Consensus in Economics:
A Trade-off between Relevance and Reliability

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If we, economists, continue to oppose each other,
we fail in our duty as scientists.

- I. Tinbergen

Abstract

Economists constantly oppose each other. “If you ask three economists a question, you will get five different answers,” says the story. This situation was already alarming to Tinbergen in the 1980s, when he urged economists to reach some kind of consensus (Tinbergen, 1982). Although there is a lot of literature discussing why economists disagree (descriptive level), few scholars have analyzed *why* economists should agree (normative level). The main objective of this project is to contribute to the latter debate. In particular, I will clarify some ambiguities that have emerged around the debate over the desirability of consensus in economics. Should economists be concerned with lack of consensus? Is consensus a desideratum of economic science? Demanding consensus is in conflict with the pluralist movement, which promotes the coexistence of diversity and also opposing views. In the first part I introduce the current debate via three positions: the *consensualists*', who stress the importance of achieving consensus; the *pluralists*', who emphasize the importance of diversity and disagreement (Rescher, 1993; Solomon, 2001, 2006); and the *conciliationists'*, who propose that both consensus and dissent are valuable and compatible (Martini, 2011, 2014; Kosoloswky & Van Bouwel, 2014). This debate, however, presents some ambiguities. First, it is unclear whether economists should aim for consensus or prioritize plurality (Debate I) and, secondly, it is confusing whether the values of consensus and dissent can coexist harmoniously (Debate II). Part of this ambiguity, I argue, is because the value of consensus is not clearly developed. Therefore, an important contribution of this project is to clarify the value of consensus and shed light on these debates. My main claim is that, although conciliationists successfully overcome the first debate, they fail to address the second. That is, conciliationists properly show that both consensus and dissent are valuable but they do not recognize that these values are in conflict. I argue that *when consensus does not arise spontaneously, there emerges a trade-off between knowledge's policy relevance and knowledge's degree of reliability*; in other words, a trade-off between relevance and reliability.

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Chapter 1

Introduction

The level of disagreement between economists has been a matter of concern since the mid-twentieth century. Machlup (1964) argued that although value judgments may influence economic disagreements the main sources of disagreement are differences in factual assumptions. Chase (1977) highlights two additional factors that explain disagreements between economists: the historical nature of economic inquiry and economists' ideological bias. Likewise, Tiemstra (1998) argues that economic disagreements are partially methodological but primarily normative. The curious thing is that, with more than 30 years difference, the three essays have the same title: *Why economists disagree*. Despite this, in the nineteenth century there was agreement that economists strongly disagree, while in the twentieth century this claim has been disputed (Blanchard 2008, Woodford 2009). In recent years, some scholars have performed empirical research to measure and explain the level of disagreement in economics. While several still discover a high level of economic disagreements (DeBenedictis & Di Maio, 2014; Randazzo & Haidt 2015), many others have emphasized that the level of disagreement is lower than what is usually believed (Gordon & Dahl, 2013; Fuller & Geide-Stevenson 2014). Nevertheless, a lot of literature investigates the current level of agreement/disagreement in economics, and very little addresses the desirability of agreement. To be clear, there is a lot of work at the descriptive level (Is there consensus in economics? Why or why not?), but there is very little literature at the normative level (Should economists aim for consensus? Why or why not?). The main purpose of this project is to address the normative level, explaining the debate over the desirability of consensus in economics and clarifying conflicts that have arisen in the current literature.

Until the mid-twentieth century, philosophers of science focused on elaborating "the scientific method." The scientific method was unquestionably the privileged way to achieve scientific knowledge. Truth and objectivity were the expected results of following this scientific method. Furthermore, since all scientists were believed to follow the same method and thus the same standards for evaluating scientific theories, consensus was also the expected outcome of the scientific research. This approach was even shared by some sociologists, i.e., Merton (1973) claimed that "sooner or later, competing claims to validity are settled by universalistic criteria" (as cited in Beatty & Moore 2010). However, later sociologists have challenged this view. First, Kuhn (1962) moved the attention from the "ideal" scientific method to the "actual" practice of science. His analysis of how scientific communities work made way for new lines of research. For instance, Sociology of Scientific Knowledge (SSK) deconstructed the notion of scientific knowledge by highlighting its social dimension (Collins & Yearley, 1992; Collins & Evans, 2002). After SSK's emphasis on the social dimension of scientific knowledge, consensus has received the attention of many sociologists and philosophers of science. The debate over consensus in science, nevertheless, is still young and mainly focused on natural sciences. Moreover, as the debate over consensus has aroused strong positions on both sides, the desirability of scientific consensus is still in dispute. While some authors stress the value of consensus (Tucker, 2003; Miller, 2013), others oppose the requirement of consensus (Rescher, 1993; Salomon, 2001). As the high level of disagreement in economics has often been perceived as cause for concern, this dispute over the desirability of consensus within philosophy of science is somehow unexpected for an economist. Is it possible that economists should not be worried when there is a high level of disagreement after all?

A critical source of confusion in the debate, I believe, stems from the fact that neither economists nor philosophers have properly explained the value of consensus and, furthermore, that they have practically ignored the non-epistemic dimension of the debate. Therefore, I will

argue that clarifying the value of consensus by incorporating non-epistemic considerations helps address the debate over the desirability of consensus in economics. In this project I will tackle the following questions: Should economists be troubled by a lack of consensus? Why is consensus desirable? Is there any conflict between demanding consensus and promoting plurality? Though consensualism emphasizes the value of consensus, pluralism only stresses the value of dissent. Combining the best parts of both positions, I will argue that *(a) both consensus and dissent are valuable, but that (b) when consensus does not emerge spontaneously, a conflict between those values gives rise to a trade-off between relevance and reliability*.

The first part of my argument was also suggested by a position that I call conciliationist, promoted by Martini (2011, 2014) and Kosoloswky & Van Bouwel (2014). Those authors aim to conciliate both consensualism and pluralism by arguing that both sides are partially right. However, since they do not develop the value of consensus in a proper and systematic manner, their contribution to this debate remains obscure. Thus, *the first goal of the project is to elucidate the conciliationist contribution to the debate over the desirability of consensus in economics (Debate I)*. However, the fact that both consensus and dissent are valuable does not mean that there is no conflict between those values. Once we establish the value of both consensus and dissent, we are faced with the question of whether those values can or cannot coexist harmoniously (Debate II). I will claim that conciliationists fail to address this second debate. In particular, they overlook the conflict between demanding consensus and promoting plurality. *The second goal of this project, then, is to examine the conflict between consensualism and pluralism that has been omitted by the conciliationists*. In particular, I'll argue that when consensus is not reached spontaneously, there is a trade-off between knowledge's degree of reliability (reliability) and knowledge's degree of policy relevance (relevance). In sum, I will argue that conciliationists have made an important contribution to the debate (that (a) both consensus and dissent are valuable) but they have committed an important omission (that (b) when consensus does not emerge spontaneously those values give way to a trade-off between relevance and reliability).

In the following chapter, Chapter 2, I will explore the current debates over the desirability of consensus in the social sciences. Since current literature is neither significant nor clear enough, some conflicts remain unresolved. For instance, arguments both in favour and against consensus are still diffuse and not well-established. Thus, conflicting views coexist without properly engaging one with the other. Consequently, the main purpose of this chapter is to introduce and relate the different viewpoints in the debate. In the first section (1a), I will define the meaning of consensus that I will use in this project. To be consistent in my analysis, I will use a definition expounded by current scholars (Tucker, 2003; Beatty & Moore, 2010). I will refer to consensus over beliefs – not action, not method – that is partially reached through a process of deliberation and has some relevance for economic policymaking. In the second section (1b), I will examine three different positions that have emerged out of the debate over the desirability of consensus in the social sciences: the consensualists, who are concerned about the lack of consensus among economists (Tinbergen, 1982); the pluralists, who stress and promote the value of dissent (Rescher, 1993; Solomon 2001, 2006); and the conciliationists, who attempt to make consensus and dissent compatible (Martini 2011, 2014; Kosoloswky & Van Bouwel 2014). In the third section (1c), I will clarify the precise point where these views conflict. On the one hand, there is a dispute over whether consensus has some value, or whether science should prioritize disagreements (Debate I). On the other hand, it is unclear whether the values of consensus and dissent can coexist harmoniously (Debate II). Furthermore, I will suggest that those conflicts are grounded in a lack of clarity about the value of consensus and an improper consideration of non-epistemic dimensions of the debate.

In Chapter 3, I examine the debate over the desirability of consensus in economics (debate I). While there is a dispute between consensualists and pluralists over whether economics should promote consensus or dissent, I will argue that conciliationists overcome this debate by showing that both consensus and dissent are valuable. However, since conciliationists have not

developed the value of consensus in a proper manner, their contribution to this debate remains vague. *The goal of this chapter, thus, is to clarify the conciliationist contribution to Debate I.* For this purpose, I will discuss the different values of consensus. First, there is a vital difference between consensus-process and consensus-output. While the former refers to the procedures by which we reach consensus –e.g., deliberation and aggregation– the latter denotes the actual state of consensus. Inspired by the pluralist position, I will reveal that the epistemic gain during the process to consensus is already captured by the value of dissent. That is, by the *critical value,* which denotes that dissent is valuable mainly because it promotes critical discourse (Mill, 1869; Popper. 1994; Longino, 1990); and by the *informative value*, which denotes that dissent is valuable because it preserves and makes use of all available information (Solomon, 2001; Sunstein, 2005; Surowiecki, 2005). Therefore, those values cannot be used to endorse consensus-output. To endorse consensus-output we need to show that consensus itself is valuable. The core part of the chapter, then, will focus on elaborating what I call the *policy value* of consensus, to which Tinbergen (1982) alluded. The policy value denotes that consensus is valuable because it enhances knowledge's policy relevance. In particular, I argue that consensus enhances policy relevance both directly and indirectly. Knowledge is directly transmitted from scientists to policymakers. Scientific consensus influences public opinion and public opinion impacts public policy. Once we take this *policy value* into consideration, the conciliationist contribution becomes clear and the debate over consensus in economics gains transparency.

In Chapter 4, I address the debate about the compatibility of consensus and dissent. As mentioned before, I believe that conciliationists fail to address this debate, as they suggest that the conflict between pluralism (supporters of the value of dissent) and consensualists (defenders of consensus) is mainly verbal (Martini, 2014, p. 116). *Contrary to this view, I will argue that the value of consensus and dissent are not easily compatible but they give rise to a trade-off between relevance and reliability*. This trade-off arises because (1) while consensus enhances relevance, it might be detrimental to reliability and because (2) while plurality increases reliability, it might be detrimental to relevance. There is, however, a scenario in which this trade-off would not take place: when scientific consensus arises spontaneously. In this case, the negative effects of both pluralism and consensualism would not occur. However, a spontaneous consensus represents a very unlikely scenario – especially in economics.

Moreover, in order to measure consensus reliability, and hence clarify the trade-off, I will elaborate a sophisticated version of the *indicative value* of consensus, based on Tucker's account. Tucker (2003) suggests that consensus becomes a good indicator of knowledge as long as it fulfills the following three elements: it is (i) uncoerced, (ii) uniquely heterogeneous, and (iii) sufficiently large. Commonly, when consensus is demanded for policy purposes it often does not follow these conditions. Thus, although economic consensus enhances knowledge relevance, it sacrifices reliability. The importance of this trade-off can be appreciated within the political literature, since for science-based policy both relevance and reliability are equally important. Thus, I reveal how acknowledging the trade-off that arises from the philosophical discussion of consensus in economics can lend insight into the debate over science-based policy in political science. Finally, I consider a possible way to overcome the difficulties of the naïve conciliationist position. I will argue that the scheme proposed to resolve this trade-off is mistaken and thus the naïve conciliationist fails. As a result, I will argue that when consensus does not arise spontaneously, the trade-off between relevance and reliability remains.

Chapter 2

The Current Debates

Viewpoints & Conflicts

The main purpose of this chapter is to introduce the different standpoints of the debate on the desirability of consensus, as well as the clashes between them. In the first section (1a), I will define consensus. In the second section (1b), I will elaborate three different positions that have emerged from the debate about the desirability of consensus in the social sciences: the consensualist, the pluralist and the conciliationist. Finally, in the third section (1c), I will discuss some conflicts between those views. On the one hand, I will show that it is unclear whether consensus is desirable or undesirable for scientific enterprise. On the other hand, I will argue that it is currently unclear (given the present state of the literature) whether consensus and dissent can or cannot coexist harmoniously. Finally, I will suggest that those conflicts are grounded in a lack of clarity about the value of consensus.

2a. On the Meaning of Consensus

First of all, it is important to stress that, unlike agreement, consensus includes a social dimension. While it is possible for a single person to agree with some beliefs, it is not possible for only a single person to achieve consensus on that belief. According to Oxford's dictionary, for instance, consensus means "a general agreement" (Consensus, 2017a). Likewise, according to the Cambridge Dictionary, consensus is defined as "a general accepted opinion or decision among a group of people" (Consensus, 2017b). Those definitions, nevertheless, are still too broad. To be more precise, I will follow Tucker's definition in which "consensus refers to a concrete agreement on a set of beliefs by a group of people at a given historical period" (Tucker, 2003, p 501). Although we now have a concrete definition of consensus, there are several issues that remain unclear. Thus, the purpose of this section is to clarify them. In particular, I will address the following issues. First, I will distinguish consensus on belief from consensus on actions. Second, I will detach consensus on belief from consensus on method. Third, I will briefly address the debate over the different procedures to achieve consensus. Finally, I will discuss the controversy over how much agreement represents consensus.

First, a consensus *on* belief should be distinguished from an agreement *to do* an action. In the former, there is an agreement about the validity of certain preposition. In the latter, people not only agree but also assume a compromise (Martini 2011, p. 11). However, consensus on beliefs may include a belief that a certain action would produce certain consequences. For instance, it is one thing to say that there is consensus on the belief that under certain conditions an increase in the quantity of money produces inflation (consensus that, in certain context, a policy *P* produces an effect *E*), and another thing to say that there is a consensus to implement a certain monetary policy (consensus that P should be implemented). Although the first kind of consensus (consensus on beliefs) can certainly be considered a valid source for policy decisions, it would be mistaken to claim that it is the only one. Policy decisions are not just based on a specific input of one group of scientists but, rather several considerations should be taken into account before making a decision. Therefore, my position should not be confused with scientism – the view that economic policy should be exclusively based on scientific knowledge. Against this view, it is important to emphasize that economics is not the only -- nor usually the most relevant -- source to consider in policy decisions. As Mirless-Flores (2016) asserts, the knowledge that belongs to the branch of "economic science development" is not sufficient for making a decision in the branch of "economic policymaking." This means that a consensus on a certain

piece of (economic) knowledge is just one input for decision-makers, and thus there is not a straight line from consensus on economic belief to consensus on policy actions. Nevertheless, it would be similarly misguided to assume that economic knowledge is irrelevant for economic policymaking. This would be akin to denying that policymaking should be based on science or that science can be a valuable source of policy. Therefore, if we avoid those extreme positions, we can say that scientific knowledge is an important, though not exclusive source for policy decisions. Consequently, in this project I refer to consensus on beliefs that has some relevance for policy decisions.[1]

Second, consensus on beliefs should also be distinguished from consensus on the method by which those beliefs are reached. That is, it does not refer to a methodological consensus. Note that, especially in economic inquiry, it is unclear whether there is a privileged method to be followed. As Hausman (1989) describes, it is possible to distinguish between at least four kinds of methodological approaches: deductivism, positivism, predictionism, and eclecticism. More recently, Reiss (2016) advocates for different methods according to different purposes (explanation, prediction and control). The point is that is hard to assert that there is one correct method for every kind of research. Indeed, several scholars support pluralism at the methodological level (Caldwell, 1985; Dow, 1997). Either way, the relationship between methods and beliefs is not straightforward. On the one hand, different methods might lead to the same conclusion. On the other hand, one method might lead to different beliefs. To give an example, economists might achieve consensus that under certain conditions monetary emission produces inflation while some of them arrive at this conclusion following empirical research, others an abstract model, and others a quasi-experiment. Likewise, since none of these methods is conclusive, by referring to them different researchers might arrive at different beliefs: it might be the case that following empirical research some researchers conclude that money produces inflation, others that inflation increases money and others that the relation is ambiguous. Therefore, we can say that consensus on method is neither necessary nor sufficient for consensus on beliefs. As Tucker (2013) asserts: "consensus on beliefs may follow many different routes or different justifications, as when different theories or methods yield identical conclusions" (Tucker, 2013, p 519). Consequently, the debate on method goes beyond the scope of the project. Consensus, in this project, refers to consensus on belief.

