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Greetje M.M. Everaert

The Political Economy of Restructuring and Subsidisation: An International Perspective

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Tiivistelmä

Monet supistuvilla toimialoilla työskentelevät yritykset joutuvat järjestelemään uudelleen toimintaansa nykyisen kiihtyvän kilpailun oloissa. Näitä aloja edustavat etujärjestöt ovat kuitenkin usein onnistuneet saamaan valtiovallan tukiaisia. Tutkimuksessa tarkastellaan tappiota tuottavan yrityksen päätöstä joko hankkia tukiaisia tai uudistaa tuotantoa viitekehyksenä Mageen ym. (1989) ns. contributions-peli. Lisäksi tarkastellaan tullien roolia kilpailukyvyttömien toimintojen uudelleenjärjestelyssä. Tutkimuksessa käy ilmi ensinnäkin se, että etujärjestötoiminnan rahoituksen ja resursseja vaativan uudelleenjärjestelyn välillä on valintatilanne siten, että molempia rahoitetaan mallissa. Vastapuolimaan asettamat rangaistustullit tuetulle viennille suuntaavat taas optimipäätöstä uudelleenjärjestelyihin ja siten koventavat budjettirajoitetta. Siksi malli osoittaa, että ulkoiset rajoitteet, kuten rangaistustullit, voivat auttaa sisäisen rahoituskurin saavuttamisessa, kun parhaat mahdolliset sääntelykeinot ovat poliittisia mahdottomia. Sosiaalisen hyvinvoinnin kannalta uudelleenjärjestely olisi tavoiteltavaa, joten poliittinen kilpailu aiheuttaa mallissa kustannuksia.

Asiasanat: pehmeät budjettirajoitteet, uudelleenjärjestely, poliittinen talous, etujärjestöt, kauppapolitiikka, supistuvat toimialat

All opinions expressed are those of the authors and do not necessarily reflect the views of the Bank of Finland.

The Political Economy of Restructuring and Subsidisation: An International Perspective*

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June 10, 2004

Abstract

In today's increasingly competitive business environment, many firms in declining industries have been confronted with the need to restructure. However, lobbies in these industries have often managed to attract government subsidies instead. This paper looks at the decision of a loss-making firm whether to lobby for subsidies or whether to restructure in the context of a contributions game as in Magee et al. (1989). We further analyse the role of tariffs in restricting uncompetitive practices such as granting state aid to unprofitable firms. Several results stand out. Firstly, there is a trade-off between spending resources on lobbying for subsidies and costly restructuring such that both restructuring and subsidisation take place in our model. Secondly, countervailing tariffs on subsidised exports shift the decision in favour of restructuring, thereby hardening budget constraints. Hence, the model illustrates that external constraints such as countervailing tariffs can help to establish internal financial discipline when first-best solutions are politically unfeasible. Thirdly, the social planner always prefers full restructuring implying that political competition comes at a cost of lower economic welfare in our model.

- **JEL-Classification:** P26, F13
- **Key Words:** Soft Budget Constraints, Restructuring, Political Economy, Lobbying, Trade Policy, Declining Industries
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1 Introduction

The past dozen years have witnessed a remarkable transformation of the global economic environment. The European Union's (EU) common market, through the introduction of robust competition law, has grown into a global powerhouse comprising 25 members. Markets in Canada, the United States (US) and Mexico have liberalised and integrated through the North American Free Trade Agreement (NAFTA) of 1994. At the global level, the General Agreements on Tariffs and Trade (GATT) has been adopted to promote trade liberalisation. The World Trade Organization (WTO), established in 1995, actively helps resolve international trade conflicts and discourage unfair trade practices such as dumping and state subsidies.[1]

This new economic environment has not only boosted opportunities for trade and exploited the benefits of a more competitive global economy, it has also forced many sectors to restructure, cut costs and make heavy investments in new technologies to stay competitive (*The Economist*, April 29, 2000).

However, not all markets have been liberalised and government intervention remains widespread. Apart from setting the regulatory environment for free competition and trade, many governments (including the US and the EU) have taken direct action to shield certain industries from international competition. For example, European and US agricultural policies still safeguard farmers from competition and involve extensive subsidisation. Equally striking is the Bush administration's 2002 decision to impose tariffs on steel imports to the US.[2] In Europe, state aid to the steel and shipbuilding industries routinely provokes discussion about the legitimacy of regional and sectoral aid (European Commission, 2003a).

By appealing to strategic considerations such as maintaining domestic production to safeguard independence or sociopolitical motives such as job retention and regional development, otherwise economically non-viable industries often successfully lobby for government subsidies. Such state aid highlights the problem of soft budget constraints (SBCs), especially where it involves recurrent bailouts of loss-making industries (Kornai, 1980). While state aid to economically *viable* enterprises might induce positive welfare effects e.g. through spillover effects from R&D, the effects of SBCs and state aid to *unviable* firms are are well documented to be negative. SBCs are blamed for shortages (Kornai, 1980), hampering innovation (Qian and Xu, 1998), preventing the restructuring of firms and efficient resource allocation (Kornai, 1980; Dewatripont and Roland, 1996), reducing output (Schaffer, 1989), impeding economic growth (Huang and Xu, 1999) and discouraging free trade (Everaert and Vandenbussche, 2001). At the root of all these negative effects is the inability of politicians to enforce financial discipline. Thus, SBCs are said to originate in the paternalistic attitudes of the state (Kornai, 1980), bargaining between politicians and firm managers (Schleifer and Vishny, 1994), and in the dynamic context of sunk costs and asymmetric information (Dewatripont and Maskin, 1995). Among the proposed ways to alleviate political commitment to SBCs, the most commonly mentioned are increasing competition or introducing private ownership (Dewatripont and Maskin, 1995; Dewatripont and Roland, 1996; Segal, 1998;

[1] Strictly speaking, competition authorities, not GATT, are responsible for issues of state aid. However, when subsidised production is sold on international markets, complaints can be filed with the WTO. High-profile cases include the tax break to US foreign sales corporations (now referred to as Extraterritorial Income, or ETI) and state subsidisation of South Korea's shipyards.

[2] On March 20, 2002, tariffs ranging from 8% to 30% were imposed for a period of three years on steel imports from Europe, Asia and South America. These measures were abandoned on December 4, 2003 after the WTO ruled that the tariffs were illegal and the EU and Japan threatened retaliation.

Berglöf and Roland, 1998; Qian and Roland, 1998).

This paper provides a political-economy framework that allows us to propose an alternative approach to alleviating political commitment to SBCs. Specifically, we explore the possibility that trade policy can act as an external commitment device in imposing hard budget discipline on subsidised exporting firms. Collie (1991) has shown that in a strategic trade framework tariff retaliation against subsidised imports usually reverses the traditional profit-shifting argument for allowing export subsidies, which, in turn, lowers optimal subsidies in equilibrium. However, such a trade framework applies solely to subsidies that improve welfare, not to subsidies of loss-making businesses.

We present a framework for assessing the impact of countervailing tariffs where subsidies do not improve welfare. Hence, the purpose of this paper is twofold. First, we look at the choice of loss-making firms on whether to lobby for government support or restructure. Decisions of such firms are modelled in the context of a contributions game where interest groups contribute to political parties. Second, we analyse the role of tariffs in restricting uncompetitive practices such as providing state aid to unprofitable firms. More specifically, we propose an alternative device to help overcome the commitment problem politicians face in curbing SBCs.

The literature on SBCs emphasises that SBCs, unlike explicit subsidies, are decided ex post and are thus endogenous. For this reason, we pay special attention to how SBCs enter the model. Borrowing from models of probabilistic voting (Magee et al., 1989), we distinguish between the unit level of the subsidy and the proportion of firms that are subsidised. We also reject the notion that political parties first contribute to buy subsequent government policies as in Grossman and Helpman (1994), since the latter framework primarily seeks to explain cross-sectoral variations in tariffs or subsidies. Instead, we focus on how political actors influence the extent of subsidisation within a particular sector. Therefore, we reverse the staging of policy selection and contributions as in Magee et al. (1989).

There are two advantages to distinguishing between the unit level of a subsidy and the proportion of firms that are subsidised. First, it allows us to make the SBC a continuous variable. Second, it allows us to make inferences about the credibility of policy pronouncements, since lobby activity can influence the scale on which policies are implemented. Policies lacking credibility receive little political support and are not implemented. Analogously, ex post lobby activity determines the proportion of firms that are subsidised such that the total subsidisation budget is not fixed ex ante.

The model we use comprises 2 countries, a home and foreign country. The home country has two sectors, an unrestructured industry and a profitable industry. Each of these 2 industries is backed by a political party. The unrestructured sector is supported by a conservative party; the profitable sector is backed by a reformist party. The model is timed so that in the first stage the two rival political parties each choose a policy programme, i.e. a unit level of restructuring and a unit subsidy. Firms in the unprofitable industry and the profitable industry respond to the announced policies by making contributions to political parties. Firms in the unprofitable industry lobby for subsidies to escape costly restructuring. To escape having to pay higher taxes, firms in the profitable industry lobby for government policies that force the ailing industry to restructure. Contributions are important in our model, since they determine the proportion of firms that are restructured and the proportion that receive government support. Production is sold in foreign markets, so the government of the foreign country must decide in Stage 3 whether to levy a countervailing duty on subsidised exports. Since restructuring should result in actual competitiveness, countervailing duties

are only applied in cases where exports are subsidised. In Stage 4, firms in the home and foreign country pursue Cournot duopoly strategies and sell in the foreign market.

One possible application of the model relates to the existence of SBCs in transition economies. Firms in transition countries inherited an obsolete capital stock and their production structures were distorted by faulty incentives and inefficiencies. To meet competitive pressures from abroad, these firms were urged to engage in deep restructuring and reorganisation (Blanchard, 1997). However instead, many firms in transition countries managed to arrange for themselves indirect subsidies in the form of soft credit conditions, tax arrears or arrears on social security contributions (Schaffer, 1998). This situation created the fear that when markets in transition countries opened up to trade, SBCs might generate international spillover effects. Everaert and Vandenbussche (2001), for example, suggest transition countries could export subsidised production to the EU. Moreover, the EU's levying of antidumping or countervailing duties on imports from Central and Eastern European Countries (CEECs) indicates how real this fear was (European Commission, 2000).[3]

Another potential application of the model involves continued state support to declining or sensitive sectors in advanced market economies (e.g. agriculture, steel, textiles and shipbuilding). Such industries are typically threatened by competition from lower-wage countries. Although productivity and technology-enhancing restructuring might help these sectors regain competitiveness, such reforms are often opposed by powerful lobbies for state support or protection.[4] Extensive unionisation, high industry concentration and the regional importance of ailing industries often go hand in hand with effective lobbying for government involvement (Willmann, 2002). Farm lobbies and textile lobbies (through prolonged protection from the Multi-Fibre Arrangements) have been particularly successful in this respect.

Conversely, increased government protection can ultimately endanger an industry allowing that industry to postpone its shift to new technologies (Matsuyama, 1990; Miyagiwa and Ohno, 2001; Crowley, 2002; Everaert, 2003).

For our purposes, the case of the transition country will be considered as our principal example. "Ailing" or "declining" industries are then equivalents for unrestructured and uncompetitive state-owned firms. The economic viability of such firms is not so much jeopardised by a shift in international comparative advantage (as is the case with declining industries in advanced market economies) but rather by inefficiencies inherited from the socialist system. Throughout the paper, we use the terms "declining," "ailing," "unrestructured," "old," or "state-owned" sector interchangeably. "Growing," "new," "profitable" and "small and medium-sized" firms refer to competitive firms in our model.

The model conveys several insights. First, it identifies the tradeoff between spending resources on lobbying for subsidies and engaging in costly restructuring. The cost of lobbying can thus outweigh the benefit of subsidisation. In our model, therefore, both restructuring and subsidisation take place in the unprofitable sector. Next, we show that countervailing tariffs on subsidised exports shift the decision in favour of restructuring, thereby hardening budget constraints. In the relationship between transition countries and the EU, this suggests external constraints (e.g. countervailing tariffs levied by the EU on subsidised exports from

[3] Anecdotical evidence suggests that Russia's subsidised energy supplies to firms in CEECs are sometimes invoked as the basis for an antidumping action, e.g. fertilizer imports into the EU (Official Journal, L 238/15, 22.9.2000).

