ECONOMIC POLICY WITH AND WITHOUT MAXIMIZING RULES

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ABSTRACT

This paper contrasts the static neoclassical and the evolutionary views of the economy and economic policy. It responds to Ng's comments on Lipsey's original criticism of third-best theory. Under a relevant definition of informational poverty and Ng's other assumptions, the expected value of any policy-created divergence from the status quo is negative: If there is not enough known to determine what to do, nothing should be done, rather than establishing first-best conditions as Ng's analysis has it. It is argued that Ng's analysis of his two other information states adds little to what common sense suggests. To address Ng's argument that policies using context-specific objective functions lack the required welfare basis, the paper studies how economic policy is actually pursued absent guides provided by welfare economics. Policies that follow from evolutionary economic theory imply that what are seen as 'distortions' in welfare economics are actually desirable forces that drive economic growth.

Keywords: First best, second best, third best, optimum resource allocation, evolutionary theory, distortions, uncertainty, public policy.

JEL Classifications: D60, H10

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At the outset, I need to remind readers of two terminological issues fully discussed in Lipsey (2017). First, I use the terms "sources of divergence," *sources* for short to refer to anything that if introduced on its own would prevent the achievement of a perfectly competitive, price-taking equilibrium that was Pareto efficient and otherwise attainable. Since policy makers may directly change a source such as a tax, or change some other variable intended to change the effects of that source, we speak of 'policy variables'. These are under the control of policy makers and are used to effect desired changes either directly or indirectly. Second, Lipsey and Lancaster refer to second-best situations as ones in which the first best is not achieved, which may be one in which a second-best optimum is or is not achieved. Ng divides our second-best situation into those in which a second-best optimum can be achieved and those in which it cannot so that, in his words, third-best rules are needed.

Part I distinguishes between three different groups of economists and the approaches they take to economic policy. Part II discusses policy making in first- and second-best worlds. Part III outlines and criticises Ng's third-best theory that attempts to derive rules of behaviour when neither first- nor second-best optima can be achieved. Part IV outlines how policy is actually determined in the absence of guidance from the theory of the optimal resource allocation. Part V offers some conclusions.

I. SOME PRELIMINARIES

Two World Views: Static and Dynamic

My original critique of third-best theory (Lipsey, 2017) concentrated on its internal consistency in the context of static theory. But in criticising my final section where I spoke of actual policy using much more context-specific objective functions than community welfare, Ng has raised the more general and very interesting issue of the conduct of policy with and without the guidance of neoclassical welfare economics. In his view (Ng 2017, Section 5) we "…have to use third-best theory or something similar to be able to say something useful in public policy." To show why I disagree with this statement, this essay ranges far wider that my original one.

To deal with this broader issue I need to set up comparisons and contrasts between three groups of economists. The first group is composed of those who accept the neoclassical, perfectly competitive, GE model and its welfare theorems as guides to policy. The second group is composed of those who argue that that model's characteristics are too remote from real experience to provide useful insights into the workings of any real economy or to be useful guides to policy. Those in the third group accept the criticisms of those in the second group but go further, arguing that the reality of endogenously generated technological change not only makes the static theory of optimal resource allocation a poor representation of the overall behaviour of the economy, but also a perverse guide for policy. I call those in the first group N-type economists and the theory they use the N-type theory (for neoclassical), those in the second group R-type economists (for rejection of the neoclassical vision of the economy) and those in the third group E-type economists and the theories that they use E-type theories (for evolutionary). In what follows I concentrate mainly on the contrast between the N and E groups since all of what the R group objects to in the neoclassical vision of the economy is included in what the E-group objects to.

N-type theory is static, which implies that technology is given and unchanging, and where all forces causing change have worked themselves out to establish an equilibrium. Competition is modelled in terms of its end-state results. A major concern is with the conditions that determine the efficiency with which resources are allocated in his static world.

In contrast, E-type theory models the economy as constantly evolving under the impact of endogenously determined, path-dependent, technological change taking place under conditions of pervasive Knightian uncertainty. Competition is modelled as an evolving process rather than as an end state−the Austrian view of competition. A major concern is with the (mainly micro-economic) conditions that determine economic growth.

At the outset, we need to note an important difference between these three approaches. To N-type economists, removing the 'distortions' that prevent the fulfilment of the conditions that produce an optimum allocation of resources in the static competitive model is seen a major goal of economic policy. To R-type economists, these distortions are irrelevant to policy because they are derived from N-type theory that has, in their view, little relation to the real world. E-type

economists agree but add that many of these 'distortions' are actually conditions that are important, sometimes essential, to economic growth so that removing them would in many cases be counterproductive.

II. POLICY MAKING IN A STATIC SECOND-BEST WORLD

Lipsey and Lancaster's Theory of the Second Best

The first-best conditions for an optimum allocation of resources are derived from a static model that fulfils a number of well-known and stringent conditions, including that all firms be price takers, and that there be neither externalities nor unexploited ranges of increasing returns. It is generally agreed that the model's full set of conditions is so stringent that it would be impossible in practice to adopt policies that would achieve most, let alone all of them.

There seems to be some difference between Lipsey and Ng in their judgments as to the importance of these conditions. Ng states (2017, Section 4): "In the real world, the rest of the economy does not observe first-best rules completely, i.e. we have some second-best distortions/sources." Also: "Most economists agree that a particular real-world situation typically may involve some distortions, inefficiencies, etc. that could be improved upon." To me these are massive understatements. In Lipsey (2007) I list nine separate classes of such sources, each one of which typically contains many, sometimes hundreds, of individual items.[1] So it is the fulfilment of the first-best rules that are the rare exceptions, not divergences from them.

Lipsey and Lancaster's (1956) original second-best theory demonstrated that the necessary conditions for maximizing any function do not provide piecemeal guides for increasing the value of that function when all the necessary conditions cannot be satisfied. In the context of welfare economics, this implies that welfare in the N-type model may be raised or lowered when a change is made to establish the first-best condition in any one market when first-

[1] For but one example, since most firms in both manufacturing and service industries are price setters rather than price takers their prices bear various relations to their marginal costs. Even when there are many firms in one industry, they usually sell differentiated products so that their prices must be set by the sellers rather than by impersonal market forces. There is, for example, no impersonal market that sets a price of a generic version of refrigerators. Instead, each producers must set a price on each of its versions and let sales determine outputs.

best conditions are not fulfilled in at least one other market. This much is agreed by all participants in this symposium.

Now we come to the next difference between Lipsey's and Ng's views. As Lancaster and I originally understood it, our second-best theory provided a purely negative, proscriptive result, telling us what not to do: do not use first-best rules as guides for piecemeal policy. This leaves open the question of how to proceed with piecemeal policy when you do not have first-best conditions to guide you−an issue that I discuss in Section IV. In contrast, many critics interpret second best as a prescriptive theory, telling policy makers that in second-best situations they should do nothing until they have solved for the economy-wide, second-best optimum, given the sources that cannot be changed. This is a view that Ng accepts in several places in his essay. For example when he writes (2017, Section 4): "We should tax heavy polluters even if we know nothing of the complicated relationships with other distortions in the rest of the economy…. Lipsey appears to disagree…". Lipsey does not disagree. Ng and I both agree that in reality full economy-wide, second-best optima, cannot be achieved any more that can first-best ones. So if I believed that policy consisted in finding and moving towards full second-best optimum positions and doing nothing if these cannot be located, I would never have given policy advice to anyone. Neither Lancaster nor I have ever suggested otherwise.

