit tariff rate of input t;

ERP_j: effective rate of protection for sector j.

We use B to denote Balassa method and C to denote Corden method. There is an important relationship between r_{th} and r_{vh}:

$$\sum_{t=1}^{m} r_{th} + \sum_{v=1}^{s} r_{vh} = 1$$

Here we assume that there are m traded sectors, n-m non-traded sectors and s value-added items. Now the domestic value-added after tariffs and taxes are derived as the following the following:

$$(A\text{-}1) \qquad V_{dj}^{B} = 1 - \sum_{t=1}^{m} a_{tj}^{P} - \sum_{h=m+1}^{n} a_{hj}^{P}$$

$$(A\text{-}2) \qquad V_{dj}{}^{C} = 1 - \sum_{t=1}^{m} a_{tj}{}^{P} - \sum_{t=1}^{m}\sum_{h=m+1}^{n} a_{hj}{}^{P} r_{th} - V_{dj}{}^{B} + \sum_{v=1}^{w}\sum_{h=m+1}^{n} a_{tj}{}^{P} r_{vh}$$

The free-trade or world value added can be defined as the following:

$$(A\text{-}3) \qquad V_{wj}{}^{B} = \frac{1}{1+T_j} - \sum_{t=1}^{m} \frac{a_{tj}{}^{P}}{1+T_t} - \sum_{t=1}^{m}\sum_{h=m+1}^{n} \frac{a_{hj}{}^{P} r_{th}}{1+T_t} - \sum_{v=1}^{q}\sum_{h=m+1}^{n} a_{hj}{}^{P} r_{vh}$$

$$(A\text{-}4) \qquad V_{wj}{}^{C} = \frac{1}{1+T_j} - \sum_{t=1}^{m} \frac{a_{tj}{}^{P}}{1+T_t} - \sum_{t=1}^{m}\sum_{h=m+1}^{n} \frac{a_{hj}{}^{P} r_{th}}{1+T_t} - V_{wj}{}^{B} + \sum_{v=1}^{w}\sum_{h=m+1}^{n} a_{hj}{}^{P} r_{vh}$$

Finally, one can compare the ERPs derived by these two methods:

$$(A\text{-}5) \qquad ERP_j{}^{B} = \frac{V_{dj}{}^{B}}{V_{wj}{}^{B}} - 1 = \frac{V_{dj}{}^{B} - V_{wj}{}^{B}}{V_{wj}{}^{B}}$$

$$(A\text{-}6) \qquad ERP_j{}^{C} = \frac{V_{dj}{}^{C}}{V_{wj}{}^{C}} - 1 = \frac{V_{dj}{}^{C} - V_{wj}{}^{C}}{V_{wj}{}^{C}} = \frac{V_{dj}{}^{B} - V_{wj}{}^{B}}{V_{wj}{}^{B} + \sum_{v=1}^{w}\sum_{h=m+1}^{n} a_{hj}{}^{P} r_{vh}}$$

Now it is clear from equations (A-5) and (A-6) that the ERPs estimated under Corden and Balassa methods differ in that the former excludes and the latter includes the term

called cumulated value added elements of the non-traded inputs, shown as the follows:

$$\sum_{v=1}^{w} \sum_{h=m+1}^{n} a_{hj}{}^{p}r_{vh}$$

Since this item is always positive, ERPs that are calculated under Balassa method are always greater (smaller) than ERPs that are calculated under Corden method if they are positive (negative).

This appendix simply shows how the Balassa and Corden methods differ from each other quantitatively. This quantitative difference has been derived from the different assumptions that are made by these two methods.

APPENDIX II

IMPORT SURCHARGE AND EXPORT TAXES

As mentioned earlier in Chapter II the Chinese government imposed additional import adjustment taxes (surcharges) on certain imports besides their regular tariffs. The surcharges became effective in 1985 following the issuing by the Chinese State Council of the *Circular of the State Council on Imposition of Import Adjustment Taxes on Certain Import Goods*[2]. We formally incorporate these new import taxes into our estimation of the *de jure* tariff rates in Chapter IV. Table A.1 lists the taxable goods and the associated surcharge rates.