[4] European shipyards, for example, adopted strategies geared to high value-added market segments. As a result, specialty shipbuiding (cruise ships, repair and ship conversion, ferry vessels, icebreakers, small tankers, etc.) has survived (European Commission, 2003c). Nevertheless, shipbuilding generally remains plagued by overcapacity and unfair or uncompetitive trade practices (especially with respect to South Korean shipyards).

transition countries) can help governments in transition countries overcome the problem of committing to enforcement of hard budget discipline. Thus, foreign trade policy can help impose financial discipline and promote the restructuring of uncompetitive firms in transition countries.[5] Third, comparing the predictions of the model with the decisions of a social planner, we shown that planners always prefer full restructuring. In our model, allowing a free political system comes at the cost of lower economic welfare.

The paper links with a number of strands of the literature. First, this work follows in the tradition of the SBC literature originating with Kornai (1980). We combine two approaches from the earlier literature that model and explain the existence of SBCs: the importance of political considerations (Schleifer and Vishny, 1994) and the inherent endogeneity of the SBC phenomenon (Dewatripont and Maskin, 1995). The novelty of our approach arises from the fact that we put diverging interests between gainers and losers from SBCs central to the analysis. Moreover, our SBC variable is decided ex post, making it *continuous*. Thus, the softness of the budget constraint is neither fixed nor decided upon ex ante.[6]

Second, in line with Collie (1991), we illustrate how trade policy can also help harden budget constraints. As mentioned, traditional arguments concentrate on competition and privatisation as channels of institutional reform fostering budget discipline. However, these arguments also oddly assume politicians, capable of designing efficiency-enhancing privatisation schemes and implement effective competition policies, are for some reason unable to enforce budget discipline.[7] Some authors have recently proposed alternative frameworks to overcome the SBC problem. Che (2002), for example, suggests that loss-making firms might be allowed to enter bankruptcy if the government designs fair individual compensation schemes for the displaced workers. The up-front costs here, however, can easily be so daunting that they prohibit adoption of such "efficient" policies. Brücker et al. (2003) suggest that a government in a transition country can enforce budget discipline in a war of attrition by withholding its EU membership application. Such an EU conditionality is thus associated with hard budget constraints. However, it remains unresolved how a government would be able to commit to withholding its EU membership application and wait until its firms start restructuring without being able to commit to enforcing budget discipline directly. The advantage of the approach in this paper is that the decision to levy countervailing duties is completely outside the reach of domestic politicians, i.e. it can be considered a genuine external constraint. We show that levying such countervailing duties is indeed welfare improving for the foreign country (EU). Our results are related to literature on how external constraints help overcome time-inconsistent domestic policies. Policy delegation to an independent body has been a typical example of an external constraint in the field of monetary economics (Cukierman, 1992). Other examples are international trade agreements such as GATT (Staiger and Tabellini, 1999) or environmental protection (Conconi and Perroni, 2003). Such agreements help governments commit to superior policies that would otherwise not be credible domestically. Analogously, Bertero and Rondi (2000) present empirical evidence as to how the requirements for joining the European single market

[5] See Everaert and Vandenbussche (2001) for an earlier formulation of this idea.

[6] This paper is the first we know of that models SBCs as a continuous variable, which Kornai (1980) considered a distictive characteristic of SBCs. In contrast, Schleifer and Vishny (1994) and Dewatripont and Maskin (1995) use a fixed explicit transfer variable to represent the SBC and focus on incentives that give rise to SBCs.

[7] The prescribed "cure" for alleviating SBCs could suffer the same credibility problems as tackling the SBC "disease" itself. Examples include insider privatisation schemes and competition policies that only break up conglomerates into complementary parts.

disciplined Italian state-owned enterprises to respect budget limits. We argue here that EU countervailing tariffs against subsidised exports from transition countries can be an equally powerful external constraint to enforce hard budget discipline – something that domestic politicians from CEECs cannot credibly commit to themselves.

Third, this work relates to contribution approaches in the political economy of trade policy (Magee et al., 1989; Grossman and Helpman, 1994),[8] which typically deal with lobbying for pro-trade or pro-protectionist policies in the framework of a small, perfectly competitive economy. Closer to our work are Brainard and Verdier (1994, 1997), who explicitly consider the option of lobbying for restructuring (as well as lobbying for tariff protection). However, their work is primarily concerned with explaining the pattern of senescent industry collapse in line with the seminal paper of Cassing and Hillman (1986). Here, we follow Hillman and Ursprung (1988) in building upon the contributions framework of Magee et al. (1989). We apply the model to the context of transition countries where lobbyists promote either the restructuring or the subsidising of an uncompetitive industry. We do not consider the possibility that transition countries choose to protect uncompetitive industries through raising tariffs, as one of the major pillars of transition reforms notably consisted of trade liberalisation. By 1996 all Central and Eastern European Accession countries had signed Europe Agreements with the EU that established free trade in industrial products with the EU.[9,10]. Also, in contrast to previous approaches, we consider a model with imperfect competition in an international setup. To our knowledge, only Moore and Suranovic (1993) have previously studied lobbying for subsidisation with imperfect competition on the product market. However, they consider a third-country model and disregard the effects of political competition.

Finally, our work contributes to the literature on the political economy of transition (Roland, 2000) by discussing restructuring and the reallocation of resources from the declining state sector towards a highly productive, growing private sector.[11] Although this literature has the advantage of incorporating dynamic issues such as the optimal speed of transition and the preferred staging of reforms (Dewatripont and Roland, 1995; Roland, 2000; Castanheira and Roland, 2000), transition itself is often modelled rather mechanicistically, disregarding the effects of political opposition to reforms or lobbying (Rodrik, 1995). Our paper seeks to incorporate explicitly the process of political rivalry within an economic model of SBCs and clarify Schleifer and Vishny's (1994) link between politicians and firms by relating the lobby contributions of interest groups to the election probabilities of politicians, albeit within a static framework.

The structure of the paper is as follows: In Section 2, we introduce the model and solve for its subsequent stages by backward induction. The equilibrium concept we use is thus subgame perfection. We first solve for the benchmark case, i.e. the case where countervailing tariffs are absent. In Section 3 we introduce countervailing tariffs on subsidised exports and analyse how they affect incentives to lobby for subsidisation. The problem for the social

[8] There is a growing body of literature that empirically tests the contributions approaches for the US. See Goldberg and Maggi (1999), and Baldwin and Magee (2000).

[9] Although the EU must open its markets more quickly than the associated countries, the Europe Agreements neverthelss aim at establishing free trade in industrial products over a gradual transition period. Restrictions to free trade appear in only a few sectors, most notably agriculture and textiles (European Commission, 2003b).

[10] For some political economy explanations of trade policy in CEECs , see e.g. Hillman and Ursprung (1996) and Wunner (1998).

[11] Note that transition here also often involves a redirection away from production by large enterprises towards a revival of small and medium-sized firms.

welfare planner is addressed in Section 4. The final section concludes.

2 The benchmark model

In this section, we analyse whether firms in unprofitable industries choose to restructure or lobby to receive subsidies. More specifically, we introduce restructuring and subsidisation of loss-making firms in the context of a political economy where some sectors in the economy benefit from SBCs while others suffer. We show how the SBC is determined ex post and modelled as a continuous variable. Several comparative static results are discussed.

2.1 Setup

Consider a three-stage model with two countries, a home and a foreign country, and two sectors in the home country, a declining or old sector and a growing or new sector. Firms in the old sector compete with firms from the foreign country, whereas firms in the new sector of the home country produce a different good for local consumption only.

More specifically, we consider a home country, i.e. a transition economy, that consists of n small and medium-sized enterprises (SMEs), which represent the new sector, and 1 state-owned enterprise (SOE), which represents the old industry. The latter is a normalisation, since one can think of different firms in the old industry as business units of the larger state-owned company. The SMEs produce a horizontally differentiated good for the local home market and each firm makes a positive profit $\frac{F}{n} > 0$, because free entry in the SME sector has not yet driven all positive profits to zero – a plausible scenario in an emerging market economy or for a growing industry. Note also that sector profits F are completely exogenous to the model. Our SOE, on the other hand, produces for and exports to a foreign market (e.g. the EU).[12,13] Hence, the old and new sectors of the home country do not compete with one another either domestically or abroad. Other topologies can be envisaged (e.g. the new and old sectors compete), but the focus in this paper is on competition between the declining sector and the foreign firm, where the locally producing sector – in the case of subsidisation – is taxed to cross-finance subsidies to the ailing industry.

Subsidisation might arise (as we assume the firm belongs to the old industry) from inherited central planning inefficiencies so the firm has higher marginal costs than a firm in the foreign country. More specifically, the marginal cost in the SOE, c, once faced with competition (from) abroad, turns out to be prohibitively high, making further production unprofitable. The marginal cost in the foreign country, c^f, is substantially lower: $c > c^f$.[14]

[12] For reasons of simplicity, we exclude consumer surplus from the model. A completely analogous result would be obtained if the home country were to import from the foreign country. However, the current setup is more intuitive when we discuss the effects of countervailing tariffs on subsidised exports in Section III.

[13] We are quite aware of studies that attribute exporting to efficient firms (e.g. Clerides et al. 1996; Melitz, 2003). In our model, the exporting firm (SOE) is considered unprofitable if it refrains from restructuring or lobbies for subsidies. In the model setup, the SOE is forced to engage in one of these activities so that it either becomes efficient or is (over)compensated with subsidies that hide its inefficiency. In either case, we observe efficient firms exporting to the EU. As such, we do not contradict the literature (Repkine and Walsch, 1999; De Loecker and Konings, 2003). Our point is merely that observed profitability may be due to successful lobbying rather than genuine competitive advantage obtained from restructuring. Anti-dumping actions of the EU against CEEC imports, even long before transition commences, might be indicative of this. See Footnote 3 for anecdotical evidence.

[14] Consider the following example. Despite cheaper labour costs in the foreign transition country, w, labour productivity in the transition country, $g(\alpha)$ is so low as to make productivity-adjusted marginal costs higher:

Therefore, the SOE needs to restructure or rely on government subsidies to survive.[15]

Throughout the model, we assume that both restructuring and subsidisation are two valuable options to make production in the home country's declining sector profitable again. We assume, however, that subsidisation is more attractive to the SOE, since restructuring is costly for firms in the old sector.[16]

We also assume that the decision to restructure or subsidise a firm in the declining sector can be influenced with political contributions (Magee et al., 1989). In other words, the amount of contributions influence the extent to which proposed policies are implemented.

Specifically, we assume that the government of the home country consists of two rival political parties, a pro-reform party, and a conservative socialist party. The former advocate restructuring and the latter favour subsidisation. Both parties compete for power and electoral results are determined by campaign contributions given to political parties (standard probabilistic voting models). Campaign contributions are important financial resources for political parties and can affect voting behaviour directly or indirectly e.g. by influencing voter turnout at the elections.[17] We further assume that in the absence of campaign contributions, each party faces an equal chance of winning the elections. Hence, in a representative democracy, the firm in the declining industry faces an equal probability of being restructured or subsidised. Assuming that government representation is reflected in actual policies, this means that 50% of the ailing industry is restructured and the other 50% receives government support. However, in our model, the SOE is not indifferent to the choice of restructuring and receiving subsidies – it strongly prefers subsidies to bearing the hefty costs of restructuring.[18,19] Nor are firms in the growing segment of the economy indifferent to the old sector's preference to subsidisation over restructuring. Since the burden of taxation to finance subsidies falls on SMEs, the latter consistently prefer that old firms restructure. Thus, both groups are willing to give campaign contributions to promote electoral victories for the party that promises to influence the proportion of firms that are restructured.

Subsidisation is assumed to be more attractive to the SOE than restructuring, but from a social welfare point of view, we find restructuring is always preferable to subsidisation (see Section 4). As such, our results differ from those in a strategic trade setting where subsidies are always considered welfare-optimising (Collie, 1991; Everaert and Vandenbussche, 2001).

The timing of the model is depicted in Figure 1. To summarise, in the first stage, two rival political parties, a conservative and a reformist party, respectively, choose a level of a policy parameter, a unit subsidy s and a unit level of restructuring α respectively, taking

$c > c^f$, where productivity g is a positive function of the level of restructuring α. Low labour productivity in the transition country can be due to the presence of an old and obsolete capital stock and inefficient ways of production as compared to Western production methods. Low product quality further necessitates restructuring.

[15] Exit is a plausible alternative to restructuring and subsidisation. However, as it would jeopardise employment in the home country, we do not deal with this possibility.