No Optimum Allocation in a Static Model Containing Realistic Sources

Now consider altering the neoclassical competitive static model to incorporate most of the static conditions that prevent the achievement of a first-best situation: e.g., price-setting firms, location of buyers and sellers in space that creates overlapping oligopolies where neither monopolistic nor perfect competition is typically possible,[2] many labour markets that are not auction markets, governments that intervene in many markets, positive and negative externalities attached to many economic activities, incomplete and asymmetric information and many missing markets. Call his an R-type model for *revised* by *rejectionist* economists. No one has even attempted, let alone succeeded, in building a GE model for an economy that incorporates these real-world characteristics. Thus, we have no idea of what a static equilibrium for such a model would look like, nor what would be the effect on its equilibrium values of various policy

[2] See Eaton and Lipsey (1989).

interventions. One thing we can be fairly confident about: it is unlikely that its equilibrium would be Pareto efficient.

It follows that there is no reason to believe that the conditions for achieving a Pareto-efficient optimum allocation of resources in the R-type model would be, if they existed and we could work them out, the same as in N-type model. For example, the pricing rule for first best in a competitive market economy, making marginal cost equal to price, would not generally be the best rule when there are oligopolies and monopolies in equilibrium, some on the positively and others on negatively sloped portions of their the long-run, average-cost curves due to various scale effects (both are possible); when there are positive and negative externalities associated with the production and consumption of some goods; and when there are many missing markets. So it requires a major act of judgment to conclude that first-best rules derived from the N-type model provide guides for policy in the real world whose characteristic are much closer to the R-type model. Both R-type and E-type economists reject this judgement. However, I will proceed in Section III as if that judgment, implicit when neoclassical welfare rules are used in real policy situations, is valid.[3]

III. AN EVALUATION OF THIRD-BEST THEORY

The Key Issue: Policy Under Informational Poverty

The core of Ng's third-best theory argument is in one alleged result: "*Proposition 3:* First-best rules for third-best worlds with Informational Poverty.*"* (Ng 1977, p.4). I have already argued why I do not accept this proposition in Lipsey (2017a), but since Ng (2017) does not accept this argument, I must try again and take the opportunity to add some key points that I missed in my earlier article.

Ng's (1977) diagrams relate to what he first calls the 'relation curve ', which shows the relation between the value of the community welfare function and the setting of the source in question but which he later switches to calling the 'welfare function'. Since it does graph

[3] I understand judgement to be required when there are non-quantifiable considerations on both sides of some issue. But since I can see no rational reasons favouring the assumption that the N-type model's first-best conditions are guides to policy in either the R or E type models, it might be more realistic to call this an act of faith rather than judgment.

welfare, I call it at various times the relation curve, the welfare function, or more generally, the objective function. Ng starts with a market, call it *X*, which is part of an economy in which the first-best rules are in place everywhere. This is shown by the fact that in his Figure 2 (p 5) the relation curve is at its maximum with a zero value for the source−i.e., its first-best setting−which second-best theory shows would not be the case whenever non-zero sources were present in some other markets. When they are present, the maximum would be at the (unknown) second-best value for the source in question. He then introduces sources in one or more other markets that shifts the relation curve in market *X*, but we do not know the direction of this shift (Informational Poverty). (In my previous paper I referred to only one other source in one other market, but Ng says his analysis is the same whatever the number of sources introduced into whatever number of other markets, and I agree with him on this point.). He then considers a policy-induced divergence in market *X* (Ng 1977, p. 4) "…from the first best rule in any direction and in any degree…". He argues that this will reduce the expected value of the welfare function since, given concavity of the relation curve , the expected loss if one goes away from the second-best optimum exceeds the expected gain if one moves towards that optimum. Thus the policy that maximises the expected value of welfare is to stay put at the first-best rule.

Although this is a perfectly valid theoretical exercise, *the proof only holds if an economy-wide, first-best allocation of resources holds initially (which implies that the first-best condition is initially satisfied in market X)*. Otherwise, (1) the relation curve will be at its maximum at the second-best setting of the source, not at its first-best setting and (2) there is no reason why the source should be at it first-best setting in market *X*. Indeed, most the economy's millions of markets for goods and services will not be at their first best setting, typically with marginal cost equal to price. In response to this observation of mine, Ng (2017, Section 4) states: "If we just start from any starting point of a status quo, we can neither justify concavity nor maximisation at that starting point for F[1]." (Ng 2017: section 4). I agree. But this confines third-best theory for the case of Information Poverty to the empirically empty case in which the policy maker finds that a universal optimum allocation of resources has been disturbed by one or more sources in other markets and she asks: Should I depart from the first-best condition in this market?

Ng then defines Informational Poverty "...as a situation where the available information is so poor that we do not know how the presence of second-best constraints elsewhere in the

economy affects the desirability of departing, one way or the other, from the first-best rule for the sector under consideration, even in some probabilistic sense." (Ng 2017, Section 2). Later in the paper he says (Ng 2017, Section 4) that under Informational Poverty his theory tells us "…just to stay with the first-best policy…". I will call this definition 'Informational Poverty-1 (IP-1 for short).

Later on, however, Ng argues something very different: that this *stay-with-the-first-best rule* implies that one should *move to establish first-best rules* in markets where they are not currently established, which, as already observed, will be the case in most markets. I will consider this critical and invalid jump shortly.

Now let us look at the issue from the point of view of a real-world policy maker. She is located in an economy that never had a first-best allocation of resources from which it has recently departed and she considers making some policy intervention in one market where that market's first-best condition is not currently fulfilled. To do this we need to redefine the concept of Informational Poverty to be relevant to such situations. What I call 'Informational Poverty-2 (IP-2 for short) occurs when the available information is so poor that we do not know how the presence of second-best constraints elsewhere in the economy affects the desirability of making any change from the status quo.[4] In this typical situation, the policy maker knows only a few relevant facts about the market under consideration: (1) the current value of the source under consideration, say s_1 in Figure 1a; (2) the first-best value of the source, say s_2 in Figure 1a; (3) that the relation curve will not be at its maximum value at the point where the first-best condition is fulfilled (because she lives in a second-best world) and (4) that the current value of the curve will not, except by accident, be at a maximum at the present value of the source in question. (Recall that points s_1 and s_2 will not typically coincide because most real markets are influenced by the myriad sources that exist at any one time.) This scant picture is all that the typical policy maker knows. Now sticking for the moment to the assumption of its concavity, let the relation curve , unknown to her, be as shown in Figure 1b and let her consider altering the source by a *small* amount, Δ (shown as a large amount to make the figure clear). But she has insufficient information to tell her which way to go. If she thinks the maximum value is at a setting less than

[4] In my original paper I implicitly assumed that Ng was using the IP-2 definition and so did not appreciate the very restrictive nature of his IP-1 definition.

s_1, she makes the correct decision and welfare rises by Δw_1. If thinks the maximum value is at a source value greater than s_1, she makes the wrong decision and welfare falls by Δw_2. Given Ng's convexity assumption, $|\Delta w_1| < |\Delta w_2|$. Given informational poverty (IP-2), there is an equal likelihood of making the right and the wrong decision. Thus the expected value of the decision to move is negative. The best thing to do is to remain with the status quo, hold the value of the source at s_1.

