Subsidies with export share requirements in China

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\textbf{ABSTRACT}

A subsidy is subject to an export share requirement (ESR) when firms must export more than a certain share of their output to receive it. Such incentives are frequently found in free trade zones, export processing regimes and measures targeted at foreign investors, both in China and other developing countries. In this paper we provide the first quantitative assessment of the effect that using subsidies with ESR has on exports, the intensity of competition and welfare, both in the enacting country and its trading partners, using a two-country model of trade with heterogeneous firms. We find that the subsidy with ESR boosts exports more than an equivalent unconditional subsidy available to all exporters. Crucially, the subsidy with ESR provides greater protection to low-profitability firms, while the unconditional subsidy does the opposite. The combination of export promotion and lower intensity of domestic competition generated by the subsidy with ESR can be described as "protectionism through exporting." The imposition of an ESR, however, greatly exacerbates the welfare loss associated with subsidizing exporters.

1. Introduction

China's ascent to become the world's largest exporter has been nothing short of spectacular, and has naturally attracted considerable attention among economists and policymakers alike.\footnote{See e.g. Naughton (2007), Branstetter and Lardy (2008), Feenstra and Wei (2010), Rodrik (2010), Song et al. (2011), Hanson (2012), World Bank (2013), among many others.} Although China's strong reliance on subsidies to promote exports is well established, the fact that several of these policy measures are subject to export share requirements (ESR)—i.e. they are only available to firms that export more than a certain share of their output—has so far been overlooked.\footnote{Naughton (1996) and Feenstra (1998) are exceptions; they, however, only offer anecdotal evidence documenting the use of these subsidies in China.} Thus, our objective in this paper is to shed light on the effects of using subsidies with ESR on a country's exports, intensity of competition and welfare from a quantitative standpoint.

Understanding the implications of imposing ESR on subsidies is of paramount importance for two key reasons: firstly, trade policy instruments featuring export requirements such as free trade zones and export processing regimes are widely popular not only in China, but also across a large number of developing countries.\footnote{Table 1 lists twelve large countries (i.e. with population above 30 million inhabitants) that offer subsidies with ESR according to the U.S. State Department's Investment Climate Statements. Additionally, 19 small developing countries were required to eliminate incentive programmes subject to ESR by December 2015 in order to comply with disciplines in the Agreement on Subsidies and Countervailing Measures of the WTO (Crékos and Wallenhorst, 2009; Waters, 2013; World Bank, 2014).} Secondly, as we show in the paper, making a subsidy subject to an ESR engenders substantial distortions over and above those caused by an equivalent unconditional subsidy granted to all exporters.

There is a wide range of policy measures such as direct cash transfers, tax holidays and deductions, and the provision of utilities at below-market rates that are subject to ESR in China. For instance, the 2004 Transitional Review Mechanism conducted by the World Trade Organization (WTO) on subsidy practices in China noted that firms located in several special economic zones and exporting at least 50% of their production enjoyed tax deductions, access to soft loans and priority access to infrastructure and land. The same document also stated that firms exporting more than 70% of their output benefited from local income tax exemptions and a reduction in their corporate

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income tax rate. Another example is the restriction faced by foreign firms until 2002, which forbade them to produce a wide range of consumer goods (e.g., digital watches, bikes, washing machines and refrigerators) unless their exports accounted for more than 70% of their production. Similar restrictions have only been lifted in 2013 for the domestic sale of video game consoles such as Nintendo’s Wii and Sony’s Playstatyn, which have been manufactured in China for more than a decade.\(^5\)

The large number of exporters in China that are eligible to benefit from subsidies with ESR based on their export intensity is staggering. Fig. 1 presents the distribution of export intensity—the share of total sales accounted for by exports—for Chinese manufacturing exporters between 2000 and 2006. Half of all exporting firms in China sell more than 70% of their output abroad, and half of these in turn, are “pure” exporters, i.e. firms selling all their output abroad.\(^6\) In contrast, \(\text{Bernard et al. (2003)}\) and \(\text{Eaton et al. (2011)}\) report a negligible share of high-intensity exporters in the U.S. and France respectively. It is also notable that none of the workhorse models of trade with heterogeneous firms such as Melitz (2003),Melitz and Ottaviano (2008) or Arkolakis (2010) can easily reproduce such a heavy right tail of the export intensity distribution. Fig. 1 suggests that the availability of subsidies with ESR in China could affect substantially the distribution of export intensity.

