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Understanding the context of the *Study Week on the Econometric Approach to Development Planning* organised by the Pontifical Academy of Sciences in 1963

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### **Statement of Originality**

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## **Abstract**

In 1963, a Study Week on the *Econometric Approach to Development Planning* was organised by the Pontifical Academy of Sciences. This paper examines the context of this Study Week and results will be presented as to why it was organised at that time and why this particular topic was chosen. In addition, this paper studies the aims of the Pontifical Academy of Sciences and the Holy See, and whether those expectations were lived up to. Furthermore, it analyses the contribution of Robert Dorfman and as to why he was one of the few to be invited. The discussion session on his contribution sheds some light on the context of the 1960s with regard to the concept of shadow prices and the connotation of the word *planning*, both in relation to the quantification of intangibles in the cost-benefit analysis. In addition, the relation between economics and the Holy See is explored as to whether and at what point both interests meet.

## Table of Contents

Abstract .....	3
Introduction.....	5
Body	
Context of the Study Week.....	7
Pontifical Academy of Sciences .....	7
Motivation, aim and set-up of the Study Week.....	8
Notions of the pope and the Holy See with regard to the respective context.....	10
Other PAS Study Weeks .....	15
Econometrics considered as a positive science? .....	15
Econometrics considered as a means.....	16
Contribution of Robert Dorfman .....	19
Robert Dorfman.....	19
Brookings Institution Conference on <i>Measuring Benefits of         Government Investments</i> .....	21
Summary of <i>Econometric analysis for assessing the efficacy of public         investment</i> .....	23
Summary of the following discussion .....	27
Analysis of the discussion with regard to the context .....	31
Conclusion .....	34
References.....	36
Appendix.....	38

## Introduction

From the 7<sup>th</sup> to the 13<sup>th</sup> of October 1963, nineteen economists, statisticians, econometricians and political economists, who were considered to be amongst the top world scientists in their respective fields, were invited to Vatican City for a Study Week (Pontificiae Academiae Scientiarum: PAS, 1965). The subject of this Study Week was the *Econometric Approach to Development Planning* and it was organised by the Pontifical Academy of Sciences, hereafter referred to as PAS. After the publication of over 1200 pages of transcripts on the week itself, very little historical research on these works has been done. Only as recent as June 2019, an article on this Study Week has been published. Dupont-Kieffer (2019) has primarily examined the tension in the discussion on econometrics between two stances. On the one hand it being regarded as a tool of positive knowledge and on the other hand it being regarded as a means to change society and create a better world. As no further historical research on this Study Week has been done, there is not any study on the context of this Study Week itself.

This paper presents research on the context in which this Study Week was organised, as to why be it timed at that specific moment and why this particular topic was chosen. Furthermore, it investigates why Robert Dorfman was invited and what his paper had to contribute to the discussion and as to whether this matched the expectations of the organising PAS.

The relationship between economics and the Holy See<sup>1</sup>, thereby also implicitly related to the PAS, is still relevant as of today. Catholic social thinking on topics related to the economics of social issues has further developed over time with multiple influential encyclicals by several popes. In March 2020, the international conference *The Economy of Francesco* will be organised in part by the Holy See in Assisi, Italy. The aim of this conference will be to initiate discussion among young economists on how to foster global change in order ensure that the economy of today and tomorrow is fairer, inclusive and sustainable without leaving anyone behind (The Economy of Francesco, 2019). Despite the fact that this time round a

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<sup>1</sup> The Holy See is the central governing body of the entire Roman-Catholic Church, located in the state of Vatican City and is subject to international law and has diplomatic relations with other sovereign states (Forshaw, 2003).

different topic will be discussed than over 55 years ago, it will aid to understand the relationship between economists and the Holy See. Thereby, it will examine as to whether and at what point both interests meet, in order to progress science and to further human prosperity.