[16] For further possibilities, see Appendix.

[17] Although explicit modelling of the voting game is beyond the scope of this paper, election outcomes are apparent after Stage 2.

[18] The SOE also prefers restructuring over subsidisation in the absence of any conflict of interest between the SOE and the SMEs. However, we will see that positive contributions are not excluded in this case. For a full discussion, see Appendix.

[19] In a dynamic context, Rodrik (1995) shows that, at the onset of transition, workers in SOEs might prefer low or no subsidies to increase their chance of finding a job in the growing private sector of the economy and increase their wages once they are employed in the private sector. As transition proceeds, however, this no longer holds, and workers in SOEs always prefer high subsidies. Our example here would be classified as the latter case.

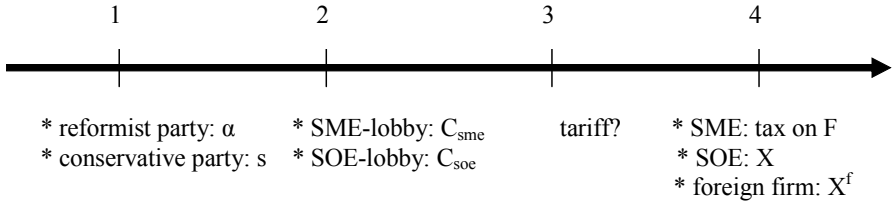

Figure 1: Timing in the model

into account both welfare considerations and the self-interest motives of politicians. One can think of these as announcements of the policies parties want to pursue when they come into power. Note that while we assume that parties can commit to levels of s and α (e.g. they promise a certain subsidy per worker), they cannot commit ahead of time to a total subsidisation budget.

The firms (or workers) that eventually get subsidised are determined by lobby activity in Stage 2, whereby contributions determine the proportion of firms in the declining sector that are restructured, q, or subsidised, $1-q$, given the unit levels of restructuring α and subsidy rates s at which restructuring and subsidisation occurs.

In the final stage, the old firm in the home country competes with the foreign firm in the foreign market and both firms choose quantities accordingly. The parties pursue a Cournot duopoly strategy.[20]

The order of stages in the game is motivated by the idea that SBCs should be modelled endogenously and as a continuous variable, i.e. the softness of the budget constraint should not be determined ex ante. Thus, the unit level of the subsidy is determined before the proportion of firms that benefit from this subsidy is decided. One can easily imagine a subsidisation scheme, initiated by the government, for which some firms automatically qualify, but where others need to lobby to receive a subsidy. Alternatively, the order of stages follows the election game, during which subsidies are proposed. The extent to which the subsidies are actually implemented, however, depends on the political support they receive. Hence, total subsidisation outlays can only be known after Stage 2. From this point of view, we capture the endogenous and continuous nature of a SBC and use it in our modelling as such.

We now solve for the benchmark case of the model. In section 3, we introduce countervailing tariffs.

2.2 Stage 3: Production

Consider production decisions at the final stage of the game. The home and the foreign firm produce an identical good for the foreign market and compete in setting quantities. In the event the home firm chooses to restructure – denoted a case q – the problem amounts to

[20]Since we choose the marginal cost of the home firm such that it drives its market share to zero when faced with competition from the foreign firm (infra), the case of a homogeneous Betrand competition is more intuitive. Higher marginal costs automatically lead to exit of the firm with the higher marginal cost (i.e. we do not even need to assume $c = \frac{1}{2}$). However, Betrand competition with homogeneous goods leads to discontinuity of the profit function and complicates the analysis in Stage 2. Moreover, in case of Bertrand competition under strategic trade with heterogeneous goods, optimal subsidies are negative (Eaton and Grossman, 1986).

solving

$$\begin{aligned} \max_{X} \pi &= (P - c_R(\alpha))X - \gamma\frac{\alpha^2}{2} \\ \max_{X^f} \pi^f &= (P - c^f)X^f, \end{aligned} \tag{1}$$

where π and π^f are home and foreign profits, respectively, and where X and X^f, respectively, stand for home and foreign production. Marginal costs after restructuring in the home country are denoted as $c_R(\alpha)$, i.e. a negative function of the level of restructuring α. For simplicity, we assume that restructuring linearly decreases marginal costs of the home firm, c, such that

$$c_R(\alpha) = c - \alpha.$$

The marginal cost for the foreign producer is denoted c^f, where $c^f < c$. Note that home profits are reduced by the *total* cost of restructuring $\gamma\frac{\alpha^2}{2}$, i.e. investment in new technologies quadratically increases with the intensity of restructuring α as in the literature on cost-reducing investment (Brainard and Verdier, 1994; Abel et al., 1996). The parameter γ indicates how costly it is to restructure in general.

Inverse demand is given by

$$P = a - b(X + X^f),$$

where P is the price of the identical good produced. Without loss of generality (i.e. normalising) we can assume that

$$\begin{aligned} a &= 1 \\ c^f &= 0. \end{aligned}$$

To simplify, we further assume that

$$b = 1.$$

Cournot-Nash solutions to the maximisation problem above yield

$$\begin{aligned} X\,|_q &= \frac{1 - 2c + 2\alpha}{3} \\ X^f\,|_q &= \frac{1 + c - \alpha}{3}. \end{aligned} \tag{2}$$

Under the subsidisation regime – denoted as case $1-q$ – the home firm is given a positive subsidy s to the marginal cost. We consequently solve

$$\begin{aligned} \max_{X} \pi &= (P - c + s)X \\ \max_{X^f} \pi^f &= (P - c^f)X^f, \end{aligned}$$

which yields

$$\begin{aligned} X\,|_{1-q} &= \frac{1 - 2c + 2s}{3} \\ X^f\,|_{1-q} &= \frac{1 + c - s}{3}. \end{aligned} \tag{3}$$

Second order conditions (SOCs) for a maximum are satisfied in both cases.

Next, we assume that productivity in the home country is so low (despite, say, low labour costs) that no production takes place in the absence of subsidisation or restructuring.[21] This forces the home government to engage in some kind of reform. From (2) and (3), we derive an expression for the home marginal costs[22]

$$\alpha = s = 0 \Longrightarrow X = \frac{1-2c}{3} = 0 \Longleftrightarrow c = \frac{1}{2}. \tag{4}$$

Using the result from (4), we presume that, in case q, this yields optimal choices of X and X^f, a price P, and home profit π being:

$$\pi\,|_q = (\frac{4}{9} - \frac{\gamma}{2})\alpha^2, \tag{5}$$

and in case $1-q$:

$$\pi\,|_{1-q} = \frac{4s^2}{9}. \tag{6}$$

Note also that for an interior or boundary solution, we restrict values of s and α to the following intervals

$$\begin{aligned} s &\in [0; \frac{3}{2}] \\ c_R(\alpha) &\in [-1; \frac{1}{2}] \Longrightarrow \alpha \in [0; \frac{3}{2}] \text{ when } c_R(\alpha) = c - \alpha. \end{aligned}$$

2.3 Stage 2: Lobbying

We now look at lobby activity in Stage 2 of the model. From expression (6), subsidisation is clearly attractive to the ailing industry as it yields positive profits. However, since subsidies are financed by taxing profits of the growing industry, they are unattractive to the latter. Faced with this conflict, both sectors in the home economy form interest groups – one to lobby to for exempting the SOE sector from costly restructuring and another to oppose increasing the tax burden on the SME sector. To focus on the main issues here, we ignore possible free-riding problems associated with the formation of interest groups. We also assume that contributions are one-sided and only given to the affiliated political party, i.e. we exclude the possibility of dual contributions and the possibility that the SOE sector contributes to the reformist party to be excluded from restructuring. Analogously, we assume that the SME sector cannot bribe the members of the conservative party to convince them of the need to restructure (Austen-Smith, 1987; for discussion, see Mayer and Li, 1994).

Lobbying influences the proportion of firms that are restructured or subsidised (Magee et al., 1989). We denote the proportion of firms in the declining sector that are restructured with q, where q is related to the contributions C_i, $i = sme, soe$ in the following way:[23]

[21] The assumption does not rule out the possibility of zero contributions. Whether or not contributions are made depends on how attractive subsidisation is to the SOE (see Appendix).

[22] Note that the condition $X\,|_{\alpha=s=0} = 0$ places an upper bound to the possible range of values for c. Given that $c > c^f$, we also have a supremum, i.e. $c \in]0; \frac{1}{2}]$. For discussion, see Appendix.

[23] Notice that the levels of s and α only affect the propensity to contribute C_i, but do not affect the probabilities q and $1-q$ directly. This is a difference with the set-up in Magee et al. (1989), but similar to Hillman and Ursprung (1988). Further, the expression q is not derived from structural foundations, but it is simple and intuitive way to explicitly model the link between politicians and firms.

$$
\begin{aligned}
q &= \frac{C_{sme}+\varepsilon}{C_{sme}+C_{soe}+2\varepsilon} = \Pr[restruct.] \\
1-q &= \frac{C_{soe}+\varepsilon}{C_{sme}+C_{soe}+2\varepsilon} = \Pr[subsid.].
\end{aligned}
$$

We can interpret q as the probability a firm gets restructured or the proportion of firms in the declining sector that are restructured, given the fact that the size of the declining sector has been normalised to one. If election outcomes are a function of campaign contributions, q can be interpreted as the probability that the reformist party wins the elections, or else, the percentage of seats in parliament the party will obtain. Its presence in parliament will then be reflected in the weight its policies carry. This assumption is critical.[24,25]

Note that we have included a term $\varepsilon > 0$, which reflects the ineffectiveness of lobbying. It represents the difficulty of manipulating or subverting politicians or election outcomes. Similarly, $\varepsilon/2\varepsilon$ reflects the proportion of firms that are restructured in the absence of contributions. Note that including ε overcomes mathematical problems where contributions are equal to zero.

Using comparative statics, we show that higher contributions from the SME sector induces more firms in the SOE sector to be restructured:

$$
\frac{dq}{dC_{sme}} = \frac{C_{soe}+\varepsilon}{(C_{sme}+C_{soe}+2\varepsilon)^2} > 0.
$$

On the other hand, an increase in the contributions of the SOE to the conservative party has a negative effect on the amount of restructuring in the declining sector:

$$
\frac{dq}{dC_{soe}} = \frac{-(C_{sme}+\varepsilon)}{(C_{sme}+C_{soe}+2\varepsilon)^2} < 0.
$$

Analogously, the probability a SOE gets subsidised is positively related to the contributions from the SOE, and negatively related to the contributions from the SME-sector:

$$
\begin{aligned}
\frac{d(1-q)}{dC_{sme}} &= \frac{-(C_{soe}+\varepsilon)}{(C_{sme}+C_{soe}+2\varepsilon)^2} < 0 \\
\frac{d(1-q)}{dC_{soe}} &= \frac{C_{soe}+\varepsilon}{(C_{sme}+C_{soe}+2\varepsilon)^2} > 0.
\end{aligned}
$$

Lobbies of the SME and SOE sectors are assumed to have the following expected utility functions (Hillman and Ursprung, 1988, Magee et al., 1989):

$$
\begin{aligned}
E[L_{sme}] &= -C_{sme} + q[F] + (1-q)[F - sX] \\
E[L_{soe}] &= -C_{soe} + q[(P - c_R)X - \gamma\frac{\alpha^2}{2}] + (1-q)[(P - c + s)X].
\end{aligned}
$$

[24] The assumption that the support for policies carries over proportionally towards effectuated policies is important. If we do not assume proportionality, politicians will only want to maximise q up to the point where they achieve a majority ($50\% + \varepsilon$) and not seek to maximise q. Here, we step away from majority voting models.

[25] A more general way to think about q is that political support in the form of donations determines the weight policies carry when they are effectuated.

Firms are risk-neutral and face the uncertainty of election outcomes. Therefore their utility consists of expected profits minus outlays for contributions C_i. In case the SOE restructures, i.e. with a probability q, cumulative after-tax profits to the SMEs are $F > 0$. In case the SOE refrains from restructuring, i.e. with a probability $1-q$, the SME-sector has to cross-finance sX to the SOE. Suppose the SOE restructures, i.e. with a probability q, profits to the SOE equal $(P - c_R)X$, net of the investment cost $\gamma\frac{\alpha^2}{2}$. On the other hand, in the subsidisation regime, $1-q$, the SOE benefits from a subsidy s to the marginal cost, such that profits amount to $(P - c + s)X$.