Third, there is a debate over which is the best procedure to achieve consensus. On the one hand, several authors –such as Mill (1869), Popper (1994) & Longino (1990)- emphasize the process of deliberation while, on the other hand, some scholars - Sunstein (2005), Surowiecki (2005) & Solomon (2006)- stress the process of aggregation. As I will develop in the subsequent chapter, the former believe that deliberation (criticizing and responding to criticism) is vital for scientific enterprise. Furthermore, they distrust aggregation (collecting researchers' individual beliefs) as a way to achieve scientific knowledge. If scientific knowledge rested on some form of aggregation, then voting could be a process to decide when knowledge is justified. Since Mill, Popper and Longino consider critical dialogue –and not voting- as the basis of scientific knowledge, they advocate the process of deliberation over aggregation. By contrast, Sunstein, Surowiecki & Solomon argue that a process of deliberation might result in a groupthink phenomenon, which could undermine the availability of information –i.e. because social pressure might conduct some scientists to repress certain positions or hide certain information. Thus, they endorse aggregation over deliberation. Deliberation and aggregation, nevertheless, are not exclusive. Indeed, it is possible to reach consensus using both processes, to start with deliberation and then finish by way of aggregation. To give an example, we can consider a committee of ten economists. At the beginning, all of them have different beliefs so they start a process of deliberation. After the deliberative process eight of them have reached an agreement that, in certain circumstances, printing money produces inflation. However, they disagree about

[1] Note that it includes consensus on beliefs that take a direct form of a policy advice – e.g., a consensus that under certain circumstances a flexible and floating exchange rate offer a more effective and stable frame than a fixed rates (example taken from Fuller & Geide-Stevenson, 2014).

both the extent and the mechanism of this relationship. Furthermore, the remaining two do not believe that there is enough evidence to conclude a relationship between inflation and the quantity of money. Since a process of deliberation is not sufficient to achieve a consensus, the group might proceed to an aggregative process. Note that, as a result of the process, one would be mistaken to conclude that there is a *unanimous consensus* in which everyone believes that money produces inflation. Rather, the committee could conclude that there is a *majoritarian consensus* (80% of economists) that, in certain conditions, money produces inflation –although there are some disagreements both in the extent and mechanism of this connection[2].

As a way to prioritize deliberation without excluding a potential process of aggregation, in this project I endorse Beatty & Moore's notion of *deliberative acceptance*: "A group deliberatively accepts p if and only if the individual members, based on the quality of their deliberation, have openly agreed to let p stand as the position of the group" (Beatty & Moore, 2010, p. 209). A vital point of deliberative acceptance is that individuals agree not only on the final belief but also on the process that leads to that position. Deliberative acceptance, then, involves a significant degree of internal convergence of beliefs amongst group members and at the same time allows for disagreement between them. Nevertheless, that definition requires a further clarification. In my view, Beatty & Moore's definition conflates two aspects that it is important to distinguish: "*genuine agreement*" (agreeing with the belief) and "*acceptance*" (accepting the group position). *Genuine agreement* refers to the extent in which each scientist agrees with the belief expressed in *p* (the position of the group). By contrast, *acceptance* refers to the extent to which each scientist agrees to let *p* stand as the position of the group. For instance, following the previous example, imagine an economist who does not believe that there is a causal relation between monetary emission and prices. However, since 80% of the economists genuinely agree with that position, she might agree to let it stand as a group position as long as she accepts the quality of the deliberative process as good enough. Individually, then, genuine agreement is not a necessary condition for acceptance. That is, a scientist might endorse *p* as a position of the group even though she does not agree with *p*. Collectively, however, it is reasonable to expect that acceptance of *p* is largely based on genuine agreement. In other words, it is reasonable to expect that to come to an agreement on a group position, *p,* a large percentage of the scientists will genuinely agree with *p,* and only a small percentage of the scientists will disagree but accept this as the group position.

Consequently, I will use consensus based on Beatty & Moore's notion of *deliberative acceptance* as long as it contains a high degree of genuine agreement. Explicitly, by consensus I will refer to a case in which, based on the quality of the deliberation, individual members of a group openly agree to let *p* stand as the position of the group, which contains a high degree of genuine agreement. According to this definition, *a demand of consensus* entails a demand of a group position which is accepted by nearly all members –i.e. an official document which represents the official position of the group. Although this official position is expected to possess a high level of deference, it does not imply that every single member genuinely agrees with that position. However, it does require that those minority scientists who disagree with the belief expressed in the group position refer to it in a respectfully way –i.e. avoiding public disqualifications. As a consequence, demanding consensus requires that a group not only (i) produces an official position but also (ii) eliminates the group's ability to publicly reject this official position. The reason is that, as I will explain in chapter 3, consensus enhances knowledge's policy relevance both directly and indirectly. While having an official position mainly contributes to the direct mechanism, reducing public dispute is required for the indirect one.[3]

[2] I'm using an example with committee just for a matter of clarity. The analysis developed in the project is even richer when it applies to a scientific community in broad terms.

[3] As the indirect way takes place through public opinion, if there were an official position but a public disagreement then the indirect mechanism would be damaged.

Finally, there is a dispute about how much agreement entails consensus. A vital point here is to distinguish between consensus and unanimity. Consensus on a certain set of beliefs does not imply that all scientists unanimously agree with those beliefs (Beatty & Moore, 2010)[4]. Although Beatty & Moore (2010) and Miller (2013) maintain that consensus (understood as deliberative acceptance) is compatible with some degree of (genuine) dissent, it remains unclear how much dissent (in terms of non-acceptance) can exist in our definition of consensus. That is, it remains undefined the minimum amount of acceptance required in a group consensus. For instance, if 99% of scientists accept *p* as a group position, it is reasonable to call it a consensus even though 1% still refuses to endorse *p*. However, should we call it consensus if an 80% of scientists accept it? What about 88%? Notice, that consensus is not only binary – with a status of yes or no. Rather, it follows a continuum with complete disagreement on one extreme and unanimity on the other. In other words, we can say that consensus is a matter of degrees –e.g. it is common to hear that there is a high degree of consensus, or that there is a growing consensus. Still, there is a certain amount of agreement necessary to call it consensus, and this threshold remains, to some extent, arbitrary.[5] In any case, our definition of consensus requires both a high level of genuine agreement (more than a simple majoritarian view) and an even higher level of acceptance[6].

2b. Viewpoints

Now that I have clarified what I meaning of consensus, in this section I will synthesize two different literatures: the general philosophy of science literature and the literature on philosophy of economics specifically. Although these literatures are unsurprisingly related, the current debate over the desirability of consensus either take place within general philosophy of science or within philosophy of economics. The goal of this section, then, is to combine both literatures in order to elaborate three different viewpoints on the desirability of consensus as they apply to the particular case of economics. First, I will address the *consensualist* position. Consensualists are alarmed by the lack of consensus in economics. Basically, they believe that economists should aim for some form of consensus. This position is the least developed in the literature. While it does not represent any particular scholar in the field of philosophy of science, it seems to be the position of some scholars in the arena of economics, e.g., Tinbergen (1982). In any case, I consider it an important position that helps to clarify other positions. Second, I will introduce the *pluralist* view. This position is mainly based on contributions by Rescher (1993), Longino (1990, 2002) and Solomon (2001, 2006). In contrast with the consensualists, who are mainly concerned with the lack of agreement in economics, the pluralists emphasize not consensus but dissent. Third, I will elucidate the *conciliationist* view. To some extent, this position is a reaction to the pluralists. Instead of opposing the demand of consensus, the conciliationists propose that both consensus and dissent are valuable. This standpoint is based on the work of Martini (2011, 2014), Beatty & Moore (2007, 2010) and Kosoloswky & Van Bouwel (2009, 2014).

C*onsensualists* observe with concern the permanent disagreement between economists. This concern reflects general public opinion. Indeed, there are constantly articles both in economists' blogs and the mainstream media that address the high level of disagreement between economists.[7] A typical question in these articles is whether a discipline with such a high level of

[4] This emerges as a clear consequence from the distinction between consensuses as genuine agreement and consensus as deliberative acceptance.

[5] This is precisely what Solomon (2001) suggests when she claims that "the decision whether or not to call a state of affairs 'consensus' or 'dissent' is to some extent arbitrary" (p. 118).

[6] We can think of something like 9 out of 10, just to put an arbitrary number.

[7] Articles in the Media: *Why Do Macroeconomists Disagree?,* by M. Thoma, The Fiscal Times, August 2014, and *Yes, Economics Is a Science,* by R. Avent, The New York Times 2013. Articles in Blogs: *Disagreements Among Economists,* by P. Krugman, March 2011; *A Simple Model of Disagreement Among Economists,* by H. Farrell, March

disagreement might be considered a science. For instance, Ryan Avent (2011) describes a conversation where someone, after complaining about the disagreements between economists, asked to him, "[Do] you think what economists are doing is scientific?". Likewise, Chetty (2013) writes an article called *Yes, Economics Is a Science* asserting that there are disagreements in every scientific discipline and thus the criticism against economics is overblown. In both cases, the point is that there is a general belief that a permanent disagreement undermines the scientific status of the discipline. This intuition has some historical basis. For instance, Bacon (1620) associated disagreement with an error in the scientific research.[8] Tinbergen (1982) was aware of this issue and, furthermore, realized that continuous disagreement challenges economics' practical goals. Therefore, he states, "If we, economists, continue to oppose each other, we fail in our duty as scientists" (Tinbergen, 1982, p 1284). Consensualists consider consensus to be a desirable state for economics. Rescher, who takes the consensualist view to the extreme, describes it in the following way: "Do whatever is needed to avert discord. Always and everywhere work for consensus" (Rescher, 1993, p. 5). Since Rescher's characterization is not charitable, the consensualist position should not be confused with Rescher's characterization. Consensualists do not assert that consensus is the most important, primary aim in economics. Rather, they say that substantial, permanent disagreement is prejudicial for economics – or any scientific discipline. Therefore, consensualists urge economists to reach some form of consensus, at some moment of time, in some issues and in some situation. Of note, absent from consensualist literature is a proper explanation of why consensus is indeed desirable. Addressing the value of consensus, therefore, is a vital contribution of this project, which I will develop in the next chapter.

Unlike consensualists, *pluralists* are not distressed by scientific disagreement. Indeed, they believe that dissent is inevitable in our complex and imperfect world. Pluralists maintain that disagreements are not only tolerable but also productive. Therefore, they are against the demand for consensus (Rescher, 1993). As I will discuss in the next chapter, there are two main reasons why pluralists emphasize the importance of disagreement in science. On the one hand, disagreements promote critical debate. On the other hand, disagreements preserve all the information available in the community. Furthermore, Longino (1990) states that the rational deliberation and critical discourse promoted by the coexistence of diverse views are constitutive of scientific objectivity.[9] At the same time, pluralists challenge the relationship between the amount of consensus and the scientific status of a discipline. In particular, they argue that consensus is neither sufficient nor necessary for knowledge. Indeed, the pluralist stresses that a process of rational inquiry rarely leads to consensus for at least two reasons (Rescher, 1993, p. 11). Firstly, because of the influence of non-cognitive biases in the research (such as economical/political interests, ideology, value judgements, and so on). Secondly, because, even if researchers were guided only by cognitive values, there still might be differences between those cognitive values (e.g., explanatory power, predictability, simplicity, elegance, etc). Moreover, there is a problem of underdetermination of theory by data which means that empirical evidence does not provide conclusive support to a specific set of beliefs but rather might be compatible with several hypotheses. Solomon (2001) provides an extensive list of different decision vectors that scientists may take into account when they choose between different hypotheses. In her view, neither consensus nor dissent is intrinsically valuable. She proposes that the ultimate scientific goal is empirical success.[10] According to her, consensus would be appropriate only when one theory possesses all the empirical success. However, as it is hard for one theory to gain all empirical success, Solomon rejects consensus as an expected

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2011; *Economic Science*, by R. Avent, March 2011; and *The Illusion of Disagreement*, by M. Yglesias, March 2011

[8] Bacon (1620) states "Disagreement . . . shows that . . . the road from the senses to the understanding was not skilfully laid out"; indeed it is a sign of "error" (as cited in Solomon, 2001, p. 52).

[9] For a deeper explanation of the epistemic value of disagreements see section 2a.1

[10] In contrast to a realist standpoint in which the ultimate scientific goal would be achieve the truth.

output of scientific research. By contrast, she maintains that empirical success is essentially maximized by dissent (Solomon, 2001, p. 101).

Correspondingly, there is an interesting distinction between stages of scientific research. A widespread view sustains that dissent is desirable when scientific knowledge is being developed – the stage of competition between hypotheses – and that consensus is desirable as the final stage of the inquiry – when there is a winner of this competition. The difficulty with this view is that the final stage – when only one theory stands as the winner of the competition – is implausible. Thus, even if this widespread view were right, it does not tackle the main problem of the debate – whether it is problematic for economics to exist in a state of permanent disagreement. Indeed, as consensus is rarely expected as the end of a rational inquiry, even if there were a scientific consensus, pluralists would regard it with suspicion, as the result of some external factor, such as institutional, political or social pressure. The contrast between consensualists and pluralists is quite evident. While consensualists observe a lack of consensus with concern, pluralists emphasize the value of disagreements and would distrust a consensus.

Finally, recent literature suggests that both consensus and dissent are valuable (e.g. Beatty & Moore, 2010; Martini, 2011; Kosoloswky & Van Bouwel, 2014). I call it the *conciliationist* position. The main claim of the conciliationists is that consensualists and pluralists pose a false dilemma. Conciliationists suggest that consensus and dissent become incompatible only when one adopts extreme positions, such as when one argues that dissent should always be avoided or that consensus should always be reached. Conciliationists maintain that it would be misguided to adopt these extreme positions. Furthermore, they suggest that dissent would be more beneficial than consensus if economics were a purely abstract and theoretical science. However, since economics also involves a practical dimension, conciliationists emphasise the relevance of consensus. Thus, according to the conciliationists, both consensus and dissent are valuable, the challenge is how to balance these two values. In order to reconcile both consensus and dissent, authors suggest different, though related, models. On the one hand, Kosoloswky & Van Bouwel (2014) propose distinguishing between academic consensus and interface consensus. While the former refers to consensus-making among scientists the latter denotes consensus-making at the interface between science and society – which includes a wider range of actors, such as laypeople, politicians, policy-makers, and so on. On the other hand, Martini (2014) distinguishes between an investigative and a dissemination phase of science. The investigative phase refers to conventional activities involved in scientific investigation, such as postulating and testing hypotheses. In the disseminating phase, the results obtained from the investigation are transformed into policy-relevant knowledge that sometimes acquires the form of policy advice. Martini explicitely addresses the relationship between his proposal and Kosolowky & Van Bouwel's.[11] Martini's idea, then, is that disagreements are especially valuable at the investigative phase while consensus is a desideratum at the dissemination phase. Through this distinction, conciliationists attempt to resolve the conflict between consensualists and pluralists. However, as I will later argue, this proposal possesses several weaknesses and thus their attempt to solve the tension between consensus and disagreement fails. In any case, we can conclude that the conciliationists stress that both consensus and disagreements are valuable and thus attempt to find the way in which they can coexist harmoniously.

In this section I have explained the current state of the debate on the desirability of consensus by elaborating three different views: a consensualist, a pluralist and a conciliationist. The first one emphasizes the importance of consensus; the second one stresses the value of dissent; and the third one attempts to combine the positive aspects of both consensus and dissent. However, I

[11] Regarding the link between those approaches, Martini (2014) says: "Their account [Kosolowky & Van Bouwel] is structurally similar to the account presented in this chapter, but, while I use my account to motivate the two theses outlined below in this section, Kosolosky and Van Bouwel use theirs in order to discuss Solomon's stance on consensus in science" (p. 116).

have still not properly examined the desirability of consensus and dissent. The reason is that these values -especially the value of consensus- are not clearly explained in the current literature. Therefore, an important contribution of the project will be to elucidate them in a clear and systematic manner. However, I do not mean to expound upon those values just because that they are not well developed. It is the lack of clarity about why dissent/consensus is valuable that creates ambiguities within the debate - in particular, it obscures various contributions and omissions made by conciliationists. Therefore, my purpose is to show how a proper classification of the value of dissent and consensus may shed light on these conflicts.

2c. Conflicts & Ambiguities

Two conflicts arise from the different views introduced in the last section. First, there is a dispute whether consensus is or is not a desideratum of economics (debate I). Second, there is a debate about whether the values of consensus and dissent can or cannot coexist harmoniously (debate II). Since my main thesis is that conciliationists make an important contribution to the first debate over the desirability of consensus in economics but fail to address the second debate on the compatibility between consensus and dissent, it is important to analyze these debates separately. The first conflict is a dispute between consensualists and pluralists about whether consensus is desirable or undesirable -or whether economists should or should not be troubled because of the lack of consensus. Consensualists maintain that consensus is desirable and view a lack of it with concern. By contrast, pluralists promote plurality of viewpoints and claim that consensus is essentially meaningless. For pluralists, what contributes to knowledge is not consensus but dissent. I maintain that conciliationists make an important contribution on this debate: there is a value of consensus that survives the pluralist criticism. In other words, both consensus and dissent are valuable. However, conciliationists have not addressed precisely wherein these values lie. Thus, their contribution remains unclear. During the next chapter, then, I will examine the dispute between consensualists and pluralists and elucidate how conciliationists overcome this debate (debate I). Once I establish that both consensus and dissent are valuable, it emerges a question until what extent both values are compatible (debate II). My point here is that conciliationists fail to address this second debate.