## **Context of the Study Week**

In order to comprehend this Study Week, it should be understood in the context in which it was organised. The *Study Week on the Econometric Approach to Development Planning* was held from the 7<sup>th</sup> to the 13<sup>th</sup> of October 1963 in Vatican City. It was organised by the Pontifical Academy of Sciences, which invited nineteen qualified experts in econometrics, economics, political economics and statistics to participate in the discussion. The experts that were invited consist of professors such as Ragnar Frisch, Robert Dorfman and Tjalling Charles Koopmans and all invitees attended the Study Week. Appendix A provides a full attendance list.

### *Pontifical Academy of Sciences*

Pope Pius XI established the Pontifical Academy of Sciences (PAS), in 1936. The origins of this Academy trace back to the Accademia dei Lincei, which was already established in 1603. The PAS has been concerned with investigating specific scientific subjects within individual disciplines and with promoting interdisciplinary cooperation (Sorondo, 2003). The PAS is an independent body, which enjoys freedom of research within the Holy See. The ruling pope does not influence activities organised by the PAS, as these activities are organised in a sphere of autonomy. These activities are in accordance with the goals set out in the statutes “The Pontifical Academy of Sciences has as its goal the promotion of the progress of the mathematical, physical and natural sciences and the study of related epistemological questions and issues” (Sorondo, 2003, p. 2).

As the PAS is not influenced by any factors, its output is a valuable source of independent scientific knowledge. This knowledge is made available to the Holy See and to the international scientific community (Sorondo 2003). Despite the claim of independence of the institution itself, it has to be contested to some extent and it should be mentioned that the Holy See accounts for all expenses incurred by the PAS on its various activities. This sheds a different light on the full independency of the Academy and on its choice of activities. Thus, there could well have been an implicit influence by the Holy See on the chosen topic for this Study Week.

### *Motivation, aim and set-up of the Study Week*

As it is of importance to analyse why the PAS has chosen this topic, in the publications of the Study Week itself, the PAS recognises several aspects of the economy at that time, as to why there was a need for this particular Study Week. In the brief introductory text by Pietro Salviucci (1965), Chancellor of the Academy, it is stated that modern economies are highly complex and that individual choices do not always lead to positive outcomes for the community. Moreover, econometrics is a new discipline, which influences the objectives towards which economic activity should be directed. The importance of econometrics has increased by the rise of development plans and policies to control economic situations (Salviucci, 1965).

Furthermore, he noted that there was to some extent an analogy with regard to the characteristics of traditional natural sciences:

Econometrics represents a considerable breakthrough on non-mathematical systems of study of phenomena that are related to economic activity. It has allowed creating new structures of a new discipline that has all the characteristics of traditional natural sciences, because, although it deals a field that is substantially different than physics and biology, it follows logical procedures and techniques that make it an analogue to those (Salviucci, 1965, p. xi).

Despite the statement of Salviucci that econometrics has all the characteristics of traditional natural sciences, it should be noted that it was not necessarily a given fact that this was the case. It is necessary to define econometrics as it has been done by one of the pioneers in this sub discipline, Ragnar Frisch, to examine as to whether the statement made by Salviucci was correct. Frisch defines econometrics, as it is set out in his paper, *Sur un problème d'économique pure*, as the unification of economic theory, statistics, and mathematics (Boumans & Dupont-Kieffer, 2011). Frisch further elaborates on what econometrics ought to be in his first Editorial in *Econometrica*:

Its main object shall be to promote studies that aim at a unification of theoretical-quantitative approach and empirical-quantitative approach to economic problems and that are penetrated by constructive and rigorous



thinking similar to what has come to dominate in the natural sciences (Frisch, 1933, p. 1).

From the outset, it can be said that that the underlying motivation for the new discipline of econometrics, was to turn economics into a proper science, by penetrating economics as it is done in the natural sciences in a manner of constructive and rigorous thinking (Boumans, 2016). Therefore, it would be understandable if the Chancellor of the Academy had stated that econometric methodology is closely aligned to that of the traditional natural sciences but it only differs in the substance it studies. However, he stated that it has all characteristics of the traditional natural sciences and that should be considered as a misunderstanding of econometrics.

