COMPENSATION UNDER INVESTMENT TREATIES – AS IF HOST INTERESTS MATTERED

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1. Introduction

Investment treaties protect foreign investors from adverse action by the states in which they invest. They do this by granting foreign investors legal rights to compensation for losses caused by certain types of government action.[1] These legal rights are enforceable. If a foreign investor believes that a host state has breached the provisions of the investment treaty, it is entitled to bring a claim against that state to international arbitration. This mechanism is popularly known as investor-state dispute settlement or 'ISDS'. If the arbitral tribunal agrees that the state breached the investment treaty, it will quantify the loss suffered by the foreign investor and order the host state to pay this amount in compensation. These awards can then be enforced around the world.

Foreign investors have used investment treaties to demand compensation for a wide range of government actions, including changes to tax policy, the imposition of new environmental and public health regulations and financial measures taken in response to economic crises. Some such claims have been successful, while others have failed. When successful, awards against host states have run into the billions of dollars. Both the amounts of money at stake and the wide range of government action implicated have raised concerns that investment treaties provide too much protection to foreign investors (e.g. Gaukrodger 2017). Numerous countries are reconsidering or reducing their involvement and the investment treaty regime is widely accepted to be facing a crisis of legitimacy.

In our view, policy responses to these calls for reform should be grounded in an analysis of the underlying economic rationales for investment treaties. In the broadest sense, the economic rationales for entering into investment treaties are to increase social welfare by:

 i. increasing the amount of (beneficial) foreign investment host countries receive; and
 ii. increasing the benefits to foreign investors of making investments.

These can be referred to as host country, and investor (or source country) perspectives, respectively. The host country perspective is particularly important to debates about reform. If host states are to be expected to continue to freely participate in the investment treaty regime, it must benefit them and their citizens also.

Our core insight is that investment treaties as they are currently drafted address two conceptually

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[1] For the purpose of this paper, we ignore provisions found in a minority of investment treaties that require host states to remove restrictions/limitations on incoming foreign investment. Such provisions are known as investment liberalization provisions. Problems of dynamic inconsistency are not relevant to questions of investment liberalization, which concern the governance of foreign investment inflows prior to any capital being sunk by the investor.

distinct economic problems. The first is dynamic inconsistency of host state policy – i.e. the possibility that a host state will offer attractive conditions to new foreign investment and then renege on the bargain once the investment has been made. The second is a broader problem that the host state may undervalue foreign investors' interests when responding to new information throughout the life cycle of the investment. New information, as we understand it, encompasses a diverse range of changing circumstances, including new knowledge about an investment's impacts, changes in commodity prices and underlying shifts in citizens' political preferences. All these events may encourage a state to change the way it regulates foreign investment, to the detriment of an investor. Yet all these circumstances differ conceptually from situations of dynamic inconsistency because, in each case, the host state would have had a different regulatory regime in place from the outset if the new information had been known before the investment was made. In subsequent sections of this paper we develop a simple mathematical model that formalizes and clarifies the relationship between problems of dynamic inconsistency and new information.

Early scholarship on the economics (e.g. Markusen 2001) and politics (e.g. Guzman 1998, 658) of investment treaties assumed that investment treaties purpose was to solve the problem of dynamic inconsistency, principally by guaranteeing that the investor would be compensated in the event of expropriation by the host state. (In the literature, this is sometimes also called the "hold-up" problem.) However, investment treaties as they are currently drafted and interpreted do not focus specifically on problems of dynamic inconsistency (Bonnitcha, Poulsen and Waibel 2017). For example, in *Tecmed v Mexico* a Spanish investor successfully sued Mexico for shutting down a hazardous waste facility in response to community opposition and alleged non-compliance with environmental operating standards; in *Bilcon v Canada* a US investor successfully sued Canada for refusing to grant regulatory permission required for the investor to proceed with the development of a marine quarry. These examples fall squarely within our conception of new information.

There are three reasons to distinguish these problems of dynamic inconsistency from problems of new information. First, as we have already noted, the original economic and political justifications offered for these treaties were grounded in their ability to solve problems of dynamic inconsistency. Second, as we show in this paper, solving problems of dynamic inconsistency generally increases both host and source country welfare. In contrast, redressing a broader tendency for the host state to undervalue foreign investors' welfare when responding to new information does not necessarily increase host country welfare. In other words, a tendency to undervalue foreign investors' welfare is not a "problem" at all from a host country perspective. Third, as an empirical matter, there are doubts about whether foreign investors' welfare is consistently undervalued within host state decision-making (Aisbett and Poulsen 2017). Of course, there are also doubts about whether problems of dynamic inconsistency are as endemic as proponents of investment treaties suggest (Bonnitcha, Poulsen and Waibel 2017). But for the first two reasons articulated in this paragraph, we think the implications for treaty design of a more targeted focus on solving problems of dynamic inconsistency ought to be taken seriously.

In this paper, we argue that investment treaties should be designed to bring Pareto improvements to the partner countries – be they a "host" or a "source" country. To this end, they should be designed and interpreted to provide the minimum protection necessary to solve dynamic inconsistency problems for the host state. Beyond this, they should not attempt to increase the importance of foreign investors' welfare in host state decision-making.

We propose a solution which maintains protection for investors from opportunistic/predatory actions by host states, while allowing host states the flexibility to change rules and regulations in response to new information about the social costs and benefits of an investment. Our solution comes in the form of an integrated liability rule and compensation standard that defines both when a state should be required to compensate an investor for adverse government action and how much compensation should be required.[2]

Our proposal is that a state should only have to compensate the investor if it breaches or modifies the domestic legal regime governing the investment, and that compensation should be the lesser of the investor's loss and the host state's gain from the host state not having had the new legal regime in place when the investment was made. One implication of our rule is that much government conduct for which compensation is currently required should not be compensable. Another implication is that, insofar as compensation is required, it should generally be less than is currently the case under investment treaties. The legal implications of our proposal are explored in detail in a companion paper (Aisbett and Bonnitcha 2018).

