When do states balance power? Refining, not refuting, structural realist balance of power theory

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As the US unipolar order is rapidly approaching its twentieth anniversary, scholars of all theoretical stripes struggle to identify dynamics of this particular order and to understand its basic patterns and consequences for foreign policy. For realists, this is a particularly difficult task with potentially lethal implications for one of their most fundamental assumptions about international relations: the assumption that states tend to balance power.

The absence of balancing and the realist response

The balance of power, first theorized by Rousseau and Hume, and more recently sophisticated by Morgenthau and Waltz in the twentieth century continues as one of the central propositions of international relations theory and remains an integrated part of any basic course on international

relations or security studies. However, there is increasing scepticism, even among realists that the proposition has sufficient explanatory value to retain its prominence. Even though, '[t]he dissolution of the Soviet Union marked the emergence of historically unprecedented U.S. advantages in the scales of world power [and] [n]o system of sovereign states has ever contained one state with comparable material preponderance' (Brooks and Wohlforth 2008: 1), there is little evidence of states balancing the United States through the traditional means of military build-up or alliances. As summed up by one sympathetic critic, '[e]verywhere one turns today, the behaviour of states, non-state actors, and even individuals appears to challenge traditional concepts of balance of power theory' (Paul 2004: 1), and the severity of this problem is only increased by the historical record. Whereas the current unipolar order may be unusual, because of the overwhelming relative power of the unipole (Wohlforth 1999), unipolarity itself is not an anomaly in the history of the international system. Thus, a recent study of eight cases spanning more than 2000 years of international history found that '[c]oncentrated power is simply not 'unnatural'. The unipolar structure of the current international system is neither historically unusual nor theoretically surprising' (Wohlforth et al. 2007: 179).

This is particularly problematic for structural realism. Formulated by Kenneth Waltz in his seminal book *Theory of International Politics* in 1979, structural realism argues that '[s]tructures shape and shove' (Waltz 1986: 343) 'by rewarding some types of behaviour and punishing others' (Gilpin 1981: 85). Like other structural theories it is a theory of constraints (Rathbun 2008: 296) that does not explain 'why state X made a certain move last Tuesday' (Waltz 1979: 122), but aims to tell us only a few big and important things about international relations. Unfortunately one of the biggest and most important things, the theory tells us, is that states balance power.

Contemporary realists have responded to this apparent incongruence between structural realist theory and the empirical record in two ways. First, neoclassical realists attempt 'to combine structural factors with domestic politics in order to explain foreign policy' (Wivel 2005: 360). They open the black box of the state and thereby return to a richer and more inclusive – but also less parsimonious and generally applicable - understanding of realism found in earlier formulations of the perspective (Rose 1998). Neoclassical realists typically accept structural realism as their starting point, but add first and second image variables in order to explain foreign policy (Schweller 2003: 317), and for this reason their

theories may be seen as more of an addendum than a contrast or challenge to structural realism (cf. Rathbun 2008).[1]

A second group of contemporary realists retain Waltz's focus on the nature and consequences of international structure, but argue that even though Waltz aimed to create a general theory, he did not include unipolarity, i.e. anarchic international systems with only one superpower, in his theory. This is unfortunate since – by structural realist standards – the international system today is unequivocally unipolar, with the United States as the only superpower, and has been so since the end of the Cold War. For this group of realists, the dynamics of the contemporary unipolar order leads them to re-conceptualize 'balancing, in particular by developing and applying the concept of 'soft balancing' (Pape 2005; Paul 2005). The general dynamics of international anarchy identified in Waltz's structural realism remain the starting point for these discussions (e.g. Hansen, Toft and Wivel 2009; Paul et al. 2004).

Neoclassical realism and the 'soft balancing' literature are both important additions to the realist tradition in the discipline of International Relations. However, both bodies of literature leave Waltz's structural realism largely unexplored thereby risking throwing the bay out with the bath water. Giving up on structural realism without sufficiently exploring the logic of the theory entails the danger of creating overly complex and internally inconsistent theories (Legro and Morvacsik), and leaving the entire realist research programme vulnerable to criticism that it is 'degenerative' (Vasquez 1997).