Note that there is an important asymmetry in the model. Whereas the cost of restructuring has to be born completely by the SOE itself and entirely in the only period of production we consider,[26] subsidisation is only costly to the SOE to the extent that the SOE has to contribute C_{soe} to get subsidised; the subsidies themselves are financed through taxes on profits from the SME sector.

Thus, the interest groups maximise their utility by simultaneously choosing contributions accordingly. This amounts to simultaneously solving

$$\begin{aligned} \max_{C_{sme}} & L_{sme} \quad \text{s.t.} \quad L_{sme} \geqslant 0 \\ \max_{C_{soe}} & L_{soe} \quad \text{s.t.} \quad L_{soe} \geqslant 0. \end{aligned}$$

First-order conditions (FOCs) are[27]

$$\begin{aligned} \frac{dL_{sme}}{dC_{sme}} &= 0 \\ \frac{dL_{soe}}{dC_{soe}} &= 0, \end{aligned}$$

and give the reaction functions for the contributions:

$$\begin{aligned} RF_{sme} &: \; C_{soe} \mapsto C_{sme} = -C_{soe} - 2\varepsilon + \frac{1}{2}\sqrt{4A(C_{soe}+\varepsilon)} \\ RF_{soe} &: \; C_{sme} \mapsto C_{soe} = -C_{sme} - 2\varepsilon + \frac{1}{2}\sqrt{-4B(C_{sme}+\varepsilon)}, \end{aligned}$$

where

$$\begin{aligned} A(\overset{+}{s}) &= s\frac{2s}{3} \\ B(\overset{+}{\alpha}, \overset{-}{\gamma}, \overset{-}{s}) &= \frac{4\alpha^2}{9} - \gamma\frac{\alpha^2}{2} - \frac{4s^2}{9}. \end{aligned}$$

The reaction functions are defined for

$$A > 0; B < 0.$$

Under the same conditions, SOCs for a maximum are satisfied. The first condition, $A > 0$, implies that both the foreign firm and the SOE produce in equilibrium. The second condition,

[26] E.g. there is no subsidy to help the firm restructuring, neither is there a possibility to spread the total cost of restructuring $\gamma\frac{\alpha^2}{2}$ over several periods where production takes place, as the model features only 1 production stage. A more dynamic set-up of the model would be an interesting extension in this respect.

[27] See Appendix for proof data in equilibrium $L_{sme} \geqslant 0$; $L_{soe} \geqslant 0$ holds.

$B < 0$, implies that we require firms in the declining sector to strictly prefer subsidisation over costly restructuring. This is the assumption we made in the model setup[28]

$$\pi\,|_{1-q} > \pi\,|_q \iff \frac{4s^2}{9} > (\frac{4}{9} - \frac{\gamma}{2})\alpha^2.$$

We have also assumed that post-restructuring profits should always be positive, i.e. the cost of restructuring should be sufficiently small such that both subsidisation and restructuring are worthwhile:

$$(\frac{4}{9} - \frac{\gamma}{2})\alpha^2 > 0 \iff \gamma < \frac{8}{9}.$$

This assumption ensures that restructuring is the first-best solution for social welfare – a view taken in this paper (see Section 4). The fact that $\pi\ |_{1-q}$ is preferred to $\pi\,|_q$ by the SOE can hence coexist with the fact that restructuring is the social first best, given that the first statement has a strong partial equilibrium (or one sector) nature.

Summarising, we solve Stage 2 under the condition that

$$\pi\,|_{1-q} > \pi\,|_q > 0$$

or

$$0 \leqslant \frac{8}{9}(1 - \frac{s^2}{\alpha^2}) < \gamma < \frac{8}{9}. \tag{7}$$

and further restrict ourselves to positive contribution schedules.[29]

Equilibrium values of the contributions are found at the intersection point of both reaction functions, as shown in Figure 2. Solving for the equilibrium values by substitution, we find that this will always yield at least one real solution. Restricting ourselves to a positive, real solution (see Appendix) yields

$$C^*_{sme} = -\varepsilon - \frac{A^2 B}{(A-B)^2}, \tag{8}$$

and via the reaction function we solve for C^*_{soe}

$$C^*_{soe} = -\varepsilon + \frac{AB^2}{(A-B)^2}. \tag{9}$$

Provided ε is sufficiently small, the equilibrium contributions are positive and fall in the first quadrant. Note that, at equilibrium, the slopes of the reaction functions have an opposite sign, i.e.

$$\begin{aligned}
\frac{dC_{sme}}{dC_{soe}}\,|_{C^*_{soe}} &= -1 + \frac{1}{2}\frac{(A-B)}{-B} > 0 \\
&\iff A + B > 0 \\
\frac{dC_{soe}}{dC_{sme}}\,|_{C^*_{sme}} &= -1 + \frac{1}{2}\frac{(A-B)}{A} < 0 \\
&\iff A + B > 0.
\end{aligned}$$

[28] The reverse implies that both the SOE and the SMEs prefer restructuring, which eliminates any conflict of interest. Therefore, we assume that $B < 0$. For a discussion, see Appendix.

[29] I.e. functions lie in the first quadrant, provided ε is sufficiently small (see Appendix).

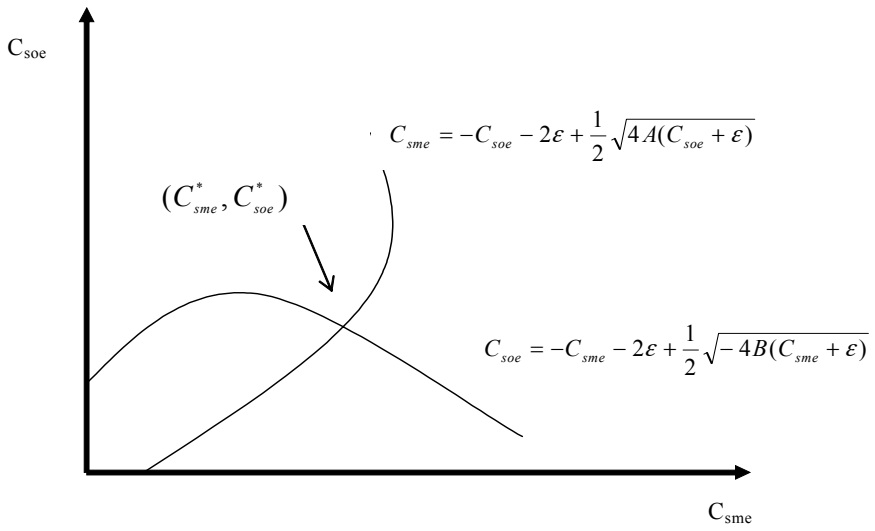

Figure 2: Reaction functions: equilibrium

For stability of equilibrium, we require[30]

$$-\frac{dC_{sme}}{dC_{soe}}\Big|_{C^*_{soe}} * \frac{dC_{soe}}{dC_{sme}}\Big|_{C^*_{sme}} < 1. \tag{10}$$

Given (8) and (9), the expressions for q and $1-q$ reduce to

$$\begin{aligned} q &= \frac{A}{A-B} \\ 1-q &= \frac{-B}{A-B}. \end{aligned}$$

With $A > 0$ and $B < 0$, it follows that q and $1-q$ are both strictly positive and strictly smaller than one such that both restructuring and subsidisation take place in our model. This implies a tradeoff exists for the SOE between the cost of spending resources on lobbying (C_{soe}) and the benefit of not having to restructure ($\pi\,|_{1-q} - \pi\,|_q$). At some point, the costs of lobbying outweigh the benefits of subsidisation. However, it is still possible to rank q and $1-q$, since with $\gamma < \frac{8}{9}$, it is easy to show that $A > -B$, i.e.

$$\gamma < \frac{8}{9} \Longrightarrow \frac{2s^2}{9} > \alpha^2(\frac{\gamma}{2} - \frac{4}{9}),\ \forall \alpha, s. \tag{11}$$

With $A > -B$, we find that, in equilibrium, the proportion of restructured firms exceeds that of state-supported firms, i.e.

$$A > -B \Longrightarrow C^*_{sme} > C^*_{soe} \Longrightarrow q > \frac{1}{2}. \tag{12}$$

This result may be summarised in the following proposition:

[30] The system oscillates as it converges to equilibrium, provided the condition (10) holds. This condition is also found in Moore and Suranovic (1993). For a full exposition, see the Appendix.

	$q = \frac{C^*_{sme}+\varepsilon}{C^*_{sme}+C^*_{soe}+2\varepsilon}$
$\frac{dq}{d\varepsilon}$	$= 0$
$\frac{dq}{d\gamma}$	< 0
$\frac{dq}{d\alpha}$	$> 0 \iff \gamma < \frac{8}{9}$
$\frac{dq}{ds}$	$< 0 \iff \alpha > 0; \gamma < \frac{8}{9}$

Table 1: Comparative statics for q

Proposition 1 *The cost of lobbying for subsidies might outweigh the benefit of subsidisation, such that, in equilibrium, both restructuring and subsidisation take place in the SOE. However, the contributions of the SME sector always exceed the contributions of the SOE such that more than half of the firms in the declining sector is subject to restructuring, provided (7) holds.*

The intuition underlying this result becomes apparent by realising that the less-desirable option for the SOE, restructuring, nevertheless still yields positive profits. This reduces the incentives to make contributions for subsidisation C_{soe}. On the other hand, incentives to resist high taxes remain very strong for firms in the new sector, because such firms have more to lose from not lobbying. When losers lobby harder (Baldwin and Robert-Nicoud, 2002), the result becomes quite intuitive.[31]

Other interesting comparative statics with respect to q and $1-q$ are summarised in Table 1.

As changes in the ineffectiveness of lobbying ε affect the size of the equilibrium contributions in an identical way, the overall effect on the proportion of firms that are restructured versus subsidised cancels out. This is in line with the intuition.

An increase in the cost of restructuring γ decreases the proportion of restructured firms in equilibrium since the contributions of the SOE will rise more sharply than those of the SMEs. Again, this is a highly intuitive result.

Higher levels of restructuring α, on the other hand, for costs of restructuring sufficiently low, i.e. $\gamma < \frac{8}{9}$, give rise to a higher proportion of firms in equilibrium under the restructuring regime. Here, SOE contributions decrease more sharply than those of SMEs.

Finally, the relation between the proportion of restructured firms and the level of the subsidy is negative. The increase of the contribution by the SOE is stronger than the increase of the contribution by the SME sector, such that, on average, more firms escape restructuring.

We summarise the comparative statics results in the following propositions:

Proposition 2 *The ineffectiveness of lobbying ε influences the propensity to contribute, but has no effect on the proportion of firms restructured.*

[31] Baldwin and Robert-Nicoud (2002) rely on asymmetries in effectiveness of lobbying to arrive at a situation where losers lobby harder.

Proposition 3 *A higher cost of restructuring γ, i.e. lower profitability of restructuring, unambiguously prevents more firms from being restructured.*

Proposition 4 *Higher levels of restructuring α encourage more firms to restructure, provided the cost of restructuring is sufficiently low ($\gamma < \frac{8}{9}$). If costs of restructuring are very high ($\gamma > \frac{8}{9}$), a policy of deep restructuring (Blanchard, 1997) is not credible, i.e. with $\gamma > \frac{8}{9}$, in equilibrium, fewer firms choose the restructuring regime when α increases.*

Proposition 5 *Higher levels of the subsidy decrease the proportion of restructured firms.*

The last two propositions are especially interesting because they relate to the credibility of policy announcements. If the cost of restructuring in general is not too high ($\gamma < \frac{8}{9}$), reformist parties that announce drastic restructuring programmes (i.e. α high) receive more political support compared to the case where they announce mediocre plans to regain competitiveness. Hence, both elements reinforce each other – the deeper the restructuring, the more firms proportionally that support it. However, if restructuring is unprofitable, drastic restructuring programmes (i.e. α high) are doomed; they provoke a strong political backlash. The credibility of the government's restructuring plans is thus a function of γ.[32]

The last proposition says that political support for subsidies is positively related to the level of this subsidy. Firms are thus quite willing to support subsidisation policies when their payoffs (in terms of the subsidy they receive) are very high. Again, this is highly intuitive.