This paper speaks to three related bodies of academic scholarship. The first is the legal and policy scholarship on investment treaties. A great deal of intellectual energy has been expended by legal scholars on arguments about the appropriate "balance" between protection of investors' interests and governments' ability alter laws and regulations governing foreign investment (e.g. Henckels 2014). But this legal analysis is seldom linked to an underlying account of investment treaties' economic rationales. Our paper makes three important contributions to this literature. Our primary theoretical contribution is to show that there is an underlying economic rationale for internationalized legal protection of foreign investment, but that this rationale is much narrower than lawyers seem to assume. Our second, related, contribution is to show how economic analysis can inform the design and development of investment treaties. The third contribution is our argument that rethinking of compensation standards must be integrated into debates about when a government should be liable. Legal scholars tend to see the two issues as distinct (e.g. Dolzer and Schreuer 2012; cf UNCTAD 2012)

This paper also speaks to economic scholarship on the legal protections that investment treaties provide to foreign investors. This body of scholarship uses economic techniques to model the efficiency and distributive effects of investment treaty provisions under various combinations of simplifying assumptions. Although this body of scholarship is still in its infancy, it has already generated important insights, notably by casting doubt the view that stronger legal protections for foreign investors are justifiable from an efficiency perspective (Aisbett, Karp, and McAusland 2010a). We advance this literature in three ways. The first is by developing more sophisticated models of the underlying investment disputes. Economic scholarship on investment treaties has focused on modelling the impact of legal rules that require governments to compensate investors for actions that completely destroy an investment (e.g. Aisbett, Karp, and McAusland 2010b: Horn and Tangeras 2016). In contrast, many investment treaty disputes concern situations where government action does not result in the complete destruction of an investment. Well known examples include disputes

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[2] By liability rule, we mean a legal rule specifying the circumstances in which a host state is required compensate a foreign investor. By compensation standard, we mean a legal rule specifying the amount of compensation to be paid if the liability rule is breached. These concepts correspond to 'merits' and 'quantum' issues respectively in investment treaty arbitrations. We use the term compensation rule when referring to a composite rule that specifies both issues.

relating to regulated utility pricing. We develop a general model that addresses the more complex issues that arise in disputes that do not involve complete shutdown of an investment.

The final body of scholarship to which this article speaks is the wider law and economics literature on legal rules that require governments to compensate private actors for loss caused by government action. This literature spans work on government liability for 'takings' and 'regulatory takings' of property under the 5th amendment to the US Constitution (e.g. Michelman 1967; Been and Beauvais 2003), as well as work on liability and damages for breach of contract by government (e.g. Fischel and Sykes 1999).[3]

We build on a line of scholarship within this literature that has grappled with the same intuition that animates this paper. In a foundational contribution, Sax (1964) argued that governments should be required to compensate for *use* of private property but not for regulation of private property. Insofar as the "investment" in question is a physical asset, this distinction roughly corresponds to our distinction between dynamic inconsistency and wider problems of new information. Rubenfeld (1993, 1116) developed Sax's approach by arguing that government action does not constitute a using when the state's interest in regulating an investment would be "equally well served by destroying that thing altogether". Rossi and Rose-Ackerman (2000, 1478) pursue a similar intuition in distinguishing between 'government as purchaser' and 'government as policymaker'. Van Aaken (2009, 519) argues that investment treaties should require the host state to compensate foreign investors for governmental action that is opportunistic but not for governmental action that is a response to unanticipated contingencies. Although the terminology used in each of these articles is different, they all grapple with the same underlying distinction between problems of dynamic inconsistency and new information.

This line of scholarship suffers two limitations. First, these scholars share the implicit assumption that government action can be characterized as *either* the result of a dynamic inconsistency in optimal government policy *or* as a response to new information. There is no economic justification for this assumption, and in many common fact scenarios the two conceptually distinct problems will be interwoven. For example, in *Crystallex v Venezuela* the foreign investor had made a series of payments to the Venezuelan government and to a Venezuelan state-owned enterprise to acquire mining rights for Las Christinas site. Venezuelan authorities subsequently rejected the investor's application to develop the site citing 'concerns for the environment and the indigenous people of the Imataca Forest Reserve'.[4] The fact that Venezuela had benefited from the sale of mining rights that were later effectively cancelled suggests dynamic inconsistency. The fact that Venezuela sought to justify its action based on an impact assessment conducted after the investor's acquisition of the mining rights suggests policy change in response to new information. Second, this line of scholarship does not develop a formal model that might anchor lawyers' attempts to characterize government conduct as functionally equivalent to that of a "purchaser" or "policymaker".

Our paper develops the literature by dealing with situations in which government action that falls somewhere in between these the two ideal types of purchaser/user and policymaker/regulator. We

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[3] In seminal work, Cooter (1985), argued that common problems of reliance and precaution arise regardless of whether the basis of a legal claim for compensation is characterized as arising from interference with property, breach of contract or tortious damage.

[4] Para 44.

do this by developing a formal (mathematical) model that gives clarity and precision to the relationship between the conceptually distinct, but empirically intertwined, problems of dynamic inconsistency and new information.

2. Understanding the economic "problems" and canonical compensation rules to "solve" them

In this section, we develop a basic model to formalize the relationship between problems of dynamic consistency and problems of legal change in response to new information. We consider two canonical compensation rules that have been proposed to fix these problems. We use our model to illustrate the impacts of these two compensation rules on investor and host country welfare.

We try to keep our model as simple as possible. We include the standard model features which are used by proponents of compensation rules in investment treaties or national law (e.g. Miceli and Seggerson 1994; Markusen 2001). We define host-country welfare as an unweighted sum of everything except investor welfare. As such, host welfare includes costs and benefits to the host state itself (such as the benefit of increased tax revenue), as well as costs and benefits for communities affected by the investment (such as the cost of environmental pollution associated with the operation of an investment). We assume that the host state maximizes host country welfare, but completely ignores the impacts of its decisions on foreign investors. By assuming the host completely ignores the welfare of the foreign investor, we are making a conservative (and not necessarily realistic) assumption, which will tend to overstate the need for investment treaties.

Our model also favours the need for investment treaties by assuming a "one-shot game" between the host and investor. That is, we assume the host does not consider the possibility of future investment (by the same or other investors) being affected by its actions. This assumption will mean that the host in our model will act more myopically than hosts can be expected to in reality – especially those trying to improve their investment reputation and attractiveness.