For this reason, the primary aim of this paper is to explore the logic of balancing in structural realist theory in order to refine our understanding of the balance of power and its consequences for state behaviour. Our most important means to do this is the microeconomic theory, which inspired Waltz to construct his structural realist arguments in *Theory of International Politics*. The argument of the paper is that it is an adequate understanding of the structural realist logic of balance power rather than the balancing proposition itself, which has resulted in much of the critique raised against the theory and its applicability in a unipolar world order.

The paper proceeds as follows. We begin by a brief recapture of structural realist theory followed by a formalized representation of structural realism, focusing on the theory's defining assumptions (the relative nature of power and the wish to retain ones position in the international capability distribution).

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[1] Neoclassical realist theories typically aim to combine Waltz's assumptions on international structure with explanatory variables such as domestic politics and the perceptions and intentions of leaders (cf. Freyberg-Inan, Harrison and James 2009; Lobell, Ripsman and Taliaferro 2009).

We use this representation to reproduce the structural realist prediction of balancing behaviour. We formally treat power as a unidimensional concept, assuming for simplicity that it is a function of military capability only and that states, therefore, only have relative concerns over military capabilities.[2] Here, states will over-allocate resources to the capability over which they have relative concerns and more so the stronger these relative concerns. *In a symmetric equilibrium or if the unipole responds to balancing by accumulating capabilities, the overallocation is amplified further by the wish to keep up.* We then extend the analysis by allowing for a two-dimensional conception of power. Here, state power is a function of both military and economic capability, and with separate relative concerns on each, we show that balancing behaviour is not a given. As over-allocation in one capability must come at the cost of under-allocation in the other, relative concerns in two capabilities separately will mitigate the pressure to over-allocate. Finally, we introduce the possibility of free-riding behaviour in addition to the structural realist assumptions and demonstrate that free-riding in one capability will further dampen the tendency to balance in the other that follows from the structural realist assumptions.

Structural realism revisited

Structural realists explain international relations in terms of rational states striving to survive in an anarchic international system (Waltz 1979). Structural realism explains 'the constraints that confine all states' (Waltz 1979: 122), but not 'why state X made a certain move last Tuesday' (ibid.: 121), Thus, it is a 'highly abstract, purely structural-systemic' theory (Schweller 2003: 345), which looks to the structure of the international system in order to explain international relations. Structural realists frequently comment on foreign policy (e.g. Mearsheimer 2001; Waltz 2000; cf. Elman 1996), but the link between their general assumptions about international relations and foreign policy are often underspecified. As the structural realist ambition is to create a parsimonious theory allowing us to explain much by little, we should not drown the structural argument in excessive detail and context.

The theory rests on the fundamental assumption of an anarchic international system as the means of coercion have not been monopolized by a central actor (a world government). Wishing to retain their relative position in the international system, states are faced with one overriding structural imperative by the logic of anarchy: 'Take care of yourself' (Waltz 1979: 107). States do this by balancing against stronger states, i.e. improving their relative position in the (aggregate) distribution of capabilities either

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[2] From a modelling perspective, this is effectively equivalent to assuming that power is a function of aggregate capabilities and that states have relative concerns in the aggregate. To conserve on notation, we opt for the simpler uni-dimensional representation of power.

by internal means (rearmament) or by external means (military alliances). Structural realism, then, is a balance of power theory. As summed up by Waltz, 'overwhelming power repels and leads others to balance against it' (Waltz 2000: 2).