Based on the trends and aspects of the economy and the science of economics that the PAS has recognised, it has organised a Study Week on the topic of *Econometric Approach to Development Planning*. The aim of this Study Week was stated in the documents as follows:

The Study Week that the Pontifical Academy of Sciences held in its headquarters in the Vatican Gardens which reunited some among the most renowned specialists in the world in the field of Econometrics, has attempted to study the contribution that the econometric analysis has brought or can bring to the knowledge of development problems and of economic fluctuations (Salviucci, 1965, p. xi).

Thus, the stated aim of this Study Week was to study and to research what econometrics has brought or could bring to the trends and problems that society faced at that moment of time. In order to achieve this aim, the set-up of this Study Week has several standing rules in order to proceed the discussions.

One of the standing rules is that “the chief aim of these discussions is to endeavour to formulate precisely the reasons which are at the root of the differences of opinion” (PAS, 1965, p. xlv, §2). Furthermore, a critical examination of these reasons should lead to agreement on a given solution or otherwise to conclude that it is impossible to establish a united stance on the problems at hand. If

it turns out to be the case that no agreement could be reached, the invited professors are expected to be concerned with two points. First, “to define the reasons why agreement appears to be impossible” (PAS, 1965, p. xlvi, §3). Secondly, “to specify the kind of research work it would be desirable to undertake with a view to solving the problem” (PAS, p. xlvi, §3). These standing rules were designed in order to get unity and they are rather necessary as in science unity of doctrine is not always the case. Therefore, the conclusions of the collective note published at the end of the Study Week are set up to mention the matters as presented just above and to give “suggestions regarding the research work which appears most suitable for arriving at a solution of the difficulties” (PAS, 1965, p. xlvii, §6).

Thus, the standing rules of the Study Week were rather clear as to state that the set up was to reach agreement and otherwise to explain why no agreement has been reached. Furthermore, it is to further examine why no agreement has been reached yet and how to achieve in future that agreement.

As this Study Week ought to achieve consensus and unity of doctrine, the PAS understood that long during personal contact is necessary to further the science and the discussion. The PAS thought the time of the debate was right in 1963, as no proper thorough debate had been organised as of yet to discuss these matters. The Study Week proceeded in the following manner:

Given that there had not yet been an extensive debate on the matter and that the moment seemed like the perfect opportunity to do so, the Pontifical Academy of Sciences offered to gather a limited number of scholars and specialists in the field. Its goal was to compile, during an extensive discussion, the synthesis of the many researches already conducted in the field; to clearly formulate the state of the different problems that are related to it; and thereby to be able to fixate the directives of research that are the most logical, the most convincing and the most promising, given the current state of science (PAS, 1965, pp. xiv-xv).

#### *Notions of the pope and the Holy See with regard to the respective context*

As with regard to what status this Study Week in itself had, it has to be noted that the participants were invited to a private audience with Pope Paul VI and some

eminent cardinals. A private audience is not simply granted to all people, not even the faithful. Thus, for the group to be invited to a private audience provides an interesting view on as to what the importance of this Study Week was for the Holy See. In this private audience, the pope recalled how enthusiastic he was at the prospect of top scientists contributing to science and to improve human conditions:

You will be speaking of « The Econometric Approach to Development Planning ». This is the theme of your study week, a theme which seeks to gather together the latest results of a new branch of science, econometry [sic], and to present them to political economists in order to aid them in formulating those plans for a more stable security and for greater development which can contribute so much to the well-being and peace of nations. (...) We are sure also that these econometric studies, integrated with the rest of our knowledge of human phenomena, including those in the field of economics, truly prove of great utility in the ordered progress of human civilisation (Paul VI, 1965, pp. xxxvii-xxxviii).

Pope Paul VI clearly stated that the underlying need for this Study Week was to help progress science and condense it for it to be implemented for policy purposes. These policies would contribute to create stability and security. Furthermore, it would be instrumental to the progress of human conditions worldwide. The pope stressed the need of integrating econometrics with other knowledge of human phenomena. From these purposes, it can be concluded that the Holy See has put vested interests on this Study Week in order to help them in their aim to better human conditions in general throughout the world. The Holy See regarded this Study Week as a means, to aid in providing policy, in order to achieve their aim.

