

The Persistence of Trade Policy in China
After WTO Accession
Online Appendix

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A1 Additional figures and tables

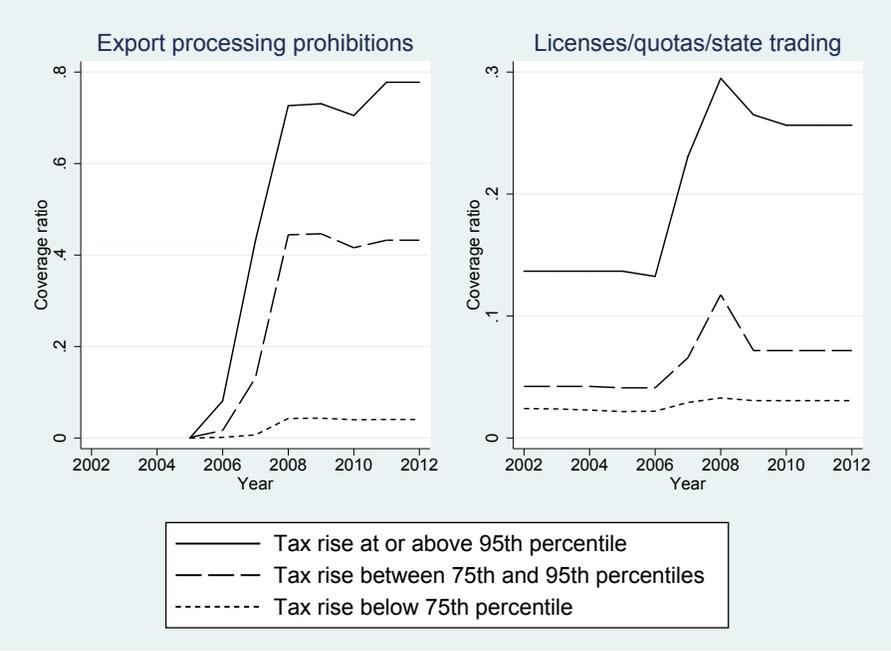


Figure A1: Product-level coordination between export tax rises between 2002 and 2012 and changes in other export policies

Table A1: Changes in export restrictions and pre-WTO tariffs by instrument

	(1)	(2)	(3)	(4)
Dependent variable:	Δ Export tax via VAT policy	Δ Export duty	Δ Export processing ban	Δ Other restriction
Tariff 1999	- .30 (.10) [.006]	- .14 (.05) [.002]	- .85 (.41) [.04]	.06 (.35) [1.00]
Observations	402	402	402	402
Clusters	35	35	35	35
R^2	.22	.16	.06	.00

This table displays the results of regressions of changes in Chinese export restrictions between 2002 and 2012 on China's 1999 import tariffs. The export restrictions are defined as follows: in column (1), the export tax equivalent of China's export VAT rebate policies; in column (2), export duties; in column (3), the share of products covered by an export processing prohibition; in column (4), the share of products requiring an export license, subject to an export quota or which may only be exported by designated firms. The unit of observation is a four-digit industry. Robust standard errors (in round brackets) are clustered at the two-digit industry level. p-values are in square brackets; these are derived from wild bootstraps (as in Cameron et al. 2008) because of the small number of clusters.

Table A2: Export taxes and exports - additional regressions

Upstream definition:	Input-output table			HS product descriptions		
Dependent variable:	ln(share)	ln(value)	ln(value)	ln(share)	ln(value)	ln(value)
Sample:	Baseline	Excl US	Baseline	Baseline	Excl US	Baseline
	(1)	(2)	(3)	(4)	(5)	(6)
Export tax	-5.13 (1.10) [.000]	-5.08 (1.13) [.000]	-4.58 (1.19) [.000]	-7.48 (.98) [.000]	-7.54 (1.01) [.000]	-7.07 (1.73) [.000]
Upstream tax	6.88 (1.46) [.000]	7.15 (1.37) [.000]	7.43 (1.47) [.000]	.57 (.29) [.052]	.57 (.27) [.04]	.46 (.23) [.051]
Processing prohibition			-.35 (.11) [.002]			-.46 (.24) [.07]
Other restriction			.34 (.25) [.17]			.95 (.37) [.02]
Product FEs	YES	YES	YES	YES	YES	YES
Section-year FEs	YES	YES	YES	YES	YES	YES
Observations	31,470	31,441	31,470	6,371	6,367	6,371
Clusters	69	69	69	42	42	42
R^2	.24	.46	.45	.21	.42	.42