Finally, we would argue that while our model is intentionally simple, it is not simplistic. By concentrating on the essence of the issues, we believe we have constructed a model that is both simple enough to be easily understood, and general enough for its results to be applicable to very complex real-world investment disputes.

Terminology

Before we begin with formal modelling, some clarification of terminology is in order. We use the term host state to refer to the entire governmental apparatus of the host country. This is consistent with the use of the term "host state" in the legal literature on investment treaties. As a matter of legal doctrine, the host state is understood as a unitary entity that is liable for breaching investment treaties as a matter of international law. For the purposes of this paper, the difference between "host state" and "host country" is not significant, because we assume that the host state maximises host country welfare. However, this distinction could be important in future extensions of our work – for example, application of our model to scenarios in which the host state's decision-making function undervalues the welfare of some host country constituencies (e.g. indigenous communities) and prioritizes the welfare of others (e.g. domestic political elites).

Regardless of whether an investment treaty is in place, foreign investment is governed in the first

instance by the host state's <u>domestic legal regime</u>. We use the term 'domestic legal regime' throughout the remainder of the paper to include the combination of rights and obligations created by any contract negotiated between the investor and the host state, as well as the powers of the host state to tax and regulate the investment under laws in force at the time the investment is made. The domestic legal regime governing the investment hence covers issues from permissible uses of land and other assets, through mandatory regulatory requirements, and tax, royalty and pricing arrangements. The investment's operating licenses – including any pre-specified taxes and charges for pollution, or royalty payments – also comprise part of the host state's domestic legal regime.

We conceptualize an investment treaty as a single compensation rule that provides an additional layer of legal protection to foreign investment over and above the domestic legal regime. This compensation rule provides some degree of protection against a host state's:

  - *Change* in its legal regime to the detriment of the investor; or

  - *Breach* of its own legal regime to the detriment of the investor.

This conceptualization of investment treaties as constraints on breach or change of the domestic legal regime reflects our understanding of the underlying economic rationales for investment treaties. Problems of dynamic inconsistency and problems of policy change in response to new information relate to the risk of changes in the way the host state treats a foreign investment once the investment has been made. An investor should not be entitled to complain if it is treatment is consistent with the domestic legal regime in force when the investment was made.

Of course, this characterization is also a simplification of the actual legal content of investment treaties to some extent. For example, the text of investment treaties requires a state to pay compensation for expropriating a foreign investment, regardless of whether that expropriation follows from a breach or change in the domestic legal regime. But such situations are exceedingly rare in practice. States invariably guarantee, through their domestic legal regime, that they will not expropriate property without paying compensation (Shan 2012, 47-53). The economic rationale for an investment treaty comes from the fact that the host state retains the power to ignore or change its own legal regime to the detriment of the investor. As an empirical matter, the vast majority of investment treaty claims to date stem from allegations of breach or change in the domestic legal regime.

A <u>compensation rule</u> specifies both when a state should be required to compensate an investor for change or breach of the domestic legal regime governing the investment, and how much compensation should be required. These rules are assumed to be perfectly enforceable.

In this section, we model and compare three options:

  1. No compensation rule – i.e. the absence of an investment treaty.
  2. Strict compensation rule – a hypothetical rule that requires the host state to pay full compensation for any losses arising from any breach or change of the domestic legal regime. Although principally used as analytical tool for comparison in the economic literature (e.g. Blume, Rubinfeld and Shapiro, 1984; Aisbett, Karp, and McAusland, 2010a), this rule is a close approximation of the actual legal content of investment treaties that contain "umbrella clauses". Such clauses have been interpreted as strict constraints on any breach or unilateral change of the domestic legal regime.

3. Miceli-Seggerson (MS) rule – a hypothetical rule that requires the host state to pay full compensation if, and only if, the breach/change of the domestic legal regime was globally inefficient (Miceli and Seggerson 1994). This is another canonical rule in the literature. It is a rough approximation of the legal content investment treaties that do not contain umbrella clauses but do guarantee foreign investors "fair and equitable treatment" (Bonnitcha and Aisbett 2013). Fair and equitable treatment, is the most well-known and widely litigated legal provision found in investment treaties. Tribunals applying this provision often engage in *ad hoc* balancing exercises to determine whether the host state's conduct is unreasonable, arbitrary or disproportionate.

We model and evaluate each of these three options as applied to increasingly complex fact scenarios. The results of this analysis are also summarized in an Appendix, for ease of reference. In Section 3 we propose a new compensation rule and show that, unlike the strict compensation rule and the Miceli-Seggerson rule, our rule generates Pareto improvements across a wide variety of factual scenarios compared to a baseline in which there is no compensation rule.

Dynamic inconsistency of policy and expropriation of investments

We begin with a simple scenario in which the host state seizes the foreign investor's assets. Such instances of outright expropriation played an important role in historical justifications of the need for investment treaties, and remain relevant today. For example, the recent investment treaty case *ConocoPhillips v Venezuela* arose out of Venezuela's expropriation of the foreign investor's oil projects.

Our simplest model involves a single foreign investor, considering making an investment. The investor's project cost, including the normal risk-adjusted return, is K. Conditional on the host maintaining and complying with the domestic legal regime in place at the time the investment is made, the present discounted value of the project in the second stage is π. The host levies taxes on π at an agreed rate t, thus the value to the investor of the project under the domestic legal regime in place at the time of investment is $\pi (1 - t)$. We assume that $\pi (1 - t) - K > 0$ – i.e. that the investor's net return in the absence of any breach or change of the domestic legal regime is positive, otherwise it would not have invested. The value of π is known ex ante and observable by all parties, including the investor, the host state, and the arbitrators who decide any claims arising under an investment treaty. In the first period the investor decides whether to invest or not.

In the second period the host state may choose to seize the investor's investment in its entirety, in breach of the domestic legal regime. This direct expropriation generates net benefits for the host state, R. For now, we assume that $R > t\pi$. Hence, in the second period the host state will always choose to expropriate. Knowing this, the investor will not invest. This is the classic dynamic inconsistency problem. Both the investor and host country are worse off because the host state's optimal policy *ex ante* and *ex post* diverge, and it cannot commit credibly to not expropriating.