This view could be further underlined and understood by exploring the line of reasoning and thinking in the tradition of catholic social thinking. The history of scientific work by the PAS has illustrated that in the 1950s and 1960s, there was already a profound engagement in discussions on development matters. Whereas in the 1950s the attention was mostly focused on reconstruction and development of underdeveloped regions, the 1960s provided further engagement with the

development of underdeveloped regions and focused in particular on the Third World (Sorondo, 2003).

As tensions in the world were running high at the height of the Cold War due to the Cuban Missile crisis in October 1962, Pope John XXIII released his encyclical *Pacem in terris* just a few months later in April 1963. This document was a reaction on this event and it was meant to persuade conflicting parties to not take up arms but rather to resolve conflicts by negotiation. Besides this main aim, it reiterated and emphasised the values of human dignity and equality for all people. Furthermore, it was also the first encyclical that was not just written for Catholics but for all men of good will. This shows the openness that came from the on-going Second Vatican Council, which was opening up the Church to the world. It should be noted that this document was published just a few months before the start of Study Week.

In this document, the pope notes that the rise in inequities within social, economic and political spheres become more widespread when public administrations fail to act appropriately on these matters. He therefore calls upon public administrations to consider the question of social and economic progress well, and to focus on the development of essential services in line with the expansion of the productive system (John XXIII, 1962, section 63).

Furthermore, the encyclical refers back to the evolution of underdeveloped countries and reflects upon a previous encyclical by Pope John XXIII, *Mater et magistra*, and the developments after the publications. It is stated that the call upon developed countries to aid the underdeveloped countries has resounded and has been widely accepted as of yet. However, further acceptance is needed and it is necessary to stress the own freedom of underdeveloped countries (John XXIII, 1962, section 121-123).

In order to comprehend as to what Pope John XXIII meant by this call, it is necessary to reflect upon *Mater et magistra*. This encyclical is on the development of the peoples, in particular in underdeveloped countries. It is denoted that there are considerable advancements in science and in scientific applications. Furthermore, it notices the rise in inequality within countries and among countries. He stresses that economic development should and must be accompanied by corresponding social progress. As a result of that, all citizens can participate in the

increased productivity (John XXIII, 1961, section 73). Economic development must be gradual and should maintain a balance between all sectors in the economy. For this, suitable economic policy is needed (John XXIII, 1961, section 131). Here, there is an explicit statement on the need for suitable economic policy. This policy should be designed to promote useful employment, enterprising initiative, and the exploitation of local resources (John XXIII, 1961, section 150).

International aid provided to underdeveloped countries will not tackle the issues of relieving wants and famine on its own. It will not alter conditions for the better in the long run. In order to help resolve this problem to some extent, besides the need for international aid, would be to provide the scientific, technical and professional training needed. Furthermore, modern methods that will stimulate and speed up economic development should be used, which would alter the well-being of the nation and its inhabitants for the better (John XXIII, 1961, section 163). There is an explicit call upon well-developed economies to contribute to the needs of the underdeveloped economies, through all sorts of means. International understanding and cooperation are necessary to achieve mutual development and perfection that should be pursued by all nations (John XXIII, 1961, section 202).

Both these encyclicals were written before the Study Week itself and it is rather clear that it calls upon developed economies and communities to aid the underdeveloped regions for the common good and to help to attain universal human prosperity.

Four years after the Study Week itself, just two years after the publication of the discourse, and two years after the Second Vatican Council had concluded, Pope Paul VI released the encyclical *Populorum progressio* in 1967. It builds on the social questions as addressed in the previous two encyclicals by Pope John XXIII. The *Populorum progressio* document brought attention to all major problems that are related to the development of the Third World. This also includes the economic development and prosperity of mankind as it is noted that rich countries are progressing rapidly whereas the poor countries move forward at a slow pace (Paul VI, 1967 section 8). The encyclical also made yet another appeal to foster international scientific cooperation, to bring about a new humanism. Furthermore, it reiterates that the economy should serve mankind and not the other way round. The

problems facing development need to be solved on a global scale, it is no longer adequate to just have individual and group effort within a country.