This table displays the results of panel regressions of log export value (or China's log share of world trade in columns (1) and (4)) on export taxes, upstream export taxes, import tariffs, upstream import tariffs, log value of world exports (omitted in columns (1) and (4)) and product and HS section-year fixed effects. Upstream policies are calculated using China's 2002 input-output table in columns (1) to (3) and HS product descriptions in columns (4) to (6). Exports in columns (2) and (5) exclude exports to the US. Columns (3) and (6) add the share of products covered by an export processing prohibition and the share of products covered by other export restrictions (license requirements, quotas and state trading requirements) as independent variables. The unit of observation is a six-digit product-year. All regressions are estimated using ordinary least squares. Robust standard errors (in round brackets) are clustered at the input-output sector level in columns (1) to (3) and at the level of the primary raw material in columns (4) to (6). p-values are in square brackets.

Table A3: Export taxes and share of exports in total sales

Dependent variable:	Share of exports in total sales		
	(1)	(2)	(3)
Sample:	All industries	Raw materials	All industries
Export tax	-.27 (.07) [.07]	-.22 (.04) [.054]	-.22 (.08) [.22]
Processing prohibition			-.04 (.01) [.04]
Other restriction			.02 (.04) [.59]
Industry FEs	YES	YES	YES
Year FEs	YES	YES	YES
Observations	1,908	810	1,908
Clusters	30	26	30
R^2	.05	.11	.06

This table displays the results of panel regressions of the share of exports in sales on export taxes, import tariffs and industry and year fixed effects. The unit of observation is a four-digit industry. Columns (1) and (3) display the results of regressions including the entire sample of industries, while column (2) displays the results of a regression including only raw materials industries. Column (3) adds the share of products covered by an export processing prohibition and the share of products covered by other export restrictions (license requirements, quotas and state trading requirements) as independent variables. Robust standard errors (in round brackets) are clustered at the two-digit industry level. p-values are in square brackets; these are derived from wild bootstraps (as in Cameron et al. 2008) because of the small number of clusters.

A2 Theory appendix

In this appendix, I present a simple theoretical framework in order to explore the relative impacts on real income of a downstream import tariff and an upstream export tax. Consider a world with two countries, home (H) and foreign (F), hereafter indexed by c . There are also two industries, upstream (U) and downstream (D). Each country produces one distinct product in each of the two industries (an Armington (1969)-type framework). A key assumption of the model is that these goods are imperfectly substitutable in production (for upstream goods) and consumption (for downstream goods). Many firms in each country are assumed to produce in each industry under conditions of perfect competition. Each country also has an endowment equal to one of a single factor (labour) that is mobile across industries but not countries, and is inelastically supplied to firms. Trade in goods between the two countries is assumed to be costless in the absence of trade policy.

For simplicity, I will assume that production of upstream goods requires only labour l and that there are constant returns to scale, so that quantity produced for a given firm in either country c is $q_U^c = z_U l_U^c$. However, production of downstream goods requires a Cobb-Douglas combination of labour and the two upstream goods m_U^H and m_U^F , with elasticity of substitution across upstream inputs of $\sigma_U > 1$:

$$q_D^c = z_D \left((m_U^{Hc})^{\frac{\sigma_U-1}{\sigma_U}} + (m_U^{Fc})^{\frac{\sigma_U-1}{\sigma_U}} \right)^{\frac{\sigma_U}{\sigma_U-1}\beta} (l_D^c)^{1-\beta}$$

Finally, the two downstream goods are consumed by labourers in each country according to constant elasticity of substitution (CES) preferences with elasticity of substitution $\sigma_D > 1$:

$$U^c = \left((x_D^{Hc})^{\frac{\sigma_D-1}{\sigma_D}} + (x_D^{Fc})^{\frac{\sigma_D-1}{\sigma_D}} \right)^{\frac{\sigma_D}{\sigma_D-1}}$$

Given the model's symmetry assumptions, the allocation of labour across industries is identical in H and F in the free trade equilibrium: a share $1 - \beta$ of each country's labour force is employed in production of downstream goods. Moreover, because of the imperfect substitutability of products at each stage of the value chain, the two countries engage in bilateral trade of both upstream and downstream goods.