The most common proposed solution to this problem is that the host state bind itself to enforceable, legal rules that require it to pay full compensation for any expropriation – for example, through an investment treaty. This is the strict compensation rule. Full compensation in this context refers to the fair market value of the expropriated asset. Under the assumption that $R < \pi$ – i.e. that the host state cannot produce more surplus from operating the investment than the investor can – this

compensation rule is sufficient to prevent the host expropriating.[5] The result is that the host state's behaviour is both dynamically consistent and efficient, the investor invests and receives $\pi (1 - t)$, the host state receives πt and both parties are unambiguously better off.

However, small modifications of this model to make it more realistic are sufficient to destroy this result. Assume now that there are heterogeneous investments and that π and R for any given investment are random variables. This is consistent with the observations that investments in different sectors are diverse, and that the prospects of any investment considered individually depends on factors such as global market prices and macro-economic conditions in the host state, which are inherently uncertain. The supports for these random variables overlap, so for some investments $R < \pi$ as before, but for others $\pi < R$. Similarly, R may be either greater or less than πt. Let the proportion of investments for which $R < \pi t$ be q_1, and the proportion for which $R < \pi$, q_2. In the absence of an investment treaty, the expected value of a given investment for the investor is $E_I = (1 - q_1)(1 - t)\pi - K$. The investor will therefore invest if

$$\pi > \underline{\pi}_I = \frac{K}{(1 - t)(1 - q_1)}$$

For the host, the expected value of an investment is $E_H = (1 - q_1)t\pi + q_1 R$. Hence, in the absence of an investment treaty, the expected value of an investment is always positive for the host (the investments that are foregone due to the lack of a compensation rule would have been beneficial to the host country). Ceteris paribus the host country benefits if more investment is encouraged by lowering $\underline{\pi}_I$. An investment treaty can help to achieve this, but it comes at a cost.

Consider the strict compensation rule. The minimum expected profit at which an investor would still invest becomes

$$\underline{\pi}_I^L = \frac{K}{(1 - t)}$$

Hence the risk of expropriation no longer has any depressing effect on investment. The investment treaty has encouraged investment, but it has done so at the cost of the expected value of each investment to the host. The host will now have to be satisfied with πt instead of R for investments with $\pi t < R < \pi$, and it will have to pay compensation of π on investments it expropriates (those with $R > \pi$). Hence the net effect of such a rule on host welfare is ambiguous. This ambiguity was absent in the simpler model, because it was assumed that the host state would always expropriate and hence the investor would never invest.

It is also worth noting that the globally efficient level of investment is achieved at $\underline{\pi}^* = K$. Although the strict compensation rule makes the host's actions efficient and dynamically consistent, and ensures that expropriation never harms the investor, there remains under-investment relative to the globally efficient level. The reason for this is that the investor bears all of K but does not capture the full benefit of their investment whenever $t > 0$. The strict compensation rule cannot achieve the first best level of investment despite eliciting efficient behaviour from the host, because it does not elicit such from the investor. Indeed, this well-known problem plagues the design of legal rules governing bilateral

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[5] Note, also, that under this assumption the application of the Miceli-Seggerson rule to this scenario is indistinguishable from the strict compensation rule, as expropriation is always globally inefficient.

interactions more generally. The investor ignores the potential benefits to the host from its investment at least as much as the host ignores the potential costs of its actions to the investor. A well understood application of the theorem of the second best in this context shows that a rule which only elicits efficient behaviour from the host will not optimize global efficiency, and indeed is not even guaranteed to improve global welfare. Such a compensation rule is even less likely to improve host country welfare, meaning that we cannot be sure it is Pareto improving.

The conclusion that the strict compensation rule still leaves us in a state of under-investment relative to the optimal level might sound rightfully odd to many readers. After all, two famous papers — Blume, Rubinfeld and Shapiro (1984) and Kaplow (1987) — have argued that such a rule generally leads to over-investment relative to the socially optimal level. The reason our conclusion thus far differs with these famous papers is that we have focused solely on the case of expropriation of a surplus generating asset — the classic dynamic inconsistency (or "hold-up") problem. The other two papers were considering situations where R=0. Their analysis, therefore, was limited to scenarios in which investments could essentially be shut-down by the government if they were found to be causing harm (e.g. polluting or destroying habitat of endangered species). Let us also consider such a context.

New information and shut-down of harmful investments

We maintain the same set-up as above, except we replace the possibility that the investment generates a potentially valuable residual upon expropriation (R) with the potential that it generates a harm, H, if left in operation. In the interest of simplicity, we assume for now that the host's only options are to put up with the harm, or to shut down the investment. Cases fitting within this fact pattern have been both common and controversial within the investment treaty regime. An example, is *Tecmed v Mexico*. The dispute concerned a hazardous waste disposal facility in Mexico owned and operated by a Spanish investor. The investor's ability to operate the facility depended on retaining an annual operating permit from Mexico's national environmental authorities. As a result of pollution leaks, community opposition to the facility began to grow. In response, the Mexican environmental agency refused to renew the facility's operating permit, forcing the facility to close. However, the Mexican government did not seize the facility and the investor retained ownership of all the physical assets.[6]

In the absence of an investment treaty, the government will choose to shut-down the investment whenever $H > \pi t$. Let the probability that this happens be p_1. The expected value to the host of the investment is $E_H = (1 - p_1)t\pi$. It is worth considering first what happens when p_1 approaches one, i.e. the host is certain to shut-down an investment. This creates the analog to the certain expropriation scenario considered in the previous section. And once again, the result will be zero investment, and zero investment is not globally efficient. But there are also some important differences between the outright expropriation scenario and the harm/shut-down scenario. In the latter scenario not all the foregone investments would have been globally efficient, only those for which $H + K < \pi$. Furthermore, a host state's optimal policy is not dynamically inconsistent in the shut-down case. Both before and

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[6] A further layer of complexity in *Tecmed v Mexico* arises from the fact that the investor had acquired the facility from the municipal government through a tender process two years prior to the point at which the environmental agency refused to renew its operating permit. However, for unrelated reasons, the tender process and associated payment were outside the scope of the tribunal's jurisdiction. As such, the case was decided without any analysis of their significance. To illustrate the new information/shut-down as simply as possible, we follow the *Tecmed* tribunal in ignoring the significance of tender process and associated payment.

after investment took place, the host's optimal policy would be to shut down/not allow the investment if it knows the investment will cause $H > \pi t$. Finally, the host state has no interest in increasing investment in the shut-down case – the foregone investments were of negative value to the host country.