Development cannot be restricted to just economic growth, for it to be authentic, “it must foster the development of each man and of the whole man.” (Paul VI, 1967, section 14). The pope refers to an eminent specialist on the matters, Louis-Joseph Lebret O.P., who stated: “We cannot allow economics to be separated from human realities, nor development from the civilisation in which it takes place. What counts for us is man—each individual man, each human group, and humanity as a whole.” (Paul VI, 1967, section 14). This quote resonates with the words used by Pope Paul VI in the private audience with the economists of the Study Week in which he stated that economics should be integrated with other knowledge of human phenomena. This illustrates that for the Holy See, development is more than just growth numbers. It is about an integral development of mankind.

It is for public authorities to direct economic development to some extent by establishing the desired goals, the plans that need to be followed and the methods that should fulfil these goals (Paul VI, 1967, section 33). There should be concerted planning as coordinated planning of projects and programs is more effective than occasional initiatives. This concerted planning is needed to promote economic and social progress but it brings about more. It gives force and meaning to the undertaken work, it puts order into human life and it thus enhances man’s dignity and his capabilities (Paul VI, 1967, section 50).

Economic growth and prosperity are prerequisite for global peace. However, high levels of inequality in economics, social and educational dimensions put peace in jeopardy. The pope even names development the new name for peace, as it provides more justice for man (Paul VI, 1967, section 76).

These documents illustrate the particular focus by the Holy See on matters of economic development. Therefore, it rather makes sense, with regard to the relation between the PAS and the Holy See, that there was a clear preference for a topic on this matter.

### *Other PAS Study Weeks*

It should be noted that this is not the first Study Week organised by the PAS. Six more Study Weeks were organised upon till this particular one. The first Study Week was titled *Biological Problem of Cancer* from the 6<sup>th</sup> to the 14<sup>th</sup> of June in 1949. The other five Study Weeks are listed with more full details in Appendix B.

There are two interesting points to be noted. First, upon till the Study Week on the *Econometric Approach to Development Planning* in 1963, all Study Weeks could be categorised as a topic from the natural sciences, such as biology or physics. Now, for the first time economics is the subject of discussion, because econometrics furthers economics with regard to methodology towards the traditional natural sciences.

Secondly, all previous six Study Weeks were titled and stated with a problem. This Study Week did not necessarily state that there was a problem at hand, but rather that further research was necessary to stimulate progress in development planning. No specific problem was discussed, which needed to be resolved quickly, but it rather discussed an opportunity. The Study Week was set up in part to seize this opportunity.

### *Econometrics considered as a positive science?*

As economics had shifted nearer in methodology from a social science towards a traditional natural science due to the rise of econometrics, it had now been considered by the PAS as a potential topic for further research. Economics as a discipline consists of a broad range of sub disciplines, such as microeconomics, macroeconomics and political economy. As econometrics, a sub discipline, was defined as being rather closely aligned to the methodology of traditional natural sciences, could it also be stated that econometrics is a positive science or a normative science?

To recall what the precise definition of both terms are, John Neville Keynes will be quoted. It should be noted that these definitions are drawn up some decades before econometrics was even invented or thought of.

A positive science may be defined as a body of systematised knowledge concerning what is, a normative or regulative science as body of systematised

knowledge relating to criteria of what ought to be, and concerned therefore with the ideal as distinguished from the actual. (...) The object of a positive science is the establishment of uniformities, of a normative science the determination of ideas (Keynes, 1917, pp. 34-35).

As mentioned above, econometrics should meet the need for economics to be closer aligned to the methodology of the traditional natural sciences. There are two manners to examine whether econometrics could be considered as a positive science. One manner is that econometrics explains what is, withstanding the need to express any political, social, financial or nationalistic bias (Frisch, 1933, p. 1). Therefore, it rejects value judgments and provides value-neutral outcomes. The other manner is to consider that econometrics tests data and its models are empirically substantiated. This provides objective knowledge and it is therefore also value neutral. Thus, on both counts it could be stated that econometrics is a positive science.