I now consider the implications for real income of the imposition by H of a unilateral trade policy, starting from free trade. I will study two types of policies: a small ad valorem import tariff $t_D \equiv \tau_D - 1 > 0$ on imports of downstream goods produced by F , and a small tax $n_U \equiv \nu_U - 1 > 0$ on exports of upstream goods produced by H . I assume that all government revenue generated by either of these policies is returned to consumers in H as a lump sum.

Real income is a function of home country income Y^H , which incorporates wage income and government revenue, and the price index of downstream goods at home, P_D^H . Under the assumptions above, the proportional change in real income for each of the two policies is as

follows:

$$\frac{d}{d\tau^D} \ln(Y^H/P_D^H) = \frac{1}{4} \frac{(1-\beta)\sigma_D}{\beta\sigma_U + (1-\beta)^2(\sigma_D - 1) + (1-\beta)}$$

$$\frac{d}{d\nu^U} \ln(Y^H/P_D^H) = \frac{1}{4} \frac{(1-\beta)\sigma_D}{\beta\sigma_U + (1-\beta)^2(\sigma_D - 1) + (1-\beta)} - \frac{1}{4}(1-\beta)$$

The gain in real income due to a downstream import tariff is thus unambiguously larger than that from an upstream export tax, given that $\beta < 1$.

The model suggests three possible advantages of a downstream tariff over an upstream export tax. First, government revenue resulting from a small downstream import tariff is larger than that from a small upstream export tax. This is because the latter policy only taxes the value added by the upstream stage of production.

Second, the upstream export tax is partly passed back through to consumers in H via imports of downstream goods from F , which use upstream inputs from H in production. This contrasts with the case of a one-stage model, in which an import tariff, which raises both relative nominal wages and local prices, and an export tax, which depresses relative nominal wages and causes price increases abroad, result in the same shift in a country's terms of trade. In the two-stage model here, this symmetry does not hold because the price increases resulting from an export tax instead accrue partly in H itself.

Third, while both policies shift labour into the downstream industry in the home country and into the upstream industry abroad, the upstream export tax has the additional distortive effect of changing the world allocation of labour across stages. This is because an upstream export tax induces substitution away from higher-cost CES bundles of raw materials and towards labour among downstream firms in F . In contrast, a downstream import tariff taxes the final stage of production, which embodies the output of both stages of the value chain, thus avoiding such an inter-stage reallocation.

A3 Data appendix

A3.1 Import tariffs and non-tariff barriers

Data for 1997 to 2011 on China’s applied import tariffs and data on China’s bound tariffs is sourced from the UNCTAD TRAINS and WTO Tariff Analysis Online databases. Data for 2012 on China’s applied import tariffs is transcribed from the 2012 volume of the annual official publication *Customs Import and Export Tariff of the People’s Republic of China*. Information on the set of products for which China’s accession agreement specifies that non-tariff barriers were to be removed is sourced from the documents associated with China’s WTO accession available on the WTO web site.

A3.2 Export duties

Data sources are discussed in the main text. According to Chinese regulations, for a published export duty rate t_x^p for a product p (hereafter this p is dropped), the tax owing on export sales of that product is calculated according to:

$$\frac{t_x}{t_x + 1} \cdot \text{exportsales}^{FOB}$$

Here, the free on board (FOB) price is the price at which goods are sold abroad (i.e. the price of goods after clearing customs). This implies a tax rate of t_x on export sales in terms of pre-duty prices.