Now consider what happens if we interpret third-best theory as advocating going to the first-best condition when it is not initially fulfilled under conditions of IP-2. This seems to be what Ng argues for in his pollution example (Ng 2017, Section 4: italic added) when he writes: "Then *moving* from this under-tax situation to the taxation of X by the full first-best amount of $N is expected to increase expected gain under Informational Poverty.". It also needs to be implied if third-best theory is to apply to the cases of ignorance covered by IP-2, rather than the empirically empty set covered by IP-1.

If third-best theory did predict that moving to fulfil the first-best condition in the market in question would maximise the expected value of welfare, this would indeed invalidate second-best theory which shows that there is no general presumption concerning the sign of the change in the objective function when first-best conditions are put in place in one market while they are not established in some others. To illustrate in the present case consider Figure 1b where the initial setting is at s_1 and we consider alternative locations for the (unknown to the policy maker) first-best setting. If that setting lies within the range s_1-s_3 the change will raise the value of the objective function, while if it is more than s_1 or less than s_3, the shift will lower it. Thus under IP-2 (IP-1 is not relevant in this case) there is no presumption that altering the source from its present setting to its first-best setting will raise the value of the welfare function. (This must be in an absolute sense as there is insufficient information to calculate expected values resulting from a large jump from one part of the function to another part; this is in contrast with a small movement to either side of the existing position where convexity holds at least over the relevant range.)

In his paper in this symposium Woo (2017) also seems to imply moving from another position to the first-best one when he refers to 'adopting' first-best policies and goes on to say

(Woo 2017, italic added): "Although *adopting* first-best policies does not maximize actual welfare, it maximizes expected welfare under Information Poverty." The welfare change resulting from a discrete move to the first-best setting from one distinctly different from it cannot be expressed in probability terms as can a small marginal change, nor can its sign be determined in the absence of information about the objective function over the relevant range. So Woo's argument only applies, as does Ng's, in situation in which sources are introduced in other markets of a first-best world and the policy maker then considers making a small deviation from the first-best position in the market in question and IP-1 holds.

Conclusion: On the basis of his own assumption about the concavity of the welfare function, the best thing to do under conditions of Informational Poverty-2 is to maintain the current value of the source in question, which typically will not be at its first-best setting. IP-1 is never relevant to any real-world policy decision since policy makers are never presented with situations in which a first-best allocation of resources has been disturbed by one or more sources in other markets and the issue is what to do in the market in question.

There is one other important possibility to consider. Let the value of the source known to be beyond the point of inflection (whose existence is explained in Lipsey 2017a), [5] the expected values of the welfare gains and losses of a small change are reversed and there is an expected gain from making a small change under conditions of IP-2. This is shown in the figure. With the initial setting at s_4, the gain from moving in the correct direction, Δw_4, exceeds the loss from moving in the wrong direction, Δw_3. But what is the policy maker does not know on which side of the point of inflection the value of the source currently lies? Note that although Δw_1 and Δw_2 are large relative to Δw_3 and Δw_4, it is the difference between the two that matters in each case. Depending on how rapidly the slope of the function is changing for small movements on either side of s_1 and s_4, the expected value of a change when the policy maker does not know if the function is in the convex or concave range, cannot even be signed, $|\Delta w_1 - \Delta w_2| - |\Delta w_4 - \Delta w_3|$ may be either positive or negative. Thus if IP-2 is such that the policy maker does not know if the present location is on the concave or convex segment of the relation curve, she cannot even put

[5] A relation curve being concave throughout its entire ranges implies that a high enough tax on that commodity can drive welfare to zero. In practice a high enough tax will instead drive the commodity's consumption to zero, making the relation curve go through a point of inflection.

an expected sign on the effect of a small departure from the status quo. Now the argument from staying put is that, since nothing is known about the probable sign in the change in the relation curve caused by a small move in either direction, it is best not to waste scarce research and enforcement resources here but to use them in places where there is some idea of the direction in which it is desirable to move.

In contrast, Woo (2017) argues that given this possibility of a point of inflection, we can still be sure that the expected value of the change in welfare resulting from a small change in the source in question will be negative because a small change will still be in the function's concave range. But this assumes that the initial value of the source is in the convex range, which can only be certain if the relation curve is at its maximum (as is shown in all his and Ng's relevant figures). But this in turn requires that first-best conditions apply everywhere initially and that one (or more) source is then introduced in other markets. Otherwise, the function will not be at its maximum when the source is at its first-best value (according to the main theorem of second best theory which is not contested here) and the present location on the function may be either on its convex or concave segment. In other words, Woo's argument applies, as does Ng's, only when IP-1 holds, not IP-2 The same argument applies to Woo's final rule: "First-best rules should be adopted for the third-best worlds with Information Poverty under a maximin decision rule." This is an argument for staying with the status quo not for making a discrete change to establish the first-best rule when it is not established initially (as is the typical case). Since his rules are all derived from IP-1 situations they are irrelevant to any practical policy situation.

Ng's Response

Ng (2017, Section 4) offers three responses to my critique. First he says "If any real world situation can be taken as the status quo, and if it should be maintained, whatever it might be, then economics is not useful at all, at least as far as public policy is concerned." But we are not dealing with any situation, only with those characterised by Informational Poverty. A sufficient reason for leaving the status quo untouched is IP-2. But this is not to be done when we have enough knowledge to suggest which way to move the policy variable in question.

Second, as already noted he says (Ng 2017, Section 4): "If we just start from any starting point of a status quo, we can neither justify concavity nor maximization at the starting point for F^1." He goes on to argue: "My logic therefore cannot be used to justify staying at any status quo." In denying that the policy maker cannot begin from any starting point other that the first-best setting, he confines his theory to apply to the empirically empty case in which a first- best allocation of recourses holds initially and some sources are then introduced in other markets.

Third Ng (2017, Section 4) argues: "The case for maintaining the status quo depends on what the status quo is.". Here I disagree. The case for doing nothing depends on not having sufficient information to know in which direction to move. The present location is irrelevant. If we genuinely do not know in which direction movement of the policy variable in question is likely to increase the value of our objective function and which to lower it, the obvious thing to do is to stay put. (Ng discusses this issue in the context of a case−smoke pollution−in which we do know in which direction we want to move. We discuss this example later it the paper where it is relevant.)

