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A Note on the International Coordination of Anti-Doping Policies

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Zusammenfassung/ Abstract

We apply ideas put forward in the literature on the international coordination of macroeconomic and trade policies to study the merits of an international coordination of anti-doping policies. Without international coordination of antidoping policies, sports associations and national anti-doping agencies that comply to an international regulatory framework like the World Anti Doping Code are at a disadvantage. We sketch a simple game-theoretic model to illustrate this disadvantage, and the advantage of an international coordination of anti-doping policies. Finally, we address the limitations of our model and how it could be extended in future research.

JEL-Klassifikation / JEL-Classification: L83

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1. Introduction

Many researchers have used techniques of modern game theory to study the effectiveness of anti-doping policies. Much of this research has focused on how to set incentives such that athletes comply with anti-doping rules (Breivik 1992, Bird and Wagner 1997, Eber and Thebot 1999, Berentsen 2002, Maennig 2002, Haugen 2004, Eber 2008, to name just a few). Results of this research show that athletes' incentives to use forbidden illicit substances depend on, for example, the efficiency of doping tests, the fair play norms against doping, and the details of the regulatory system. Less is known about how to set incentives to sports associations and anti-doping agencies to enforce anti-doping rules. Focusing on the incentives of sports associations and anti-doping agencies is important because, as Eber (2002) has shown, sports associations and anti-doping agencies may have an incentive to tolerate a suboptimal level of doping in the absence of binding commitments to a strict anti-doping policy. In order to enforce a binding commitment to a strict anti-doping policy, Eber (2002) suggests that anti-doping policy should be delegated to an institution like the World Anti-Doping Agency (WADA), and that this institution should be independent from sports federations and the International Olympic Committee. In our research, we take Eber's (2002) research one step further to argue that an international anti-doping agency like WADA may also help to resolve the problem of international coordination of anti-doping policies. We argue that in the absence of binding commitments a lack of international coordination of anti-doping policies may inflate doping in international competitions. Our research builds on earlier research in the international macroeconomics (Hamada 1976) and international trade (Spencer and Brandner 1983) literature, where the effects of international coordination of national (economic) policies have been extensively studied by means of game-theoretic models.

In order to develop our argument, we derive the Cournot-Nash equilibrium of a simple two-country duopoly model. In our model, sports associations and national anti-doping agencies minimize a loss function defined over sporting performance of athletes and the prevalence of doping among athletes. We measure sporting performance of athletes relative to the performance of foreign athletes. Moreover, we assume that sporting performance of athletes can be promoted using doping. We argue that in the absence of international coordination and binding commitments, sports associations and national anti-doping agencies have an incentive to inflate sporting performance of athletes relative to the sporting

performance of foreign athletes using doping. If foreign anti-doping agencies, in response to such a policy, seize retaliation measures by loosening their fight against doping, the Cournot-Nash equilibrium shifts to a configuration in which overall sporting performance artificially increases in both countries because sports associations and anti-doping agencies tolerate to a broader extent doping among athletes.

We organize the remainder of this research as follows. In Section 2, we describe the international system of anti-doping agencies. In Section 3, we develop a simple model to illustrate our argument. In Section 4, we discuss our results and offer some concluding remarks.

2. The International System of Anti-Doping Agencies

WADA is a supranational organization that was founded after the World Anti-Doping Conference that took place in 1999 in Lausanne. It has been registered since 2002 in Montreal. WADA tries to coordinate and harmonize on behalf of the IOC (International Olympic Committee) the fight of National Anti-Doping Agencies (NADAs) against doping. It has developed to this end a program (World Anti Doping Code [WADC]) to improve compliance on the side of the international sports federations to the goal of a world wide doping free sport (WADA, 2009). The WADC was then adopted by the World Conference against Doping in Sport on March 5, 2003 in Copenhagen, and subsequently implemented for the first time on occasion of the 2004 Olympic Games in Athens. A revised version of the WADC was enacted on January 1, 2009. The WADC specifies different measures (for example, doping controls in competitions and in training) to reduce the prevalence of doping in sports, and is widely regarded as an appropriate means to make possible an effective the fight against doping. In total, WADA has accredited 34 anti-doping laboratories. These laboratories test blood and urine samples along the lines specified in the WADC and the lists of the forbidden illicit substances. In sum, the WADC is regarded as an important legal instrument backing the international anti-doping campaign, although its effectiveness in fulfilling its objective has not yet been evaluated (Kern, 2007, 44). Houlihan (1999, 9) and Pound (2002, 53) regard WADA as an ``Experiment in International Law".