A3.3 Export VAT rebates

Data sources are discussed in the main text. For each product and time period, the data specifies a VAT rate, a rebate rate and the type of rebate policy applied to the product. Different policy types imply different calculations of equivalent export taxes based on the associated Chinese regulations (see e.g. Deloitte Touche Tomatsu 2005, Chan 2008).

First note that firms whose sales are entirely domestic normally pay VAT on value added (at rate t_v^p for product p), by paying VAT on sales while claiming credit for the VAT paid on purchases of inputs; i.e. they are charged ‘output VAT’ while claiming credit for ‘input VAT’. This corresponds to the following formula (again omitting p):

$$t_v \cdot \frac{\text{sales}}{t_v + 1} - \text{inputVAT}$$

A3.3.1 Nonzero rebate, not tax-exempt

Consider a firm which produces the goods it sells abroad, and which exports in a single product category for which the rebate rate r^p is not zero. Such a firm may calculate its

VAT payable as the difference between output VAT on local sales and input VAT on local purchases as above, plus a third term d :

$$d = (\text{exportsales}^{FOB,p} - \sum_{p'} \text{bonded}^{p'}) \cdot (t_v^p - r^p)$$

where $\text{bonded}^{p'}$ corresponds to purchases of imported inputs in sector p' that do not go through customs, which may be nonzero if the firm participates in processing trade.

Say that the firm does not purchase bonded imports, and that its input purchases may be unambiguously allocated across inputs used for goods sold domestically and inputs used for exported goods. Then the tax applicable on exports is:

$$\text{exportsales}^{FOB,p} \cdot (t_v^p - r^p) - \text{inputVAT}$$

Under the assumption that the nondistortionary policy is a full rebate of VAT on exports, this would imply an export tax bill on a given product with VAT rate t_v and rebate rate r of:

$$(t_v - r) \cdot \text{exportsales}^{FOB}$$

While the firm's actual tax bill will differ from this depending on its input VAT, the firm may be assumed to take reimbursement of input VAT into account when purchasing inputs; i.e. the reimbursement of input VAT may be considered to be a component of input prices. This implies a tax rate of $\frac{t_v - r}{1 - (t_v - r)}$ on pre-tax export sales.

Note that if the firm does not produce the goods exported, but instead buys these from another firm for export, then input VAT (here, the amount of VAT paid by the firm producing the goods to be exported) is rebated to this firm according to the prevailing rebate rate, so that it should be the pre-tax rather than the FOB price that is used in the calculation above. I abstract from this distinction by assuming that all exporters are the producers of the goods exported.

A3.3.2 Zero rebate, not tax-exempt

Products with a zero rebate rate are treated as products sold domestically, so that the applicable formula for tax payable is:

$$t_v \cdot \frac{\text{sales}}{t_v + 1} - \text{inputVAT}$$

Again assuming that the nondistortionary policy is a full rebate of VAT on exports, this implies a tax rate of t_v on pre-tax export sales.

A3.3.3 Exempt from taxes

A small subset of products are classified as 'exempt from taxes', which means that they pay no output VAT on exports, but their input VAT is not reimbursed. I thus model the

applicable export tax in this case as equal to exporters' input VAT. I use the 2002 Chinese input-output table, in which I observe pre-tax gross output and input shares, to calculate the rate of implied export tax per unit of pre-tax gross output for a given input-output sector. I then use a concordance between HS products and 2002 Chinese input-output sectors (see below for details of this concordance) to apply these export tax rates to each product in the 'tax-exempt' category. This assumes uniformity of production functions across products within input-output sectors.

The export tax rate per unit of output for a given input-output sector k is thus calculated to be:

$$\sum_{k'} \beta^{kk'} \frac{t_v^{k'}}{1 + t_v^{k'}}$$

where $\beta^{kk'}$ is the observed expenditure share per unit currency of (pre-tax) output of sector k on inputs from sector k' .

A3.4 Constructing export tax equivalents

Here, I calculate the export tax rate jointly implied by the two policies above, for each of the three types of export VAT rebate policies.