Despite the lack of benefit to host countries, the principle that governments should be required to pay full compensation whenever they shut down an investment – i.e. the strict compensation rule – has been considered as a means of avoiding inefficient over-regulation. However, as we will see below, full market-value compensation for any shut-down is also well-known not to be able to achieve the global first-best (Blume, Rubinfeld and Shapiro, 1984; Miceli and Seggerson, 1994).

Let us continue to assume that $p_1 = 1$ (and hence all investments are harmful to the host country), but allow now for a probability $0 < p_2 < 1$ that $H > \pi$. Under the strict compensation rule, the host will regulate efficiently and shut-down the investment with probability p_2. The minimum profit at which it is globally efficient to invest is

$$\underline{\pi}^* = \frac{K}{\left(1 - p_2\right)}$$

The minimum profit at which investors choose to invest, however, remains

$$\underline{\pi}_I^L = \frac{K}{(1 - t)}$$

Where t is small relative to p_2, the strict compensation rule induces investors to invest in globally inefficient projects because investors are essentially insured against the risk of future regulatory responses to harmful investments. This is the observation made by Blume, Rubinfeld and Shapiro (1984) and Kaplow (1987).

The most famous solution to the problem of how to simultaneously redress the host state's supposed tendency to undervalue foreign investors' interests while avoiding induced over-investment in globally inefficient projects is the Miceli-Seggerson (1994) (MS) rule. This rule requires full compensation to be paid by the host if, and only if, it regulates inefficiently. With the MS rule in place, the host has no incentive to regulate inefficiently, no compensation is paid in equilibrium and excess investment (from a global welfare perspective) is avoided. It follows that the MS rule is globally welfare improving.[7] However, the MS rule decreases host country welfare compared to the no-compensation case by encouraging investment in projects that leave the host country worse off. All of these conclusions about the MS rule remain when we relax the assumption that $p_1 = 1$. As such, the Miceli-Seggerson rule fails to satisfy our requirement for Pareto improvements.

Mixed dynamic inconsistency and new information

Regulation of harmful investments

Consider now an additional degree of complexity, in which the host state has the option to regulate in a way that avoids the harm without necessarily shutting down the investment. Examples of this scenario include new environmental regulations imposing expensive back-filling requirements on an open-pit mine already in operation, and requirements that an investor operate to higher technical

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[7] Indeed, it returns us to a state of slight under-investment relative to the global optimum, for the same reason under-investment was observed despite the strict compensation rule in the dynamic inconsistency scenario.

standards than were required when the investment was originally approved. The regulation causes a loss, L to the investor. If $L > \pi(1-t)$ the investor will shut-down the investment and we are back in the shutdown case considered in the previous section. Therefore, we will focus on the domain $L < \pi(1-t)$, in which the loss is sufficiently small that the investor does not choose to shut down their investment. We also assume that $L > \pi(1-t)-K$, that is, the loss is sufficiently large that the investor would not have invested if they had known the regulation would occur.[8]

Because the regulation (by assumption in this case) does not cause the investment to shut-down, regulating the investment comes at no cost to the host state *ex post*. Hence, in the absence of an investment treaty the host state will choose to regulate whenever $H>0$. Knowing this, and in light of our assumption that $L > \pi(1-t)-K$, the investor will never invest. However, unlike in the shut-down case, the host state in this scenario would have gained $t\pi$ from allowing and subsequently regulating the investment (were an investment to occur). Thus, we have a scenario where the host state 's optimal policy is dynamically inconsistent *and* the host state is responding to new information. This is a central conceptual insight of our paper.

Note that we have avoided analyzing this scenario in terms of the host state's motive. Indeed, our model shows that a search for the host state's "real" motive in this context is inevitably fruitless. In this scenario the host state's decision-making responds to the presence of *both* new information *and* dynamic inconsistency in optimal policy. This is where our argument departs from law and economics scholars such as van Aaken (2009), who seek to characterize state conduct as *either* the result of new information *or* the result of dynamic inconsistency.

Let us consider the investment and efficiency implications of applying a strict compensation rule in this scenario. The host state will now only regulate if the avoided harm is greater than the compensation payment, i.e. if $H>L$. Hence the host's behavior is efficient. Let the probability that $H>L$ be r_1. The minimum profit required for an investment to be globally efficient is $\pi = K+r_1L+(1-r_1)H$. The minimum profit required for the investor to invest is $\pi = K/(1-t)$, since it is fully insured against the losses caused by regulation. Thus, the strict compensation rule leads to more investment than would be the case in the absence of any compensation rule, but does not in general lead to the efficient level of investment. Investment under the strict compensation rule may be higher or lower than the globally efficient level depending on the relative sizes of H, L, t and r_1. Indeed, the fact that the strict compensation rule encourages investments that are globally inefficient (as well as ones that are globally efficient) means that the imposition of such a rule is not necessarily globally welfare improving.

Now consider the implications of the strict compensation rule for host country welfare. Recall that in the absence of any compensation rule there would be no investment, so the host country's reference welfare is zero. The expected value of an investment is $t\pi -r_1L-(1-r_1)H$. This value is not necessarily positive, reflecting the fact that the strict compensation rule may induce investments which lower host country welfare, regardless of whether the host state chooses to regulate or not. Hence the adoption of a strict compensation rule has an ambiguous effect on host country welfare in this

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[8] This assumption focuses our attention on the domain in which there is a potential for welfare gain from a compensation rule when compared to the no compensation rule situation. If $L < \pi(1-t)-K$ the investor would have invested anyway. In situations where the investor would have invested anyway, a compensation rule brings no global efficiency benefit and is purely distributive in its effects, to the detriment of host country welfare.

scenario.