As for the exports, the Chinese government rarely taxes its exports except for about thirty commodities. These commodities are either a) very competitive while the world market is limited; or b) in short supply in the domestic market. Export taxes have a negative protective effect for the underlying traded sectors. We take that into account in deriving the *de jure* implicit tariff rate in Chapter IV. As a reference, the list of the taxable commodities and the associated export tax rates are given in Table A.2.

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[2] See *Shuishou yu caiwu shouce* (Handbook of the Taxes and Finance, 1986), pp.680-681.

Table A.1
Schedule of Import Adjustment (Surcharge) Taxes

	Commodities	Surcharge Rate
1	Polyester textured filaments (yarn)	40%
2	Woven fabrics, other than tire cord, of synthetic fibers	40%
3	Woven fabrics, other than tire cord, of regenerated fibers	40%
4	Woven fabrics, of manmade fibers (discontinuous or waste)	40%
5	Electronic calculators	80%
6	Digital data processing machines of a word length less than 32 bits	40%
7	Peripheral equipment for digital data processing machines of a word length less than 32 bits	30%
8	Color video projectors	70%
9	Television pictures turbes	50%
10	Sedan cars, jeeps and passenger vehicles with less than 30 seats	80%
11	Motor trucks with a loading capacity less than 8 tons	50%
12	Motorcycles, autocycles, and cycles fitted with an auxiliary motor, with or without sidecars: sidecars of all kinds	20%
13	Photo-copying and thermo-copying apparatus	80%
14	Television image & sound records or reproducers	70%

Source: MOFERT: Almanac of China's Foreign Economic Relations and Trade, 1986.

Table A.2
China's Export Tax Rates in 1985

Commodities	Export Tax Rate
Chestnuts	10%
Edible kernels of apricot, ffresh or chilled	10%
Ferro-manganese	10%
Ferro-chrome	10%
Ferro-titanium	10%
Ferro-alloys other than manganese, tungsten, chrome, silicon, vanadium, molybdenum, & titanium	10%
Jelly fish	20%
Fresh water fish, frozen	20%
Goat skins	20%
Crude antimony ores and concentrates	20%
Antimony and articles of antimony	20%
Tungsten ores and concentrates	20%
Ferro-tungsten	20%
Ferro-molybdenum	20%
Pig iron and cast iron	20%
Prawns,fresh, chilled or frozen	30%
Crude Laquer	30%
Ferro-silicon	30%
Herring roe, fresh or chilled	40%
Herring roe, frozen	40%
Herring roe, dried salted or in brine	40%
Coal	40%
Lignite whether or not agglomerated	40%
Peat (including peat litter)	40%
Ingots and slabs of unwrought tin	40%
Cinnamon, cassia, lignea	50%
Dang gui (crytotaenia canadensis)	50%
Eel, fried	60%
Hoantchy	60%

Source: General Customs Administration of the People's Republic of China: Official Chinese Customs Guide 1985/86.

APPENDIX III

EXPORTABLE AND NON-EXPORTABLE INDUSTRIES

In Chapter V, we made a distinction between the exportable and non-exportable industries. Within the non-exportable industries, we further distinguish between the import competing industries and import non-competing industries. This appendix will list the all the sectors under each category.

We define exportable industries as those sectors that exports account for at least 15 percent of the total production. Otherwise they will be non-exportable industries. Furthermore, a non-exportable sector is defined as import competing if total imports account for at least 15 percent of total production of that sector. Otherwise, the sector will be import non-competing industry.

The list of the traded sectors under each category is given in Table A.3. Among others, sewing and tailing is classified as exportable sector and shipbuilding is classified as import competing sector.