To conclude, in this chapter I discussed three issues. First, I elucidated the meaning of consensus. I established that we are referring to consensus on belief – not action, not method – that is partially reached through a process of deliberation and has some relevance for economic policymaking. Explicitly, by consensus I refer to a case in which, based on the quality of the deliberation, individual members of a group openly accept *p* (the position of the group), even if *p* does not represent their own view, as long as *p* does reflect a high degree of genuine agreement. Second, I scrutinized the debate over the desirability of consensus through three conflicting views: the consensualists, who are concerned about the lack of consensus among economists; the pluralists, who stress and promote the value of dissent; and the conciliationists, who attempt to make both consensus and dissent compatible. Third, I revealed that some conflicts in the debate remain unresolved. On the one hand, there is a dispute over whether consensus is desirable or whether science should prioritize disagreements (debate I). On the other hand, there is tension over whether consensus and dissent can coexist harmoniously (debate II). I suggested that while consensualists properly address the former debate, they fail to recognize the latter. I believe that a crucial weakness of both debates is a lack of clarity surrounding the value of consensus. Thus, in the next chapter, I will address this lack of clarity and elucidate the conciliationists' contribution to the debate on the desirability of consensus and dissent. In the final chapter, I will expose the conciliationists' omission in the debate on the compatibility between the value of consensus and dissent.

Chapter 3

Debate I: On the Desirability of Consensus

The Missing Value of Consensus

As expressed before, "Debate I" addresses whether consensus is desirable. Consensualists maintain that economists should aim for consensus. By contrast, pluralists maintain that consensus is basically meaningless for scientific enterprise. However, since consensualists and pluralists have not established a proper exchange, *Debate I* suffers some ambiguity. I believe that a large part of this ambiguity is that neither side has properly outlined why consensus is valuable. In particular, I will argue that there is a value of consensus that has been neglected in the debate: the *policy value,* which relates to the policy relevance of scientific knowledge. As this policy value has not been properly expounded, I will maintain that the pluralists' criticism does not address it. Moreover, I will suggest that this is a way of interpreting the point made by the conciliationists, who show that both consensus and dissent are valuable. In other words, I will argue that the consensualists' contribution can be seen as a criticism to the pluralist view: in order to maintain that both consensus and dissent are valuable, conciliationists need to reject the pluralists' claim that consensus is irrelevant.

In this chapter, therefore, I will elucidate the conciliationists' contribution to the debate about the desirability of consensus in economics. For this purpose, in section (3a) I will first examine the pluralist position on this matter, focusing on explaining their argument against consensus. Basically, pluralists sustain that if the epistemic gain occurs during the consensus process, then this contribution is better captured by the value of dissent rather than the value of consensus. Afterwards, I will develop the conciliationists' contribution. In order to make consensus desirable, conciliationists reveals that there is a value of consensus that goes beyond the value during the process of reaching consensus. I suggest that they do that by recovering one value of consensus vaguely proposed by the consensualists but which is absent in the pluralist critique. Therefore, in section (3b) I will develop this 'missing' value of consensus, which is mainly related to the policy relevance of knowledge. Finally, in section (3c), I will elaborate upon the conciliationist's contribution both to the debate within philosophy of science and within economics. In a time where economics' pluralist movement is rising, emphasizing the value of consensus avoid an extreme pluralist standpoint.

3a. Pluralist Position

In this section I will examine the pluralist position in the debate on the desirability of consensus. I will distinguish between two epistemic values of dissent: one that shows how disagreements contribute to critical argumentation (*Critical Value)* and one that stresses how disagreements contribute to the preservation and usage of all available information (*Informative Value)*. Then, I will analyze the relation between those values and two ways to reach consensus: deliberation and aggregation. Afterwards, I will elucidate the pluralist argument against consensus. A crucial point here is to distinguish the process of consensus-making from consensus as an outcome. According to the pluralists (Rescher, 1993; Solomon, 2001), consensus itself (consensus-output) is not epistemically relevant but the epistemic gain takes place during the process to reach consensus (consensus-process).

3a.i. The value of dissent

One of the most influential proponenets of the value of dissent is J.S Mill[12]. In chapter 2 of *On Liberty,* Mill (1869) explains three reasons why disagreements in science are desirable. First, the dominant view might be false and some of the dissenting opinions might be true. In that case, to reject disagreements could imply silencing the truth. This case is especially important as soon as we recognize the fallibility of scientific knowledge. Second, the dominant and the dissident views may be both partially true and partially false. Again, rejecting the dissidents' views would imply a loss of truth. Third, dissent is epistemically valuable even if the dominant view possesses all the truth. In this case, disallowing dissident views would imply the loss of "the clearer perception and livelier impression of truth, produced by its collision with error" (Mill, 1869, Ch II.1). A truth, Mill adds, is better understood when one knows both its pros and cons. Karl Popper also highlights the importance of dissent. In *The Myth of the Framework* (1994) Popper states that "the growth of knowledge depends entirely on the existence of disagreement" (p. 34). Popper's reasons to value dissent are similar to those exposed by Mill: disagreements lead to discussion, argumentation and mutual criticism. Furthermore, since Popper passionately stresses the problem-solving character of science (Popper, 2014) dissent plays a crucial role in detecting, exposing and correcting errors or refusing conjectures. For instance, let's consider a community of economists who are studying the causes of inflation. If all of them were monetarists, then there would be little space for criticisms and critical dialogue. As well, there would be a lack of economists who challenge this monetarist view. Instead, if some of them believe that inflation is mainly caused by expansion of the money supply but others believe that it is caused by economic activity, others by an increasing concentration and so on, then there will be more space for critical debate and economists will achieve a better understanding of the causes of inflation. Even if they conclude that monetary emission is the main cause, by addressing the critiques the community would increase its understanding.

In line with Mill and Popper, Longino (1990) stresses the significance of critical dialogue in scientific activity and highlights the social dimension of scientific practice[13]. In her view, rational deliberation and critical discourse are constitutive of scientific objectivity. Since social and cultural values are part of scientific practice, in order to achieve objectivity the critical deliberation should fulfil four requirements: there must be recognized avenues for criticism (of evidence, methods, assumptions and reasoning); there must be shared standards of evaluation; the community must be responsive to criticisms; and the intellectual authority must be equally distributed (Longino, 1990, p. 76). Moreover, since it is precisely this plurality that warrants the objectivity of scientific inquiry, direct efforts at silencing dissenting views would threaten scientific objectivity. Following the previous example, if there were only monetarists, scientific objectivity would be at risk. Hence, Longino (2002) states that "a diversity of perspectives is necessary for vigorous and epistemically effective critical discourse" (p. 131). Indeed, she uses this idea to argue that the lack of women and ethnic minorities contributing to scientific dialogue, even unintentionally, constitutes a grave cognitive defect, which reduces the community's critical foundations.

Another value of dissent is related to the use and preservation of information. Sunstein (2005) maintains that different judgements are (partially) grounded in different pieces of information. Therefore, an attempt to remove a dissenting view may entail a loss over the availability and use of information. This argument is similar to the one exposed by Solomon in *Social Empiricism* (2001). There, she claims that dissent in scientific inquiry is valuable because it preserves all the

[12] "It still remains to speak of one of the principal causes which make diversity of opinion advantageous, and will continue to do so until mankind shall have entered a stage of intellectual advancement which at present seems at an incalculable distance. We have hitherto considered only two possibilities: that the received opinion may be false, and some other opinion, consequently, true; or that, the received opinion being true, a conflict with the opposite error is essential to a clear apprehension and deep feeling of its truth. But there is a commoner case than either of these; when the conflicting doctrines, instead of being one true and the other false, share the truth between them; and the nonconforming opinion is needed to supply the remainder of the truth, of which the received doctrine embodies only a part" (Mill, 1869, ch 2)

[13] Stressing the social dimension of scientific knowledge, however, does not lead her to a relativistic approach.

empirical success accessible to the community. In her view, consensus might also threaten part of this empirical success. Therefore, she does not maintain that all dissent is valuable but that dissenting views should be accompanied by empirical success. Similarly, Sunstein maintains that dissenting views are valuable even when are considered implausible, but they are not valuable when they are "speaking nonsense" –- that is, not grounded in information**.** Furthermore, in *The Wisdom of Crowds* (2005) Surowiecki argues that large groups of lay people often make better decisions than a small group of (expert) elites. Basically, he argues that in a large group of diverse, independent, decentralized people "the errors each of them makes in coming up with an answer will cancel each other out" (Surowiecki, 2005, p 10). For this purpose, he explains that a good aggregate judgement depends on three conditions: independence, diversity and decentralization. That is, large groups of diverse, independent and decentralized people preserve and make use of all information available in the community. Solomon (2006) explains that the epistemic value of dissent developed by Solomon and Sunstein differs from the one proposed by Mill, Popper and Longino. According to Mill and Popper, dissent is valuable because it increases everyone's understanding through criticism, by responding to those criticisms and further deliberation. According to Sunstein and Solomon, dissenting views are valuable even if there was no deliberation.

It is important to pinpoint precisely where the difference between these two values of dissent lies: one emphasizes that dissent is valuable because it promotes critical discourse (Mill, Popper, and Longino) and the other stresses that dissent is valuable because it preserves information (Sunstein, Surowiecki, and Solomon). For a matter of clarity, I will call the former *critical value* and the latter *informative value*. Notice, however, that these two values are not incompatible. Rather, both of them can coexist amicably: dissent is valuable both because it preserves information and promotes criticism. Furthermore, there is a synergy between the two values. On the one hand, rational deliberation and criticism are more meaningful when more information is available; on the other hand, utilization and availability of information increase as scientists exchange their views. The proponents of each value, however, endorse different consensus procedures. The *critical value* is intimately related to a process of deliberation. Indeed, without (rational) deliberation there would not be room for argumentation and response to criticism. Therefore, according to Mill, Popper and Longino, dissent would be epistemically pointless without a scientific discussion. By contrast, Solomon, Sunstein and Surowiecki are skeptical about the outcome of deliberation and criticism. They point out that the ideal of promoting rational deliberation until reaching consensus threatens the usage and availability of information (*informative value*) since when consensus is expected as a result of deliberation researchers tend to overlook or hide information[14]. Therefore, they highlight the benefit of a process of aggregation instead of deliberation. Fortunately, deliberation and aggregation are not mutually exclusive (Beatty & Moore, 2010). These processes would clash if taken to an extreme; for instance, when researchers are forced to reach unanimity or are forbidden to speak with each other. But without an extremist position both values of dissent are compatible and epistemically beneficial[15].

3a.ii. Pluralist argument against consensus

Based on the analysis developed above, I will now consider the pluralists' argument against consensus. First, Pluralists maintain that consensus is a highly implausible output even in the case of a pure rational inquiry. Second, pluralists distinguish between the process to reach consensus (consensus-process) and the state of consensus (consensus-output). Their main argument is that what is valuable is the consensus-process rather than the consensus-output. Finally, pluralists challenge the value of consensus-output that links consensus with knowledge.

[14] The negative side of demanding consensus will be developed in chapter 4.

[15]As exposed in chapter 2, Beatty & Moore's notion of deliberative acceptance combines a strong process of deliberation with some form of aggregation to conclude the consensus procedure.

As a result, pluralists stress that science should not aim for consensus but rather recognize the expected diversity of views and find the way to make them productive.[16]

Pluralists detach consensus from rational deliberation. According to pluralists, rational inquiry rarely leads to consensus. Indeed, as many philosophers have argued, the link between rational deliberation and consensus is not straightforward (Laudan, 1990; Rescher, 1993; Dietricht & Skipper, 2007). First, pluralists argue that scientists –specifically economists- are not neutral researchers only moved by cognitive values. Rather, they have biases and interests that interfere with the deliberation process. Second, even if economists were only be moved by cognitive values (impartial economists), there might be differences in their cognitive values or cognitive methodology. Some researchers might prioritize empirical adequacy, others simplicity, or explanatory adequacy, or generality and scope. Moreover, even if people share their cognitive values, there might be differences in people's experiences and available data. For instance, economists who lived during period of high inflation might attribute a higher value to the harm caused by inflation than people who never lived under inflation. Third, even if everyone shares the same cognitive value and possesses all the available information, there is a problem of underdetermination of facts by data. As expressed by Laudan (1990): "For any finite body of evidence, there are indefinitely many mutually contrary theories, each of which logically entails the evidence" (p. 269). Consequently, there are several reasons not to expect consensus even as an output of a rational inquiry.

The pluralists' main criticism of consensus, however, is not that consensus is highly unlikely. The point is that even if we assume that deliberation contributes to (some degree of) consensus, the epistemic gain is in the process for reaching consensus (*consensus-process*) and not in consensus itself (*consensus-output*). That is, the fact that the process of deliberation is epistemically significant does not make consensus valuable. Rather, this contribution is better captured by the *critical value* of disagreement discussed above. This is precisely the criticism made by Rescher (1993) in *Pluralism, Against the Demand of Consensus*. In particular, Rescher claims that if consensus is epistemically significant only when it follows a specific procedure (rational deliberation), then the epistemic gain is in the process, not in the subsequent outcome. Indeed, the epistemic gain that comes from critical dialogue is independent of whether such dialogue ends in consensus. For instance, in a dialogue between two economists one point out flaws or missing relevant evidence in the others' position. Based on this exchange, the economist might elucidate his position and analyze how the new evidence affects his conclusion. The epistemic gain of this exchange is completely independent of whether the two economists finally agree. If we extend this example to a group of several economists, we discover that the epistemic gain takes place during the consensus, which is independent of whether consensus is the actual output. This is why pluralists claim that the value of the consensus-process should not be confounded with the value of consensus-output.

In order to fully oppose consensus, however, pluralists also need to show that there is not value in consensus-output. For this purpose, pluralists challenge the link between consensus and knowledge. I will call the idea that consensus is valuable because it works as an indicator of scientific knowledge *indicative value*. Indeed, consensus in a scientific community is usually perceived as a sign of shared knowledge. The fact that philosophers always contest each other and, unlike mathematicians, cannot reach consensus, was perceived as symptomatic of a lack of knowledge for a long time, e.g., by Roman physicians (Miller, 2013). In particular, a lack of consensus is frequently perceived as if there is not enough evidence supporting a theory, or as if personal or social elements are interfering with scientific research (Beatty & Moore, 2010). However, many philosophers are suspicious of using consensus as an indicator of knowledge. Evidently, consensus can be reached for many different reasons, e.g., shared common bias,

[16] "The pluralist: Accept the inevitability of dissent in a complex and imperfect world. Strive to make the world safe for disagreement. Work to realize processes and procedures that make dissent tolerable if not actually productive" (Rescher, 1993, p. 5)

shared political/economical interests, shared class background, fighting a common foe, the Zeitgeist, and so on. Furthermore, there are several cases in which knowledge is in the hands of a few who are against the majority view. Therefore, within the philosophical community it is well accepted that "consensus on beliefs is neither a sufficient nor a necessary condition for presuming that these beliefs constitute knowledge" (Tucker, 2003). For instance, a consensus among economists that inflation is caused by monetary emission does not necessarily mean that inflation is actually caused by monetary emission. Conversely, a lack of consensus that monetary emission causes inflation does not mean that inflation is not actually caused by monetary emission. For instance, even if economists disagree, a long period of monetary emission might end with several years of high inflation -as happened in Argentina between 2007 and 2015. As a consequence, pluralists conclude that consensus is not a good indicator of knowledge.

In this section, I have developed the pluralist's position that emerges in the philosophy of science literature. In particular, I have reconstructed the pluralist's argument against consensus. First, pluralists distinguish between two values of dissent: (1) dissent promotes critical discourse *(critical value*) and (2) dissent preserves information (*informative value)*. Second, pluralists challenge the idea that a rational enquiry necessarily leads to consensus. It is so because (i) scientists are prone to be influenced by non-cognitive values; (ii) even if that did not happen, they could hold different cognitive values; (iii) even if that did not happen, they could achieve different conclusions from the same data –because of the problem of undetermination of fact to theory. Third, pluralists make a crucial distinction between consensus-process and consensus-output. They argue that the epistemic gain occurs during the process to reach consensus, which does not imply that consensus-output is also valuable. Thus, they conclude that none of the previous values can be used to support the value of consensus-output. Finally, pluralists challenge the idea that consensus is a good indicator of knowledge (*indicative value)*. The main point here is that consensus can be reached for many different reasons. Therefore, pluralists conclude that it is unwise to correlate lack of consensus with lack of knowledge. Consequently, pluralists argue that consensus is irrelevant for scientific enterprise.