One critical problem standing in the way of achieving WADA's goal of harmonizing and coordinating the worldwide fight against doping is the lack of compliance on the part of international sports

associations. This lack of compliance is not surprising given that, while trying to cooperate in the fight against doping, international sports associations compete against each other both internationally and in the markets for resources, attention, etc.. The effectiveness of the WADC, hence, depends largely on whether and if so, to which extent, international sports associations are willing to bring their international and national anti-doping regulations into line wit the WDC and to act under the rules of this international regulatory system.

To reinforce compliance, stricter implementation requirements were imposed on international sports associations inasmuch as they were asked to include some provisions verbatim in their subordinate regulatory systems, and deviating regulations with respect to minimum and maximum standards are no longer permissible. Jakob and Berninger (2008, 61 f.) provide a useful overview of important changes in implementation requirements. An institutionalized control and enforcement procedure that allows the international and national implementation and enforcement of the WADC regulations to be monitored, and sanctions in the case of non- or misapplication to be imposed, however, does not yet exist. An immediate consequence is that international sports associations are still forced to cooperate and to fight doping on a trust basis, albeit with the risk that other sports associations in the same sport fail to cooperate and, in fact, do not effectively fight doping. Under such a condition, where compliance to the rules of the WADC is more or less voluntarily, cooperating sports associations which comply to the rules of the WADC are at a disadvantage. In other words, a sports association that enforces doping controls reduces the international winning chances of its athletes as it cannot be sure that other sports associations impose equally effective controls. In this respect, it should also be mentioned that many nations do not even have established a NADA. At the beginning of 2009, there existed in total only 119 NADAs, that is, 85 nations of the 204 nations that participated in the Olympic Games in 2008 had not established a NADA.

WADA only can achieve compliance to the anti-doping rules if international sports associations apply the WADC regulations because international sports associations are responsible for enforcing the application of the WADC by their subordinate national sports federations. International sports associations, therefore, control the application of the anti-doping regulations for the sport that they represent. Delegating this right to control to the WADA, in turn, is not in the interest of international sports associations. In fact, international sports associations have criticized in the past attempts made

by WADA to harmonize regulations by insisting on their right to fight doping along the lines of their own national regulations. Illustrating such a conflict, the dpa (Deutsche Presse Agentur, dpa press release of September 23, 2012) reported: ``UCI is no longer willing to admit WADA representatives as official observers at cycling races in future", and a dpa press release from June 6, 2002, reports: ``FIFA adamantly refused to admit WADA observers to the World Cup". The FIFA (International Football Association), the UCI (International Cycling Association), and the ITF (International Tennis Federation) already had publicly adopted a frontline position on the signing of the WADC (see dpa press release of June 6,.2002): ``FIFA wants to remain autonomous", ``FIFA does not accept WADA's function as a kind of supervisory body".