2.4 Stage 1: Choosing policy levels

The comparative statics results from Table 1 apply for any given parameter value. However, political parties choose and announce "optimal" policy parameters in the first stage. Suppose political parties not only care about maximising general welfare, but also about their chance of re-election (Magee et al., 1989).[33] Alternatively, these are the percentage of seats a party obtains in parliament or the weight attached to the policy propositions they make. Utility functions of political parties U_{ref} and U_{con} are thus a weighted average of total welfare in the home country, W, and of the probability of re-election, q and $1-q$, respectively. Parameter ϑ indicates the relative importance of the self-interest motive in politicians' decisions. Parameter ϑ is enclosed in $[0;+\infty[$. Home welfare W consists solely of home profits, since consumption takes place in the foreign country. Thus, we seek solutions to

$$\begin{aligned}
\max_{\alpha} U_{ref}(q,W) &= \vartheta q + q[F + (\frac{4}{9} - \frac{\gamma}{2})\alpha^2] + (1-q)[F - \frac{2s^2}{9}] \\
\max_{s} U_{con}(1-q,W) &= \vartheta(1-q) + q[F + (\frac{4}{9} - \frac{\gamma}{2})\alpha^2] + (1-q)[F - \frac{2s^2}{9}].
\end{aligned}$$

FOCs are

$$\begin{aligned}
\frac{dU}{d\alpha} &= \vartheta\frac{dq}{d\alpha} + \frac{dq}{d\alpha}[(\frac{4}{9} - \frac{\gamma}{2})\alpha^2] + q[(\frac{8}{9} - \gamma)\alpha] + \frac{dq}{d\alpha}[\frac{2s^2}{9}] \\
&= 0 \\
\frac{dU}{ds} &= -\vartheta\frac{dq}{ds} + \frac{dq}{ds}[(\frac{4}{9} - \frac{\gamma}{2})\alpha^2] + \frac{dq}{ds}[\frac{2s^2}{9}] + (1-q)[-\frac{4s}{9}] \\
&= 0.
\end{aligned}$$

[32] One could interpret γ as a variable that relates the firm's technology to that of firms at the frontier. With high levels of γ, firms are far from the technologically most efficient firms, and this might decrease their willingness to scale up their efficiency (Acemoglu et al., 2002)

[33] In Magee et al. (1989), political parties only care about their re-election chances.

It is easy to see that the solution for α will be given by

$$\alpha^* = \frac{3}{2},$$

because α is restricted in $\alpha \in [0; \frac{3}{2}]$, and that

$$\frac{dq}{d\alpha} > 0,$$

and

$$\frac{dW}{d\alpha} > 0 \quad \text{with} \quad \gamma < \frac{8}{9}.$$

Thus, the choice of the policy parameter of the reformist party is neither influenced by the relative weight of welfare considerations, nor by the conservative party's choice of policy programme. We summarise this in the following proposition:

Proposition 6 *Independent of ϑ and s, the level of restructuring is chosen maximally.*

Since α^* and s^* are simultaneously set in the first stage and given the above proposition, we can continue to solve for s^* by considering:

$$\frac{dU_{con}}{ds}\Big|_{\alpha^*=\frac{3}{2}} = 0.$$

Restricting solutions to those that are positive and satisfy $A > 0; B < 0$, we have the following solution to s^*,[34] provided $\frac{8}{9} - \frac{16}{27}\vartheta < \gamma < \frac{8}{9}$:

$$s^* = \frac{3}{20}\sqrt{40 - 45\gamma + 5\sqrt{-729\gamma^2 + 1296\gamma - 576 - 540\gamma\vartheta + 480\vartheta}}.$$

Interpreting this solution, we find that, provided costs of restructuring γ are not too low ($\gamma > \frac{8}{9} - \frac{16}{27}\vartheta$), there is an optimal level of subsidy that maximises politicians' utility U_{con}. For very low costs of restructuring, however, subsidisation and lobbying for subsidisation are unattractive, since even conservative politicians will favour restructuring and thereby eliminate all competition on the political market. Note that in the case of transition economies, the costs of restructuring were significant – the inherited capital stock was old and the quality of products was low. The case where $\frac{8}{9} - \frac{16}{27}\vartheta < \gamma < \frac{8}{9}$ is thus relevant here. SOCs for a maximum are also satisfied. We summarise our result for s^* in the following proposition:

Proposition 7 *Provided restructuring is sufficiently costly, an optimal level of the subsidy can be found that satisfies $A > 0$ and $B < 0$. However, when restructuring is not costly, the optimal level of the subsidy is zero and complete restructuring results.*

[34] At the equilibrium values α^* and s^*, the condition (10) for stability of the contributions equilibrium is always satisfied for sufficiently high values of ϑ ($\vartheta > 1.94$). For lower values of ϑ ($\vartheta < 1.94$), we require that $\gamma > \frac{984 - 596\vartheta + 64\sqrt{2}\vartheta}{1107}$, which is a slightly stricter condition than $\gamma > \frac{8}{9} - \frac{16}{27}\vartheta$.

2.5 The SBC interpreted

In the model developed above, SBCs emerge because restructuring inherently generates winners and losers. The losers then lobby the government to extend the benefits they enjoyed during socialism. Subsidies in this model acquire an *endogenous* dimension, since total outlays for subsidisation in the economy ultimately depend on the contributions of lobbies *after* the new policies are announced.

Our approach yields a *continuous* variable for SBCs. Given that, without contributions, firms face an equal probability of being subsidised or restructured, i.e. $q = 1 - q = \frac{1}{2}$, we take S as a measure for the softness of the budget constraint, whereby

$$S = s^* X \mid_{1-q,s^*} [(1-q) - \frac{1}{2}] = s^* X \mid_{1-q,s^*} (\frac{1}{2} - q).$$

The variable S reflects the total subsidisation outlays in excess of those that would result in the absence of political contributions. Given the result from Proposition 1,

$$S < 0.$$

The continuity of our SBC variable is useful in our model, since – in the spirit of Kornai (1980) – this should be an essential characteristic of an SBC variable. To our knowledge, our study is the first that combines continuity with endogeneity and political elements in an SBC model.

The novelty of this approach arises from our emphasis on the fact that SBCs generate winners and losers. Moreover, relations between politicians and firms are more explicitly embedded in the political structure of the real economy, adding realism to the model.

In an extensive survey on SBCs, Mitchell (2000, p.66) describes SBCs as a situation in which a firm is *"allowed to continue operating even though its assets would yield a greater return in an alternative use."* Once we show in the Section 4 that aggregate welfare is higher under complete restructuring, the definition straightforwardly applies to our model.

3 Countervailing tariffs

In the previous section, we explored the incentives for subsidisation and restructuring in the absence of countervailing tariffs. Given that SBCs are generally viewed as harmful to economic welfare, we now consider whether external constraints such as countervailing duties can promote restructuring and harden budget constraints.

Thus, we introduce an additional stage in the model (see Figure 1) in which the foreign government may decide to levy countervailing duties t on subsidised imports. We then look at how this affects the propensity to contribute and the proportion of firms that are subsidised. In other words, countervailing duties may alter the incentives in the home country to lobby for subsidisation. Restructuring, however, is assumed to confer legitimate competitive advantage (the WTO rules out the use of countervailing measures in this case).[35] While the results for

[35] Recall that we have taken the position that the SOE must be partially subsidised to be able to compete abroad, i.e. subsidies obscure the SOE's underlying inefficiency. Thus, countervailing duties on behalf of the EU are justified on the basis of unfair trade practices in CEECs. In case, however, the SOE would be genuinly more efficient than the foreign (EU) firm, then special interest politics in the EU should explain trade intervention and anti-dumping duties against CEEC imports. This, however, is not the position we take in this model (see Footnotes 3 and 12).

restructuring from Section 2 hold unchanged, home profits under the subsidisation regime are now

$$\pi\,|_{1-q} = (P - c + s - t)X.$$

The foreign government may choose a countervailing tariff against subsidised exports, i.e. in the case $1-q$. This tariff is chosen to maximise foreign welfare W^f,[36] which consists of foreign profits $\pi^f = (P - c^f)X^f$, tariff revenue tX and – given that consumption takes place in the foreign market – consumer surplus $(X + X^f)^2\frac{1}{2}$. The problem can thus be expressed as

$$\max_t W^f(t,s) = (P - c^f)X^f + tX + (X + X^f)^2\frac{1}{2}.$$

This results in a tariff rate

$$t^* = \frac{0.5 + s}{3}.$$

SOCs for a maximum are satisfied.

The less-than-proportional reaction of t^* to s is apparent, since

$$\frac{dt^*}{ds} = \frac{1}{3}.$$

Substituting this result back into π yields

$$\pi\,|_{1-q} = (\frac{4s-1}{9})^2.$$

The results for lobbying in Stage 2 continue to hold, but now we define A' and B' as

$$\begin{aligned} A' &= s\frac{4s-1}{9} \\ B' &= \frac{4\alpha^2}{9} - \gamma\frac{\alpha^2}{2} - (\frac{4s-1}{9})^2. \end{aligned}$$

and compare both regimes for given levels of s in Table 2.

Given that, for given levels of s and α, the proportion of firms that are restructured under the tariff regime q' is higher than when countervailing tariffs are absent q, countervailing tariffs act as a constraint on the size of the subsidised sector. We summarise this in the following proposition:

Proposition 8 *Countervailing tariffs induce more firms to restructure.*

Note that the above proposition only holds for similar levels of s and α. This need not be the case, since optimally chosen levels of s^* and α^* might differ under a countervailing tariff regime. To compare total outlays for subsidisation under the two regimes (with and without the tariff), we also need to solve for s^* in the former case. The total subsidy budget consists of the unit subsidy s^* multiplied by the number of production units $X\,|_{1-q,s^*}$, times the proportion of firms subsidised $(1-q)\,|_{s^*,\alpha^*}$. It is easy to show that in the countervailing regime, the optimal solution for α^* is found at $\frac{3}{2}$, as in the benchmark case. However, to find the optimal solution to s^*, we must rely on numerical simulations. Figures 3 and 4 compare

[36] If the tariff entirely closes the gap created by the introduction of a subsidy, i.e. $s = t$, all incentives to lobby for subsidisation disappear and restructuring becomes the way to go as long as $\gamma < \frac{8}{9}$ makes restructuring attractive.

without tariff		with tariff
$X\mid_{1-q} = \frac{2}{3}s$	$>$	$X\mid_{1-q} = \frac{4s-1}{9}$
$\pi\mid_{1-q}\mid_{1-q} = \frac{4}{9}s^2$	$>$	$\pi\mid_{1-q} = (\frac{4s-1}{9})^2$
$RF : C_{soe} \longrightarrow C_{sme}$	$>$	$RF : C_{soe} \longrightarrow C'_{sme}$
$RF : C_{sme} \longrightarrow C_{soe}$	$>$	$RF : C_{sme} \longrightarrow C'_{soe}$
$q = \frac{A}{A-B}$	$<$	$q' = \frac{A'}{A'-B'}$

Table 2: Comparing the Baseline model with the Countervailing Regime

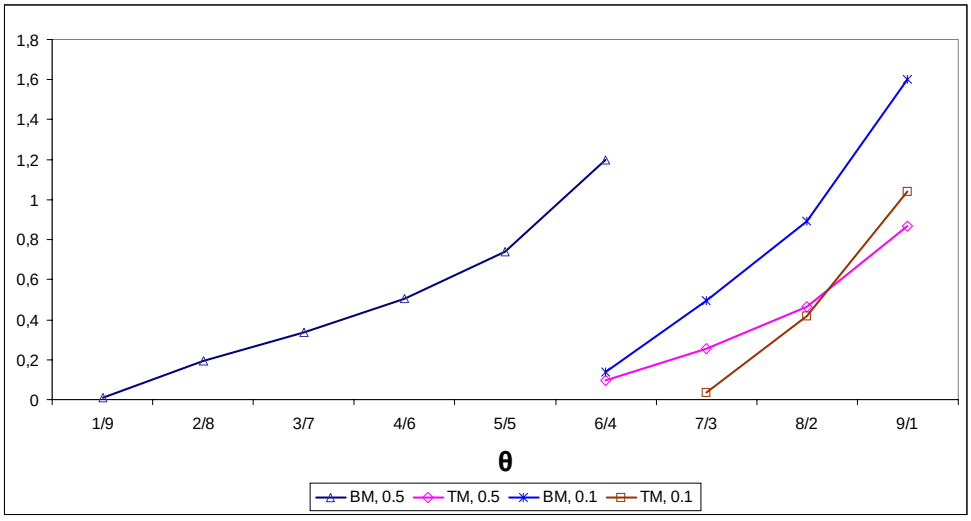

Figure 3: Total subsidy outlays, $\gamma = 0.25; \gamma = 0.75$

total subsidy outlays $s^* X\mid_{1-q,s^*} (1-q)\mid_{s^*,\alpha^*}$ under the two regimes for different values of γ and ϑ. The relative weight of politicians' self-interest motive versus their concern for general welfare, i.e. ϑ, is indicated on the X-axis. The abbreviations BM and TM refer to results from the benchmark model and the tariff model, respectively. The value for γ is specified after the comma.