In this paper, we revisit structural realism and its underlying assumptions using the formal tools of microeconomics that Waltz himself explicitly but informally draws upon (Waltz 1979: 89-91, 93-94, 98). As to the merit of formalization, recall the history of the Quantity Theory of Money: The central tenet, the long run neutrality of money, was first formulated by Hume when, in 1752, he speculated that '[if] four fifths of all the money in Great Britain [were] annihilated in one night [...] must not the prices of all labour and commodities sink in proportion [...]?' (quoted in Wennerlind 2005: 225). As Lucas reminds us, Hume did not derive the theory from data, as 'the data needed to construct the [theory] were not collected for any economy. Nor did Hume deduce the theory from the axioms of utility theory, for the development of this useful equipment was more than a century in the future' (Lucas 1986: 405). Even if the central insight was understood by Hume, who realized it through informal reasoning, later and more formalized formulations have deepened our understanding of the conditions relating the quantity of money and the general price level. For example, we know now that the neutrality of money holds only when the real output is not affected by money and the velocity of money is held constant – we know, in short, that monetary neutrality is a long run phenomenon.[3]

David Hume's formulation of the Quantity Theory was not build with the scaffolding of formalization and neither, of course, was Kenneth Waltz' formulation of structural realism. The tools of formal modelling help uncover the mechanics of a theory (how, exactly, does one go from assumptions to predictions), and the more we understand the foundations of a theory, the better we can determine its applicability. The challenge of enduring uniploarity does not *disprove* the assumptions of structural realism. They are abstractions and in that sense necessarily 'false'. But it does challenge us to inquire into the conditions under which these abstractions seem adequate.

The formal representation of structural realism in this article draws heavily on recent advances in microeconomic theory, with which structural realism shares many fundamental assumptions: self-interested, unitary actors who rationally do what they find best (i.e. maximize an objective function) given the resources available to them. Also, they share the structuralist perspective: Actors are

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[3] Whether, in fact, Hume understood the short-term non-neutrality of money remains a source of controversy. See Wennerlind (2005) for a recent discussion.

exhaustively described by a preference relation and the systemic dynamics come from external impulses in the form of either price changes or changes in the international distribution of capabilities.[4]

Specifically, we draw on work on reference dependent consumption theory.[5] Utility is reference dependent when the utility of an allocation is affected by the allocation of some point of reference, such as for example own past consumption or the consumption of others. The latter literature bears some resemblance to structural realism because relative consumption matters in addition to absolute consumption, just as states in structural realism have preferences over the relative magnitude of their capabilities. Even if the tools we use are taken from microeconomic theory, the focus here is different. The microeconomic literature is normative in the sense that it focuses on the social efficiency of resource allocations, essentially comparing decentralized equilibria with the pareto-efficient allocation chosen by a social planner. As individual consumption does not take place in anarchy, understanding deviations from the social optimum will, in theory at least, allow governments to achieve an optimal allocation by setting appropriate taxes or subsidies. In IR-theory, a generally accepted normative yardstick, equivalent of pareto-efficiency, does not exist and even if one did, there would not be a world government to enforce the optimal solution. We therefore explore the positive rather than normative implications of the core assumptions of structural realism. We ask, then, how the resource allocation changes by, say, relative capability considerations compared not to the choice of a social planner but to the resource allocation that would obtain if states had no relative concerns.

A Formalized Representation of Structural Realism

Consider a state that faces the choice of allocating its total resources between economic and military capabilities. The state wants to be strong in both the economic and military sector, such that the objective function *U(e,m)* (defined over economic capabilities, *e*, and military capabilities, *m)* is monotonically increasing in both arguments. The state's preference for economic and military capability is constrained by the productive capacity of its resources, *r*. It is assumed for simplicity that resources can be converted into either capability at a constant relative cost, which is normalized to 1 without loss of generality. The state, then, faces the following resource constraint: *e + m=r*. It should be noted that

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[4] There are important differences, of course. Notably, threats to property or persons and all coercive means are assumed away in most economic theorizing. Contrary to IR.