3b. The Missing Value of Consensus

So far, I have distinguished three values: (1) the *critical value* and (2) the *informative value,* that occur during the consenus-process; and (3) the *indicative value,* which refers to consensus as an output. There is, however, another value of consensus that has not been considered by pluralists: that *consensus enhances knowledge's policy relevance*. To elaborate this 'missing' value of consensus is precisely the goal of this section. Moreover, elaborating the *policy value* is a crucial contribution of the whole project: both the conciliationist contribution, that I will explain in next section, and the trade-off between reliability and relevance are based in this *policy value*. I will address this goal in the following way. Firstly, I will reveal that the idea that there is another value of consensus which is not related with consensus as an indicator of knowledge (*Indicative value*) but with consensus for knowledge's policy relevance (*policy value*) is already present in the literature –though in a diffuse way. Secondly, I will argue that consensus enhances policy relevance both directly (informing policy makers) and indirectly (through public opinion). Finally, I will reflect on potential criticisms to this *policy value*.

Notice that, so far, both the values of consensus and dissent analyzed in the previous section have mainly an epistemic character. That is, both the *critical value* and the *informative value* address the epistemic gain prompted by disagreements in the consensus-process. Likewise, the discussion on whether consensus is or is not a good indicator of scientific knowledge (*indicative value)* is also essentially epistemic, as it directly refers to the relation between consensus and knowledge. By contrast, the *relevance value* that I will present below is not only epistemic. Indeed, several authors introduce it stressing its non-epistemic elements. For instance, Martini

(2011) calls it "the pragmatic reason" for consensus. Evans (2000) also refers to this value when he argues that "when there is an ambiguity between economists, policy decisions remain political ´in the deepest sense´" (Evan 2000, p 222). Similar ideas are emerging in the debate over global warming and the relation between climate scientists and public opinion (Lewandowsky et al., 2012; Aklin & Urpelainen 2014). This distinction between the exclusive epistemic values exposed before and the fact that the following 'missing' value also contains non-epistemic elements will play an important role both to understand the conciliationists' contribution and their omission.

3b.i. A diffuse but collective perception

Several authors have suggested that consensus might be desirable for reasons that go beyond the epistemic debate. Solomon (2006) explicitly states that although from an epistemic viewpoint dissent is healthier for science, sometimes consensus may be desired for *political* reasons (Salomon, 2006, p. 38).[17] However, she does not explain what those political reasons are. Likewise, one year later, in her analysis of the National Institute of Health (NIH) Consensus Conferences, she suggests that these conferences are not epistemically beneficial but still they play a *rhetorical* role. There, she stresses the importance of scientific knowledge to be seen as trustworthy. "If health care practitioners trust the results of NIH consensus conferences, which have a social epistemology that seems trustworthy, then they will be more likely to believe them and put them into practice" (Salomon, 2007, p. 174). Nevertheless, she does not develop this point further. Indeed, she neither develops this (political or rhetorical) non-epistemic dimension in her main book *Social Empiricism* (2001). Similarly, Beatty & Moore (2010) argue that "consensus does have an important role to play in *authorizing decisions*, whether in politics, science, or the courts" (p.206, emphasis mine). There, they refer to Guston (2006) who argues that scientific consensus is critical "if science is to be a source of enlightenment and legitimation for policy" (Guston 2006, in Beatty & Moore 2010, p. 200). Furthermore, in *Masking Disagreement Among Experts*, Beatty (2006) argues that there is a trade-off between reaching consensus and reporting the degree of disagreement. In particular, he highlights how reporting disagreements affects the credibility and authority of the group.

Martini (2011, 2014) develops those ideas in a more organized way. In his doctoral thesis, *Consensus and Disagreement in Small Committees* (2011), he dedicates a section (5.1.3) to explore the different values of consensus in science. In addition to some epistemic values – i.e. he mentions a value of consensus associated to Kuhn's notion of paradigm– he stresses that consensus has also a *pragmatic* value. In particular, he states that the applicability of scientific knowledge requires a coherent set of statements. Therefore, he suggests that consensus is desirable to apply scientific theories and models to concrete problems. Furthermore, he points out that this pragmatic value of consensus would not apply if science were understood just as an abstract exploration. However, since science also entails a practical (applied) dimension, the pragmatic value of consensus becomes significant. Note that this is even more important in economics, as the application of economic knowledge involves a policy decision. For instance, a consensus that inflation is caused by monetary emission has clear consequences for monetary policy decisions. Likewise, a consensus that austerity affects economic growth has clear implications for fiscal policy decisions. In *Seeking Consensus in Social Sciences* (2014), Martini insists on this pragmatic value of consensus. He argues that "the best strategy to defend consensus seeking in social science is not by linking consensus to either truth or empirical success, but, more pragmatically, to the legitimation of policy making and the normative

[17] "In general, according to Social Empiricism, consensus is usually epistemically undesirable. It is not enough for one theory to have the most evidence; it must have all the empirical successes for consensus to be appropriate. Most of the time, dissent is epistemically better for science. (I stress the epistemic desirability, rather than overall desirability, since there can sometimes be political reasons for coming to consensus. Medical practice and environmental science are two areas in which consensus has political advantages. These political advantages may or may not outweigh the epistemic disadvantages of coming to a consensus.)" (Salomon, 2006, p 38).

dimension of social science" (Martini, 2014, p. 119). Thus, he claims that consensus is not a theoretical desideratum, since it is not connected to truth or empirical success; rather it is a normative desideratum for a science that aims to be relevant and transmissible.

This non-epistemic dimension of the value of consensus is now becoming evident in the debate over climate change. While there is a high level of scientific consensus that climate change entails serious risks and that global warming is mostly the product of human (anthropogenic) activities, public opinion on this issue has not reflected this consensus. Therefore, several empirical studies have emerged showing the role of scientific consensus in public beliefs about climate change. In *The Pivotal Role of Perceived Scientific Consensus in Acceptance of Science* (2012), Lewandowsky, Gignac & Vaughan argue that "public support for climate legislation has been shown to depend on people's perception of a consensus among climate scientists" (p. 1). In particular, they find that perceived scientific consensus explains about 60% of the variance in the support for climate change policy. Likewise, in *Perceptions of Scientific Dissent Undermine Public Support for Environmental Policy* (2014) Aklin & Urpelainen show that "even modest amounts of scientific dissent undermine public support for environmental policy" (p. 173). They emphasize that it is important to understand the role of scientific consensus as a legitimate source of policy formulation.

So far, I have discussed several authors, in several fields, who have suggested that consensus is desirable for reasons that do not fall into the epistemic frame. Solomon argues that consensus has a *political* or *rhetorical* role*;* Beatty & Moore link consensus with *trust* and *authority*; and Martini highlights its *pragmatic* value. While all three emphasize different aspects, they all agree on one feature: *scientific consensus enhances the policy relevance of scientific knowledge*. Throughout the rest of the section I will bring together all these insights and develop the *relevance value* of consensus in a more clear, structured and explicit manner.

3b.ii. Consensus for knowledge's policy relevance

The non-epistemic dimension of the value of consensus entails both abstract and concrete benefits. Regarding abstract values, it can be argued that scientific consensus enhances *public trust* in science. By public trust, I refer to the trust that society places in scientific research.[18] Trust is a great value for a community or organization, since it facilitates social interaction. As Fukuyama (1995) states, organizations and institutions largely depend on trust among people. Goldman (2001) analyzes the reasons why laypeople should trust in certain experts instead of others. Unlike the expert-expert relationship, the novice-expert relationship suggests one in which the novice is not in a position to evaluate the expert's knowledge against his own. Therefore, Goldman proposes several reasons why a novice should trust in one specific expert instead of another. One of these reasons, indeed, is the level of agreement between putative experts. In particular, Goldman argues that "to the extent that it is feasible, N [novice] should consult the numbers, or degree of consensus, among all relevant (putative) experts" (Goldman, 2001, p 97). Furthermore, when we observe the main reasons why laypeople actually consider something scientific, the top three reasons according to the National Science Foundation (2010) are: "conclusions based on solid evidence", "carefully examining different interpretations of results" and "replication of results by other scientists" (as cited in Resnik, 2011, p. 7). These results are clearly connected to the idea that consensus enhances public trust in science: a high

[18] Although the term "trust" has been used in several different ways (Resnik, 2011), the idea that society trusts in science is self-evident. On the one hand, scientific knowledge has a strong influence on our system of law. Think, for instance, of food and health legislation. Each year, scientific institutes receive millions in public resources. Indeed, according to the Science and Engineering Indicators (2016) provided by U.S. National Science Foundation, more than 75% of the population agrees that government should fund basic scientific research. Furthermore, while only 10% considers that current government is spending "too much," almost 40% considers it "too little." Thus, besides the difficulties to come up with an exact definition of public trust, I will follow the common belief that we (society) trust in science and ask whether scientific consensus affects public trust.

level of disagreement suggests that conclusions are not based on solid evidence, different interpretations have not been carefully examined, and results have not been replicated. Consequently, as Beatty (2006) states, exposing the lack of consensus might affect the credibility and authority of the group: "another reason why scientific experts might simplify the state of knowledge with regard to a particular issue, or why they might let a particular position stand as the group's in spite of disagreement among themselves, is to protect their expert status. As long as they openly contest each other's knowledge with regard to an issue of public concern, they may raise questions in the minds of the lay public as to whether they know what needs to be known, and even whether they have the competence to figure it out. By withholding information about the degree of disagreement among them, a group of scientists might preserve its perceived status as the group to consult and defer to—i.e., the experts—with regard to a particular set of issues". (Beatty, 2006, p. 54)

Public trust in science, then, is not just an abstract value. Indeed, public trust plausibly explains the huge amount of resources that societies spend on scientific research, which is necessary for science to exist at its current scale.[19] We can say that public trust in science does not only concern science's reputation but also science's authority. This brings us to a more specific and concrete value that I want to stress as the missing value of consensus, that is, the *policy relevance* of scientific knowledge. The relation between consensus and scientific knowledge's policy relevance is indeed the main value highlighted by most of the authors mentioned before – specially the authors that I described as conciliationists. Martini (2014) states that scientific consensus plays a significant role in *legitimizing policymaking* and Beatty & Moore (2010) point to its role in *authorizing decisions*. In negative terms, Van Bowel (2009) argues that a "lack of scientific consensus often is used to undermine or criticize science and the public policy based on it" (Van Bowel, 2009, p. 121). The mechanisms that connect scientific consensus with its policy relevance, however, require further elaboration. Thus, in the rest of this sub-section I will argue that *scientific consensus enhances scientific knowledge´s policy relevance both directly and indirectly*.

The direct way refers to how scientific knowledge is transmitted from scientists to policymakers — what Wren-Lewis (2015) calls the *knowledge transmission mechanism*. The point here is that scientific knowledge cannot be instructive for policymaking when there is not a coherent set of advice. Thus, it is not just that the results are taken more seriously when scientists agree than when they disagree, as Van Bowel (2009) suggests. Rather, it is mainly that without a uniform piece of knowledge, there is nothing concrete to be considered (Martini, 2011)[20]. Therefore, when there are several viewpoints contradicting each other, economic policy is hardly based on economic knowledge. In other words, when there is a lack of consensus there is not shared knowledge to inform policymakers but several opinions on which policymakers are, in theory, equally justified in choosing the more beneficial for their own interests. For instance, if some economists says that austerity is detrimental for economic growth, others says that it has no effect and others says that it is beneficial, then policymakers are equally justified (both politically and epistemically) to implement any policy. There is not restriction for them to make a choice based on their own interest or political benefits. This is precisely the point exposed by Tinbergen (1982): "there is a clear need for a policy that is more determined. This should be based, amongst other things, on the "as good as possible" socio-economic theory, and the latter must be accepted by as many economists as possible. If we, economists, continue to oppose each other, we fail in our duty as scientists. What should the politicians and the citizen do, if we cannot come to a more or less unanimous verdict? Then they will perhaps be guided by worn/old viewpoints, or only by narrow self-interests" (p. 1284).

[19] As Polanyi (1945) states: "science can continue to exist on the modern scale only so long as the authority that it claims is accepted by large groups of the public." (as cited in Martini, 2014)

[20] "Any application of theories and models in science to concrete problems, at least for those sciences that have such direct application, requires the formulation of a coherent set of statement on which the practitioners are to act. In other words, reasoned action requires a coherent principle of action, a consensus" (Martini, 2011, p. 70).

This idea has also been emphatically argued by Evans (2000). In *Economic Models and Economic Policy: What Economic Forecasters Can Do for Governments*, Evans analyzes the Panel of Independent Forecasters in the UK during the twentieth century as a concrete example of how a lack of consensus among economists allows policymakers to make discretional decisions between different views. When there is ambiguity, economic models have the potential to legitimate a wide and opposing range of policies. Hence, policy decisions become just the result of political evaluation without economic orientation. For instance, Evans argues that in most of their meetings, including their first meeting in 1993, the Panel of Independent Forecasters presented several conflicting economic forecasts and policy recommendations. Since it was unclear whether there was any kind agreement between economists, the "report of panel of independent forecasters" failed to inform the Chancellor which recommendations he should consider. "As a result, the group of economic models as a whole appears to have no clear implication for policy unless someone is able to decide which one to believe. Because of the ambiguity of econometric and other tests, economic modellers have, as yet, been unable to do this and so economic policy decisions remain political in the deepest sense" (Evans, 2000, p. 222). Therefore, Evans claims that it is unclear that a solution for a better use of economic knowledge in policymaking is to have more "scientific" models or "better" economists. Rather, he suggests that "instead of looking to the economic community, the sociological solution… is to look outside it and to develop *new ways of making economic policies which recognize and build up consensus needed to sustain policies*" (Evans, 2000, p 223. Emphasis mine).

The indirect way refers to how scientific consensus affects policymaking through public support. The level of responsiveness of government policy to public opinion has been an important subject of debate in the political sciences for at least 30 years. In *Effects of Public Opinion on Policy* (1983), Page & Schapiro suggest that public opinion is frequently a proximate cause of policy decisions. As both public opinion and policy decisions affect each other, they emphasize that there is not only a substantial congruence between opinion and policy but also that public opinion tends to move before policy. Hence, they conclude that "opinion changes are important causes of policy change" (Page & Schapiro 1983, p 189). Twenty years later, Burstein (2003) reviews those findings. In *The Impact of Public Opinion on Public Policy,* Burstein upholds Page & Schapiro´s results. In particular, he stresses three important findings: that the impact of public opinion on policy is substantial, that salience increases the impact of public opinion; and that the impact remains strong even when other actors – such as political organizations or elites– are taken apart in the process[21]. Although there is some debate about the extent to which public opinion influences policy – e.g., Wlezien & Soroka (2012) reveal that the strength of responsiveness is conditioned by the political system -- there is also a widespread agreement that public opinion influences policymaking in a non-depreciable way (Burstein, 2010). The 2014/2015 austerity case in Greece illustrates the point. Indeed, in Greece the effect of public opinion was so strong that it led to a change in the prime minister. Tsipras took over power in January 2015, and some months later he launched a referendum to decide whether to accept or reject the bailout conditions proposed (until then imposed) by the European Commission, the International Monetary Fund and the European Central Bank. In this case, public opinion influenced the policy decision in a well-defined way. However, public opinion can also influence policy in less explicit forms. Since the people ultimately decide who is the Prime Minister, Prime Ministers do not commonly ignore the complaints of their (past and future) supporters.

Since we already established the link between public opinion and policy, we now need to show that scientific consensus affects public opinion. The point here is that a lack of a clear scientific consensus undermines public support on a related public policy. To illustrate this point, I will consider the case of global warming. Over the last several decades, public opinion on global

[21] "Overall, the findings about responsiveness seem quite robust, not strongly affected by the activities of political organizations or elites, type of issue, or time" (Burstein, 2003, p. 36).

warming has fluctuated. At the beginning, the public disputed whether global warming was occurring; then they debated whether it was dangerous; and afterwards they debated whether it was caused by human activities (Oreskes & Conway, 2010).[22] Because of that situation, several empirical studies have been performed to understand what determines public support for environmental policies. Lewandowsky & Gignac (2012) reveal that perceived scientific consensus plays a significant role in shaping public opinion. Although their analysis mainly refers to climate change, it also analyzes other issues like whether smoking causes lung cancer or HIV causes AIDS. Thus, the authors highlight two conclusions. First, that public opinion, or more specifically public support for climate change policies, depends on the public perception of consensus among scientists. Second, that this result is not unique to climate science but that the public's perception of consensus shapes public opinion in the areas previously mentioned. Furthermore, Aklin & Urpelainen (2014) studied the relation between public beliefs and scientific consensus in a quantitative way. In particular, they analyzed how much scientific dissent is necessary to strongly undermine the public´s support of environmental policy. They found that even small amounts of disagreement might have large effects on public beliefs.[23]

3b.iii. Potential criticisms

Last section, we elucidated the 'missing' value of consensus, the *policy value,* which contains non-epistemic reasons to value consensus in economics. Firstly, I suggested that exhibiting disagreements affects public trust in science. However, since science´s reputation is a very abstract concept, I mainly focused on a concrete aspect: the policy relevance of scientific knowledge. In particular, I argued that *scientific consensus enhances scientific knowledge´s policy relevance in both a direct and indirect way*. While the former refers to the direct transmission of knowledge from scientists to policymaker, the latter refers to the indirect effect of public opinion on policymaking. In this section, I will analyze three potential criticisms to the *policy value* of consensus. First, I will observe that the empirical studies of the effects of scientific consensus on public opinion do not include the *social* sciences. Second, I will look at how what shapes public opinion is not scientific consensus but public *perception* of consensus. Third, I will highlight the fact that, especially in economics, there may be difficulty with the *timing* of consensus.