3. A Simple Model

The world consists of two countries, home and foreign. Every country is populated by a national anti-doping agency and athletes. The anti-doping agency of the home country minimizes the following loss function:

$$L = -\ \lambda\ (\ p - p^*\ ) + (\ 1 / 2\ )\ (\ d - d_T\ )^2, \qquad (1)$$

where $\lambda > 0$ is a weighting factor, p denotes athletes' sporting performance, d denotes the prevalence of doping among athletes, $d_T > 0$ denotes the doping ``target" of the anti-doping agency, and an asterisk denotes a foreign variable. The loss function specifies that the anti-doping agency suffers from a loss if the sporting performance of athletes falls short of the sporting performance of foreign athletes. In some sense, our loss function, thus, can be interpreted to capture the ``keeping up with the Joneses" effect well-known from the macroeconomics literature (see, for example, Pierdzioch 2003). This effect specifies that consumers do not only derive utility from their own consumption, but that, for a given level of own consumption, households feel worse off if other households increase their consumption. In addition, the loss function specifies that the anti-doping agency suffers a loss whenever the prevalence of doping among athletes deviates from the doping target. The quadratic functional form captures the idea that a prevalence of doping lower than the doping target may result in funding cuts and a lower public anti-doping budget. A prevalence of doping that is higher than the agencies' doping target, in turn, may trigger questions concerning the competence of the anti-doping agency. The positive doping

target reflects that the capabilities of a national anti-doping agency to fight doping depend on financial constraints set by its stakeholders (government and sports associations). Even if a national anti-doping agency wanted to detect as many dopers as possible, available financial resources are a binding constraint for a national anti-doping agency, implying that a positive doping target can be interpreted as reflecting a pragmatic anti-doping policy, given financial constraints. The loss function of the foreign anti-doping agency is identical to the loss function given in Equation (1), except that the foreign doping target may differ from the home doping target.

Sporting performance depends positively on the prevalence of doping and negatively on the sporting performance of foreign athletes. The ``production function" of sporting performance is given by:

$$m = c\,d - b\,m^*, \qquad (2)$$

where $c > 0$ denotes the sensitivity of sporting performance with respect to the prevalence of doping, and $0 < b < 1$ denotes the degree of cross-national ``substitutability" of sporting performance. In other words, if a foreign athlete wins an Olympic gold medal in a certain discipline, a home athlete cannot also win a gold medal in the same discipline. The home athlete, however, can still win a silver or bronze medal, implying that the sporting performance of foreign athletes is not a perfect substitute for the sporting performance of home athletes. We, thus, assume that the parameter b is positive but strictly less than unity. We also note that m can be interpreted as a broad measure of sporting performance. This measure of sporting performance does not necessarily refer only to, for example, Olympic medals. The foreign production function is identical to the home production function, except that the roles of m and m^* are interchanged, and d is replaced by d^*.

Minimizing Equation (1) subject to Equation (2), and their foreign counterparts yields the Cournot-Nash equilibrium of the model under *discretionary national anti-doping policies*.[1] Assuming that the home and foreign doping targets are identical, a symmetric international Cournot-Nash equilibrium is given by[2]

[1] For a general textbook treatment of the relevant microeconomic foundation of duopoly models, see Gravelle and Rees (2004), Chapter 16.

[2] Assuming symmetry with respect to doping targets simplifies the analysis, but it also renders possible a comparison of the result given in Equation (3) with the result given in Equation (8) below for the case of an international coordination of anti-doping policies.

$$m = m^* = (\lambda c + d_T) \, c \, (1 - b) / (1 - b^2) \qquad (3)$$

Discretionary national anti-doping policy implies that both home and foreign can set their respective doping targets without consulting the other country. As studied by Eber (2002) in a closed-economy model, such a discretionary anti-doping policy implies that a national anti-doping agency has an incentive to tolerate doping. Even more, the home anti-doping agency has an incentive to actively promote the prevalence of doping by setting a higher doping target, d_T, such that the sporting performance of home athletes increases at the expense of the sporting performance of foreign athletes. Formally, this argument can be illustrated by increasing d_T and holding d_T^* fixed. We get

$$\partial m / \partial d_T = c / (1 - b^2), \qquad (4)$$

which is strictly positive. The corresponding cross-national foreign derivative is given by

$$\partial m^* / \partial d_T = - c \, b / (1 - b^2), \qquad (5)$$

which is strictly negative. The negative cross-national effect of a looser national anti-doping policy, of course, sets an incentive for the foreign country to seize a retaliation measure by increasing its doping target. If both the home and the foreign anti-doping agency increase their doping targets by the same amount, we get

$$\partial m / \partial d_T = \partial m^* / \partial d_T^* = c \, (1 - \mathrm{b}) / (1 - b^2). \qquad (6)$$