[5] Notably Dupor and Liu (2003) and Chugh (2008).

the resource constraint implies a trade-off between economic and military capability such that if e, say, is increased m must fall for constant r.[6]

Power, in structural realism, is a function of seven capabilities, two of which are military strength and economic capacity. With the other capabilities, notably size of territory, size of population, and resource endowment, held constant, sooner or later there will be decreasing returns (of power) to individual capabilities. That is, the 'power return' from military spending or economic investment increases but at a decreasing rate. This is the equivalent of a production function, which we denote f.

We use this simple general equilibrium framework to represent structural realism by allowing for two assumptions at the heart of this theory: (*i*) the relative nature of power generating capabilities and (*ii*) states' preference for retaining their position in the international capability distribution. Formalization entails precision and precisely defining what in fact is meant by relative concerns is intricate. Do states care about their relative size of their capabilities or do they care about their rank in the international capability distribution? Are the preferences of one state negatively dependent on the capabilities of others (monotonically decreasing) or are they negatively interdependent (meaning that states have a preference for occupying a better position than other states)?[7] Here, we do not derive axiomatically a structural realist utility function, but rather propose one formalization that is both useful and workable. Also, our formalization seems to have become standard formulations of relative concerns and *Keeping Up With the Joneses* in microeconomic theory.[8]

If power is relative, an increase in the capabilities of state A detracts from the power of state B, even if the capabilities of state B are unchanged. We capture the relative nature of power by assuming that the objective function is decreasing in the capabilities of others, $U'_{e*}<0$ and $U'_{m*}<0$, where the capabilities of other states are marked by an asterix.

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[6] This may seem strict as long run economic capability (sustained growth in GNP per capita) is a prerequisite for military capability just as military capability, in times of severe external threats, may be a prerequisite for economic capability. Still, in the short run it is clear that available resources allocated to one sector are forgone in the other, and in the long run the empirical literature suggests a robust, negative partial correlation between defence spending and economic growth, owing to a negative productivity differential between the military and civilian sectors. See for example Guaresma and Reitschuler (2003).

[7] Ok and Koçksen (2000) provide an informative discussion of different conceptualizations of relative concerns in consumption theory. In their terminology, our conceptualization of relative concerns is *spite*.

[8] See Dupor and Liu (2003).

The preference for retaining ones position in the international capability distribution implies that if a capability increases of a relevant other, the state will want to increase its own capability in response. This we represent by having the marginal rate of substitution between capability 1 and 2 increase when capability 1 goes up in another state and decrease if capability 2 goes up abroad. This means, for example, that the relative preference for economic to military strength decreases as the military capability of others increases. Formally, $(U'_e/U'_m)_{m*}<0$. [9]

While not a standard assumption of structural realism, we allow also for free-riding behaviour in each of the two capabilities. Free-riding can occur within alliances: If one state within an alliance invests in military to supply power (a collective good within the alliance), this reduces the incentive of other states to also invest in military. We formally represent free-riding behaviour as a decrease in the marginal rate of substitution between capability 1 and 2 when a foreign country accumulates capability 1 and an increase if capability 2 goes up abroad. For example, a free-rider's marginal rate of substitution between economic and military capability increases when the military capability of the other (allied) state increases: $(U'_e/U'_m)_{mr}>0$. [10]

The Benchmark Model: Relative Concerns and Over-allocation

Figure 1 provides a graphical representation of the framework. f is the production function (power as a function of military capability), and I_0 shows the highest attainable indifference curve (defined over the economy, e, and power). As usual, the slope of I_0 equals the marginal rate of substitution. The optimal resource allocation between economic and military capabilities is the point on the horizontal axis directly below the point of tangency between I_0 and f.

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[9] Our representation of relative concerns is essentially an assumption on the utility *level* from the capabilities of others, while the wish to retain ones position is an assumption on the *marginal* utility. The former is identical to the representation of *jealousy* in consumption theory, and the latter is identical to the representation of *Keeping up with the Joneses*. Both formulations are proposed by Dupor and Liu (2003).