How does the MS rule perform in circumstances of regulation that do not involve complete shut-down of investments? The minimum profitability required for an investor to invest under the MS rule will be $\pi = (K+r_1L)/(1-t)$. Again, investment will not be equal to the globally efficient level. Although the MS rule is less likely to induce investment that is globally inefficient than the strict compensation rule, it does not completely remove this possibility. (Note, the contrast with the complete shut-down scenario, in which the MS rule does induce the globally efficient level of investment.) The reason for this is that, in the regulation scenario, the host may be left with harm from the investment. This harm is ignored by the investor, when it makes its decision of whether to invest. Hence the introduction of a MS compensation rule has ambiguous effects on global welfare.

Under the MS rule, the expected value of an investment for the host is $t\pi - (1-r_1)H$, which is similarly more likely to be positive than under the strict compensation rule, but not guaranteed to be so. Hence the adoption of the MS compensation rule has an ambiguous effect on host welfare compared to the situation where an investment treaty is absent.

Fiscal transfers

A mixture of dynamic inconsistency and new information may also be involved when the host changes fiscal transfers to or from an investment. These cases form a significant proportion of known disputes under investment treaties. One example is the series of disputes relating to gas distribution concessions arising out of Argentina's financial crisis. Argentina privatised the gas distribution sector in the 1990s. This process involved tendering a series of gas supply concessions to investors. The concessions entitled foreign investors to gas tariffs based on the US Producer Price Index, calculated in US dollars and adjusted twice annually. Successful investors paid hundreds of millions of US dollars to acquire these concessions from the Argentine government. In late 2001, Argentina entered a period of profound economic crisis. The government responded with a range of measures, including removal of the peg that had tied the peso's value to the US dollar since 1992. Having deindexed the peso, continuing to pay gas tariffs tied to the US market would have resulted in a significant windfall gain for the investors. Instead, Argentina unilaterally deindexed gas tariffs, over-riding the agreed terms of the concession contracts.

Legal scholars will not be surprised to learn that these situations of fiscal transfer are mathematically similar to the situations of regulation examined in the previous section. Let the new fiscal transfer that the host state imposes on the investor be T. To capture the fact that most increases in fiscal transfers required of investors are justified by the host on some social or environmental grounds, we again allow for a revealed harm from the investment of $H>0$. Recall our assumptions that the host completely ignores investor welfare and that there are no reputational costs. Under these assumptions, the host state will always choose to demand an increased fiscal transfer once the investment is made, just as the host state always choose to impose new regulation in the scenario examined in the previous section. Knowing this, investors will decline to invest in the absence of a compensation rule. So far nothing new.

Consider now the implications of the strict compensation rule, which requires full market value compensation for any losses to the investor. The analysis is also similar to the regulation scenario examined in the previous section. In the scenario of a pure fiscal transfer, the loss to the investor

exactly equals the gain to the host – both equal T. If the host knows it will have to compensate to the value of T, it will never choose to demand the transfer in the first place. Hence, the investor will choose to invest whenever the private benefits exceed the private costs: $\pi(1-t) > K$. Since the minimum profitability required for the investment to be globally efficient is $\pi = K+H$ it is once again ambiguous whether the strict compensation rule leads to over- or under-investment relative to the globally efficient level. Similarly, it is ambiguous whether committing to such a rule brings benefits to the host since the net value to it of investments is $\pi t-H$ which is not necessarily greater than zero.

Things start to get interesting when we consider the implications of a MS rule in this scenario. This is because a pure fiscal transfer itself has no effect on net global welfare. To the best of our knowledge, the implications of such a knife-edge situation for the application of the MS rule have not been considered in the literature to date. It seems reasonable that the rule could either be interpreted to mean that compensation should never be paid (since the host's actions were not inefficient) – in which case the MS rule is identical to no compensation rule for the fiscal transfer cases. Or it could be interpreted that the host must always compensate (since the host's actions were not efficiency enhancing) – in which case the MS rule is indistinguishable from the full loss compensation rule for the fiscal transfer scenario.

3. A new rule that provides Pareto benefits

The foregoing analysis illustrates that, even under favourable simplifying assumptions, investment treaties' potential to increase host country welfare stems largely from their ability to solve problems of dynamic inconsistency. Indeed, in the harm/shut-down scenario, in which new information is the sole driver of change in the way the host state treats the investment, both the strict compensation rule and the MS rule unambiguously decrease host welfare compared to a situation in which there is no investment treaty. This violates the Pareto principle.

The challenge, then, is to develop a new rule that solves problems of dynamic inconsistency while still leaving host states the flexibility to change the domestic legal regime governing investments in response to new information. Recall that problems of dynamic inconsistency arise if, once the investor's costs are sunk, it is in the host state's self-interest to alter its laws and regulations to obtain a greater share of the benefits of the investment. In these circumstances, investors will be reluctant to invest in projects that would be mutually beneficial for both the investor and the host country. A commitment device, such as a compensation rule in an investment treaty, can solve this problem. To solve problems of dynamic inconsistency, a compensation rule must either:

- remove the incentive for host states to engage in opportunistic conduct of this sort; or
- ensure that, if an investor invests in a mutually beneficial project, it is not at risk of opportunistic state conduct that leaves it worse off than if it had not invested.

These design principles require a fundamental rethinking of the compensation standards contained in investment treaties. Compensation under investment treaties is currently based on the amount the investor has lost from the host state's failure to maintain the domestic legal regime that was in place when the investment was made. This approach to compensation requires a tribunal to construct a hypothetical counter-factual of the situation the investor would have been in *but for* the host state's action of which it complains. In contrast, we suggest that compensation should be based on either the host state's gains or the investor's losses that result from the host state not having had the new

domestic legal regime in place when the investment was made.[9] In other words, the relevant counter-factual should be a hypothetical situation in which the new domestic legal regime was already in place at the time when the investment was originally made.

This leaves the question of whether compensation should be based on the host's gain or the investor's loss from the host state not having had the new domestic legal regime in place when the investment was made. In our view, compensation should be the minimum of the two. There are two reasons for this approach. The first is the Pareto principle. As will become clear from the analysis that follows, a rule that always required compensation equal to the investor's loss from the host state not having had the new domestic legal regime in place when the investment was made would induce investors to make investments that reduce host country welfare but remain profitable to the foreign firm. An example is the situation in which the investor pays a small up-front fee to the host state to acquire a mining concession, the investor's mining activities are subsequently revealed to have catastrophic environmental consequences and the host state responds by shutting down the mine.