A3.4.1 Nonzero rebate, not tax-exempt

The applicable export taxes are:

$$\frac{t_x}{t_x + 1} \text{exportsales} + (t_v - r) \cdot \text{exportsales}$$

We may calculate the tax rate on pre-tax export sales using:

$$\begin{aligned} p^{\text{pretax}} &= p^{\text{FOB}} - \frac{t_x}{t_x + 1} p^{\text{FOB}} - (t_v - r) \cdot p^{\text{FOB}} \\ \implies p^{\text{FOB}} &= \left(1 - \frac{t_x}{t_x + 1} - (t_v - r) \right)^{-1} p^{\text{pretax}} \\ \implies p^{\text{FOB}} &= \left(\frac{t_x + (t_v - r) + t_x(t_v - r)}{1 - (t_v - r) - t_x(t_v - r)} + 1 \right) p^{\text{pretax}} \end{aligned}$$

So the applicable export tax rate on pre-tax export sales is $\frac{t_x + (t_v - r) + t_x(t_v - r)}{1 - (t_v - r) - t_x(t_v - r)}$.

A3.4.2 Zero rebate, not tax-exempt

The applicable export taxes are:

$$\frac{t_x}{t_x + 1} \text{exportsales} + \frac{t_v}{t_v + 1} \text{exportsales}$$

We may calculate the tax rate on pre-tax export sales using:

$$\begin{aligned}
p^{pretax} &= p^{FOB} - \frac{t_x}{t_x + 1} p^{FOB} - \frac{t_v}{t_v + 1} p^{FOB} \\
\implies p^{FOB} &= \left(1 - \frac{t_x}{t_x + 1} - \frac{t_v}{t_v + 1} \right)^{-1} p^{pretax} \\
\implies p^{FOB} &= \left(\frac{t_x + t_v + 2t_x t_v}{1 - t_x t_v} + 1 \right) p^{pretax}
\end{aligned}$$

So the applicable export tax rate on pre-tax export sales is $\frac{t_x + t_v + 2t_x t_v}{1 - t_x t_v}$.

A3.4.3 Exempt from taxes

The export tax rate on pre-tax sales due only to non-reimbursement of input VAT may be calculated as:

$$\begin{aligned}
p^{VAT} &= p^{pretax} + \sum_{k'} \beta^{kk'} \frac{t_v^{k'}}{1 + t_v^{k'}} p^{VAT} \\
\implies p^{VAT} &= \frac{1}{1 - \sum_{k'} \beta^{kk'} \frac{t_v^{k'}}{1 + t_v^{k'}}} p^{pretax}
\end{aligned}$$

Export duties then imply that:

$$\begin{aligned}
p^{FOB} &= p^{VAT} + \frac{t_x}{1 + t_x} p^{FOB} \\
\implies p^{FOB} &= \left(1 - \frac{t_x}{t_x + 1} \right)^{-1} \left(\frac{1}{1 - \sum_{k'} \beta^{kk'} \frac{t_v^{k'}}{1 + t_v^{k'}}} \right) p^{pretax} \\
\implies p^{FOB} &= \left(\frac{t_x + \sum_{k'} \beta^{kk'} \frac{t_v^{k'}}{1 + t_v^{k'}}}{1 - \sum_{k'} \beta^{kk'} \frac{t_v^{k'}}{1 + t_v^{k'}}} + 1 \right) p^{pretax}
\end{aligned}$$

So the applicable export tax rate on pre-tax export sales is $\frac{t_x + \sum_{k'} \beta^{kk'} \frac{t_v^{k'}}{1 + t_v^{k'}}}{1 - \sum_{k'} \beta^{kk'} \frac{t_v^{k'}}{1 + t_v^{k'}}}$.