At some point, in the early decades of the twentieth century, “the normative was seen to be scientifically illegitimate and should be prohibited from proper economic science” (Hands 2009). A staunch supporter of this position was Lionel Robbins, as was Milton Friedman, who stated “positive economics is in principle independent of any particular position or normative judgment” (Friedman, 1953, p. 2). By the middle of the twentieth century, some years before the Study Week, the view Robbins on the positive-normative divide became predominant and mainstream within the economics profession. For many economists, despite it not belonging to economic science in a strict term, normative ideas remained an important aspect of economic policy debate (Hands 2009).

#### *Econometrics considered as a means*

As econometrics was regarded as closely aligned to the methodology of the traditional natural sciences and as a positive science, the fundamental questions on the scientific methodology of the discipline might be interesting for the science itself. However, for the Holy See to have been indirectly involved in organising a scientific debate, which discussed in depth the epistemological questions on the



positive-normative divide, is not rather obvious. As Pope Paul VI stated earlier, there is a need for “more stable security and for greater development, which can contribute so much to the well being of nations” (Paul VI, 1965, p. xxxvii). Presenting the results of this Study Week to political economists could further this aim, as it provides and aids in formulating these development plans. Thus, the Holy See regarded economics, and thereby econometrics, primarily as an engineering science, to use it as a means to achieve its aims.

As the Holy See primarily regarded this Study Week as an aid in fostering the means to achieve its aims, it is interesting to have a closer look at the invited professors, in particular with regard to their stances on this matter. Do they share the aims as set out by the Holy See and research for potential social improvements or are they rather concerned with the abstractness of their models and not the applicability of their models?

In order to comprehend this distinction, a closer look will be taken at a trend in the 1950s when economists such as Jan Tinbergen began to work in the new field of development economics (Boumans & De Marchi, 2018). Jan Tinbergen was one of the econometricians who operated and researched out of personal motivation to help to reduce poverty. Tinbergen understood the problems in underdeveloped countries and therefore focused on methods that worked under primitive conditions. By providing these methods to policy makers, actual progress was made possible. This was in stark contrast with mathematical economists, who were primarily focused on the refinements of their models and theories. Yet in practice, these models did not contribute to the application of development planning (Boumans & De Marchi, 2018).

Thus, there were two different methodologies to further development economics. On the one hand there was a deductive methodology and on the other hand there was an inductive methodology. Throughout the 1960s and beyond, there was still no unity in what approach was best to progress (Boumans & De Marchi, 2018).

This difference in methodology could be better understood in the light of McCarthyism in the late 1940s, 1950s and beyond. After the Second World War, suspicion rose of the Soviet Union and communist informants on US territory.

Named after the US Senator Joseph McCarthy, this movement was focused on exposing communists as it was seen as a threat to national security (Storrs, 2015). This had influence on several aspects of life, also with regard to science.

This divide in science and methodology became more apparent in mathematics in this time period as there became a renewed distinction between pure mathematics and applied mathematics. The former was not related or affected by any ideas that would be non mathematical, whereas the latter would be potentially affected by applications with certain ideas of ideology (Düppe & Weintraub, 2014). There is to some extent an analogy to economics, as by the rise in econometrics, the methodology shifted towards the traditional natural sciences and by the use of mathematics, it enabled some economists to distance themselves from value judgments or from political and ideological affiliations.

The distinction between both stances might be an underestimated factor by the PAS, as the two different interests both seems not to be in line with the interests of the PAS and thereby implicitly the Holy See. The Holy See regards econometrics as a means to achieve their aim: to reduce poverty and better human conditions worldwide. This view seems to be embodied by an econometrist as Tinbergen, whose prime focus is to further this aim by using theories and science. On the other hand, there is a group, which is primarily focused on mathematical optimisation without regard for the real world difficulties and just focused on the pure science. This distinction will be revisited further on in the paper and illustrated in light of the discussion on the article of Robert Dorfman presented to the Study Week, titled *Econometric analysis for assessing the efficacy of public investment*.

In order to get these developments plans to further the aim of the PAS and the Holy See, science is of importance. It has become the under pinner of public policy to help people progress. In particular as there was a trend in the early decades of the twentieth century to objectify the standards for appraisal of public investments. This objectifying tendency has also shed light on a particular problem in relation to this trend (Dorfman 1965). The tendency to quantify the benefits and costs of a public investment was not yet well developed and remained an issue to be discussed in the 1960's.