The alternative of always requiring the host state to reimburse any gains it has made from not having had the new domestic legal regime in place when the investment was made would discourage host states from taking actions *ex post* which bring it great benefits at small cost to the investor. To illustrate, consider the situation in which a foreign investor buys land with the intention of developing a housing estate. The Ministry of Electricity subsequently realizes that major net savings are possible if all the houses in the new estate install solar panels, the Ministry installs a neighbourhood battery system, and the cost to the Ministry of building new infrastructure to connect the estate to the grid is thereby avoided. This globally efficient outcome could be achieved if the state mandated the solar panels be installed on all the houses in the new estate. However, the state is almost certain not to mandate solar installation if it is required to compensate the investor for all the gains that would be achieved by it.

On this basis, we propose the rule that **when a host state breaches or modifies its domestic legal regime, the host must compensate the investor for the lesser of the investor's loss and the host state's gain from the host state not having had the new domestic legal regime in place when the investment was made.**

The remainder of this section shows the investment, compensation, welfare and efficiency implications of this rule. Specifically, we show that our rule increases both host country welfare and investor welfare, as compared to a situation in which there is no compensation rule. This result holds across all the scenarios considered in Section 2, regardless of whether the host state's conduct is driven by dynamic inconsistency of optimal policy, new information post-investment, or a mixture of the two. Crucially, our rule does not require a tribunal to distinguish whether dynamic inconsistency or new information drives the host state's decision to change or breach the domestic legal regime governing the investment. Instead, our rule is designed in such a way that it targets state conduct only to the extent that it is driven by dynamic inconsistency.

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[9] In cases involving breaches of the domestic legal regime, our reference to the new domestic legal regime refers to a domestic legal regime that would have permitted the host state to engage in the conduct of which the investor complains.

Dynamic inconsistency of policy and expropriation of investments

We once again begin with the classic scenario of direct expropriation, which is the most well-known example of a dynamic inconsistency problem. Our rule requires compensation in this scenario. To calculate the compensation required under our rule, we need to know the gain for the host state and the loss to the investor that results from the host not having had the new legal regime – i.e. a legal regime that authorized uncompensated expropriation – in place at the time the investment was made.

Returning to the model we developed in Section 2, if the host state expropriates the investment, the investor has a net return of −K. If, at the time the investment was made, the host state's domestic legal regime had permitted unilateral expropriation the investor would not have invested, so would have a net return of zero. Hence the investor's loss as result of a domestic legal regime permitting unilateral expropriation not being in place from the outset is K, the investor's project cost. The host state meanwhile has a payoff of R resulting from its failure to observe its commitment not to expropriate. If a domestic legal regime allowing uncompensated expropriation had been in place ex ante, the host would have a payoff of zero also. Hence the host's gain from having breached its own domestic legal regime is R.

If R > K, our compensation rule says that the host must compensate the investor K. In this case, the investor is left indifferent between having invested or not. Since there is a positive probability in general that host states will not expropriate, the expected value of investing for the investor is still positive. Hence the investor will always invest and the problem of under-investment is solved. If R < K, our rule says that the host must compensate R. So the host is left with a zero payoff if it chooses to expropriate ex post. If it does not expropriate, it gets the positive payoff of tπ. Hence the host state will never choose to expropriate in this situation and the investor will invest. Our compensation rule fully efficiently solves underinvestment due to the problem of dynamic inconsistency and achieves a Pareto improvement in expected payoff (and hence global welfare improvement).

New information and shut-down of harmful investments

Next consider the harm/shut-down scenario. If harm occurs and the host state chooses to shut-down the investment, its payoff is zero and the investor's payoff is −K. If the host had told the investor in advance that it would shut-down the investment in the event of harm, the investor would not have invested and both investor and host would have zero payoffs. In this case, our rule says the host pays no compensation, because it gained nothing from allowing and then shutting the investment down. Our rule requires no compensation and hence has no effect in the shut-down case. As such, it avoids the reduction in host country welfare associated with strict compensation rule or the MS compensation rule. This is an important application of our rule and a significant departure from existing investment treaty jurisprudence. Cases in which host states have shut-down foreign investments are both common and controversial in the investment treaty regime. *Tecmed v Mexico*, mentioned previously, is an example.

Consider now a new variation of the shut-down scenario in which the host state *sells* a foreign investor a concession-right to make an investment, as is common in sectors like mining, infrastructure and telecommunications. An example is the case *Crystallex v Venezuela* discussed previously. The sale price in this scenario is an instantiation of R, the residual benefit to the host state of the investment having been made in our model. As in the simple harm/shut-down scenario, the investment is subsequently revealed to cause harm, H, and the host state then has the option to respond by shutting

down the investment. In this case, our rule requires compensation to be the lesser of R and K. In other words, compensation in this scenario will, at most, require the host state to reimburse the payment the investor made to acquire the concession. This is another empirically important example of our rule's operation in practice, and a significant departure from existing investment treaty jurisprudence.

Mixed dynamic inconsistency and new information

Regulation of harmful investments

Next consider the case in which the host has the option to regulate in a way that avoids the harm without shutting down the investment. This scenario involves both dynamic inconsistency and new information, and clearly illustrates the underlying logic of our rule. Here, again, we return to the model from Section 2.

Under the assumption that L is sufficiently large that the investor would not have invested if it had known the regulation would occur – i.e. $L > \pi(1-t)-K$ – the host state has a gain of $t\pi$ from not having had its final regulatory policy in place at the time the investment decision was made. The corresponding loss for the investor is $K + L - \pi(1 - t)$. The required compensation is the lower of these two values and the host state will choose to regulate only if the value of the avoided harm is greater than the required compensation. The combination of decreased probability of regulation and guaranteed compensation in the case of regulation means that investment (and investor welfare) will increase (compared to the no compensation rule case). Since the host state never has to compensate more than it has gained from an investment, ex ante host country welfare has also unambiguously increased. Since both investor and host country are better off, our rule has also unambiguously improved global welfare.