This expression is strictly positive, that is, the sporting performance of both countries increases: athletes run faster, jump longer, and they put the shot farther, in a potentially larger number of international competitions. The increase of sporting performance, however, is artificial insofar as it only traces back to a higher prevalence of doping tolerated by anti-doping agencies.

In contrast to the mechanism studied by Eber (2002), the mechanism that gives rise to an incentive to tolerate doping arises in our model because a national anti-doping agency has an incentive to increase

the “market share”' of home athletes in international sporting competitions at the expense of the market share of foreign athletes. In other words, the mechanism that we study rests on the lack of commitment to fight doping in an international setting, whereas the mechanism that Eber (2002) studies rests on a lack of commitment to fight doping that arises because an anti-doping agency is not independent from sports associations. Our mechanism can be effective even if national anti-doping agencies were completely independent of sports associations. At the same time, if national anti-doping agencies are not independent from sports associations, this lack of independence is likely to strengthen the mechanism at work in our model. The mechanism that Eber (2002) studied and the mechanism that is the focus of our analysis, thus, may reinforce each other.

The *international coordination of anti-doping policies* can be modeled by assuming a monopolistic international anti-doping agency. This international anti-doping agency has the exclusive right to enforce anti-doping policies. We assume that the international anti-doping agency maximizes the sum of the home and the foreign loss function.

$$L^c = (1 / 2) (d - d_T)^2 + (1 / 2) (d^* - d_T)^2, \qquad (7)$$

where the loss function, L^c, denotes the loss in the case of coordinated policy, and where we assume that international coordination results in the same doping target at home and abroad. Upon minimizing Equation (7) subject to Equation (2) and its foreign counterpart, and collecting terms, we get the following symmetric international coordination solution:

$$m^c = m^{c*} = c\, d^* (1 + b) (1 - 2b + b^2) / (1 - 2b^2 + b^4). \qquad (8)$$

As expected, sporting performance (and, thus, the prevalence of doping) under international coordination of anti-doping policies is smaller than under discretionary national anti-doping policies ($m^c < m$), illustrating the observations outlined in Section (2).[3] An international anti-doping agency accounts for the negative spillover effect of discretionary national anti-doping policies on the sporting performance of the respective other country.

[3] Note that $(1-b^2) (1 + b) (1 - 2b + b^2) = (1 - b) (1-2b^2 + b^4)$.

4. Discussion

Our simple two-country model illustrates how international coordination of anti-doping policies (or lack thereof) can influence sporting performance and the prevalence of doping. In our model, international coordination of anti-doping policies results in less doping, but before this result can be generalized to derive policy conclusions much more research needs to be done. In order to derive our result, we used a very stylized two-country model in which anti-doping agencies minimize a loss function and the links between sporting performance and doping, on the one hand, and the cross-national link between sporting performance, on the other hand, was rather mechanistic and simple. One could easily imagine other models in which the optimality of international coordination of anti-doping policies versus discretionary national anti-doping policies is more complex. For example, one could imagine that the case for an international coordination of anti-doping policies is weakened if such a policy requires the establishment of a large and potentially resource consuming and rent seeking anti-doping bureaucracy. At the same time, an international anti-doping agency that enforces the international rules of the fight against doping could replace resource consuming and rent seeking national anti-doping bureaucracies. In future research, our simple model may serve as a useful starting point to think about such extensions of our model.[4]

[4] In order to develop other useful extensions of our model, one could draw, for example, on the large and significant literature on the international coordination of macroeconomic policies. See Drazen (2000), Chapter 12, for a useful survey.

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