A3.5 Prohibitions of exports via processing trade

Data for 2005 to 2012 on products prohibited from export via processing trade is assembled from the set of ad hoc official notices updating the list of prohibited products; I observe these notices starting in 2004. I define the policies prevailing on January 1 of each year as the data for that year, with the exception of 2008, when I also include major changes to the list of prohibited products that took effect in mid-January. The data is observed at the

ten-digit product level, and I define a six-digit HS product as subject to a prohibition if at least one of its constituent ten-digit goods is subject to such a prohibition. The full list of notices is as follows:

Shangwu bu, haiguan zongshu, guojia huanjing baohu zongju gonggao (2004) no. 55
Shangwu bu, haiguan zongshu gonggao (2005) no. 26
Shangwu bu, haiguan zongshu gonggao (2005) no. 50
Shangwu bu, haiguan zongshu, huanbao zongju gonggao (2005) no. 105
Shangwu bu, haiguan zongshu, huanbao zongju gonggao (2006) no. 63
Shangwu bu, haiguan zongshu, guojia huanjing baohu zongju gonggao (2006) no. 82
Shangwu bu, haiguan zongshu, huanbao zongju gonggao (2007) no. 17
Shangwu bu, haiguan zongshu gonggao (2007) no. 110
Shangwu bu, haiguan zongshu gonggao (2008) no. 22
Shangwu bu, haiguan zongshu gonggao (2008) no. 121
Shangwu bu, haiguan zongshu gonggao (2009) no. 37
Shangwu bu, haiguan zongshu lianhe gonggao (2010) no. 63

A3.6 Export licenses, quotas, state trading and designated trading

Data for 2002 to 2012 on products requiring export licenses, subject to export quotas, or subject to designated trading or state trading requirements is taken from the annual official notices announcing this list of products. I do not include textiles and apparel products affected by the Multifiber Arrangement or subsequent bilateral agreements. I also exclude goods on lists of dual-use products subject to export quotas or lists relating only to small-scale border trade. Some categories of goods are moved from the ‘main’ list to the list of dual-use products during the sample period, and I do not include these products in any year. I do include a separately published list of tobacco products that are subject to export restrictions throughout the period. The data is observed at the ten-digit product level, and I define a six-digit HS product as subject to one of these policies if at least one of its constituent ten-digit goods is subject to the policy. The full list of notices is as follows:

Duiwai maoyi jingji hezuo bu, haiguan zongshu gonggao (2001) no. 17
Duiwai maoyi jingji hezuo bu gonggao (2001) no. 44
Duiwai maoyi jingji hezuo bu, haiguan zongshu gonggao (2002) no. 59
Shangwu bu, haiguan zongshu gonggao (2003) no. 64
Shangwu bu, haiguan zongshu gonggao (2004) no. 78
Shangwu bu, haiguan zongshu gonggao (2005) no. 85
Shangwu bu, haiguan zongshu gonggao (2006) no. 100
Shangwu bu, haiguan zongshu gonggao (2007) no. 101
Shangwu bu, haiguan zongshu gonggao (2008) no. 100
Shangwu bu, haiguan zongshu gonggao (2009) no. 125
Shangwu bu, haiguan zongshu gonggao (2010) no. 128
Shangwu bu, haiguan zongshu gonggao (2011) no. 98

A3.7 Export prohibitions

Data for 2002 to 2012 on goods prohibited from export is assembled from a set of ad hoc official notices. I drop any product (at the level of aggregation used in the relevant official notice) subject to an export prohibition in any year from the data used in the empirical analysis in all years. The full list of notices is as follows:

Duiwai maoyi jingji hezuo bu gonggao (2001) no. 19
Shangwu bu, haiguan zongshu, linyeju gonggao (2003) no. 27
Shangwu bu, haiguan zongshu, linyeju gonggao (2004) no. 40
Shangwu bu, haiguan zongshu, guojia huanjing baohu zongju gonggao (2005) no. 116
Shangwu bu, haiguan zongshu gonggao (2006) no. 16
Shangwu bu, haiguan zongshu gonggao (2006) no. 35
Shangwu bu, haiguan zongshu gonggao (2006) no. 87
Shangwu bu, haiguan zongshu gonggao (2008) no. 96
Shangwu bu, haiguan zongshu gonggao (2009) no. 110

A3.8 Concordance between products and industries

To define variables at the industry level, I use a National Bureau of Statistics concordance between four-digit Chinese industries and eight-digit HS products (according to the 2005 Chinese product classification) kindly provided to me by Loren Brandt, Johannes Van Biesebroeck, Luhang Wang and Yifan Zhang. After aggregating to the six-digit level, I drop any six-digit products that are concorded to more than one two-digit industry, since I cluster at the two-digit industry level in the empirical analysis. I then average the relevant data across the six-digit products concorded to each industry.