Note that s^* is not defined for all combinations of ϑ and γ (something we also encountered in the benchmark model). Comparing total subsidy spending under the two regimes for values of γ and ϑ,where s^* is defined, leads us to an even stronger conclusion than proposition 8. Not only are the proportion of subsidised firms lower under the countervailing regime for given levels of s; also at optimal levels of s^* total subsidisation outlays are lower in the presence of countervailing tariffs. We summarise this in the following proposition:

Proposition 9 *Countervailing duties restrict the total budget on subsidisation.*

The intuition is that countervailing duties punish firms that rely on subsidies and push them towards restructuring. This result implies that an external constraint such as EU trade

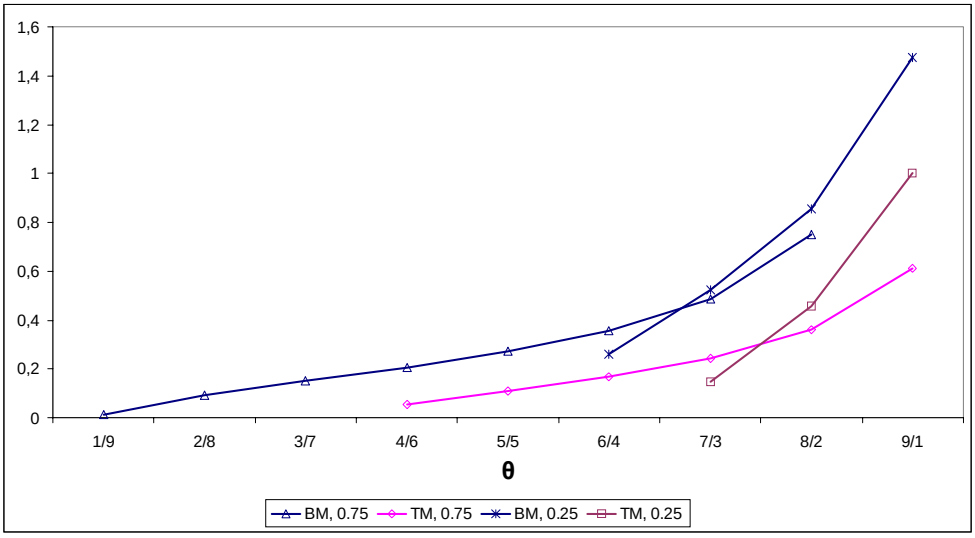

Figure 4: Total subsidy outlays; $\gamma = 0.1; \gamma = 0.5$

policy may help harden budget constraints in transition countries. In our approach, hardening of budget constraints is effected both through promoting restructuring of uncompetitive firms and through restricting the total budget spent on subsidisation. Thus, given the fact that domestic politicians cannot credibly commit to enforcing restructuring (a first-best solution for the home country, see Section 4), action by the foreign government might help bring about this result. Remarkably, this result comes about when the foreign government acts fully in its own interest, optimising its own social welfare by levying a welfare maximising countervailing tariff. This highlights the advantage of our approach. Whereas previous approaches to harden budget constraints stressed the need to privatise or demonopolise, or the need to postpone EU application, they consistently overlooked the problem that committing to successful privatisation and demonopolisation or committing not to apply to EU membership before firms are restructured, might be as big a problem as committing to hard budget constraints. The advantage of our approach lies in the fact that domestic politicians in our model endogenously respond to policies that are entirely outside their discretion, but are optimal for the foreign government. It avoids shifting the commitment problem, and thereby may be well worthwhile for policymakers to explore.

Our proposition in no way implies that we advocate reversion to protectionist policies. While we are aware that some EU anti-dumping actions may have involved concessions to special interests, in our model, special interest politics play a role in the transition country. This gives rise to unfair trade practices in the CEECs against which welfare "restoring" tariffs are levied. In a first-best scenario, EU-style competition policies in transition countries would be enforceable and granting aid to inefficient firms would be prohibited. Hence, countervailing policies would be made redundant. However, given the lack of commitment on the side of domestic politicians to enforce budget discipline and the lack of commitment to implement privatisation or demonopolisation programmes that wrest vested interests from the socialist system, we argue second-best policies such as levying countervailing duties might help overcome commitment problems domestic politicians are facing.

4 The social planner

We now turn to the implications for social welfare. A dictatorial social planner is not subject to lobby behaviour, so we leave out contributions in calculating aggregate welfare. Comparing the decisions of a social planner with the results obtained under Section 2 and 3 reveals the economic cost of political competition. More specifically, we compare

$$W\mid_q = F + (P - c^R(\alpha))X - \gamma\frac{\alpha^2}{2} = F + \frac{4\alpha^2}{9} - \gamma\frac{\alpha^2}{2},$$

and

$$W\mid_{1-q} = F - sX + (P - c + s)X = F - \frac{2s^2}{3} + \frac{4s^2}{9} = F - \frac{2s^2}{9},$$

where it is apparent that aggregate welfare is higher in the case of restructuring

$$W\mid_q > W\mid_{1-q}, \forall s > 0, \gamma < \frac{8}{9}.$$

Moreover, we can show that with $\gamma < \frac{8}{9}$

$$\frac{dW}{d\alpha} > 0 > \frac{dW}{ds}.$$

This result is summarised as:

Proposition 10 *The social welfare planner prefers to impose maximal restructuring on the entire declining sector of the economy.*

This result is in line with the literature on SBCs that emphasises its destructive consequences for general welfare (see Section 1). SBCs are *never* welfare-enhancing ($\gamma < \frac{8}{9}$).

5 Conclusion

In this paper, we developed a political-economy framework to analyse a firm's choice between investing in new technologies and lobbying for state support. We created a two-country, two-sector model with rivaling political parties that mirror the interests of winners and losers of SBCs. Lobby groups in our model attempt to affect policy outcomes by contributing to political parties, which, in turn, determines the relative proportion of restructured to subsidised firms. However, in accordance with Magee et al. (1989), the levels of restructuring and subsidy levels are chosen in a previous stage by the respective parties. This approach was taken to emphasise the endogenous nature of state aid to firms, especially if we consider state support to firms as a form of soft budget constraints. The model led to several insights. First, it revealed that firms in the declining industry faced a tradeoff between the cost of lobbying and the benefit of being subsidised, as the former could outweigh the latter. In particular, the model predicts that, in the declining industry, the proportion of restructured firms exceeds the proportion of subsidised firms. Second, levying countervailing tariffs on subsidised exports shifted the decision in favour of restructuring and restrained total budget spending on subsidisation, thereby hardening budget constraints. Thus, the model showed that external constraints such as countervailing tariffs may help establish internal financial discipline where first-best solutions are politically unfeasible. Third, we found that a social

planner will always prefer full restructuring, implying that political competition comes at a cost of lower economic welfare in our model.

The paper leaves several related issues unaddressed. Specifically, further research could try to incorporate dynamic issues explicitly in the model by, say, repeating the stage game of the model or allowing for different production periods. Other possible areas to explore are what happens when the foreign country also has the option to restructure or when the cost of restructuring γ depends on the level of restructuring α. Finally, consideration of the case where firms receive subsidies to support ongoing restructuring efforts could have value.

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Appendix

A Benchmark case: $\pi\,|_{1-q} > \pi\,|_q > 0$

A.1 Model

- For interior or boundary solutions:

$$\begin{aligned} X\,|_q &\geqslant 0 \Longleftrightarrow c_R(\alpha) \leqslant \frac{1}{2} \Longrightarrow \alpha \geqslant 0 \\ X^f\,|_q &\geqslant 0 \Longleftrightarrow c_R(\alpha) \geqslant -1 \Longrightarrow \alpha \leqslant \frac{3}{2} \\ X\,|_{1-q} &\geqslant 0 \Longleftrightarrow s \geqslant 0 \\ X^f\,|_{1-q} &\geqslant 0 \Longleftrightarrow s \leqslant \frac{3}{2} \end{aligned}$$

- Conditions such that reaction functions fall at least partially in a positive quadrant
  - Deriving the reaction functions from the FOCs $\frac{dL}{dC_i} = 0$ gives rise a second-order equation with the following solutions

$$\begin{aligned} C_{sme} &= -C_{soe} - 2\varepsilon \pm \frac{1}{2}\sqrt{4A(C_{soe}+\varepsilon)} \\ C_{soe} &= -C_{sme} - 2\varepsilon \pm \frac{1}{2}\sqrt{-4B(C_{sme}+\varepsilon)} \end{aligned}$$

  - Restricting the solution of the Nash equilibrium in contributions to positive values, we rule out the possibility of

$$\begin{aligned} C_{sme} &= -C_{soe} - 2\varepsilon - \frac{1}{2}\sqrt{D_{sme}} \\ C_{soe} &= -C_{sme} - 2\varepsilon - \frac{1}{2}\sqrt{D_{soe}}. \end{aligned}$$

    Hence, we are left with reaction functions that are possibly positive for some values of the other lobby's contributions.
  - The reaction function of C_{sme} exhibits positive values when

$$\begin{aligned} -C_{soe} - 2\varepsilon - \sqrt{4A(C_{soe}+\varepsilon)} &> 0 \\ C_{soe}^2 + (4\varepsilon - A)C_{soe} + 4\varepsilon^2 - A\varepsilon &< 0 \end{aligned}$$

    Since the coefficient of C_{soe}^2 is positive, where the second-order equation has no roots, $C_{soe}^2 + (4\varepsilon - A)C_{soe} + 4\varepsilon^2 - A\varepsilon < 0$ will never be satisfied. Therefore, we need

$$\begin{aligned} D &= A^2 - 4A\varepsilon > 0 \\ \frac{A}{4} &> \varepsilon \end{aligned}$$

    i.e. ε needs to be sufficiently small. We then have $C_{sme} > 0 \Longleftrightarrow C_{soe} \in \left]\frac{-(4\varepsilon - A) - \sqrt{D}}{2}; \frac{-(4\varepsilon - A) + \sqrt{D}}{2}\right[$. Since $-(4\varepsilon - A) + \sqrt{D} > 0 \Longleftrightarrow -4\varepsilon + A + \sqrt{D} > 0$ for small values of ε, the reaction function will lie in the positive quadrant I (and not in quadrant II where $C_{soe} < 0, C_{sme} > 0$).

– The reaction function of C_{soe} exhibits positive values if, completely analogously, $\varepsilon < \frac{-B}{4}$ and $C_{soe} > 0 \Longleftrightarrow C_{sme} \in]\frac{-(4\varepsilon+B)-\sqrt{D}}{2}; \frac{-(4\varepsilon+B)+\sqrt{D}}{2}[$. With $-(4\varepsilon + B) + \sqrt{D} > 0 \Longleftrightarrow -4\varepsilon - B + \sqrt{D} > 0$ for small values of ε, the reaction function will lie in the positive quadrant where both $C_{soe}, C_{sme} > 0$.

- Conditions for existence of intersection of the reaction function: Equilibrium

  – Substitution of the reaction function C_{soe} into C_{sme} gives rise to solving a second-order equation in C_{sme}.

$$\frac{(A-B)^2}{A^2}C_{sme}^2 + (8\varepsilon\frac{(A-B)^2}{A^2} + 4B)C_{sme} + 4\varepsilon^2\frac{(A-B)^2}{A^2} + 4\varepsilon B = 0$$

  – Solutions exist when the discriminant is positive. Since the discriminant equals $16B^2$, there will always be at least one real solution.

$$C_{sme}^* = \frac{-\varepsilon(A-B)^2 - A^2B}{(A-B)^2}; -2\varepsilon$$

  Solutions will intersect once in the positive quadrant, and once in the negative quadrant.