[10] This is identical to the notion *Running away from the Joneses* as proposed by Dupor and Liu (2003).

Figure 1
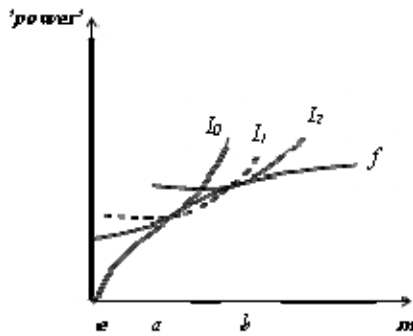
Suppose, first, that states care only about the absolute size of their capabilities. The optimal resource allocation is found where $U'_e(e)/U'_m(m)=f$. This is represented by the tangency between I_0 and f, and the optimal level of military is given by the point a on the horizontal axis. Suppose instead, as does structural realism, that states have relative concerns for the power generating capability. The optimality condition then becomes $U'_e(e)/U'_m(m-a_2m^*)=f$.[11] This flattens the indifference curve, such that under relative concerns giving up one unit of military capability requires a larger compensation in terms of economic capability than under absolute concerns. This is illustrated by the dashed I_1. As there is no tangency between I_1 and f at the point a, the state is no longer optimizing. Graphically, the optimal resource allocation under relative concerns requires the movement from point a to point b on the horizontal axis. It is clear that the more capabilities the other state has (the higher is m^*), the flatter the indifference curve and the more resources will be allocated to military capabilities.[12] Our representation of structural realism employs the assumption that overwhelming power repels (formally, $U'_{m^*}<0$) and we show that the prediction of balancing behaviour through the accumulation of power-generating capabilities follows.

The assumption that states wish to retain their position in the international capability distribution has a similar graphic interpretation. If the other state, the unipole, say, accumulates power-generating capabilities (here, m^*), this will further flatten the indifference curve (by $(U'_e/U'_m)_{m^*}<0$), and the state will therefore immediately respond by, also, accumulating power – that is: by balancing. This would further shift the optimal allocation to the right of b.

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[11] a_1 and a_2 are assumed to be such that $a_i< m/m^*$ for i=1, 2.

[12] From a normative perspective, relative concerns also imply overconsumption. States do not fully internalize the security externality that their own accumulation of capability presents to others states. Therefore, in equilibrium states tend to over-accumulate capabilities in the sense that the marginal benefit of the last unit of capability is more than offset by the marginal loss incurred by other states. The argument is similar to Dupor and Liu (2003).

Relative Concerns in Two Capabilities

Suppose that states have relative concerns not over the abstract notion of power (as in Figure 1), but over individual capabilities. As there is no unique way to aggregate the seven differently denominated capabilities, it is unclear how states in practice balance power (aggregated capabilities). The assumption made here is essentially that states make relative comparisons at the level of the individual capabilities. The optimal resource allocation is found where the marginal return to either capability is equalized, $U'_e(e - a_1e^*)/U'_m(m - a_2m^*) = f$. Inspection of this optimality condition reveals that when states have relative concerns of equal intensity in two separate capabilities, it simplifies to $U'_e(e)/U'_m(m) = f$. This is identical to the condition for optimality under absolute concerns. Thus, when states have relative considerations of equal intensity in separate capabilities, they behave as if they only had absolute considerations. This is intuitive: Relative considerations for each capability individually results in over-allocation of resources to this capability (as illustrated by the movement from *a* to *b* in Figure 1). But because of the resource constraint, over-allocation in one capability requires a proportional under-allocation in the other. If relative concerns are equally strong, the tendency to over-allocate will be exactly offset by the requirement to under-allocate somewhere else. When relative concerns do not exactly offset each other there will be over-allocation of resources to the capability where the relative concern is the strongest. The resource allocation is then determined by the relative intensity of the relative concerns.