Table A.3
Classifications of Exportable and Non-exportable Sectors

I-O Code	Sector	M/Output (%)	X/output (%)
Exportables			
23	Forages, manufactured	10.09	41.70
7	Petroleum & natural gas extraction	0.03	32.17
34	Articles of culture, education, sports & art	10.26	31.23
28	Sewing & Tailoring	22.33	29.02
54	Ceramics	3.55	21.19
17	Aquatic products	11.35	19.29
26	Knit goods	1.67	17.86
29	Leather, fur & the related manufactures	5.08	15.36
9	Mining & dressing of non-ferrous metals	10.70	15.30
Non-exportables			
	Import competing sectors:		
75	Electronic computers	207.07	0.36
70	Ship building	117.22	19.93
43	Synthetic chemical materials and chemicals, n.e.s.	100.86	7.18
63	Special equipment for industrial use	74.33	1.61
69	Motor vehicles	63.55	0.16
8	Mining & dressing of ferrous metals	45.95	0.00
78	Instrument, meters & other measuring equipment	45.00	1.53
77	Other electronic & telecommunications equipment	43.40	1.89
57	Smelting & pressing of ferrous metals	42.20	0.56
12	Timber and bamboo	40.01	0.36
45	Chemical fibre	33.38	0.00
40	Chemical fertilizers & pesticides	30.91	0.30
66	Special equipment, n.e.s.	27.79	1.06
58	Smelting & pressing of non-ferrous metals	26.19	3.76
41	Organic chemical manufactures	20.31	0.52
67	Machinery, n.e.s.	19.37	11.77
68	Railway transport equipment	16.48	0.57
30	Sawlog processing & man-made board manufactures	15.52	0.19
	Import non-competing sectors		
15	Slaughtering and meat products	3.41	14.94
36	Petroleum refineries	0.50	14.02
10	Mining & dressing of building & other non-metal minerals	4.96	13.92
19	Other food manufacture	2.85	11.48
39	Basic chemical materials	11.49	10.97
44	Medical & pharmaceutical products	2.74	10.10
65	Daily used machinery	14.84	8.55
24	Cotton textiles	2.93	7.50
5	Fisheries	0.14	6.33

Table A.3 (continued)
Classifications of Exportable and Non-exportable Sectors

I-O Code	Sector	M/Output (%)	X/output (%)
47	Rubber manufactures for daily use	0.00	5.89
60	Metal manufactures for daily use	1.72	5.77
31	Furniture & other wood manufactures	1.63	4.05
42	Chemical manufactures for daily use	5.56	3.99
4	Side-line production	1.03	3.61
49	Plastic manufactures for daily use	2.52	3.52
1	Farming	1.23	3.28
37	Coking	0.17	3.14
3	Animal husbandry	1.49	3.04
6	Coal mining and dressing	0.90	2.97
59	Metal manufactures used for production	5.20	2.75
16	Egg and dairy products	2.14	2.42
32	Paper making and manufactures	11.60	2.35
25	Woollen textiles	4.47	1.74
72	Electric machinery	7.01	1.60
46	Rubber manufactures used for production	0.51	1.36
74	Electric equipment & machinery, n.e.s.	5.79	1.27
53	Glass & glass products	5.12	1.20
62	Machine building for metal processing	14.36	1.09
22	Tobacco manufactures	3.98	0.90
56	Non-metal manufactures, n.e.s.	0.33	0.68
61	Boiler and motor manufactures	5.88	0.67
55	Fireproof materials	1.21	0.43
81	Other manufactures for household use	2.46	0.34
2	Forestry	2.72	0.32
64	Machine building for the agricultural sectors	3.05	0.29
52	Brick, tile, lime & light building materials	0.12	0.22
50	Cement	4.37	0.13
35	Power generation, steam & hot water	0.56	0.03
48	Plastic manufactures used for production	0.35	0.00
33	Printing	0.22	0.00
11	Salt	0.00	0.00
13	Production & supply of running water	0.00	0.00
51	Cement & asbestos products	0.00	0.00
79	Machines and equipment repairs	0.00	0.00
80	Other manufactures used for production	0.00	0.00

M/Output: imports domestic output ratio;
X/Ouput: exports domestic output ratio.

Note: Sewing and Tailering is considered as exportable sector and ship building is considered as import competing sector.

Source: Chinese State Information Center: 1985 Input-Output of China.

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