In the previous section I showed that several empirical studies find consensus an influential guide for public beliefs. Those studies survey issues related to the climate sciences, environmental studies and medical science, but none of them addresses consensus related to social sciences. So the question is whether consensus' influence on public opinion can be extended to social domains. For instance, one can argue that in terms of impartiality, natural scientists enjoy greater prestige. Since economic theories directly affect economic interests, people may be suspicious about the impartiality of economists' opinion. However, I do not think that this argument against consensus in economics is valid, because the criticism against the impartiality of economists is equally applicable to others disciplines. In particular, it is false to argue that only economic debates affect economic interests. As Oreskes & Conway (2010) show, debates about the effects of climate change and smoking cigarettes deeply affect economic interests. The former affects the business of companies that pollute, while the latter affects the business of large tobacco companies. Public hardly ignores that both social and natural scientific debates possess huge economical implications. Consequently, claiming that social studies do not influence public opinion because they affect economic interests -and the

[22] As Oreskes & Conway (2010) show, interest groups have played an unfair role promoting skepticism to the society beside what the empirical evidence suggest.

[23] "As soon as the respondents were told that there is some disagreement among scientists, the level of public belief in the problem and demand for a policy response decreased… If the public's prior expectation is that scientific studies and results are beyond dispute, even small skeptical minorities undermine the public's faith in the study, even as scientists are used to continual criticism and debates" (Aklin & Urpelainen, 2014, p 175).

public is aware of that- is flawed. In any case, I agree that more empirical studies should be performed so as to understand the scope of consensus' influence on public opinion.

The second criticism asserts that what influences public policy support is not the actual level of consensus but, as Lewandowsky & Gignac (2012) argue, what the public perceives to be the level of scientific consensus. Note that the perception of consensus is not necessarily a reflection of the real level of consensus. For instance, while over the last few years there has been a high degree of consensus on anthropogenic global warming, the perceived consensus has fluctuated. Oreskes & Conway (2010) show that the relation between smoking and lung cancer has experienced a similar path. Therefore, we can state that actual scientific consensus is not a sufficient condition for the public perception of consensus. However, it seems hard to deny that certain kinds of real consensus are necessary for the public to perceive consensus. Still, if the media and elites played a massive role in public beliefs, it could be argued that the public might perceive consensus where there is none, e.g., during the USSR there was a public consensus on Lysenko's theory of biological adaptation (Tucker, 2003, p. 505). In any case, the existence of real consensus strongly contributes to perceived consensus. In other words, ceteris paribus, it is undeniably more plausible for societies to perceive consensus when there is actual consensus than when there is not. Therefore, although the relation is not straightforward, we can affirm that scientific consensus tends to influence public beliefs and thusly enriches public support of policy decisions.

Finally, the third criticism reveals a timing limitation in scientific consensus. Policymakers commonly have to make decisions before scientific consensus has been reached. For instance, after the financial crisis of 2008, policymakers in the U.S. and Europe had to decide whether to increase or decrease public spending, quantitative easing, interest rates and so on. By the time they had to make policy decisions, it was unclear whether there was any kind of consensus. Note that this timing lag is not exclusive to economics. Some decades ago, when policymakers were debating whether to regulate smoking, there was not a scientific consensus on whether smoking causes lung cancer (US Department of Health and Human Services 2004). However, there are reasons to believe that the timing lag between when consensus is reached and when policy is required is even more pronounced in economics than in other disciplines. On the one hand, economic policies have to be made constantly. There are several situations in which policymakers need to make decisions immediately, regardless of the degree of scientific consensus. Indeed, it can be argued that policymakers decide whether to increase or decrease taxes or whether to increase or decrease the minimum wage the whole time -- even when they do not implement a new policy they are deciding not to do that. On the other hand, economics as a field sees more internal dispute than physics, biology or medicine. Indeed, there has been a long debate about why economists typically disagree. The main sources of disagreements, it has been argued, are differences in factual assumptions (Friedman, 1953; Machlup 1964), personal interests and ideological biases (Chase, 1977; DeBenedictis & Di Maio, 2014), and methodological and normative differences (Tiemstra, 1998; Randazzo & Haidt, 2015). These sources seem to cause more disagreement in economics than in other disciplines. For instance, because economists are often unable to perform large-scale controlled experiments empirical tests in economics are more disputed, i.e., because it is difficult to gather evidence in the real world; it is difficult to properly isolate parameters; and it is difficult to reproduce experiments. All these factors make it harder for economists to achieve consensus and thus increases the timing lag between consensus-availability and policy-requirements.

The first two criticisms that we analyzed just affect the indirect mechanism by which scientific consensus enriches the policy relevance of scientific knowledge. Even if these criticisms were right –- though I have argued against them -- they would just weaken the indirect way by which scientific consensus influences policymaking. By contrast, the third criticism mainly, though not exclusively, affects the direct mechanism. If it is true that it is harder to expect consensus in economics by the time policy decisions are required, then one might think that the political relevance of consensus is threatened. However, this conclusion is misguided for at least two

reasons. Firstly, because the "timing" argument does not affect the *potential* policy relevance of consensus but the *actual* one. That is, this argument does not argue against the idea that when consensus is reached then it enhances policy relevance. It is an argument that brings skepticism to the idea that consensus will be available at the proper time. Nevertheless, it does not affect the argument that consensus, when available, enhances knowledge's policy relevance. Secondly, the timing argument also fails to capture the actual relevance of consensus because it rests on an implicit assumption that consensus enhances knowledge's policy relevance only in cases when consensus is reached spontaneously. That is, it seems to assume that there are no available mechanisms to influence the possibility of reaching consensus. However, if we consider that consensus can also be reached through non-spontaneous mechanism -i.e., consensus promoted by some institutional design-, then the timing argument largely loses its strengths. In other words, the timing argument seems to ignore cases that use institutional design in order to achieve consensus. For instance, let's consider the case of the independent panel of forecasters in the UK. In this case, there was a concrete institution in which economists had the possibility to reach some form of consensus in a proper time to provide a common input to policymakers. Likewise, let´s consider the actual Central Planning Bureau (CPB) in the Netherlands. Once a year, they publish and present in the parliament the Central Economic Plan which contains a unique and agreed-upon economic forecast. This forecast has a strong relevance in policy decisions. As a result, I maintain that the three potential criticisms are misguided and, thus, the *policy value* of consensus remains significant both in its potential and actual scope.

3c. Conciliationists' Contribution

Based on the analysis developed before, in this section I will elucidate conciliationists' contribution both to the debate within the philosophy of science and to the debate within economics. Regarding the debate within the philosophy of science, I will argue that conciliationists use the policy value (developed in section 3b) in order to overcome the pluralist argument against consensus (developed in section 3a.ii). While the debate between pluralists and consensualists suggests that either consensus or dissent is valuable, conciliationists show that both consensus and dissent are valuable. I will argue that the philosophy of science's debate can be used to shed light on the economic debate. In particular, I will apply the philosophical discussion to clarify some pluralist positions that have arisen in economics. The section is therefore structured as follows. Firstly, in section 3c.i., I will outline conciliationists' contribution to the debate in philosophy of science. Secondly, in section 3c.ii., I will apply this contribution to clarify the pluralist debate in economics. Finally, I will share some conclusions.

3c.i. Conciliationists' contribution to the debate within the Philosophy of Science

As introduced before, pluralists argue that the epistemic gain that takes place during the process to reach consensus is captured by the values of dissent. According to them, consensus-output is irrelevant for scientific purposes. In this section, I will argue that, against this pluralist view, conciliationists claim that both consensus and dissent are valuable. In order to support this position, I need to show the flaws in the pluralist argument against consensus. I will separate the pluralist position into four premises in order to detect exactly where is the disagreement between pluralist and conciliationist. Moreover, distinguishing pluralist argumentation in four premises allows me to elucidate the conciliationist contribution to the debate.

Pluralist argumentation against consensus takes the following form:

(1) The epistemic gain during the consensus-process is not a value of consensus itself.
(2) Indeed, this epistemic gain during the consensus-process is better captured by the

values of dissent discussed above (*critical and informative values*).

(3) The only value of consensus suggests that consensus is a good indicator of knowledge (*indicative value*).

(4) The indicative value is misguided.

➢ Conclusion: Consensus is irrelevant for scientific enterprise.

Now that pluralist argumentation is clearly expressed, I will analyze where conciliationists find the argumentation faulty. In line with pluralists, conciliationists do not argue against the distinction between consensus-process and consensus-output. Indeed, they accept that the epistemic gain during the process of consensus does not make consensus itself valuable. Thus, they endorse premise (1). In addition, they concede that the epistemic gain that occurs during the consensus-process is captured by both the critical and informative values promoted by dissent. Therefore, they do not argue against premise (2). Furthermore, conciliationists accept that the link between consensus and knowledge –*indicative value*- is problematic. Thus, they endorse premise (4). However, conciliationists oppose the idea that the only value of consensus is the indicative value. The point of disagreement between pluralists and conciliationists is therefore premise (3). In particular, conciliationists suggest that there is another value of consensus that is missing in the pluralist analysis: that *consensus enhances knowledge's policy relevance*. This *policy* value, then, should be incorporated in premise (3). A new premise (3') should state that there are two values of consensus: the *indicative* and the *policy* value. However, rejecting only the *indicative value* is not enough to conclude that consensus is irrelevant for scientific enterprise. In order to reach this conclusion, pluralists also need to argue against the *policy value*. In other words, once we recognize this *policy value* of consensus, the pluralist's conclusion becomes misleading since we can state that consensus is valuable not because it indicates knowledge but because it enhances the policy relevance of that knowledge[24].

Value of Consensus	Value	Meaning	Character
Consensus-Process	*Critical* Value	Critical Discourse	Epistemic
	Informative Value	Preserving Information	Epistemic
Consensus-Output	*Indicative* Value	Sign of Knowledge	Epistemic
	Policy Value	Policy Relevance	Epistemic & Non-Epistemic

Table I – The Value of Consensus

As a corollary of the analysis realized in this chapter, we have reached a clear characterization of the different values of consensus (See Table I). This table does not attempt to be exclusive, but it is a useful guide in the debate over consensus. First, it suggests a distinction between consensus-process and consensus-output. Then, it recognizes that there are two values to be considered during the process of consensus: the *critical value* and the *informative value*. As explained in section 2a.i., these values are promoted by dissent and have mainly an epistemic character. More importantly, this table includes the two different values of consensus: the *indicative value*, which states that consensus can be seen as sign of knowledge, and the *policy value*, which states that consensus enhances knowledge's policy relevance. While the indicative value is mainly epistemic, the policy value also entails a non-epistemic element. As we have

[24] This conclusion assumes that the applied dimension of science is part of the scientific enterprise. Since it might be a contested issue, I will address the debate on the scope of the scientific enterprise in the following section (3c.ii.).

argued, conciliationists' contribution to the philosophical debate over the desirability of consensus in science is to show that pluralists' position properly challenges the indicative value but does not address the policy value. As a result, conciliationists conclude that both consensus and dissent are valuable.

3c.ii. Conciliationists' contribution to the debate within Economics

The conciliationist's contribution can help clarify some aspects of the debate on pluralism in economics. In particular, the missing value of consensus exposed before is crucial to avoid an extreme pluralism. Before analyzing extreme pluralism, in this section, I will first introduce some relevant aspects of the pluralist movement in economics. Then, I will argue that the previous analysis on the debate within philosophy of science has a direct application in the debate within economics.

The 1992 *Plea for a Pluralistic and Rigorous Economics*, promoted by Hodgson, Mäki & McCloskey marked a milestone for the pluralist movement in economics. The plea, published in the *American Economic Review* and signed by forty-four leading economists -including four Nobel laureates, such as Granger, Modigliani, Samuelson & Tinbergen-, calls for "a new spirit of pluralism in economics, involving critical conversation and tolerant communication between different approaches" and urges economists to include this new pluralist spirit "in the character of scientific debate, in the range of contributions in its journals, and in the training and hiring of economists" (Hodgson, Mäki & McCloskey, 1992). The pluralist movement emerged as a response against the intolerant hegemony of mainstream economics[25]. Pluralists oppose the lack of dialogue between mainstream economists and those who propose new approaches. Those who signed the 1992 plea addressed this explicitly: "we the undersigned are concerned with the threat to economic science posed by intellectual monopoly. Economists today enforce a monopoly of method or core assumptions, often defended on no better ground than it constitutes the 'mainstream'". Furthermore, this mainstream conservative attitude also gave rise to a Post-Autistic Economics in 2000, driven by several groups critical of the mainstream –such as behavioral economics, heterodox economics, feminist economics, and so on. From the end of the twentieth century, then, the pluralist movement in economics has expanded to include those who analyze economics from both outside and inside the discipline.

Pluralism, nevertheless, has several meanings. There is also a distinction between plurality and pluralism; while the former is a descriptive claim, the later has a normative connotation. That is, pluralism argues for plurality: "pluralism, as distinct from plurality, is essentially a normative term: it amounts to the advocacy of plurality. Pluralists maintain that a variety of perspectives, accounts, beliefs and approaches to action should exist and should be striven for" (Mariyani-Squire & Moussa, 2015, p. 194). Notice, however, that plurality is often used as an argument for pluralism. Based on the Duhem-Quine problem, one argument usually mentioned to support pluralism in economics is the fact that there is no conclusive way to warrant the validity of a unique theory or hypothesis -both because theories cannot be tested in isolation and because observation and facts are theory-laden and compatible with several hypothesis (Dutt, 2012, p. 18). So, the argument here is that, because of the likely outcome of scientific research is a diversity of opinion –or there is not a conclusive way to maintain only one hypothesis-, science should embrace pluralism. Although I agree with the premise, I do not see how plurality itself constitutes an argument to support that pluralism is always desirable. This argument fails by a naturalistic fallacy: because it is, it should be. In other words, this argument just explains why

[25] "Circa 1965, mainstream economists' elevated social status and methodological hubris predisposed them to dismiss alternative theories tout court as unscientific. Dissenters objected to the mainstream's hegemonic intolerance in a variety of ways…" (Garnett, Olsen & Starr, 2009, p. 2)

plurality is the *expected* scenario of scientific research but it does not provide an argument itself to support why this is a *desirable* situation. On the other hand, pluralism may refer to different levels. While it started as a movement mainly against the methodological hegemony of mainstream economics, authors have identified several levels upon which the debate about pluralism takes place. Dow (2008), for instance, distinguishes between an ontological, an epistemic, a methodological and a theoretical level. Dutt (2012) maintains these dimensions and adds normative and prescriptive dimensions. Maki (1997) provides an even longer lists: ontological, veristic, intentional, theoretical, linguistic, epistemological, pragmatic, methodological, meta-methodological, axiological, ethical and ideological. Following the core of the project, I will not address the debate over pluralism at methodological, epistemological or ontological level. Rather, I will engage with pluralism at the level of beliefs.

My goal here, then, is to use the previous analysis to clarify one interpretation of pluralism at the level of belief. Notice that I do not attempt to criticize the pluralist movement in economics as a whole –indeed, I mostly share its spirit and motivation. Rather, I will criticize a specific interpretation of this movement which I call '*Extreme Pluralism*'. Extreme pluralism follows the original spirit of the pluralism movement but takes it to an extreme. It states that pluralism is desirable always and in every dimension: "in addition to the fact that pluralism in each dimension is desirable, since there is a relation between choices in different dimensions, pluralism in one dimension is good not only for itself, but also, instrumentally, for pluralism in other dimensions" (Dutt, 2012, p. 19). Contrary to this *I will criticize the idea that economics should always embrace diversity of opinions*. Of course, this does not mean that economics should always avoid plurality, or that economists should become disengaged. I do believe that an open and broad-minded economics, which has the capacity to engage in a critical conversation among the different approaches is extremely healthy. My point is that diversity of opinions is not always desirable because a constant state of disagreements can be detrimental in certain cases. In order to provide a proper criticism of this view, I will first put on the shoes of extreme pluralists and develop the best argumentative line to support their view.

The extreme pluralist view can be reconstructed as follows:

(1) Plurality (diversity of beliefs) contributes to knowledge.
(2) By contrast, consensus (convergence of beliefs) does not contribute to knowledge.
(3) Furthermore, demanding consensus entails a risk to the knowledge process.
➢ Conclusion: economics should always embrace diversity of views (pluralism).