Of course, we do not need an elaborate theory of third best to tell the policy makers what to do in cases of IP-2. If we know absolutely nothing about what an intervention in a given market will do to our objective function (whatever that function may be and wherever we now are), the best thing for the real-world policy maker to do, and what he certainly does do without any elaborate advice, is to leave the market alone and concentrate scarce research and administrative resources on developing and enforcing policies for markets where some knowledge exists as to the kind of intervention that is needed. Simple opportunity cost calculation tells him that this is the right thing to do. Such decisions are made implicitly all of the time when most existing markets are left alone by policy makers. Determining, imposing and policing the application of the first-best rules in any markets would be difficult enough a static world where this must be determined only once in each market. But in our real world of dynamic change, products come and go with great frequency, often lasting very short times. To locate, impose and police the application of first-best pricing rules in such markets is a non-trivial task. To do so when you have no idea of the best settings for the variables under your control would be to waste of scarce administrative resources. (I will say more about the contrast between the static theoretical world and the dynamic real world in the next section.)

Conclusion: if you do not know which way to move, the best thing to do is to stay put. Once you have some idea of the direction of desired movement, you can use economic analysis to help in your decisions both as to the methods to use in making the move and how far to go. If the first-best conditions happen to be fulfilled in the market under consideration, then they should be left in place, but there is no justification for moving piecemeal from a situation in which first-best conditions do not apply to one in which they do.

Informational Abundance

(The discussion in this and the next section refers to Ng (1977, Figure 4, p. 7 and the surrounding discussion.) At the opposite extreme from informational poverty comes Ng's Informational Abundance: perfect information. Ng argues (1977, p. 6) that: "With perfect information and negligible costs of administration, third-best policies converge with second best ones.". This is shown by the upper right hand point of the three parts in his Figure 4. This statement cannot mean fulfilling more of the second-best conditions piecemeal as knowledge accumulates, since we cannot know what these are until we have perfect knowledge.[6] Also, in our non-static, real-world one can never have perfect knowledge of all the relevant relations. For example, neither firms nor policy makers can know what new inventions and innovations will come from any given amount of current R&D activity, because undiscovered knowledge is, by definition, not currently knowable. So in an evolutionary world one can never reach the point of complete knowledge about the effects of any given allocation of resources. Both Lipsey and Ng agree, although not for identical reasons, that this state is irrelevant since it could never be reached.

Informational Scarcity

This is Ng's intermediate case, in which "…the available information is sufficient for such a judgement [about the direction and extent of welfare-increasing divergences of second-best optimum from that resulting from the first-best rule] but is not perfect…" (Ng 1977, p. 4). Indeed, given the ubiquity of sources in the real world, this case covers the majority of actual

[6] In private correspondence Ng has explained: "I was doing hypothetical comparisons of alternative hypothetical situations, not gradual accumulation of knowledge over time."

policy-relevant situations. Here third-best theory provides no new specific rules, nothing new by way of formal theory as to how to behave in such situations. What Ng does offer are many interesting observations that apply to all policy makers, including those of types N, R, and E, a conclusion that is reinforced by the discussions of the pursuit of policy without neoclassical guides in Section IV below.[7]

Illustrative is Ng's discussion of the pricing of road usage (Ng, 2017, Section 2) where he makes observations similar to those quoted in the next section from an R-type economist, Mark Blaug. Ng says this discussion is an example of third-best theory. But as shown by Blaug, one does not need any third-best 'theory' to make these observations, which real-world policy advisors and policy makers do all the time without recourse to welfare theory. We do not need, for example, second- or third-best theory to tell us what to consider in the trade-off between road and rail pricing when the two are substitutes for each other. Practical policy makers do this all the time, using information about cross elasticities, relative costs and other related matters but not needing third-best theory to tell them what to do and how far to go in their measures. Indeed, it seems clear that Ng's observations tell them nothing new to do in addition to what would obviously be done by types R and E policy makers, and that can be observed to be done in countless existing studies. Ng (2017, Section 2) goes on to say: "Such policies are often mislabelled 'second-best' which really have to take account of all interrelationships, including in the production side." Here we see once again the different interpretations of second-best theory, prescriptive according to Ng, and proscriptive according to Lipsey & Lancaster.

[7] Among other things, Ng suggests that in many cases unfavourable externalities would exceed favourable ones and this would justify raising prices on the outputs in question. Our types N, R and E policy makers would agree here, the main difference being that Ng's would take price equals marginal cost as the benchmark from which to have prices depart, whereas the other policy makers would take the current market prices as the benchmark and decide what tax to impose, given the best estimate of the net external effects. Ng's discussion of education and defence as justifying their provision through taxes rather than market prices would be acceptable to all three types of policy makers, as would the discussion of alternative ways to raise the necessary revenue, although types R and E economists might disagree to some extent with N types on comparative assessments of the alternatives. Ng concludes his discussion with the observation that (Ng 1977, p. 11): "…there are many difficulties associated with the collection of relevant information here. But further study would seem to be justified in view of the importance of the issue.". I could not agree more and only observe that a lot of good knowledge has been accumulated since Ng wrote this passage. For just one example, the web site of the Canadian Ecofiscal Commission gives several studies of the kinds of information that Ng calls for and that has guided policy makers in helping governments institute policies that the majority of voters seem to agree are desirable and that draw nothing from first- second- or third-best theories.

Little more needs to be said about this important case, except that in spite of general agreement on how to proceed without the non-existent formal guidance from third-best theory, there are some important differences between the approaches to these issues that would be taken by the three types of policy makers. First, as the availability of the relevant information approaches zero, Ng's asserts that his policy 'converges' on the first-best conditions whereas in Lipsey's analysis, and in the observed behaviour of real-world policy makers, it 'converges' on maintaining the status quo. Second, Ng's third-best values for the sources 'converges'[8] on the unique (but as yet unknown) second-best ones as knowledge is increased, while those of E- and R-type policy makers 'converge' on a *range* that is their best estimate of the values that will achieve their stated objectives, but certainly not on the (unknown) second-best static optimum values.

An important gap

Ng (2017, Section 2) summarises the rules that follow from his third-best theory as follows:

1. First-best rules for first-best worlds.
2. Second-best rules for second-best worlds.
3. First-best rules for third-best worlds under Informational Poverty.
4. Third-best rules for third-best worlds under Informational Scarcity.

If we use Ng's definition of IP-1 as not knowing enough to depart from first-best conditions when they are currently fulfilled, there is an important gap between items 3 and 4 on this list. In 4 we do know enough to suggest which way to move the policy variable. But there is no advice as to what to do under the common situations that occur under IP-2. There the current setting of the policy variable is not at its first-best value and we do not know enough to estimate which way to move it. If remove his gap by interpreting case 3 to cover IP-2, the advice is to retain the status quo not to move to the first-best condition. Finally there are no formally derived third- best rules for case 4. Instead , as already observed, there are only some sensible

[8] But see footnote 6.

discussions, much of which would appeal to most policy makers whether or not they had heard of first-, second-, or third-best theory.