A3.9 Definition of nonagricultural products and industries

I omit from the empirical analysis all eight-digit HS products defined as ‘agricultural products’ in China’s official schedule of bound tariffs (available from the WTO web site); these are the products covered by the WTO’s Agreement on Agriculture. So that I do not exclude agricultural products but include their major raw materials, I also drop fertilizers and pesticides from the analysis. I use a 2005 concordance of Chinese industries to HS products from China’s National Bureau of Statistics (see above) to identify fertilizers and pesticides products in the HS data as those produced by the three-digit industries ‘Fertilizer manufacture’ and ‘Pesticide manufacture’. I use the same concordance to classify industries into agricultural and agricultural raw materials industries, according to whether at least half of their products are agricultural goods or agricultural raw materials.

A3.10 Definition of raw materials and capital goods

I define raw materials as HS products identified by the UN Broad Economic Categories (BEC) classification as neither ‘consumption goods’ nor ‘capital goods’ (according to its

correspondence with the System of National Accounts, which is included in the BEC documentation), nor as ‘parts and accessories’. I also divide raw materials products into primary or semiprocessed raw materials according to whether they are classified by BEC as primary goods. I then use a 2005 concordance of Chinese industries to HS products from China’s National Bureau of Statistics (see above) to classify industries as raw materials industries, and then into primary or semiprocessed raw materials industries, according to whether more than half of their products are in these categories. Capital goods and capital goods industries are classified similarly, defining both final capital products and their parts and accessories as capital goods.

A3.11 Upstream import tariffs and export taxes

Data used in Sections 4 and 6 on upstream tariffs in 1999 and upstream export taxes in 2002 and 2012 is derived using China’s 2002 input-output table. I also use information on value added by industry from the 2003 survey of industrial production, as collected by China’s National Bureau of Statistics. This survey data includes all non-state industrial firms with sales above five million Renminbi and all state-owned industrial firms. I first create a version of the input-output table by four-digit industry, based on the assumption that throughout the input-output table, each industry’s importance in each input-output sector is equal to its value added as a share of the total value added of that sector. To concord industries to input-output sectors, I use a concordance provided by Brandt et al. (2012) linking the Chinese industrial classification used in 2002 (on which 2002 input-output sectors are based) to the classification used afterwards. I keep only information on the value of inputs from nonagricultural raw materials industries (as defined above) to nonagricultural downstream industries. I then define upstream tariffs and upstream export taxes for each downstream industry and year by taking a weighted average of the tariffs and export taxes (respectively) incident on raw materials industries in that year. The weights are equal to the share of each raw material in the input usage of the downstream industry, relative to total input usage from nonagricultural raw materials industries by that downstream industry.

Data for 2002 to 2012 on upstream import tariffs and export taxes for the analysis of Section 5 is derived in two ways. The first method uses China’s 2002 input-output table. Products are conformed to input-output sectors using information from a 2005 concordance of Chinese industries to HS products from China’s National Bureau of Statistics (see above). Ambiguous or missing concordances are coded using a concordance of products to 2007 input-output sectors from China’s 2007 input-output table, or by hand when necessary. I define export taxes (or import tariffs) for each input-output sector as the simple average of export taxes (or import tariffs) across the six-digit products in that sector. I then calculate each sector’s upstream export tax (or import tariff) by using the shares of each input sector in the total intermediate usage of the downstream sector, omitting the diagonal, as weights.

The second method uses product descriptions in the 2002 English-language six-digit HS classification and the 2002 to 2006 Chinese eight-digit product classifications (which are equivalent at the six-digit level). I first identify all primary six-digit products using the UN BEC classification, ignoring agricultural primary products and primary products in HS

section 11 (i.e. textiles and apparel). I then identify all nonprimary HS products for which at least one of these primary raw materials is mentioned in the product description, with the goal of finding products made of that raw material. I thus exclude products with references such as ‘other than (material)’ and other irrelevant products such as machines for cutting the material. Using these criteria narrows the data to products made of 42 different primary raw materials. I include in the final dataset only nonprimary products whose descriptions refer to exactly one of these materials, so that I may cluster by primary raw material. I then define upstream export taxes (or import tariffs) as the average export tax (or import tariff) across the six-digit HS products associated with a particular raw material (e.g. roasted and unroasted molybdenum ores).