The first premise is grounded in the two epistemic values of disagreement discussed in section 2a.i: diversity of beliefs both promotes critical debate (*critical value*) and preserves information (*informative value*). As discussed before, this is a vital aspect of scientific enterprise and thus I strongly support premise one. Premise two, also seems to be right. If we value consensus because of deliberation, this is already captured in premise one. Therefore, it cannot be used as an argument for consensus. Furthermore, as we have claimed several times, consensus is neither sufficient nor necessary for knowledge. Thus, I will construct my criticism assuming that it is sound. Premise 3 can be understood as the argument that demanding consensus affects the two values of dissent referred to in premise 1. On the one hand, it can be argued that a demand of consensus may interfere with the process of deliberation. For instance, pushing scientists to support a belief that they otherwise would not support. On the other hand, a demand of consensus can cause people to hide important information that might hinder the path to consensus. Demanding consensus, then, might affect both the critical and informative values that take place during the consensus-process –i.e. when consensus is expected as a result of deliberation, it can give rise to a groupthink dynamic, where researchers tend to polarize their positions and overlook or hide information[26]. Therefore, I will also accept premise 3. So far I have not opposed any of the premises behind the pluralist argument. My main argument against

[26] The negative effect of aiming for consensus will be developed further in the next chapter.

extreme pluralism, then, is not that premises are wrong, but that the conclusion does not follow from them. The reason is that while the premises can be encompassed under an epistemic dimension, the conclusion (that economics should always embrace diversity of opinions) also involves non-epistemic elements. That is, while the premises only show that plurality is beneficial for epistemic purposes, the conclusion expresses that plurality is beneficial for every purpose. Consequently, there are two ways to make the conclusion valid: either we can modify the premises or we can modify the conclusion. However, I will argue that neither of these options can save the extreme pluralist conclusion.

The valid conclusion that arises from the premises can be formulated in the following way: economics should always embrace diversity of opinions as soon as economics is only concerned with epistemic goals. Notice that first premise (plurality contributes to knowledge) exclusively asserts that diversity of views is epistemically beneficial. Likewise, premise two (consensus does not contribute to knowledge) only opposes the epistemic relevance of consensus. The same thing can be said about premise three (demanding consensus entails a risk to knowledge's process), which expresses that demanding consensus may be epistemically harmful. Therefore, I maintain the natural conclusion should remain at the epistemic level. Based on the premises, there are no reasons to conclude that plurality is also non-epistemically desirable. Thus, if pluralists want to claim that economics should always embrace diversity of opinions (the original conclusion), then they would have to add another premise. On the one hand, they could add a fourth premise which states that (4) the only goal of economics is to produce scientific knowledge. On the other hand, they could add a different fourth prime premise which states that (4') Plurality is always desirable also for non-epistemic purposes. To criticize these premises different arguments are required.

The idea that the only goal of economics is to produce scientific knowledge has been challenged both by economists and philosophers of science. Within economics, there is a famous distinction between three domains: normative economics, positive economics and economic policy-making (Colander, 1992; Mireles-Flores, 2016). While the notion of normative and positive economics is extremely disputed, there is no doubt that policy-making constitutes a crucial domain of economics. Indeed, if we think in macroeconomics, policy-making constitutes not only the applied aspect of the field but it is also commonly used to test economic models or hypotheses. Additionally, Reiss (2016, p. 153) endorses a pluralist position regarding the goals of economics. In particular, he identifies four different economic goals: to describe, to explain, to predict and to control. Once again, to control refers to the policy scope of economics where economic theory is put into practice. Therefore, there are solid grounds to claim that the fourth premise (which states that the only goal of economics is to produce scientific knowledge) would be wrong. It is false that the only goal of economics is to produce scientific knowledge; but another crucial goal of the discipline is to develop economic policies –or in Reiss' terminology, to control. Claiming that the only goal of economics is to build abstract models or theories, hence, would be denying the policy dimension of the discipline or rejecting that control is one of the goals of economics –and so far, I have never seen the pluralists argue for that. Furthermore, within the philosophy of science, Douglas (2009) emphasizes the role that science plays in society. To illustrate her point, she highlights the large and predominant role of scientists in current society. Thus, she criticizes that the role of philosophers of science has not followed the transformation in the scope of science but remains tied to the past, when scientists had a minor influence in society. Nowadays, the influence of science and scientists in society is massive and unquestionable.[27] For economics and economists it is even more visible. Most countries have an economic department, mainly comprised of economists, who decide economic

[27] "The importance of science advisor changed from a sporadic, occasional influence, to a strong, personal relationship, to a deeply entrenched institutional necessity. Scientists now clearly occupy influential and important roles throughout our government, providing advice on a wide range of technically based issues… Even when science advice is divided, simply ignoring the experts is not a viable option… Yet, despite the clear authority of the scientist´s voice in contemporary society, this aspect of science has been largely ignored by philosophers of science." (Douglas, 2009, p. 43).

policies. Hence, to claim that the only goal of economics is to produce scientific knowledge would be to deny the way in which economists are involved in public life and to deny that economic research shapes practical and political decisions. Again, I have never seen pluralists argue this position.

The last way to make sense of the extreme pluralist claim -that economics should always embrace diversity of opinions-, would be to support the premise that (4') plurality is always desirable also for non-epistemic purposes. This idea was precisely refuted in the previous chapter (2b). Indeed, one of the main contributions of the project has been to develop the non-epistemic value of consensus. I have argued that consensus is desirable mainly because it enhances the policy relevance of scientific knowledge. Furthermore, as we have explained before and will develop afterwards, a constant diversity of opinion between economists would undermine the policy relevance of economics knowledge both in a direct and indirect way. On the one hand, a lack of consensus would challenge the direct transition of knowledge from economists to policymakers (direct way). On the other hand, a permanent diversity of opinion would undermine the policy relevance of knowledge because it would threaten public support and influence (indirect way). As a result, it is misguided to claim that (4') plurality is always desirable also for non-epistemic purposes. Therefore, we can conclude that the extreme pluralism position, which asserts that economics should always embrace diversity of views, is unfounded.

3c.iii Concluding remarks

In this chapter, I have examined the debate over the desirability of consensus in economics. While there is a dispute between consensualists and pluralists over whether economics should promote consensus or dissent, I have argued that conciliationists overcome this debate by showing that both consensus and dissent are valuable. However, since conciliationists have not elaborated upon the value of consensus in a proper manner, the conciliationists' contribution to this debate is not clearly defined. Throughout this chapter, I have defined the conciliationist contributiont. First, I distinguished between the consensus-process and consensus-output. While the former refers to the procedures to reach consensus, the latter denotes the actual state of consensus. There, I have argued that the epistemic gain during the process is already captured by the values of dissent proposed by Mill, Popper and Longino (*critical value*) and by Solomon, Sunstein and Surowiecki (*informative value*). Consequently, these values cannot be used to endorse consensus. To endorse consensus we must show that consensus itself is valuable. This is precisely the conciliationists' contribution. While pluralists challenge the value of consensus by arguing against the *indicative value*, consensualists reveal that there is another value of consensus that the pluralists have overlooked. The core part of the chapter, then, has been to develop this *policy value* of consensus, which had been briefly mentioned by Tinbergen (1982) but not elaborated upon. In particular, we have argued that consensus enhances policy relevance both in a direct and indirect way. The direct way refers to the direct knowledge transmission from scientists to policymakers. The indirect way involves the public. It states that scientific consensus influences public opinion and public opinion impacts public policy. Once we take this *policy value* into consideration, conciliationists' contribution becomes clear and the debate over consensus in economics gains transparency. Finally, I have argued that this contribution is important both to clarify the debate on consensus in philosophy of science and the debate on pluralism in economics. Regarding the former, I have shown why the pluralist position, which states that consensus is irrelevant for scientific purposes, is mistaken. Regarding the latter, I have argued that extreme pluralism, which holds that science should always embrace diversity, is unfounded. As soon as we recognize that economics plays a vital role in the society, consensus becomes an important desideratum of the economics discipline.

Chapter 4

Debate II: On the Compatibility between Consensus and Dissent' Values

Trade-off between Relevance and Reliability

In the last chapter I have explained the conciliationist's contribution to the debate over the desirability of consensus (debate I). Now it is time to address whether or not consensus and dissent can coexist (debate II). Although the conciliationists successfully argue that both consensus and dissent are valuable, they fail to analyze the relationship between them. I will now analyze how those values are related. In particular, I will argue that from consensus and dissent's values it emerges a *trade off between knowledge's policy relevance (relevance) and knowledge's degree of reliability (reliability)*. That is, as long as economists attempt to increase the degree of relevance they sacrifice a degree of reliability and, *vice versa*, as long as they aim to increase the degree of reliability they lose a degree of relevance. The reason is that the mechanism to increase relevance –consensus- weakens knowledge reliability, while the mechanism that contributes to knowledge reliability –plurality- threatens relevance. The importance of this trade-off is that for evidence-based policy both relevance and reliability are required.

The chapter is structured as follows. Firstly, I will explain each element of this trade-off. Then, I will present a sophisticated version of the *indicative value* of consensus, which is useful to measure consensus reliability and hence clarify this trade-off. Afterwards, I will explain the importance of this trade-off by referring to the political literature –in particular, to the debate on science-based evidence. Finally, I will analyze an attempt to solve this trade off that comes from a *naïve conciliationists'* view. I will reveal that the compatibility of consensus and plurality proposed by naïve conciliationists depends on an implicit independent assumption between an investigative and disseminating phase. Once we uncover the problems of this independent assumption, the peaceful coexistence between consensus and plurality collapses and the trade-off remains.

4a. Trade-off between Relevance and Reliability

Unlike Martini, who claims that much of struggle between consensus and dissent is principally verbal[28], in this section I will argue that the tension is not merely verbal but genuine. In particular, I will argue that *when consensus does not emerge spontaneously there is a trade off between knowledge's degree of reliability (reliability) and knowledge's degree of policy relevance (relevance)* –that is, a trade off between the value that comes from dissent and the value that comes from consensus. More concretely, I will argue that when there is not a spontaneous consensus among scientists, demanding consensus might be beneficial for the degree of relevance of knowledge but it is prejudicial for its degree of reliability. By contrast, promoting plurality might be beneficial for the degree of truth but it is detrimental for its degree of relevance. In order to explain this conflict, I will first introduce the trade-off at the theoretical level and then I will illustrate it with real examples.

4a.i. Explaining the trade-off

[28] "Both sides of the quibble—supporters of the value of dissent and defenders of consensus—have a wealth of reasons on their sides, but much of their disagreement is merely verbal". (Martini, 2014, p. 116)

The trade-off that I am presenting here is the result of the theoretical framework developed in the previous chapter. In particular, it is the result of combining the pros and cons of *promoting dissent* with the pros and cons of *demanding consensus*. Notice, then, that the main part of the work has already been done. In particular, last chapter, I largely discussed the pros of both *promoting dissent* and *demanding consensus*. The purpose here is to expose the cons and to reveal the tension between consensualism and pluralism. More precisely, I will show that those aspects shape a trade off between relevance and reliability.

Let´s start with the positive side of consensualism (demanding consensus) and pluralism (promoting disagreements). The benefit of pluralism is based on the values of dissent expounded previously: the *critical value* and the *informative value*. The former means that disagreements promote critical dialogue, which includes discussion, argumentation, detection of errors, and mutual criticism. The latter means that disagreements contribute to preserve and make use of all information available in the community. Notice that both values of disagreements are essentially epistemic. That is, they express that disagreement enhances knowledge's degree of reliability. Therefore, I state that *promoting plurality enhances knowledge's reliability*[29]. By contrast, the benefit of consensualism is based on the *policy value* of consensus. As explained, consensus enhances knowledge's policy relevance both through a direct and indirect way. The direct way refers to the straight knowledge transition from scientists to policymakers and the indirect way involves the public: it states that consensus influences public opinion and public opinion influences public policy. Notice that the *policy value* of consensus is not only epistemic, but the virtue of being relevant has mainly a non-epistemic character: from the fact that a common belief is relevant it does not follow that it is reliable; likewise, from the fact that a common belief is reliable it does not follow that it is relevant. Thus, I state that *consensus enhances knowledge's relevance*, which is independent of the *reliability* character presented before.

However, both demanding consensus and promoting disagreements also possesses a negative side. On the one hand, *promoting disagreements undermines knowledge's degree of (policy) relevance*. The reason is that continuous scientific disagreements affect both the direct and indirect way in which scientific knowledge influence policy that we described before. Regarding the direct way, the point is that when there are several viewpoints contradicting each other, politicians have no concrete voice to listen and they are able to base their decision exclusively in their own interest -- rather than in the public good. This is precisely what Tinbergen (1982) explains: "What should the politicians and the citizen do, if we cannot come to a more or less unanimous verdict? Then they will perhaps be guided by worn/old viewpoints, or only by narrow self-interests" (Tinbergen 1982, p. 1284). Evans (2000) illustrates this situation with a real case: "As a result, the group of economic models [presented at the panel of independent forecasters in the UK] as a whole appears to have no clear implication for policy unless someone is able to decide which one to believe. Because of the ambiguity of econometric and other tests, economic modellers have, as yet, been unable to do this and so economic policy decisions remain political in the deepest sense" (Evans 2000, p. 222)[30]. Regarding the indirect way, the point is that scientific disagreement undermines public support on related public

[29] Reliable belief is relevant since epistemologists commonly consider reliability as a necessary condition of having knowledge or justification. According to the *Stanford Encyclopedia of Philosophy:* "Reliabilism is an approach to epistemology that emphasizes the truth-conduciveness of a belief-forming process, method, or other epistemologically relevant factors. The reliability theme appears in theories of knowledge, of justification, and of evidence. "Reliabilism" is sometimes used broadly to refer to any theory that emphasizes truth-getting or truth indicating properties. More commonly it is used narrowly to refer to process reliabilism about justification"

[30] Although it can be argued that every political decision is deeply political, when Evans (2000) claims that policy decisions "remain political in the deepest sense" he seems to make a distinction between (a) policy decisions that are based both in political reasons and scientific knowledge and (b) policy decision that are only based in political reasons. Policy decisions that remain political in the deepest sense, then, refers to those decisions that ignore scientific knowledge and are exclusively based on political interests. As argued before, lack of consensus allows policy makers to disregard scientific knowledge and make decisions based on their own interests.

policy. That is, when scientific consensus is unclear then different sources of information and opinion –like media, interest groups and so on- acquires a greater influence. This issue is even stronger since what shapes policy public's support is not the actual but the perceived scientific consensus. When scientists do not clearly explain the level of scientific consensus, interest groups can take advantage of the situation and influence the public to their own interests.[31]

On the other hand, *demanding consensus undermines knowledge's degree of reliability*. The reason is that demanding consensus may affect the two values of dissent mentioned above: *critical and informative values*. Regarding the critical value, it can be argued that a demand of consensus may interfere with a process of deliberation. For instance, it may discourage scientists from making a criticism or revealing an error in a position to which they are sympathetic. Likewise, a demand of consensus may push scientists to back a belief that they otherwise would not support because they do not believe that there is enough evidence to support it. Regarding the *informative value*, it can be argued that a demand of consensus can cause people to hide important information. In particular, a demand of consensus may create a context of social, time, and/or institutional pressure that can make scientists hide information that might be relevant to the epistemic process. Both issues are emphasized by the phenomena known as 'groupthink. As Solomon explains: "it [the groupthink phenomenon] occurs when a group of individuals aims to reach consensus on a controversial topic. Peer pressure, as well as pressure from those in authority (if present in the group), leads dissenting individuals to change their minds and, perhaps as important, not to share their knowledge of contrary evidence" (Solomon 2006, p. 31). Moreover, it is also argued that the dynamics of groupthink regularly polarizes positions, making the final consensus different from common beliefs. Consequently, demanding consensus weakens the reliability of scientific output.

Trade-Off *Reliability vs Relevance*	*Reliability*	*Relevance*
Consensualism	*Detrimental for Truth* (-)	*Beneficial for Relevance* (+)
Pluralism	*Beneficial for Truth* (+)	*Detrimental for Relevance* (-)

Table II – Trade Off between Reliability and Relevance

Notice that the negative side of demanding consensus weakens the positive aspect of plurality. In addition, the negative side of pluralism undermines the positive aspect of consensus. As a result, they create what I call *a trade off between reliability and relevance* –that is, a trade off between knowledge's degree of reliability and knowledge's degree of policy relevance (Table II). This means that in order to increase reliability economists need to sacrifice some degree of relevance and, *vice versa,* enhancing relevance entails a loss in terms of reliability. Let's explain how this trade-off takes place in economics. Imagine a situation in which economists are studying a specific topic –i.e., whether monetary emission (in a specific context) causes inflation. Imagine, as well, that different economists have different views. While some of them believe that monetary emission causes inflation, others believe that it does not. Furthermore, some believe that there is not enough evidence to decide who is right. Within those who believe that monetary emission does cause inflation, there is a debate over the mechanisms and degree

[31] Oreskes & Conway (2010) provides different examples in which interest groups have played an unfair role in promoting skepticism to the society beside what the empirical evidence suggest –i.e. with the cases of global warming and the consequences of smoking.

of the relation. Meanwhile, while this debate is ongoing, policymakers have to make policy decisions. They cannot wait until all those different beliefs converge. Real world and current institutions demand that policymakers make constant decisions. Furthermore, it is highly likely that this internal convergence of beliefs would never arrive spontaneously. In a situation like this, those economists face a trade-off between relevance and reliability. If they continue to argue, then the policy decisions will be primarily based on the self-interest of politicians on duty. Further, this constant disagreement would raise questions –both for policy makers and the general public- if there is such a thing as economic knowledge. If the economists want to avoid this situation and produce a relevant input to policymakers, then they must reach some form of consensus. However, when this consensus is the result of social, institutional or political pressure instead of a result of a genuine process of convergence of belief then those economists would gain relevance by sacrificing reliability.