Interestingly, Woo's (2017) proposed application of third-best theory to public economics covers only the case of informational poverty, suggesting implicitly, what I have argued explicitly above, that in the other two cases of informational scarcity and abundance third-best theory offers little beyond common sense observations.

Further Points

My major disagreements with third-best theory are given above, but there are some other points in Ng (2017) that need to be addressed.

Context specificity

In Lipsey (2017a) I contrasted Ng's approach (Ng 2017, Section 1) with my more context-specific approach in two ways. First, although there is some context specificity in Ng's third-best theory in the sense that appropriate policies to increase community welfare do vary with three different states of available knowledge, one of which we all agree is unattainable, the advice to establish first-best conditions in situations of Informational Poverty applies to a large number of markets irrespective of their specific contexts. Second, and more important, there is no context specificity in third-best theory with respect to the choice of the objective function, which is always community welfare. However, in most real-world policy situations the objective function is context specific, such as reducing our carbon footprint, reducing traffic congestion, or evaluating alternative policies for producing biofuels. In all such cases, the justification for the policy is the measurement of the effects of the existing situation, not a deviation from optimal welfare conditions, combined with measurement of the effects of the suggested policy plus identifying side effects, such as making the distribution of income more unequal, and to evaluate policies to mitigate them where they are thought to be undesirable. In each of these cases, different policies may be, and usually are, called for. There is no overall non-context-specific policy, such as equating marginal (or average) cost to price, that applies in the cases of all specific policy objectives. I will say much more about such policy issues in the next section.

Refutation of Second Best theory?

Ng writes (2017, Section 3): "I never intended and still do not wish to refute the second-best theory which I regard as valid (if interpreted correctly) and important.". But the argument that when you do not have enough information to tell which way to alter some policy variable we should move it to its first-best setting independent of the context (other than this paucity of relevant knowledge) would, if correct, be a refutation of second-best theory. Second-best theory says that piecemeal establishment of first-best conditions, whether under Informational Poverty or Informational Scarcity, is not an optimal policy since it is just as likely, in the absence of further context-specific knowledge, to lower as to raise welfare.

Expected and actual values of changes in welfare

At the end of his Section 3 Ng (2017) quotes me as follows: "…according to second-best theory,… there are few, if any, scientifically derivable general rules for developing piecemeal policies that apply to all market economies at all times. Instead, specific knowledge of the market in question, and its relations to other markets, is needed to establish that a policy change will *necessarily* increase the whole community's welfare.". He then goes on to state: "The crux of why both Lipsey and I are largely correct lies in the italicized (by Lipsey himself, showing his awareness of its importance) word 'necessarily'. Both my Propositions 3 and 4 do not claim 'necessarily', only efficiency in the sense of expected value. Since the maximization of some expected values makes sense under uncertainty, my propositions nevertheless provide some useful general rules and are thus somewhat different, if not opposite, to the spirit of the second sentence of the above quoted passage from Lipsey." [9]

My "necessarily" refers to whatever is Ng's policy objective, actual or expected welfare. The fundamental difference between Ng and I, does not turn on whether or not the policy affects changes in actual or expected values. My point about Ng's informational-poverty argument is that he tries to show that the expected value of welfare is necessarily lowered by making a small

[9] I find this a strange argument. In dealing with Ng's specific arguments regarding his propositions, I refer, as he does, to the expected value of making a change. However, in most welfare analysis the emphasis is on changes that will increase the actual value of welfare. In the above quoted passage from me, one can insert "expected value of the" before the "whole community's welfare" and the passage stands as it then is.

deviation from the first-best rule. Since this is important, let me repeat: Ng's argument is that in situations of informational poverty the expected value of the change in welfare accompanying a small deviation from the first-best rule is *necessarily* negative. This is also true when I consider departing from any initial position under IP-2 with a concave relation curve.

Smoke nuisance

I do not think that Ng correctly states the differences between us in his case of factory A emitting polluting smoke. He asserts a contrast between what he and I would do under the two of his three information states that could possibly be achieved. First, under informational poverty he would adopt the first-best solution and says I would do nothing. But factory A does not represent a case of informational poverty because we know the direction we want to go: reduce the smoke emissions with a tax or other instrument. So the informational poverty contrast is invalid. Only in the case where we really did not know if the smoke was doing net harm or net good−a genuine case of informational poverty− would my policy maker do nothing. Next comes the case of informational scarcity: we know that the source is doing harm but e.g., not how much net harm is being done. Ng suggests I would do nothing in this case because a second-best optimum could not conceivably be calculated while he would adopt the first-best tax, adjusting it to take account of any relevant information. Of course, as argued many times earlier, just because second-best theory provides no general rules in the absence of further information, the practical R- and E-type policy makers do not stay idle. All that second-best theory tells us is that we cannot know with scientific certainty that our intervention will do more good than harm. When our job is done we must make a judgment that we have done the best we can do in an uncertain world where we cannot know everything. So for all cases of informational scarcity, there is no fundamental difference between what would be done by Ng on the one hand and any E- or R-type policy advisor on the other. The only difference is that the E- or R-type policy advisors would not start with the presumption that first-best theory provided any usable guide.

Ng (2017, Section 4) concludes with this observation: "The theory of second best is very important. However, it does not mean that we should not tax the factory unless we know all the complicated interrelationships (virtually impossible).". Of course I agree. In case there are others under the misapprehension that I, as a theorist of the second best, would not recommend any

market intervention policy unless the impossible task of estimating all of the second-best implications could be completed, I am grateful to Ng for pointing out how silly this would be. After all, if I accepted Ng's interpretation of second-best theory as a prescriptive theory of how to set policy, I would not have engaged in the many policy situations that have occupied so much of my professional life.

The First Fundamental Theorem of Welfare Economics

Ng (2017, Section 1) is probably in the majority when he argues that the first fundamental theorem is "useful" Also when he argues that it "…highlights the working of the invisible hand…" and serves "…as a very useful benchmark for us to focus on the important divergences between the specific context of the real world and the strict requirements of the theorem…[directing] us to focus government intervention on environmental disruption and food safety where the divergences are likely to be more severe….Consumers know whether dishes are delicious or not, but may not know of some health hazards that may occur only in the future." In contrast, I join those economists, including Mark Baugh, William Baumol and many others, who regard the two fundamental theorems as having no practical value either as policy guides or as formal defences of the market economies as we know them.[10]

R- and E-type policy advisors, such as myself, welcome support from theorists of the fundamental theorems that environmental and food safety should be major objects of public policy. However, in spite of what Ng argues we do not need first- or second- or third-best theory to tell us, or those we advise, that this is so. Ample empirical evidence tells us of the importance of measures to control these undesirable, sometimes lethal, matters. What would be impressive would be if there was advice that came from third-best theory and convinced policy makers of its