Under the slight model extension that states hold relative concerns in separate capabilities, the core assumptions of structural realism no longer generate the unconditional prediction of balancing behaviour and, hence, of a short-lived unipolar moment. By the assumption of a trade-off between capabilities, balancing in one capability requires falling behind on the other. Enduring unipolarity, then, is not necessarily an explanatory problem for structural realism as modelled.

The model with a two-dimensional conception of power also allows for some rough predictions about balancing behaviour. Because of the tendency of balancing in separate capabilities to offset, we should expect to see economic balancing primarily from states where relative concerns in the military sector are unimportant. This suggests that states with which the unipole has historical ties in the military realm (such as Western Europe) are more likely to balance economically. These countries can afford the military consequences of focusing resources on economic balancing because relative capability concerns in the military sector are unimportant. Similarly, the model predicts stronger military balancing from countries where relative economic considerations are unimportant.

Until now we have explored only the allocative implications of the two core structural realist assumptions. To these we now add the possibility of free-riding behaviour: When a state accumulates a given capability, a free-riding state will shift its marginal evaluation of the two capabilities in favour of the other capability. To understand how this affects the resource allocation between capabilities, consider the example of a state that wishes to keep up economically but free-ride militarily. Suppose a relevant other state increases its economic capabilities. Because of the resource constraint, the military capabilities must fall in this, the other, state. By the wish to keep up in the economic capability distribution, the accumulation of economic capability in another state prompts the state to follow suit and accumulate economic capability itself. In the military sector, however, the lower capability of the alliance partner also prompts a wish to accumulate military capability (so as to compensate for the loss of common military capability). But because of the resource constraint, both capabilities cannot rise simultaneously. So the need to compensate for the lower military capability of the alliance partner, dampens the tendency to balance in the economic sector.[13] This corresponds to the situation in the bottom left cell of Table 1.

Table 1

The upper left cell shows a situation where a state wishes to keep up in both dimensions. Suppose, again, that the relevant other state increases its economic capability. As before, this can only be done if foreign military capability is reduced (this follows from $e^* + m^* = r^*$). The wish to keep up economically

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[13] The reverse is also true: The wish to keep up economically dampens the free-riding tendency in the military sector.

prompts an increased allocation of resources to economic capabilities (by $(U'_e/U'_m)_{e^*}>0$), and at the same time the wish to keep up militarily frees up resources for economic balancing as there is now less to keep up with, seeing that the military capability of the other state has fallen. So, (by $(U'_e/U'_m)_{m^*}<0$) the state reduces its resource allocation to the military and thereby frees up resources for the economy (by $e + m = r$). This, finally, amplifies the tendency to balance in the economic sector. With similar logic, it can be demonstrated that the tendency to free-ride in one capability is amplified by a similar tendency in another capability (bottom right cell), whereas the wish to keep up in one capability has a dampening effect on the tendency to free-ride in another (top right cell).

Incorporating the insight from Table 1, it follows that balancing behaviour is more likely to come from states that (*i*) do not have off-setting relative concerns and (*ii*) do not free-ride on the capabilities of the unipole on any dimension. Balancing is less likely to occur when the opposite applies.

These results have been derived under the assumption that overwhelming power repels, formally that $U'_{i^*}<0$ for $i^*=e^*,m^*$. But it has been demonstrated that under slight extensions of a very simple structural realist framework, even power that repels need not prompt balancing behaviour.

Conclusion

'Although arguably the most frequently used term in the field of international relations, balancing remains an ambiguous concept', Randall Schweller writes in a discussion of the concept (Schweller 2004: 166). This is a problem, not only for realist theory, but for our understanding of international relations in general and the unipolar world order in particular. Therefore, this paper has explored the structural realist concept of balancing. By introducing a two-dimensional conception of power and discussing the logic of free-riding we were able to refine the structural realist logic and to specify its predictions about balancing behaviour. Applying and testing the propositions developed in the paper will allow us to help explain the lack of balancing behaviour in the contemporary and previous unipolar systems.

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