There is, nevertheless, a situation that neutralizes this trade-off. It is related to the spontaneousness of the consensus. A *spontaneous consensus* takes place when scientists arrive at a shared position through a genuine convergence of beliefs —free from any kind of pressure. *Spontaneous consensus*, then, can be distinguished from *compelled consensus* -when consensus is reached to satisfy an obligation or as a consequence of some form of pressure. Consequently, I maintain that the trade-off between relevance and reliability would not exist if the consensus arose spontaneously. The reason is that a spontaneous consensus would neutralize the negative side of both consensualism and pluralism. On the one hand, if consensus emerged spontaneously the dynamics of groupthink would not take place and the critical and informative values would not be affected. Consensus would be a genuine result and not a consequence of social, political or peer pressure nor a consequence of hiding information. On the other hand, as there would not be disagreements between scientists, a spontaneous consensus would facilitate the policy relevance of that knowledge. Both policymakers and public opinion would receive a shared view. Of course, this scenario is extremely unlikely. As we have seen, non-cognitive biases might affect researchers in different dimensions (e.g. economical/political interests, ideology, value judgements, and so on); cognitive values might differ between researchers (e.g., explanatory power, predictability, simplicity, elegance, etc); and the empirical evidence might be compatible with several hypotheses (underdetermination of theory by data). Consequently, since we can rarely expect spontaneous consensus, the trade off between relevance and reliability is hardly avoidable.

4a.ii. Measuring the reliability of consensus

In chapter 3a I have outlined several arguments why pluralists criticize the value of consensus as an indicator of knowledge *(indicative value)*. Indeed, I have argued that pluralists are right when they claim that consensus is not necessarily an indicator of knowledge.[32] However, in *The Epistemic Significance of Consensus*, Tucker (2003) goes further, analyzing the relation between consensus and knowledge more deeply. Aware that consensus is neither a necessary nor a sufficient condition for knowledge, he analyses the conditions under which consensus indicates shared knowledge. In other words, he studies different conditions that make the "knowledge hypothesis" (consensus is grounded in shared knowledge) the most likely explanation of consensus. In particular, Tucker argues that when consensus is (1) uncoerced, (2) uniquely heterogeneous, and (3) sufficiently large, the knowledge hypothesis becomes more likely to explain consensus than the competing hypothesis (Tucker, 2003, p. 504). In this section, I will develop these conditions and suggest that his account can be understood as a sophisticated version of the indicative value, which contributes to measuring the reliability of consensus.

[32] On the one hand, consensus can be the result of different processes undertaken for many different reasons, e.g., shared common bias, political/economical interests, class background, common foe, and so on; on the other hand, there are several cases in which knowledge is in the hands of a few who are against the accepted view.

Instead, consensus would be explained by the fact that scientists are forced to support a position. The first condition (uncoerced consensus) is quite easy to grasp. When scientists are coerced or threatened into holding a view, then this view does not reflect knowledge. Instead, consensus would be explained by the fact that scientists are forced to support a position. For instance, Tucker mentions the consensus on biological adaptation theory in the USSR, where dissident scientists were at risk of being sent to the Gulag. If scientists did not agree with the consensus they faced severe penalities. The second condition (uniquely heterogeneous) basically means that no subgroup shares an extraneous feature. For instance, it avoids cases in which all scientists are from the same nation, same gender, same university and so on. This condition is crucial in order to eliminate alternative hypotheses that explain consensus in terms of joint interest, power relations, shared bias, cultural context or ideological convictions. As Tucker states: "in the absence of coercion, the more heterogeneous the consensus group, the easier it is to refute alternative hypotheses that link properties that only some members of the consensus group share with the consensus… But if the consensus group is composed of some persons who are not connected to each other in any power relationship, others who do not share political interests and ideologies, of both genders and many cultures, such hypotheses are less probable than the knowledge hypothesis" (Tucker, 2003, p. 506)[33]. In short, Tuckers argues that in the absence of coercion, lack of heterogeneity would threaten the knowledge hypothesis of consensus. Thus, uniquely heterogeneous is a crucial factor to increase the likelihood of the knowledge hypothesis by rejecting alternative hypotheses of consensus. Finally, the third condition (sufficiently large) is important because larger groups avoid accidental consensus. In particular, if the group of researchers is small then it is likely that some unobserved bias still remains. As a result, Tucker claims *that it is epistemically justified to use a large, uncoerced and uniquely heterogeneous consensus on belief as a (fallible) indicator of knowledge*.

For the purpose of this project, I will call *sophisticated Indicative value* this view proposed by Tucker, which identifies *large, uncoerced and uniquely heterogeneous consensus on belief* as a fallible indicator of knowledge. Notice that Tucker´s account only makes sense once there is consensus. It means that this *sophisticated indicative value* does not suggest that a lack of consensus denotes a lack of knowledge. Rather, it provides a framework to analyze the epistemic significance of consensus once there is consensus[34]. As the relation between consensus and knowledge is suspicious, to use large, uncoerced and uniquely heterogeneous consensus as an indicator of knowledge is epistemically valuable. Possible criticism to the efficacy of using uncoerced uniquely heterogeneous large consensus as an indicator of knowledge is that unique heterogeneity is hard to identify. For instance, only recently have scholars argued that the lack of women in science threatens the objectivity of knowledge in the field since the scientific community is not heterogeneous enough (Longino, 1990). Furthermore, the large condition of Tucker's indicative value is in many cases problematic. In particular, when consensus is settled by a small institutional arrangement or expert committee –such as the Consensus Conferences that took place from 1977 until 2013 under the National Institutes of Health (NIH) Consensus Development Program (Solomon, 2007). Similarly, coercion is not always easy to identify. In some cases, research institutes or research projects are funded by different actors that ask for a final result during a certain period of time, which can be considered a kind of coercion. However, while it is hard to identify whether Tucker's conditions are fully satisfied in practice, it is sometimes possible to identify when they are not fully

[33] "In the absence of coercion, the more heterogeneous the consensus group, the easier it is to refute alternative hypotheses that link properties that only some members of the consensus group share with the consensus. Alternative hypotheses may attempt to explain a concrete consensus on beliefs with particular power relations, or political interests, or ideological convictions, or gender bias, or cultural contexts. But if the consensus group is composed of some persons who are not connected to each other in any power relationship, others who do not share political interests and ideologies, of both genders and many cultures, such hypotheses are less probable than the knowledge hypothesis" (Tucker, 2003, p 506).

[34] In other words, X indicates Y, means that if X then one can reasonably infer Y. But it does not mean that if not X one can reasonably infer not Y.

satisfied. For instance, when all scientists belong to the same country (Washington consensus) or when those scientists who oppose the official position are penalized (USSR example). Precisely because those situations are common in real scientific practice, it is important not to use mere scientific consensus as a sign of knowledge but to have a parameter to identify shared knowledge. Therefore, although not conclusive, Tucker´s account remains meaningful: scientific consensus is a useful though fallible indicator of knowledge as long as the three conditions -(1) uncoerced, (2) uniquely heterogeneous, and (3) sufficiently large- are fulfilled.

Using this *sophisticated Indicative value*, the trade-off between relevance and reliability becomes more visible. Imagine we are in a typical situation where economists uphold several opposing views. As stated before, in this situation economic knowledge cannot contribute to policymaking. Thus, imagine that policymakers demand some form of consensus. For instance, imagine a good scenario in which policymakers design some form of institution to inform them about the best knowledge on a certain topic –in particular, they bring together ten well-known economists and decide to take into account the consensus reached in this committee. Clearly, this institutional arrangement will strongly increase the policy relevance of economic knowledge, since there will be a unique and share voiced to transmit this knowledge to the policymakers. However, this piece of knowledge will lose reliability as the consensus that arises from that committee would not fulfill the conditions required by the *sophisticated Indicative value*. We can now observe this loss of reliability by analyzing the three elements (1) uncoerced, (2) uniquely heterogeneous, and (3) sufficiently large described above. First, this consensus will be affected by some form of coercion –coercion does not necessarily mean an imposition from above, but it also may entail some form of social pressure or time pressure. For instance, let´s consider the National Institute of Health Consensus Conferences that took place from 1977 until 2003. Participants had two days to argue their viewpoints and, afterwards, there was a half day for organizers to gather all information and write down the consensus. Certainly, this is not enough time to express a consensual scientific position and thus some authors –i.e. Solomon 2007- protested against "the pressure of late night writing sessions"[35]. Second, a group of ten economists is not sufficiently large. Indeed, in the debate on the optimal size of Monetary Policy Committees, some have suggested that an optimal size is between five and nine members (Berger & Nitsch, 2011), which does not fulfill the 'large' requirement. Third, it is implausible that with such a small number of scientists the uniquely heterogeneous condition would be fulfilled. As a result, economic knowledge gains degrees of relevance to the cost of losing degrees of reliability.

4a.iii. Trade-off and science-based policy

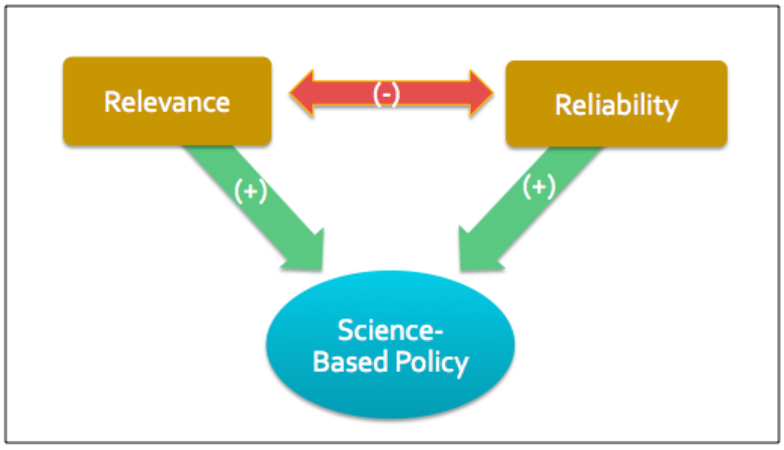
In this section I will explore the connection between the philosophical literature analyzed throughout the project and the political science literature. The purpose of analyzing this connection from a political perspective allows us to realize the practical scope of this trade-off. More precisely, I will show how the debate of science-based policy uncovers the importance of being aware that economists face a trade-off between relevance and reliability.

Nowadays, there is an agreement that scientific knowledge is a crucial input for policymaking. Moreover, Pedersen (2014) states that "improving the use and impact of science-based policies and practices at the national and transnational level is important for enhancing the quality and legitimacy of democratic governance systems" (p. 547). Although we should avoid scientism or

[35] "Concerns have also been expressed about the time pressure to produce a statement in two-and-a-half days, and especially the lack of time for reflection or gathering of further information…. [However,] The Consensus Development Program has also resisted suggestions to remove the pressure of late night writing sessions by lengthening the conference or adding additional meetings. Perhaps it does not want to give up the motivating force and rhetorical power of a press conference at the conclusion of the meeting". (Solomon 2007, p. 170-171)

epistocracy –a country only ruled by 'the knowers'-, we should also build a mechanism to avoid dogmatism and self-interested behavior by facilitating access to cognitive authorities and scientific knowledge for both policymakers and society. This means that while policy-making should not be exclusively based on scientific knowledge, it should not completely ignore it. More precisely, Pedersen claims that the social contract that shapes the relation between science and democracy can be characterized through some implicit political norms that can roughly be described as follows: (1) in a well-ordered society, democratic decision-making and public debates must be informed by a scientific approach to the relevant facts; (2) democratic decisions and public policies that deliberately ignore relevant scientific facts are illegitimate or otherwise normatively defective; and (3) the scientific community must inform policymakers about facts and findings, where this is relevant, but should leave decision-making to the democratic process." (Pedersen, 2014, p. 547).

In this framework, we can state that for science to inform policy both relevance and reliability are required (graph I). On the one hand, it is important that scientific knowledge is reliable. That is, we want advice that has a high epistemic value. However, the fact that scientists achieve reliable knowledge does not guarantee that policymakers will take it into account. For relevance, what matters is the knowledge-transition mechanism (Wren-Lewis, 2015) which refers to how the ideas of scientists are transmitted to policymakers and to the general public. Therefore, we can state that science-based policy requires both reliability and relevance (good and transmissible knowledge). The problem of this trade-off, therefore, is that it challenges the prospect of science-based policy. If, on the one hand, consensus enhances knowledge's policy relevance but demanding consensus challenges knowledge's reliability, and on the other hand, dissent enriches knowledge's reliability but weakens relevance, then science-based policy faces a tough panorama. Thus, it is important that those involved in the study and practices of science-based policy are aware of this trade-off.



Graph I – Trade-Off and Science-Based Policy

Both *relevance* and *reliability* elements can be related to the notions of *political and epistemic robustness* introduced by Lentsch and Weingart in *The Politics of Scientific Advise* (2011). According to the authors, the relationship between scientists and policymakers should encompass two aspects: *epistemic robustness* –which refers to the justification of knowledge- and *political robustness* –which is related to responsiveness and political acceptability and feasibility. The point of Lentsch and Weingart is that it is not enough to simply meet the epistemic standards of scientific validity and reliability. Scientific advice should also be politically suitable and legitimate –legitimacy, for example, involves public acceptability. Although the connections between the conceptual framework developed in this project and the one proposed developed by Lentsch and Weingart (2011) are evident, I am not suggesting that

both frameworks match perfectly. What I suggest is that there are connections between both frameworks and, furthermore, that it might be interesting to develop further research to consider to what extent the trade off between relevance and reliability that emerges from the philosophical literature on consensus in science can be meaningful to the notions of political and epistemic robustness that arise from the political debate**.**

To end this section, I will illustrate the trade-off between relevance and reliability using the *Washington Consensus* as a case wherein economics gained relevance by sacrificing reliability. The *Washington consensus* arose in the 90th, with a paper by J. Williamson called *What Washington Means by Policy Reform* (1990). In this work, Williamson explains ten propositions by which 'Washington can muster a reasonable degree of consensus"[36]. These propositions are mainly policy instruments, among which we can mention: fiscal discipline, tax reform, interest rate liberalization, trade liberalization, privatization and deregulation. The goal of the paper was precisely to "set out what would be regarded in Washington as constituting a desirable set of economic policy reforms" in order to "establish a baseline against which to measure the extent to which various countries have implemented the reforms being urged on them". (Williamson, 1990, p. 7). In short, this work had the explicit goal to influence policymaking. Ten years later, Williamson (2000) revealed that this work originated as a result of a question he received on which policies are widely accepted as being supportive for development –in particular, with the purpose of applying them in Latin America. Unfortunately**,** an important consequence of writing down this consensus is that these ideas acquired a great degree of policy relevance. Between 1980 and 2000, a lot of developing countries adopted several of these recommendations, mainly in Latin America – including Chile, Argentina, Brazil and Mexico. However, the negative side is that these experiences ended with economic collapses –e.g. the financial and economical crises in Mexico 1994, Brasil 1999, and Argentina 2001. Clearly it would be unfair to conclude that these crises are only a consequence of following the Washington consensus. However, based on the *sophisticated indicative value* discussed above, we can state that the reliability of this consensus was really low since (i) the sufficiently large and (ii) uniquely heterogeneous conditions were not fulfilled. As the name suggests, the economists involved in the consesnsus shared a unique characteristic: belonging to Washington.[37] There are several issues to add regarding the low degree of reliability. However, I believe that the previous description is enough to illustrate the trade-off. Washington Consensus was a case in which establishing a clear and easily transmissible consensus strongly increased policy relevance by severely damaging reliability.

4b. A Failed Attempt to Solve the Trade-off

In this section I will analyze an attempt to solve the trade off that comes from a *naïve conciliationists'* view, which states that there is no conflict between consensus and dissent' values but that both of them can coexist harmoniously. This position is based on a possible interpretation of the framework proposed by Martini (2014) and Kosoloswky & Van Bouwel (2014), which distinguishes between an investigative and disseminating phase of scientific research. I will argue that this framework, which attempts to conciliate consensus and dissent, suffers several problems. In particular, I will claim that the compatibility of consensus and plurality depends on an implicit *independence assumption* between an investigative and disseminating phase. Once we uncover the problems with the independent assumption, the peaceful coexistence between consensus and plurality collapses. So, firstly I will reconstruct

[36] By Washington, Williamson (1990) means "both the political Washington of Congress and senior members of the administration and the technocratic Washington of the international financial institutions, the economic agencies of the US government, the Federal Reserve Board, and the think tanks" (p. 8)

[37] The reliability of that report was even worse, as this consensus was not even representative of the Washington view. As Williamson (2000) recognized later: My fifth reform area, a competitive exchange rate, is one where I long since concluded I was a bad reporter of the Washington scene" (p. 254)

what I call the naïve conciliationists position. Secondly, I will explain why it fails. Finally, I will share some concluding remarks.