[10] I am also convinced by arguments from Blaug, (2007: 188) that "the idea that Adam Smith somehow stated a primitive version of the first theorem is a historical invention; indeed, it a historical travesty." Smith's view of competition was that of active competition between firms constantly jostling for superior competitive positions, the Austrian process rather than the neoclassical end-state view of competition. Such competition was, in his view, desirable because it "…promotes the 'wealth of nations,' meaning the growth of national income, which results in the material improvement of the standard of living of even the poorest in society." (Blaug: 189). He also (2007: 192) cites several authors who have argued the same view in contrast to the more common view that Smith's invisible hand was a precursor of the first welfare theorem.

practical value but could not have been derived by E- or R-type theorists from the tools at their command. Personally, I can think of none. [11]

IV. POLICY MAKING IN A NON-NEOCLASSICAL WORLD

Ng (2017, Section 5) has argued that without the guide of welfare optimality rules, there can be no rational theory of policy. To refute this contention I must discuss policy making in models that seek to get closer to reality than the neoclassical competitive model. I first discuss the view of the economy advocated by E-type economists, only considering the view of R-type economists where relevant. Then I consider the formation of policy by those who accept these non-neoclassical views

Endogenously Generated Technological Change Under Uncertainty[12]

E-type economists argue that because we live in a dynamic rather than a static world, the first-best concept of a static, optimal allocation of resources has no policy relevance. Even if we were given full information about everything that can be known, an optimum cannot be defined, let alone attained, because of endogenously generated technological change undertaken under conditions of pervasive Knightian uncertainty. Let me elaborate.

Neoclassical theory of resource allocation is an enormously powerful theory, useful in many policy applications, particularly in situations modelled as partial equilibria in individual markets. As a full model of the whole economy, however, it has serious deficiencies, particularly when it is used to determine an economy-wide, optimum allocation of resources. As noted in the introductory section, it is a static theory that models an equilibrium in which firms are fully adjusted to their environment. In actuality, competition takes the form of active struggling of firm against firm with growth-creating technological innovations being a major tool by which

[11] It has been suggested to me that the kind of taxes on polluting activity as recommend by Pigou are an example. But we do not need first-, second- or third-best theory to decide how to deal with polluting activities. We measure their harmful effects, the costs of alternative measures of reducing them, and make a recommendation that would balance the marginal cost of alleviation with the marginal benefits of further reductions. We do this sort of thing all of the time, without any need in to make reference to violations of the conditions for an optimal allocation of resources in an imaginary static economy.

[12] Much of this section contains brief summaries of many of the points detailed in Chapter 2 of Lipsey, Carlaw and Bekar (2005).

they strive to gain temporary competitive advantages over each other. Invention and innovation takes place under conditions of genuine Knightian uncertainty and not just risk. The difference between these two concepts is important. In risky situations, agents can enumerate the possible outcomes of their actions and attach probabilities to each. Thus two maximising agents faced with the same information and the same choice will make the same decision, the one that maximises the expected value of the results. In contrast, in uncertain situations agents cannot even enumerate all of the possible outcomes of any activity, let alone assign probabilities to each.

In a neoclassical world of risk only, because agents can calculate the expected values of different lines of activity they will, for example, allocate R&D funds optimally so as to maximise the expected value of the payoffs. In a world of uncertainty, agents must make guesses about the values of different lines of activity, including R&D. Different agents will make different guesses, even under identical conditions.[13] In such a world, static maximisation is impossible and firms are, as I have said many times elsewhere, more correctly seen as groping into an uncertain world in a manner that is profit seeking but not profit maximising. Here the concept of a static optimum allocation of resources is undefined since no one can know in advance the actual or expected outcomes of each possible resource allocation.

Many of the 'distortions' that are seen as undesirable sources of market failures in the neoclassical theory of optimal resource allocation are what drives the economy towards desirable results. Innovation creates asymmetric information that creates market power, which in turn creates the profits that drive the system's growth. Really large profits are the carrots that induce agents to attempt large leaps into the unknown where failures greatly outnumber successes, as well as making more modest decisions also under conditions of uncertainty. If information was transferred immediately and costlessly, there would be no profits of innovation and hence little or no innovation. Baumol (2002) argues, using much empirical evidence, that the profits of

[13] Furthermore, because of the characteristics of endogenously generated technological change, the clear neoclassical dichotomy between the objective function and the choice set that is necessary for a unique stationary equilibrium does not exist. Firms are continually faced with a choice of how much and what type of innovation they should attempt. Because, as shown by ample evidence, a firm's current capabilities depend partly on decisions made in the past, its set of feasible choices evolves endogenously. This point is made with great effect in Nelson and Winter (1982).

imperfect competition drive the technological arms race, which is a prime generator of economic growth. Non convexities are also a key part of the desirable growth process. Scale effects, rather than being imperfections to be offset, are some of the most desirable results of new technologies. Entry costs for new products and new firms are the necessary costs of innovation and the source of some of the rents that drive such behaviour.

All of this conflicts with the main neoclassical policy advice which is to remove 'distortions' that prevent the attainment of a static optimum allocation of resources. Given what we know about the characteristics of endogenously generated innovation, the very market 'imperfections' that are seen as impediments to optimality are often important incentives for growth in a dynamic economy and are to be encouraged not suppressed.[14]

This critical contrast between N- and E-type theories was originally made with great force by Joseph Schumpeter (1934). In the modern words of Mariana Mazzzucato, the R.M. Phillips Professor of Economics at the Science Policy Research Unit, Sussex England (2015: 5-6):

> According to neoclassical economic theory…the goal of government policy is simply to correct market failures…once the sources of failures have been addressed…market forces will efficiently allocate resources…[Instead] nearly all the technological revolutions in the past−from the Internet to today's green tech revolution−required a massive push by the State. Silicon Valley's techno-libertarians might be surprised to find out that Uncle Sam funded many of the innovations behind the information technology revolution"

She goes on to explain that the part the US government has played in ICT innovations, had been especially important in filling in the financing gap between proof of concept, which is typically financed by venture capital, and commercialisation, a gap that is often too long to attract or hold impatient venture capital.

[14] A full understanding of the processes involved here requires an in-depth knowledge of the characteristics of technology and technological change as shown, for example, in the works of Nathan Rosenberg (e.g., 1982, 1994 and 1996).

What matters here is that the understanding of the behaviour of the evolving economy as expounded in this section leads the state to adopt policies to influence many variables in ways that cannot be described as removing market failures or imperfections. In holding these views on policy, evolutionary economists join the wider group of R-type economists who argue that the two 'fundamental theorems' of welfare economics have no applicability as guides to real world policy. Indeed Baumol (2002: 143) goes further and calls them "fairy tales" with little or no relation to our own world.[15] As Baumol and Wilson put it (2001: x-xi)[16]:

> "The two welfare theorems lead us to expect a tendency to Pareto optimality in a stationary snapshot of the economy's working… [But] in practice the market economies have little to brag about in terms of their static efficiency…Clearly, no-one, other than a professional economist, is deeply impressed by the stationary performance of the capitalist economy, perhaps because of such phenomena as imperfect competition, pervasive externalities and all sorts of governmental and other interference in the workings of the market. It is the growth record, not the static efficiency of the industrial economies that make them the envy of the other nations"

Policy Without Optimum Conditions

Given the above, should we despair, as Ng would have it, of making judgments about good and bad policy? No, we just cannot be absolutely sure that anything we do will unambiguously raise the entire community's welfare, either in a deterministic or probabilistic sense. So policy must be a mixture of evidence, theory and judgement. As Mark Blaug, an R-type economist, put it (2007, p. 202-3: italics added).