  – Restricting ourselves to a positive solution yields

$$C_{sme}^* = \frac{-\varepsilon(A-B)^2 - A^2B}{(A-B)^2} = -\varepsilon - \frac{A^2B}{(A-B)^2}$$

  and via the reaction function C_{soe}^*.

$$\begin{aligned} C_{soe}^* &= \varepsilon + \frac{A^2B}{(A-B)^2} - 2\varepsilon + \sqrt{-B(-\varepsilon - \frac{A^2B}{(A-B)^2} + \varepsilon)} \\ &= -\varepsilon + \frac{A^2B}{(A-B)^2} + \left|\frac{AB}{(A-B)}\right| \\ &= -\varepsilon + \frac{A^2B}{(A-B)^2} - \frac{AB}{(A-B)} \\ &= -\varepsilon + \frac{AB^2}{(A-B)^2} \end{aligned}$$

- Conditions for existence and stability of the equilibrium: Alternative approach

  – Interpret the reaction functions as a (dynamic) system of difference equations:

$$\begin{aligned} C_{sme,t} &= -C_{soe,t-1} - 2\varepsilon + \frac{1}{2}\sqrt{4A(C_{soe,t-1} + \varepsilon)} \\ C_{soe,t} &= -C_{sme,t-1} - 2\varepsilon + \frac{1}{2}\sqrt{-4(C_{sme,t-1} + \varepsilon)B} \end{aligned}$$

To write this into matrix notation, do a linear approximation (Taylor expansion) around the intersection point C^*_{sme},C^*_{soe} which gives

$$\begin{aligned} C_{sme,t} &= C^*_{sme} + \frac{dC_{sme,t}}{dC_{soe,t-1}}\Big|_{C^*_{soe}} (C_{soe,t-1} - C^*_{soe}) \\ &= x + ricocsme * C_{soe,t-1} - ricocsme * y \\ C_{soe,t} &= C^*_{soe} + \frac{dC_{soe,t}}{dC_{sme,t-1}}\Big|_{C^*_{sme}} (C_{sme,t-1} - C^*_{sme}) \\ &= y + ricocsoe * C_{soe,t-1} - ricocsoe * x \end{aligned}$$

which is of the form

$$u_t = Au_{t-1} + b$$

and can easily be rewritten, subtracting $u^* = Au^* + b$, as

$$z_t = Az_{t-1}$$

- A solution to $u_t = Au_{t-1} + b$ exists if $(I - A)^{-1}$ exists, i.e. if $det(I - A) \neq 0$.

$$\det(I - A) \neq 0 \Longleftrightarrow ricocsme * ricocsoe \neq 1$$

- Stability is guaranteed if the characteristic roots λ_i associated with $det(A - \lambda I) = 0$ are $|\lambda_i| < 1$.

$$\begin{aligned} det(A - \lambda I) &= 0 \Longleftrightarrow \lambda = \pm\sqrt{-ricocsme * ricocsoe}i \\ |\lambda_i| &< 1 \Longleftrightarrow -ricocsme * ricocsoe < 1 \end{aligned}$$

where we have oscillating behaviour towards stability:

$$\begin{aligned} z_t &= 2(\sqrt{-ricocsme * ricocsoe})^t * \\ &\left\{(c_1 \cos(t\frac{\pi}{2}) - c_2 \sin(t\frac{\pi}{2}))\begin{bmatrix} 1 \\ 0 \end{bmatrix} - (c_2 \cos(t\frac{\pi}{2}) + c_1 \sin(t\frac{\pi}{2}))\begin{bmatrix} 0 \\ \frac{\sqrt{-ricocsme*ricocsoe}}{ricocsme} \end{bmatrix}\right\} \end{aligned}$$

where c_1, c_2 relate to the initial values at time $t = 0$, i.e. relate to z_0 where our dynamic system starts.

- Conditions for equilibrium values to be positive
  - for C^*_{sme}

$$\begin{aligned} C^*_{sme} &= -\varepsilon - \frac{A^2B}{(A-B)^2} \\ &> 0 \Longleftrightarrow \varepsilon < \frac{-A^2B}{(A-B)^2} \end{aligned}$$

  - for C^*_{soe}

$$\begin{aligned} C^*_{soe} &= -\varepsilon + \frac{B^2A}{(A-B)^2} \\ &> 0 \Longleftrightarrow \varepsilon < \frac{AB^2}{(A-B)^2} \end{aligned}$$

	$RF_{sme} : C_{sme}(C_{soe})$	$RF_{soe} : C_{soe}(C_{sme})$
$\frac{dC_i}{dC_j}$	$= -1 + \frac{\frac{2s^2}{3}}{\sqrt{4A(C_{soe}+\varepsilon)}}$ $> 0 \Leftrightarrow C_{soe} < \frac{s^2}{6} - \varepsilon$	$= -1 + \frac{-(\frac{4\alpha^2}{9} - \gamma\frac{\alpha^2}{2} - \frac{4s^2}{9})}{\sqrt{-4(C_{sme}+\varepsilon)B}}$ $> 0 \Leftrightarrow C_{sme} < \frac{-B}{4} - \varepsilon$
$\frac{dC_i}{d\varepsilon}$	$= -2 + \frac{\frac{2s^2}{3}}{\sqrt{4A(C_{soe}+\varepsilon)}}$ $< 0 \Longleftrightarrow \varepsilon \overset{!}{>} \frac{-s^2}{24} - C_{soe}$	$= -2 + \frac{-(\frac{4\alpha^2}{9} - \gamma\frac{\alpha^2}{2} - \frac{4s^2}{9})}{\sqrt{-4(C_{sme}+\varepsilon)B}}$ $< 0 \Longleftrightarrow \varepsilon > \frac{-B}{16} - C_{sme}$
$\frac{dC_i}{d\gamma}$	$= 0$	$= \frac{(C_{sme}+\varepsilon)\alpha^2/2}{\sqrt{-4(C_{sme}+\varepsilon)B}}$ > 0
$\frac{dC_i}{d\alpha}$	$= 0$	$= \frac{-(C_{sme}+\varepsilon)(\frac{8}{9}-\gamma)\alpha}{\sqrt{-4(C_{sme}+\varepsilon)B}}$ $< 0 \Longleftrightarrow \gamma < \frac{8}{9}$
$\frac{dC_i}{ds}$	$= \frac{\frac{4s}{3}(C_{soe}+\varepsilon)}{\sqrt{4A(C_{soe}+\varepsilon)}}$ > 0	$= \frac{\frac{8s}{9}(C_{sme}+\varepsilon)}{\sqrt{-4(C_{sme}+\varepsilon)B}}$ > 0

Table 3: Comparative statics results: reaction functions

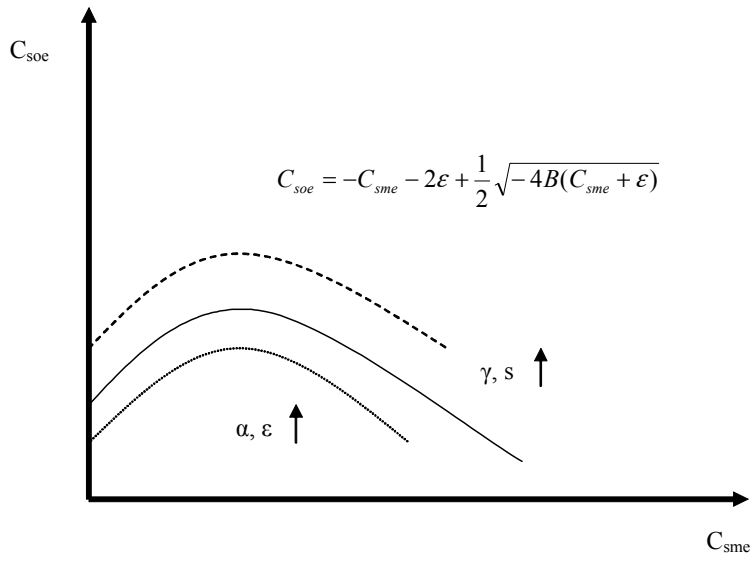

Figure 5: Reaction function C_{soe}

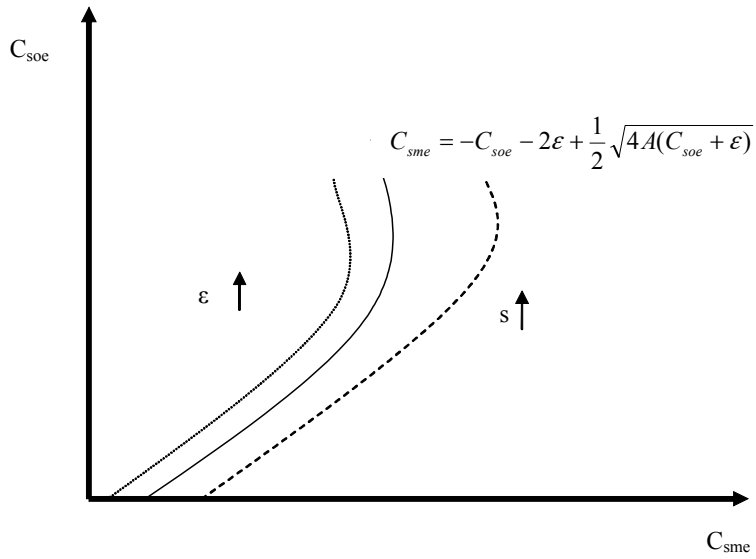

Figure 6: Reaction function C_{sme}

	C^*_{sme}	C^*_{soe}
$\frac{dC_i^*}{d\varepsilon}$	$= -1$ < 0	$= -1$ < 0
$\frac{dC_i^*}{d\gamma}$	$= \frac{A^2(A+B)}{(A-B)^3}\frac{\alpha^2}{2}$ $> 0 \Longleftrightarrow A > -B$	$= \frac{-\alpha^2 BA^2}{(A-B)^3}$ > 0
$\frac{dC_i^*}{d\alpha}$	$= \frac{(-A-B)A^2(\frac{8}{9}-\gamma)\alpha}{(A-B)^3}$ $< 0 \Longleftrightarrow \gamma < \frac{8}{9}$	$= \frac{2A^2B(\frac{8}{9}-\gamma)\alpha}{(A-B)^3}$ $< 0 \Longleftrightarrow \gamma < \frac{8}{9}$
$\frac{dC_i^*}{ds}$	$= \frac{\frac{8s}{9}A(A^2+3B^2+AB)}{(A-B)^3}$ > 0	$= \frac{\frac{-4s}{9}B(3AB+4A^2+3B^2)}{(A-B)^3}$ > 0

Table 4: Comparative statics: equilibrium values

	$q = \frac{C^*_{sme}+\varepsilon}{C^*_{sme}+C^*_{soe}+2\varepsilon}$
$\frac{dq}{d\varepsilon}$	$= 0$
$\frac{dq}{d\gamma}$	$= \frac{\alpha^2}{2}\frac{-A}{(A-B)^2}$ < 0
$\frac{dq}{d\alpha}$	$= \frac{\alpha A(\frac{8}{9}-\gamma)}{(A-B)^2}$ $> 0 \Longleftrightarrow \gamma < \frac{8}{9}$
$\frac{dq}{ds}$	$= \frac{4}{9}\frac{s}{(A-B)^3}(-2A^2 - AB + 3B^2)$ $< 0 \Longleftrightarrow \gamma < \frac{8}{9}$

Table 5: Comparative statics: q

- Comparative statics, reaction functions: See Table 3 and Figures 5 and 6.

- Comparative statics, equilibrium values: See Table 4.

- Comparative statics, q: see Table 5.

  – Remark first that

$$\begin{aligned} \frac{\partial q}{\partial C_{sme}}\Big|_{C^*_{sme}} &= \frac{1}{A} > 0 \\ \frac{\partial q}{\partial C_{soe}}\Big|_{C^*_{soe}} &= \frac{1}{B} < 0 \end{aligned}$$

  – Since $A > -B$,

$$\left|\frac{\partial q}{\partial C_{sme}}\Big|_{C^*_{sme}}\right| < \left|\frac{\partial q}{\partial C_{soe}}\Big|_{C^*_{soe}}\right|$$

    i.e. increasing C^*_{soe} at equilibrium has a stronger negative effect on q than increasing C^*_{sme} in the positive direction.

  – Also, since

$$\begin{aligned} A &= A(\overset{+}{s}) \\ B &= B(\overset{-}{s}, \overset{+}{\alpha}, \overset{-}{\gamma}) \end{aligned}$$

    $\frac{\partial q}{\partial C_{sme}}\Big|_{C^*_{sme}}$ and $\frac{\partial q}{\partial C_{soe}}\Big|_{C^*_{soe}}$ vary with the value of s, α and γ.