4b.i. Naïve conciliationists argument

As it is common since the Ancient Greeks, when there is a dispute between two apparently incompatible views, a new position arises introducing the golden middle way. This is precisely what Martini (2011, 2014) and Kosoloswky & Van Bouwel (2014) have done. Aware of the tension between consensualists and pluralists, they have attempted to conciliate both sides of the dispute. Martini (2011) states: "while it is perfectly fine to claim that both the advocates of disagreement and those of consensus have good reasons for defending their claims, if one wants to be liberal on the subject, one should at least show that the claims on one side are compatible with those made on the other side" (Martini 2011, pp. 72-73). Furthermore, in 2014 both Martini and Kosoloswky & Van Bouwel proposed a conceptual scheme to frame the debate on consensus and plurality in economics. These schemes, that I will criticize in this section, distinguish between an investigative and dissemination phase of science – a la Martini (2014)- or between an academic and interface consensus –a la Kosoloswky & Van Bouwel (2014). It is unclear, however, whether the authors attempt to suggest that both consensus and disagreement are completely compatible or whether some tension remains. And if the latter is the case, it is unclear what specifically is this tension. Indeed, there is a possible interpretation which suggests that there is not any conflict between consensus and disagreement. I will call it a "naïve conciliations" view. To be clear, a conciliationist view only states that both consensus and disagreement are valuable. By contrast, a naïve conciliationist view also states that *there is not a struggle between consensus and disagreement, but both of them can coexist harmoniously*. Through the rest of the section, I will argue that this naïve conciliationist view is mistaken. Although it is true that both consensus and disagreements are not necessarily incompatible, I will show that a tension between both sides remains. Before that, I will now elucidate the premises behind the naïve conciliationist position.

The naïve conciliationist position can be reconstructed as follows:

(1) Disagreements contribute to scientific knowledge, but might be detrimental for policy purposes.
(2) Consensus enhances knowledge´s policy relevance, but might be detrimental for epistemic purposes.
(3) It is possible to distinguish between two moments in science: Investigation & Dissemination phase.
(4) The Investigation phase mainly concerns epistemic issues; Dissemination phase also includes non-epistemic goals.
(5) While scientists should embrace plurality during the investigation, consensus is a non-epistemic desideratum at the dissemination phase.

➢ Consequently, there is not a struggle between consensus and disagreement, but both of them can coexist harmoniously.

The first two premises of the naïve conciliationist's position are based on what we developed in previous sections. Indeed, they constitute the four elements of the trade off that we just explained. Premise one (1) suggests that, unlike pluralists, conciliationists are aware that persistent disagreement may be detrimental for policy purposes[38]. Premise two (2) states that, unlike consensualists, conciliationists are somehow aware that consensus might be detrimental

[38] In section 3b.i, I showed that there was a diffuse but collective perception between conciliationists that a lack of consensus affects the policy relevance of economic knowledge. For instance, Martini (2014) states: "Lack of consensus among scientists leaves room for interest groups to enter the policy making debate with parochial agendas and little or carefully hand-picked evidence" (p. 115). Or more concretely, "An eternally disagreeing scientific community might just have to renounce its public role" (p.116).

for epistemic purposes.[39]

Premise three (3), which distinguishes between the investigation and dissemination phase, is the a vital step to conciliate consensus and disagreement. While the investigative phase refers to conventional activities involved in scientific investigation -such as postulating and testing hypotheses-, the disseminating phase transforms the results into policy-relevant knowledge. This means that the dissemination phase involves not only theoretical goals but also pragmatic ones –such as relevance to a given problem or risk considerations. This is precisely the meaning of premise four (4), which states that the dissemination phase also involves non-epistemic goals. That is, at the dissemination phase, when "the results of empirical or theoretical investigation are transformed into policy relevant knowledge, and possibly, passed on in the form of advice or policy recommendations", the theoretical values that guide the investigation phase –such as empirical adequacy, simplicity, predictability and so on- are not sufficient (Martini, 2014, p. 119). Therefore, premise (5) establishes that consensus is not relevant due to epistemic reasons –it is not a goal during the investigation phase-, but because of non-epistemic reasons –it is a goal at the dissemination phase. Martini nicely summarizes this issue in the following way: "if science accepts the challenge of producing policy relevant knowledge, then a phase of consensual formulation of "public knowledge" should follow the messy and disagreement-ridden phase where all scientists are battling each other over the best hypotheses, models and methods. To conclude this part, consensus is one of the non-theoretical desiderata for social science in the organizational phase" (Martini, 2014, p. 120). As a result of this naïve conciliationist approach, it is possible to conclude that there is not a struggle between consensus and disagreement, but both of them can coexist harmoniously. The conclusion looks natural. If disagreement enhances knowledge's degree of reliability but detrimental to knowledge's degree of relevance and consensus is good for relevance, let's keep diversity when scientists are developing knowledge and only aim for consensus when the goal is to use it. Separating scientific enterprise in two phases, thus, is the key to solving the conflict between consensus and disagreements.

4b.ii. Naïve conciliationism under scrutiny

This naïve conciliationist position, however, faces several difficulties. While the first two premises are accurate, the problem starts with the distinction between the investigation and the dissemination phase of science (premise 3). My main criticism, is that this distinction, which constitutes the basis of the conceptual framework that conciliates pluralism and consensualism, is misguided. My argument is twofold. On the one hand, I maintain that it is unclear how to trace a distinction between the investigative and the disseminating phases. On the other hand, I argue that even if that distinction were sharped, the naïve conciliationist position does not contemplate how those phases relate to each other. For the naïve conciliationist conclusion to be sound, these stages must not only be separable but also independent. Therefore, as soon as we discover an interrelation between these phases, the peaceful coexistence between plurality and consensus collapses.

Curiously, although the distinction between the investigative and dissemination phase plays a vital role in Martini's argument, he does not devote much space to describing each of them. Combining premises three and four (3 & 4), the main differences between these two phases can be described through three issues: kind of activities, goals and the people involved. Regarding the kind of activities, the investigation phase involves the classical activities attributed to

[39] For instance, Martini (2014) mentions: "But consensus can also harm scientific goals: it tends to eliminate fringe theories that are potentially groundbreaking, and that can thus significantly impact the course of science; it tends to make scientists conservative, seeking peer validation more than the pursuit of knowledge" (p. 116). However, I believe that they are not fully of the whole potential epistemic harm that we discussed at the beginning of this chapter. This might be one of the reasons why conciliationists have not noticed the trade-off exposed before.

science, such as postulating hypothesis, testing hypothesis, performing experiments, replicating experiments and so on. In the dissemination phase, however, it is important to analyze whether the theoretical investigation is relevant to a specific purpose, to consider the risk involved in different situations, to see whether the knowledge is transmissible to certain audience, and so on. Regarding the goals, Martini suggests that the investigation phase only pursues theoretical goals -in our framework, epistemic goals. For instance, we can mention empirical adequacy, verifiability, replicability, and so on. These goals, however, are not sufficient in the dissemination phase. In the latter, there are non-theoretical goals (in our framework, non-epistemic goals). For instance, Martini mentions relevance and transmissibility. Regarding the people involved, the investigation phase takes place only between scientists or experts. The dissemination phase, by contrast, takes place between scientists and society as a whole.

However, there are several situations where it is difficult to define which phases they belong to. For instance, let's think about when an economist writes an article in a blog or a newspaper. This does not fit in either of these phases. On the one hand, it does not involve the activities or goals that belong to the investigation phase. On the other hand, although it might contain some of the characteristics described in the dissemination phase, an article in a blog or a newspaper is better described as an economist expressing his personal opinion. Indeed, this activity may not belong to the scientific sphere at all as does not attempt to express a general view. For instance, let's consider when an economist publishes a book –for instance, we can think of *Why Nations Fail* by Acemoglu & Robinson, or *Capital in the Twenty-First Century*, by Piketty. These books are written for the general public and might fit in the characterization of the dissemination phase. However, they do not represent a general view but rather the research and ideas of one or two economists. Furthermore, it can be argued that they also belong to the investigation phase as these works are discussed in specialized journals. So it seems that they belong to both or maybe none of these phases. Let's consider, now, what seems a clear example of the investigation phase in economics: articles published in specialized journals. They postulate a hypothesis, perform some form of experimental process and share the result with their peers. However, even these cases might be considered part of a dissemination phase. For instance, several policymakers are economists well trained in the academic world who continuously follow these journals. These papers might contain policy-relevant knowledge that has passed the peer review and hence policymakers can use them to base their decisions. For instance, we can mention the famous (and embarrassing) example of Reinhart & Rogoff (2010), *Growth in a time of debt,* in which the authors show a negative correlation between debt and GDP growth –especially for debt levels over 90%- based on badly manipulated data. So, not only articles, but also books and even papers are difficult to characterize in one specific phase.

Let's assume, nevertheless, that the distinction is sharped and we can clearly distinguish economic practice into these two phases. My second point is that, even assuming that the distinction stands, it does not solve the struggle between plurality and consensus. The reason is that claiming that these phases are *different* does not mean that they are *independent*. Indeed, I maintain that they are not. Of course both Martini and (indirectly) Kosoloswky & Van Bouwel mention that these stages are interdependent[40], however they do not address the question of what this interrelation means and what consequences it has. The first thing that we can notice is that these phases are temporally related. First, there is a moment in which scientists investigate and achieve some kind of knowledge. Second, the scientists interact with the rest of the society to share that knowledge. Since the goal in this second stage is different, it is expected that this interaction also contribute, influence and introduce some modifications to the previous stage of knowledge. The dissemination phase, then, is conditioned by the achievement obtained in the investigation phase. In other words, consensus at the disseminating phase requires some form of consensus at the investigative phase which implies that those phases are not independent. As Kosoloswky & Van Bouwel (2014) asserts, "for interface consensus, some form of academic

[40] "Of course the two phases are interdependent and may partly overlap, but that does not imply that the investigative phase of science should be made identical to the disseminating one" (Martini, 2016, p. 116).

consensus or a first attempt to establish consensus is required to start up the interface process" (Kosoloswky & Van Bouwel 2014, p. 73). As we have said, if there is spontaneous consensus among scientists then the peaceful coexistence between relevance and reliability becomes plausible. However, the problem starts when there is not a genuine academic agreement. How could scientists and society reach consensus with each other when they lack internal consensus? As *academic consensus is necessary for interface consensus*, it is unclear how to answer this question without affecting the epistemic value of consensus. Furthermore, since consensus within scientists (even more among economists) is not the expected outcome of scientific research it is crucial to address these issues. What is the impact of demanding consensus at the dissemination phase when there is no consensus at the investigation phase? How does it affect the epistemic value of this consensus? Without tackling these questions, it is unwise to state that consensus and disagreement can coexist harmoniously and there is not a struggle between them.

However, we can go a step further and make a distinction not between investigation and dissemination phases but rather between public and private spheres. That is, one might state that the trade-off between relevance and reliability could be solved if scientists disagree in private but agree in public. For instance, since a public acceptance of a group position does not imply a genuine agreement with those beliefs, scientists might publically accept a group position while expressing their criticisms in private. However, the idea that a *public-private* distinction might solve the trade-off faces similar problems to the naïve conciliation proposal –based on an *investigation-dissemination* distinction. Firstly, it is hard to trace a line between the private and public sphere. Indeed, in a scientific community, it is hard to establish which domain belongs to the private sphere. For instance, articles published in scientific journals belong to the public sphere. Likewise, an article in a blog, an article in a newspaper and a book belong to the public sphere. Secondly, even if we can make a private-public distinction, establishing that scientific journals belong to the private sphere, a solution based on a public restriction of disagreement would imply a restriction on the public domains through which economists express their opinions and their research –such as newspapers, blogs or even books. For example, Krugman would not be free to publish his articles in the New York Times, several blogs would face content limitations and probably Piketty could not have published *Capital in the Twenty-First Century*. Beside the ethical and political difficulties, those restrictions also possess an epistemic limitation that affects the mechanisms to increase knowledge reliability –as the critical and informative value discussed in last chapter. Thus, while preventing public disagreement would increase relevance, it would affect reliability, which is precisely the trade-off exposed above. As a consequence, the public-private distinction does not represent a potential solution to the trade-off.

Summarizing, I have criticized the naïve conciliationist's position which states that there is not a struggle between consensus and disagreement but both of them can coexist harmoniously. My main criticism is against the distinction between an investigative and disseminative phase (premise 3). My argument is not only that it is not possible to distinguish between them but that even if it were possible to trace a line between them, these phases are not independent. I have argued that the naïve conciliationist's conclusion depends on this 'independent' assumption. That is, in order for the naïve conciliationist conclusion to be valid the investigation and dissemination phases must be independent. Without the independence assumption, there is only one scenario in which the values of consensus and dissent can coexist harmoniously: when academic consensus emerges spontaneously. As I have argued several times, this is rarely the case. Without spontaneous consensus, rejecting the independent assumption challenges the peaceful coexistence of consensus and dissent's values**.** For instance, what is the effect of demanding consensus at the dissemination phase when there is no consensus at the investigation phase? How does it affect consensus' reliability?. As argued in the previous chapter, without a genuine academic consensus demanding consensus might undermine its epistemic value. The problem of the naïve conciliationists' view, then, is that, since they accept that the investigative and disseminating phases are interdependent, they do not provide a proper analysis of what happens when there is not spontaneous consensus among scientists. Once we remove the

independent assumption between the investigation and the disseminating phases, the conclusion (harmonious coexistence between consensus and plurality) collapses.

4b.iii. Concluding remarks

In this chapter I have addressed the debate on the compatibility between the values of consensus and dissent. While conciliationists suggest that the conflict between supporters of the value of dissent (pluralists) and defenders of consensus (consensualists) is mainly verbal, I have argued that they face a real conflict. In particular, I have claimed that consensus and dissent's values are not easily compatible but they give rise to a *trade off between relevance and reliability*. Ignoring this conflict, is what I called the conciliationist's omission. This trade off arises (1) because while consensus enhances relevance, it might be prejudicial for reliability and (2) because while plurality increases reliability, it might be detrimental for relevance. Furthermore, I have suggested that there is a scenario in which this trade-off would not take place: when scientific consensus arises spontaneously. In this case, the negative effects of both pluralism and consensualism would not occur. However, I have also claimed that a spontaneous consensus is a very unlikely scenario –especially in economics. Another way to appreciate this trade-off is through the *sophisticated indicative value* of consensus exposed by Tucker (2003). It suggests that consensus becomes a good indicator of knowledge as long as it fulfills the following three elements: (i) uncoerced, (ii) uniquely heterogeneous, and (iii) sufficiently large. Commonly, when consensus is urged for policy purposes it does not follow these conditions. One way to appreciate the importance of the trade-off is considering its impact on science-based policy. Here, I suggested that for science-based policy both relevance and reliability are important. Thus, being aware of this trade-off that arises from the philosophical discussion over consensus in economics can be insightful for the debate over science-cased policy in political science. To illustrate this point I have analyzed the case of the Washington consensus. Finally, I have considered a possible way to overcome this trade-off that comes from a naïve conciliationist's position. I have argued that this solution rest on an implicit and weak independent assumption between the investigation and disseminating phase. However, since these phases are not independent, naïve conciliationist's attempt to solve the trade-off fails. As a result, the trade-off between relevance and reliability remains.

Chapter 5

Conclusion

In this project I have examined the debate on the desirability of consensus in economics. The thesis has both a theoretical a practical motivation. On the one hand, I believe that it is crucial to elucidate the effects of the high level of disagreement commonly attributed to economists. On the other hand, I believe that the lack of consensus between economists is part of the reason why some countries are still facing basic economic problems that seem to be solved in the standard literature –e.g. the eternal problem of high inflation in Argentina. The three main achievements of this project can be summarized as follows: (1) clarifying the current debate, (2) elaborating the missing *policy value* of consensus, and (3) exposing a trade-off between relevance and reliability. Through these findings we have also shown the flaws in some existing positions –such as extreme pluralism and naïve conciliationism. Another important contribution has been to bring together literature from different disciplines. In particular, the project combines philosophical, political and economic literature.

One limitation of the project is related to the scarcity of real case studies, in contrast to hypothetical examples. Partially, this is due to a lack of space. But it is also because real economics cases are deeply controversial, since it is extremely hard to analyze which is or was the state of knowledge at one moment of time. Still, the purpose of the project is more philosophical than historical. That is, the purpose is to provide a conceptual clarification rather than an historical understanding. I believe that this goal has been fruitfully achieved. Moreover, as the framework developed throughout the project combines different disciplines, it can be useful for those who study philosophy of science, social epistemology, economic theory, economic history, economic policy, public policy, and other social sciences.

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