We investigate the consequences of subsidies subject to ESR in the context of a two-country model of trade in which firms are heterogeneous in their productivity as in Melitz (2003), but also in terms of firm-destination-specific demand shifters as in Eaton et al. (2011).\(^4\) Thus, in the absence of subsidies, each exporter in our model has a unique optimal export intensity—which we call “natural” export intensity—determined both by aggregate variables such as a country’s expenditure and price index, transport costs and idiosyncratic demand shifters. Since we also assume that the fixed costs associated with operating in a given market are destination-specific, it follows that our model produces both “regular” exporters, i.e. firms that sell both in the domestic market and export, as well as pure exporters. In contrast, in the workhorse Melitz (2003) model, all exporters in a given country sell some of their output domestically and have the same export intensity.

Heterogeneity in firms’ demand across different markets is a crucial element of our model because it accommodates a wide range of reasons why a firm would choose to export the majority of its output in the absence of subsidies with ESR—e.g. producing a sophisticated good that is not demanded locally, belonging to a global value chain, or having a well-developed network of foreign customers, among others. The magnitude of the distortions produced by a given combination of subsidy and ESR is shaped by the share of firms that are induced to change their allocation of sales between the domestic and foreign market when the policy is in place. This in turn is intimately connected to the natural distribution of export intensity prevailing in the country offering the subsidy.

We study a scenario in which one country unilaterally offers firms located there an ad-valorem subsidy on total sales subject to an ESR. That is, the subsidy is made available only to firms with an export intensity greater than or equal to a threshold \(\eta \in (0, 1]\). We show that firms operating subject to the ESR can be of one of three types: constrained or unconstrained regular exporters and pure exporters. The first two types sell in both markets and differ in terms of whether they would have operated at an export intensity at least as high as the ESR threshold under laissez-faire or not. The former—i.e. the unconstrained regular exporters—can operate at their optimal export intensity and still obtain the subsidy. Conversely, a subset of firms that would have operated at an export intensity below \(\eta\)—the constrained regular exporters—are induced to alter their allocation of sales across markets to receive the subsidy. We show that these firms simultaneously reduce their domestic sales and increase their exports in order to achieve an export intensity exactly equal to the ESR threshold. Furthermore, we show that the reduction in profits caused by a firm not operating at its natural export intensity increases with the difference between the latter and \(\eta\). Thus, firms with relatively high export intensity but still below the ESR are the ones for which the profit boost provided by the subsidy is likely to exceed the loss associated with the misallocation of sales across markets. Lastly, relatively less productive firms choose to satisfy the ESR and receive the subsidy by becoming pure exporters—thereby saving on the fixed cost of selling domestically. An important result emerging from our model is that the provision of a subsidy with an ESR strictly below 100% increases the share of exporters operating at the export intensity threshold, but also the share of pure exporters.

The parameters of our model are calibrated to reflect the share of exporters and salient features of the distribution of export intensity in a hypothetical, large developing country that does not provide subsidies subject to ESR, with the intention to capture the distribution of export intensity that would have prevailed in China had it not provided subsidies with ESR. We estimate the natural export intensity distribution by combining information on the use of subsidies with ESR by developing countries gathered from the U.S. State Department’s Investment Climate Statements and cross-country firm-level data on firms’ export intensity from the World Bank’s Enterprise Surveys for the period 2002-2012. We also use the export intensity distribution observed in China in 2013—a point in which important incentives subject to ESR at the national level had been phased out—as a robustness check of our results.

Undertaking a comprehensive evaluation of all subsidies subject to ESR in China is beyond the scope of our paper for two reasons. Firstly, as we document in detail in Section 2, China imposes ESR on a wide range of incentives, such as tariff concessions, cash transfers and tax breaks. Secondly, there is extremely limited systematic data available on the size and scope of subsidies offered to exporters in China (Lardy,

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\(^{4}\) Questions by the European Communities with regard to China’s Transitional Review Mechanism on Subsidies and Countervailing Measures, September 30, 2003 (references G/SCM/Q2/CHN/5 and G/SCM/Q2/CHN/7).


\(^{6}\) The pervasiveness and distinct features of high-intensity exporters in China have also been studied by Lu (2010), Dai et al. (2016) and Lu et al. (2014).

\(^{7}\) More precisely, only 0.7% of U.S. exporters display an export intensity greater than 90%. Using data from the Enquête Annuelle Entreprises, SESSI, for the year 2000, we find that the corresponding figure for France is 1.9%.

\(^{8}\) Other models that feature firm-destination heterogeneity in demand are \(\text{Bernard et al. (2011)}, \text{Crozet et al. (2012)}\) and \(\text{Cherkashin et al. (2015)}\).

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![](Export Intensity Distribution of Chinese Manufacturing Exporters, 2000-2006.png)

Fig. 1. Export Intensity Distribution of Chinese Manufacturing Exporters, 2000-2006

The figure depicts the kernel density of export intensity—defined as the share of exports in total sales—for Chinese manufacturing firms reporting a positive value of exports. Data are for the period 2000-2006 and are described in detail in Appendix A.
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