- Two special cases for s^* can be envisaged in Stage 1:

  – First, in the case where $\vartheta = 0$, i.e. when politicians maximise social welfare $U_{con} = W$, the choice of s^* will involve zero levels of the subsidy. However, this eliminates all competition on the political market, since both parties will be in favour of maximal restructuring. This is in fact the solution of a social welfare planner (see Section 4).

– Second, the case where political parties care only about their self-interest, i.e. for $\vartheta \longrightarrow +\infty$ and $U_{con} = 1 - q$, the choice of s^* is given by $\lim_{\vartheta \longrightarrow +\infty} s^*(\vartheta)$. This expression goes to infinity for $\gamma < \frac{8}{9}$, but since choices of s are restricted to yield non-negative production levels, the subsidy will be chosen to maximally, i.e. $s^* = \frac{3}{2}$. Alternatively, it is easy to show that, given $\alpha^* = \frac{3}{2}$

$$\frac{d(1-q)}{ds}\Big|_{\alpha^*=\frac{3}{2}} > 0, \forall \gamma < \frac{8}{9},$$

and therefore, subsidy levels will also be chosen maximally, i.e.

$$s^* = \frac{3}{2},$$

provided they do not squeeze SME profits below zero:

$$F \geqslant s^* X\,|_{1-q,s^*}\ .$$

In case

$$F < s^* X\,|_{1-q,s^*}$$

the optimal choice of subsidy level will be constraint by the tax-raising capacity of the SME-sector (Rodrik, 1995) and will yield

$$s^{**} < s^* \text{ s.t. } s^{**} X\,|_{1-q,s^{**}} = F.$$

- In equilibrium, utilities of interest groups are positive:
  - $L_{sme} \geqslant 0$, provided F is large enough
  - $L_{soe} \geqslant 0$, as we can calculate that at $\alpha^* = \frac{3}{2}$

$$\begin{aligned} L_{soe} &= -\varepsilon + \frac{AB^2}{(A-B)^2} + \frac{A(A-B)}{(A-B)^2}(1 - \frac{9}{8}\gamma) - \frac{B(A-B)}{(A-B)^2}\frac{2}{3}A \\ &= -\varepsilon + \frac{\frac{5}{3}AB^2 + (1-\frac{9}{8}\gamma)A^2 - (1-\frac{9}{8}\gamma)AB - \frac{2}{3}A^2B}{(A-B)^2} \end{aligned}$$

which is positive for $\gamma < \frac{8}{9}$!

A.2 Extensions

We briefly discuss some extensions of the model and perform some robustness checks with respect to the model set-up and the assumptions.

- Comparative advantage

  In the benchmark model, we have assumed that the SOE just breaks even when it refrains from restructuring or does not receive any subsidies ($c = \frac{1}{2}$). We could also assume that the SOE is truly loss-making ($c > \frac{1}{2}$) and needs to be bailed out until its profits $\pi\,|_{1-q} = 0$. However, for the SOE to prefer to get bailed out, we still need to assume $\pi\,|_{1-q} > \pi\,|_q$. With $\pi\,|_{1-q} = 0 > \pi\,|_q$ however, restructuring is no longer the first-best solution for welfare. Therefore, also in the case $c > \frac{1}{2}$, we need to assume $\pi\,|_{1-q} > \pi\,|_q > 0$ such that little is changed compared to the analysis in the benchmark case.

- Population and industry distribution

  In the above analysis, we have assumed that in the absence of contributions, firms face an equal chance of being restructured and subsidised. This could be because this is the outcome of a randomised experiment. Alternatively, we could find this result deeper in the structure of the economy, e.g. because employment is equally distributed among the old and the new industry, and that, in the absence of campaign contributions, workers always vote for the party that aligns with the interests of the sector in which they are employed. Then both parties have an equal chance of winning the election. Therefore, $\varepsilon/2\varepsilon$ represents the importance of the growing sector in the total economy or the direct impact of votes of the population. Contributions then shift this proportion towards a different political outcome.

  Now, assume the SME-sector only represents 20% of total economic activity, whereas the SOE is responsible for the remaining 80% of production and employment. How does this affect our results?

  Note first that probabilities over restructuring and subsidisation will be affected accordingly, i.e. in the absence of contributions, 20% of economic activity in the SOE sector will be subject to restructuring, whereas the other 80% of production will be subsidised:

$$\begin{aligned} q &= \frac{C_{sme}+\varepsilon}{C_{sme}+C_{soe}+5\varepsilon} \\ 1-q &= \frac{C_{soe}+4\varepsilon}{C_{sme}+C_{soe}+5\varepsilon}. \end{aligned}$$

  For the reaction functions, this means we now have

$$\begin{aligned} C_{sme} &= -C_{soe}-5\varepsilon+\frac{1}{2}\sqrt{4A(C_{soe}+4\varepsilon)} \\ C_{soe} &= -C_{sme}-5\varepsilon+\frac{1}{2}\sqrt{-4B(C_{sme}+\varepsilon)}. \end{aligned}$$

  Except for a level change, this does not affect our results and the equilibrium values are now

$$\begin{aligned} C^*_{sme} &= -\varepsilon-\frac{A^2B}{(A-B)^2} \\ C^*_{soe} &= -4\varepsilon+\frac{AB^2}{(A-B)^2}. \end{aligned}$$

  Again, there is only a level change in the value of C^*_{soe} and other results are unaffected. Again, $A>-B \Longrightarrow q>\frac{1}{2}$ and results go through. However, the entire tax-absorbing capacity of the SMEs could be smaller in case their share in the economy is relatively small. However, such effects can also be analysed in the framework presented above.

- Spillover effects of restructuring to the SME sector

  Suppose restructuring efforts in the declining sector not only benefit the growing sector indirectly by relieving its tax burden, but also by directly increasing profits by an amount $\delta\frac{\alpha^2}{2}$, i.e. proportionally to the amount of restructuring carried out by the

SOE. The parameter δ captures the strength of these spillover effects.[37] This profit increase could take place because of a better resource allocation in the economy after restructuring, or because of decreased labour overstaffing and decreased demand for other inputs such as energy and raw materials, since they are now used in a more efficiently after restructuring.[38] These inputs are consequently more cheaply available for the growing sector in the economy, increasing its profits.

Including spill-over effects into the lobby utilities yields:

$$\begin{aligned} L_{sme} &= -C_{sme} + q[F + \delta\frac{\alpha^2}{2}] + (1-q)[F - sX] \\ L_{soe} &= -C_{soe} + q[(P - c_R)X - \gamma\frac{\alpha^2}{2}] + (1-q)[(P - c + s)X]. \end{aligned}$$

Equilibrium contributions are completely analogous

$$\begin{aligned} C^*_{sme} &= -\varepsilon - \frac{A''^2 B}{(A'' - B)^2} \\ C^*_{soe} &= -\varepsilon + \frac{A'' B^2}{(A'' - B)^2}, \end{aligned}$$

but now

$$A'' = s\frac{2s}{3} + \delta\frac{\alpha^2}{2}.$$

Assuming spill-over effects to the SME sector are strictly positive, i.e. $\delta > 0$, it is easy to see that, for given levels of α and s, more firms will be restructured, since

$$A'' > A > -B.$$

Note that the comparative statics results will be affected accordingly as we now have $\frac{dA}{d\alpha} \neq 0$.

Alternatively, one could argue that positive spill-over effects only manifest themselves after considerable restructuring effort and that small restructuring efforts or one-sided reforms even generate adverse spill-over effects. In our specification, this would imply, for instance, that we have

$$A''' = s\frac{2s}{3} + \delta_1\frac{\alpha^2}{2} + \delta_2\alpha, \quad \text{where} \quad \delta_2 < 0 < \delta_1$$

Such specifications greatly complicate the comparative statics results. We have thus opted for a simple specification where spill-over effects are assumed to be non-existent.

[37] In a way, this term can be considered the counterpart of the cost of restructuring $\gamma\frac{\alpha^2}{2}$ by the firm in the declining sector.

[38] Kornai (1980) precisely identified SBCs as the cause of perpetual shortages in socialist economies. It was a situation where supply could not keep pace with demand.

B Case: $\pi\,|_q > \pi\,|_{1-q} > 0$

B.1 Stage 2: Contributions

Suppose $B > 0$, i.e. $\pi\,|_q > \pi\,|_{1-q}$. This means that restructuring is now also the preferable policy to the SOE, e.g. because $\gamma < 0$. The "inherent" incentive to contribute has thus changed. Note that the inherent incentive is related to the proportion of the population preferring a restructuring policy. This incentive used to be

$$q\,|_{C_{i,j}=0} = \frac{\varepsilon}{2\varepsilon}.$$

Now, since both the SMEs and the SOE prefer restructuring,

$$q\,|_{C_{i,j}=0} = \frac{2\varepsilon}{2\varepsilon} = 1.$$

Moreover, since no conflict in interest exists any longer, no contributions will be given, i.e. $C^*_{i,j} = 0$. I.e. $L_{i,j}$ is maximised for $C^*_{i,j} = 0$.

B.2 Stage 1: Policy levels

Since

$$q \neq q(\alpha, s)$$

the utility to politicians is now maximised at

$$\begin{aligned} \frac{dW}{d\alpha} &> 0 \Longrightarrow \alpha^* = \frac{3}{2} \\ \frac{dW}{ds} &= 0 \Longrightarrow s^* \in [0; \frac{3}{2}]. \end{aligned}$$

C Case: $\pi\,|_q = \pi\,|_{1-q} > 0$

C.1 Stage 2: Contributions

Suppose $B = 0$, i.e. $\pi\,|_q - \gamma\frac{\alpha^2}{2} = \pi\,|_{1-q}$. This could be because $\gamma = 0$. We can take 2 assumptions here.

- Only restructuring takes place. In this case, we are back in the case where restructuring is strictly preferable.
- 50% of the SOE gets restructured, the remaining part gets subsidised
  - It is immediately clear that an incentive to contribute on the part of the SMEs will continue to exist in this case. Again, taking into account the 'inherent' incentive to restructure, q should be defined

$$q\,|_{C_{i,j}=0} = \frac{3\varepsilon}{4\varepsilon}$$

– Lobby utility L_{soe} will be maximised for the SOE at $C^*_{soe} = 0$, but an explicit incentive to contribute will exist on the part of SMEs. They maximise their utility

$$L_{sme} = -C_{sme} + \frac{3\varepsilon + C_{sme}}{4\varepsilon + C_{sme}} F + \frac{\varepsilon}{4\varepsilon + C_{sme}} (F - \frac{2}{3} s^2)$$

at

$$C^*_{sme} = \begin{cases} -4\varepsilon + \sqrt{\frac{2}{3}\varepsilon s} & \varepsilon < 2\sqrt{6}s \\ 0 & \varepsilon > 2\sqrt{6}s \end{cases}$$

C.2 Stage 1: Policy levels

We solve for our two assumptions.

- Only restructuring takes place. In this case, we are back in the case where restructuring is strictly preferable.
- 50% of the SOE gets restructured, the other gets subsidised
  - For the reformist party, we again have

$$\max_{\alpha} U_{ref} \Longrightarrow \alpha^* = \frac{3}{2}.$$

    The conservative party faces the analogous problem

$$\max_{s} U_{con}.$$

  - We solve for both the case where $C^*_{sme} = -4\varepsilon + \sqrt{\frac{2}{3}\varepsilon s}$ and where $C^*_{sme} = 0$. This corresponds to the cases where ε is small and large, respectively. In the latter case, where ε is large, $s^* = 0$. The intuition behind this result is that, since contributions are zero, q and $1 - q$ are not a function of s, such that U_{con} is maximised where W reaches a maximum. This is at the lowest possible level of s. In the case where ε is small, $C^*_{sme} > 0$. As $\frac{d(1-q)}{ds} < 0$ in this case and W a concave function, we find for low values of ϑ a non-negative solution for s^*. On the other hand, with ϑ high, the sign of $\frac{d(1-q)}{ds}$ dominates. This results in $s^* = 0$. Summarising

$$s^* = \begin{cases} 0 & \varepsilon > 2\sqrt{6}s \\ \sqrt{\frac{9}{2}(-\vartheta + 1 - \frac{9}{8}\gamma)} & \varepsilon < 2\sqrt{6}s; \vartheta < 1 \end{cases}$$

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