A3.12 Effective rates of protection

Data on effective rates of protection by industry is derived using definitions from Corden (1966) and China’s 2002 input-output table. I first concord products to input-output sectors using information from a 2005 concordance of Chinese industries to HS products from China’s National Bureau of Statistics (see above). Ambiguous or missing concordances are coded using a concordance of products to 2007 input-output sectors from China’s 2007 input-output table, or by hand when necessary. I define export taxes (or import tariffs) for each input-output sector as the simple average of export taxes (or import tariffs) across the six-digit products in that sector. I then calculate each sector’s input tariff or input export tax by using the shares of each input sector in the gross output of that sector as weights. I take information on the share of value added in gross output for each input-output sector from China’s 2002 input-output table. I calculate the effective rate of protection due to tariffs for a sector as the difference between its tariff and its input tariff, divided by its value added share. Similarly, I calculate the effective rate of protection due to export taxes for a sector as the difference between its input export tax and its export tax, divided by its value added share.

A3.13 Trade flows

Data for 2002 to 2012, and for 1999, on trade flows is sourced from the UN COMTRADE database, using free on board (FOB) data provided by China as the source for information on Chinese exports by value and quantity (and import value for 1999). Data on world trade flows is also sourced from the UN COMTRADE database, and is equal to the total of all export flows reported by exporters. For all trade quantity data, I use only information on net weight in kilograms where available.

A3.14 Industry-level sales and exports

Data for 2002 to 2007 on industry-level exports and sales as reported by firms in current Renminbi are based on industry-level tabulations of China’s annual firm-level survey of industrial production (see above). Exports (sales) for each industry are defined as the total

of exports (sales) for all firms in the industry, excluding those reporting negative output, sales, exports or employment. Since the 2002 survey data uses a older industrial classification, I concord these sectors to industries as defined after 2002 using a concordance provided by Brandt et al. (2012).

A3.15 Foreign investment priorities

Data on priority sectors for foreign investment is based on China's 2002 guidance catalogue for foreign investment. This catalogue lists products in each two-digit industry for which FDI is encouraged, restricted or prohibited (e.g. 'Manufacturing of advanced printer devices such as laser and jet printers'). I construct variables counting the number of products that are encouraged and discouraged (restricted or prohibited) in each two-digit industry. I do not include agricultural products or agricultural raw materials in these measures. In some cases, such as mining, the catalogue lists industries at a level of aggregation larger than the two-digit industry, in which case I allocate products based on the two-digit industries to which they appear to belong.

A3.16 Value added by state-owned enterprises

Data on the share of value added in each industry that is produced by state-owned enterprises is calculated using China's 2003 firm-level survey of industrial production (see above). I first identify firms belonging to one of the following three categories of the registration-based classification explained in Holz and Lin (2001): state-owned enterprises, state-owned joint operation enterprises and solely state-invested limited liability companies. I subsequently calculate the proportion of value added in each industry that is produced by this subgroup of firms, dropping all firms reporting negative value added.

A3.17 WTO disputes relating to export-side instruments

I identify WTO dispute settlement cases for which China was the respondent between 2002 and 2012 using the WTO web site. This provides short summaries of each dispute, from which I identify cases relating to China's export-side policies, and the specific industries on which these policies were said to be incident. The three disputes involving industry-specific export policies, other than the export restrictions studied by this paper, are as follows (note that the first of these mostly involved import-side measures):

China - Measures affecting imports of automobile parts (brought by the US, EU and Canada in 2006)

China - Certain measures affecting the automobile and automobile-parts industries (brought by the US in 2012)

China - Measures relating to the production and exportation of apparel and textile products (brought by Mexico in 2012)

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