> "Virtually all economists are in favor of road pricing because they believe that the potential Pareto improvement created by reducing road congestion and saving travel time greatly outweigh the costs of installing the necessary hardware, including the enforcement costs of policing whatever system is installed. There will be many gainers

[15] One wonders if those who accept these theorems as demonstrating that the real market economy operates efficiently would accept the exactly analogous argument that communist economies operate efficiently because they do so in the fairy-tale world of *das Capital*.

[16] As quoted by Blaug (2007:201)

but there will also be many losers,… Here once again we have the classic difficulty of separating efficiency from equity. What do economists in fact bring to such an argument? First of all, a considerable familiarity with the facts regarding the use of public and private vehicles. Secondly, a considerable familiarity with the facts regarding family income and transport expenditure patterns, including the possession of private cars, allowing for accurate estimates of the price elasticity of demand for more or less fuel-efficient vehicles, not to mention the price elasticity of demand for gasoline. Thirdly, considerable experience with survey evidence in large-scale social experiments comparing families and individuals with unequal access to transport to gauge the effect of, say, a miles-travelled tax rather than a fuel-based tax, possibly varying across people with different risks of causing accidents. *None of this will provide neat answers to the revolutionary introduction of road pricing. All it will do is to add one more highly informed voice to the squabble and that, I say, is what modern welfare economics is about and ought to be about, rather than teaching and learning a set of mathematically expressed fundamental theorems."*

What makes economic analysis applicable to all such issues is that if an objective function is formally analysed, it is much more context-specific than maximising the community's overall welfare. In reply to this point, that I also made at the conclusion of Lipsey 2017a, Ng (2017, Section 5) states:

> "True, we may know where to build bridges and so on if we are contented with answering much less general objective functions. However, we do not want to build bridges, etc. for their own sake. Ultimately, we (or the society) want or should want to promote social welfare (Ng 1990, 2013); at least that should be an important objective of public policy and the main concern of welfare economics. Then the second-best theory (or its generalization/application) says that, relieving congestion (even if done efficiently by building the right bridges in the right places) in a particular location may make the whole system less efficient and reduce the over-all social welfare level!"

Yes, second-best theory does tell us that, in the absence of further information, building a bridge might lower community welfare (if, e.g., it caused a great deal of congestion further down

the line, or some more distant second-best effects). Indeed, anything is possible, depending on the specific circumstances, and there is no point telling fairy tales to pretend that there can be certainty about the effect of any such policy on social welfare. The best we can do is to make judgments based on all the factors that Blaug and I list above. We use GDP as a first approximation to social welfare in practical situations but do not believe we can find fully generalised necessary conditions for increasing some social welfare function (or its expected value).

So if we do not have a community welfare objective function, where do the more context-specific objectives come from? They come from a variety of sources: some from policy makers responding to public opinion; some from policy makers seeking to lead public opinion; some from academics whose researches have revealed a problem to which they seek to persuade policy makers to respond. And what does the typical objective function look like? A quick perusal of actual policies at all levels of government will reveal many illustrations and here are but a few: climate change is harmful and needs to be curtailed; public health and education have many positive externalities and should be to some extent subsidized, while in many countries accepted social values call for them to be provided free; the distribution of income that the free market would produce, and the one that our mixed market economy actually does produce, are both socially undesirable; the technological changes that drive long-term economic growth require judicious public support at various stages in their development and application; air and water pollution are harmful to health. In each of these cases direct evidence is relevant to evaluating both the objectives and the means proposed to achieve them, without the need for an overriding community welfare function. At no time does the policy maker pretend that she has proven scientifically that the adoption of the required measures will produce a second-best optimum value of the variables being targeted, or that what is to be done can be shown scientifically to necessarily raise the whole community's welfare. The desirability of the objectives and the assessment of the effectiveness of programs designed to achieve them are based on some evidence, some theory, and a substantial dose of judgment.

Note three things about these actual policy practices. First, the rejection of the applicability of the welfare theorems does not imply that there can be no concept of efficient and inefficient resource allocations. For examples: the zero price of capital charged in the early days

of the USSR clearly resulted in much waste of scare capital; price controls tend to be associated with undesirable shortages and surpluses; value added taxes have many advantages over sales taxes. It is just that there is no concept of a unique, optimum allocation of resources that can be determined with scientific accuracy. Second, the judgement that the two fundamental theorems of welfare economics are not practical guides to policy does not imply that many of the categories of traditional welfare economics are valueless. For example, the concept of favourable and unfavourable externalities and their measurements are important guides to policy. Indeed they go back at least to Pigou's *Economics of Welfare* (1920), long before the fundamental theorems were developed, and they play an important part in the economics of technological change. Third, since as already observed, it is sustained long-term economic growth, not the most efficient allocation of resources, that is the real triumph of market capitalism, real-world economic policy concerns many variables that are not in the list to be influenced according to optimum-resource-allocation theory, and rejects many that are.

The Value of Second-Best Theory

Given all that has just been said, we might ask: Why then do we need second-best theory at all? There are at least three important answers.

First, as already observed, in practical policy making we typically seek to maximise the value of much more context-specific and empirically measurable functions than community welfare and it is important to know that first-best rules do not necessarily tell us how to increase the value of such functions when they are not to go to their maximum values, because there will be second-best interactions even in these more restricted cases. Second, there are situations in which the evolutionary view of the economy can be ignored and in which static analysis can be useful. Specifically, if the time period under consideration is short enough, or the market under consideration insulated enough, that the structure of the economy can be assumed to be at least approximately constant over the period of analysis, static theory can often be used successfully. In such cases, the second-best theory's proscription of what not to assume to be objective-function-increasing is valuable and second-best conditions can often be derived as Boadway (2017) shows. Third, the profession is split as to the value of the first two 'fundamental' theorems of welfare economics. For myself, and those R- and E-type economists who think

likewise, both theorems apply only to imaginary economies that are so far from any real ones as to be useless as guides to policy. In contrast, others think they are valuable guides, as does Ng when he says (2017 Section 1): "In fact, I regard the first welfare theorem as one of a very few, if not the most important general result in economics." Those who think that way might want to raise community welfare by establishing in a piecemeal fashion the first-best rules−something that Ng does not advocate (except in this situation of IP-1). Second-best theory shows that this is not a sure way to increase welfare even in that model. Instead, those who study welfare effects in static models, for any reason, must address second-best issues. As Boadway (2017) shows there is active literature doing just this, studying various issues in second-best settings in the context of such models.