Fiscal Transfers

The analysis of changes in fiscal transfers to or from the investor is similar to the regulation scenario, yet different enough to be interesting. In the fiscal transfer scenario the host state imposes a new tax of T on the investor after the investment is made. Under the assumption that T is sufficiently large that the investor would not have invested if it had known that the transfer would be imposed – i.e. $T > \pi(1-t)-K$ – the host state's gain from allowing the investment and then imposing the fiscal transfer is $t\pi+T-H$. The investor's loss is $K + T - \pi(1 - t)$. Our rule requires compensation $\min(t\pi+T-H, K + T - \pi(1 - t)) > 0$. In this way, our rule allows a host state some flexibility to vary or violate the agreed fiscal regime governing the investment. However, the effect of our rule is to ensure that such ex post variations are fair to the investor, in the minimal sense that, where the host state has gained from allowing an investment and subsequently varying the agreed fiscal regime, the investor at least is not left worse off from having made the investment. This minimal protection has important incentive effect in encouraging mutually beneficial investment to go ahead. In this scenario, as in all the others – our rule achieves a Pareto improvement in welfare compared to a situation where there is no compensation rule.

Until now we have assumed that the investor would not have invested had the new domestic legal regime been in force when the investment was made. In scenarios in which the investment is not fully expropriated or shutdown, however, it is possible that the investor would have invested anyway. It is important to note that, in such scenarios, the host state has not gained anything by subsequently changing its legal regime, as compared to a counter-factual in which the new domestic legal regime had been in place when the investment was made. Hence our compensation rule implies there is no

compensation due when the investment would have taken place anyway under the modified domestic legal regime.

An empirically important application of this analysis is when mineral prices rise more than expected, leaving investors with windfall gains. Host states typically respond by trying to reclaim some of these windfall gains through higher taxes. For example, in *Paushok v Mongolia* a foreign gold mining company sought compensation for Mongolia's introduction of a new windfall profits tax on gold sales. The tax was a response to the boom in commodity prices during the 2000s, and was calculated at the rate of 68 per cent on the portion of the sale price exceeding a base price of USD 500 an ounce. There was no suggestion that the tax increase made the investment unprofitable from an *ex ante* perspective. The tribunal in this case did not award compensation to the investor, partly because the investor had not negotiated a specific agreement with the host state to freeze the rate of tax on gold sales over the life cycle of the investment. Our rule would not require compensation in such cases, even if the host state was in breach of such an agreement.

4. Conclusion

Questions about the design and reform of investment treaties should be grounded in analysis of the underlying economic rationale for these treaties and the extent to which they are effective in achieving the objectives of the states that sign them. With this proposition as our starting point, we argue that investment treaties should be designed and interpreted to solve problems arising from dynamic inconsistency of optimal policy for host states, but that they should not restrain the way in which states respond to new information. Using a law and economics approach, we develop and justify a proposal for the reform of investment treaties that is focused exclusively on solving dynamic inconsistency problems. Our proposal addresses the circumstances in which a state should be held liable for breach of an investment treaty, and the amount of compensation that should be required in such circumstances. Our proposal is that a state should only have to compensate the investor if it breaches or modifies the domestic legal regime governing the investment, and that compensation should be the lesser of the investor's loss and the host state's gain from the host state not having had the new legal regime in place when the investment was made.

In addition, our proposal addresses several practical problems with existing investment treaty jurisprudence. Under our proposal, tribunals are only required to determine whether a state has breached or changed the domestic legal regime governing an investment, and then to engage in relatively straightforward valuation exercises to calculate the amount of compensation required (which may be zero). Our proposal does not require a tribunal to identify a host state's motive. On the contrary, we have shown that many factual scenarios involve mixed motives, and argued that the search for a state's real motive in such contexts is likely to be fruitless. A related benefit of our rule is that it doesn't require a tribunal to verify whether new information cited by a host state as a justification for legal change is really "new" information at all. This is significant, because it means that tribunals applying our rule can avoid being drawn into complex and expensive debates about what was, or should have been, known at the time an investment was made. For all these reasons, we think our is an important point of reference in ongoing debates about the reform of the investment treaty regime.

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6. Appendix

Summary of our main results from Section 2.

For the case of simple expropriation of the investment (no uncertainty about social costs of the investment):

- In the absence of a compensation rule
    - The host's optimal policy is dynamically inconsistent.
    - Investment will be lower than the globally efficient level.
- Strict compensation rule
    - Raises investment c.f. no compensation but still *fails to reach the global optimum*.
    - Unambiguously improves global welfare.
    - Has *ambiguous effects on host welfare* because it increases investment but lowers the expected value to the host of each investment.

For the case of simple shut-down of the investment (no dynamic inconsistency of optimal policy for host)

- In the absence of a compensation rule
    - The host's optimal policy is dynamically *consistent*.
    - Investment will be lower than the globally efficient level.
    - The foregone investments would *not* have been of value to the host.
    - Only some of the foregone investments would have been globally efficient.
- Strict compensation rule
    - Raises investment c.f. no compensation so far that it *causes over-investment* relative to the global optimum.
    - Has an *ambiguous* impact on global welfare.
    - *Unambiguously decreases* host welfare because it forces the host to either accept or compensate investments that are harmful to it.
- Miceli-Seggerson rule
    - Raises investment c.f. no compensation, *avoids over-investment, but fails to reach the global optimum*.
    - *Unambiguously increases* global welfare.
    - *Unambiguously decreases* host welfare because it forces the host to either accept or compensate investments that are harmful to it.

For the case of regulation or taxation of the investment (mixed dynamic inconsistency and new information problem)

- In the absence of a compensation rule
    - The host's optimal policy is dynamically *inconsistent*.
    - Investment will be lower than the globally efficient level.
    - Some of the foregone investment would have been of value to the host.
    - Some of the foregone investment would have been globally efficient.
- Strict compensation rule
    - Raises investment c.f. no compensation so but does not achieve the first best and may

lead to either under- or over-investment compared to the global optimum.

- o Has an *ambiguous* impact on global welfare.
- o Has an *ambiguous* impact on host welfare.

- Miceli-Seggerson rule
    - o Raises investment c.f. no compensation so but does not achieve the first best and may lead to either under- or over-investment compared to the global optimum.
    - o Has an *ambiguous* impact on global welfare.
    - o Has an *ambiguous* impact on host welfare.