Comments on Boadway's Paper

Boadway (2017) discusses many cases where results are insightful whatever model is being used. Let us briefly mention some. Boadway's (2017, Section 3) discussion of applied welfare analysis covers an approach to policy that is outside of the N-type model and that can be useful, Harberger's famous triangles and squares. For those who are willing to take consumers' surpluses as valid objects of policy, Harberger's approach provides a logically consistent method of measuring incremental gains from piecemeal policies (not maximising ones) in what are clearly second-best situations. This approach has been used in in practice and requires only the judgment that increases in these measures are valid indications of socially desirable improvements and that the analysis has covered a sufficient set of relevant second-best reactions in other markets. Boadway's discussion of optimal taxation (2017, Section 4) takes place within the N-type model but is an illustration of the value of second-best analysis when one judges that the use of such a model is appropriate. He concludes "…it is the second-best principle itself that puts the onus on the analyst to judge whether to opt for uniformity [of tax rates]." His discussion of information as a second-best constraint (Boadway Section 5) shows that the study of such cases can shed light on real issues, even if all of the conclusions regarding community welfare in the model are not accepted as relevant to the real world. For example, the incentives to avoid commodity taxes through changes in labour supply and in tax planning and even evasion that can be mitigated by changing the direct-indirect tax mix is an example of analysis that is applicable in many circumstances in addition those assumed in the N-type model. Boadway's

discussion of intertemporal second-best conditions (Section 5-a) once again reveals tendencies that apply beyond the model in which they are developed. This also seems to be so with the analysis of the pros and cons of using taxes on capital income in addition to normal progressive income taxes, the time inconsistency issues of public policy, in-kind transfers, work fare and minimum wage legislation. With necessary corrections, all of these cases can be studied in evolutionary models of a growing economy and many of the original insights transferred to it.

V. CONCLUSION

Ng states (2017. Section 3): "Recognizing the tremendous significance of this [second-best] theory, I just tried to salvage something out of welfare economics from the almost total annihilation of the second-best theory." There are at least three major types of response to Ng here.

First, I wonder if followers of third-best theory recognise the enormity of this third-best proposal that under conditions of informational poverty we should adopt first-best rules. There are tens of thousands of individual prices of different commodities, probably hundreds of thousands, and for the vast majority of these we have no idea of how community welfare, or GDP, would be altered by a small change in any of the sources that currently affect each. So Ng would have the authorities spending vast amounts of resources trying to establish, administer and enforce first- best conditions, usually marginal cost equals price, in each of these markets. Furthermore, welfare-maximising rules appear much easier to discern and apply in a static model where they only need to be fulfilled once, compared with the dynamic setting of the real world where they need to be altered as market conditions change. For one example, new products come and go with great frequency in today's world and any pricing policy that required individual decisions on each product's price, such as 'equate price with marginal cost', would be difficult to administer. So it would be a costly and unproductive task to hold that in every one of the economy's myriad markets where we have IP-2 we should seek to establish and maintain the first-best conditions.

Second, as Boadway shows in this contribution to this symposium, second-best theory is alive and well among those who are willing to use the standard static models of the economy and ignore some of the more distant second-best effects of the policies they study.

Third, neoclassical welfare economics, as condensed in the first and second fundamental theorems needs more than third-best theory to rescue it from the criticisms of those who reject these theorems as policy guides. This includes two sorts of economist. First, those R-type economists, such as Blaug and Baumol, who regard the theorems as applying only to an imaginary world with no relation to the real world even in its static formulation. Second, those E-type economists who accept this criticism but go further by arguing that in dynamic world of pervasive technological change the rules of neoclassical welfare economics are closer to rules about what not to do rather than about what to do. To both of these groups neoclassical welfare economics is dead once we reject the real-world applicability of the neoclassical, competitive, general-equilibrium model of the economy, the concept of a static, optimal allocation of resources, and the two 'fundamental theorems' of welfare economics−and this without any help from second-best theory.

Of course the zombie continues to walk and to instruct students at all levels, but it is not welcome in the class rooms of those many economists who accept the analysis of Section IV. All that second-best theory does is to show how not to maximise any objective function, including a community welfare function, for those who think they can define a meaningful and empirically relevant one.

Ng argues in conclusion that I cannot recommend policies on such matters as building bridges or controlling traffic congestion unless I have a model of community welfare and how to maximise it. It should be obvious by now that I disagree. We can estimate the effects on local costs and benefits, we can estimate some side effects, we can consider how income distribution will be affected; we can estimate the effect on GDP (a community measure) and, if we think it appropriate, on more modern measures of aggregate happiness. We can do all this, and much more, without accepting several common fictions: that there is an identifiable and measurable community welfare function; that a model of static efficiency tells us something about the behaviour of our real dynamic world; that we can separate policies for efficiency from those

affecting distribution by using the second fundamental theorem of welfare economics−income redistribution without efficiency effects. Efficiency and distribution are inevitably intertwined in any market economy and we need policies based on as much knowledge as can be obtained, as much theory as is relevant to the markets under consideration, and a large unavoidable dose of judgment, often based on experience of successes and failures in past policy interventions.

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Figure 1a

What the Policy Maker Knows Under Informational Poverty

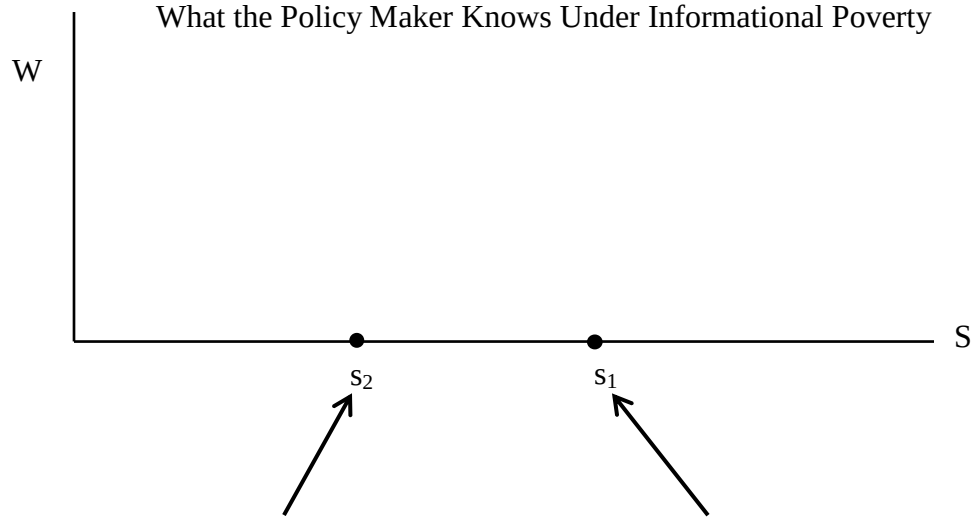

Figure 1b

Negative Expected Value of a Small Deviation from the s_1 Status Quo