### **Contribution of Robert Dorfman**

As discussion and research was to be done on the *Econometric Approach to Development Planning*, eighteen articles were presented and discussed by the invited professors. In order to narrow and focus the scope of this research on the Study Week, one article has been chosen for further analysis in greater detail. That article is on the *Econometric analysis for assessing the efficacy of public investment* presented by Robert Dorfman.

This article has been chosen, as it fits in the context due to the rise in government expenditures on public proposals. Therefore, there became a need to objectify the criteria for the appraisal of such proposals (Dorfman, 1965). In this article, an attempt has been made to quantify the benefits and costs of public investment proposals. As it has been set out in Dorfman (1965), to appraise these proposals in a more objective manner, econometrics would need to quantify the intangibles in order to aid in incorporating all factors to the project in monetary values. The quantification in the cost-benefit analysis would further the development of underdeveloped countries and aid in the efficiency and struggles that these countries face, which are in line with the aims examined in the previous parts of this paper. The cost-benefit analysis would provide just that with an objective scientific model. Thus, it is of interest to further examine this particular contribution to the Study Week.

This section of the paper will focus in particular on the contribution of the article written by Robert Dorfman towards the aim of the Study Week and his particular topic will be put in a broader context.

#### *Robert Dorfman*

In order to comprehend as to why Dorfman was one of the few professors to be invited for this Study Week, it is necessary to first present an image of him as an economist and person.

Robert Dorfman (1916-2002) was a social economist at heart, as he noted himself in the introduction of the book *Economic Theory and Public Decisions – Selected Essays of Robert Dorfman*, by stating “my central concern during most of my career has been social decisions: how to reach them and how to judge them. (...)”

Social deciding (...) has been lurking in the background and nearly motivating all my work” (Dorfman, 1997, p. xiii). Although social-decision making is not what might be regarded as the usual concern of an economist, it is for Dorfman. However, there is an overlap on social decision-making and welfare economics and those combined are a unity, which is rather hard to be disentangled.

During the Great Depression, Dorfman experienced first hand what struggles an economic downturn could bring about. Once war erupted over the globe, he was also part of the armed forces in World War II. He later enrolled in a PhD programme in economics “because economics seemed to embrace the critical social problems then confronting the country and the world” (Dorfman, 1997, pp. xiv-xv). He experienced these problems himself and wanted to contribute in search of better decision making to alter the conditions of society.

Dorfman entered the Air Force and worked on an improved system for planning, holding budgeting into account. By seeing the clear benefits of mathematics and statistics to the plans, he understood the importance of linear programming for business, economic policy and also for economic theory. Together with Robert Solow and Paul Samuelson he published the influential handbook titled, *Linear Programming and Economic Analysis*. This book was immediately accepted enthusiastically for optimising complex programmes both within industry and in economic planning by governments. When the Second World War was over, mathematics was applied across disciplines in the social sciences. In 1954, Dorfman wrote an article titled, *A Catechism: Mathematics in Social Science*, in which he refutes some of the critical questions on the use of mathematics in economics.

Dorfman denotes that he started in a great time to begin an academic career as the Depression and the War was over and big development plans turned out to be a success. In Europe the Marshall Plan was helping Europe to recover and in the Third World there was a Green revolution. This Green revolution was the transfer of some technology to the developing world between 1950 and the 1960s that increased agricultural production worldwide (Hosch, 2009). Therefore, it could be stated that in his time as a beginning scientist, development plans were already heavily in use and prompted considerable achievements.

Throughout his career Dorfman has also focused on the concept of cost-benefit analysis. The articles that he wrote on this matter after the PAS Study Week were mainly on the need for better comprehension and that further research was needed.

Furthermore, Dorfman has also contributed to environmental economics already back in the 1970's. It becomes apparent that Dorfman has knowledge in multiple fields and he oversteps boundaries to which an economist is normally bounded. He denoted it himself, as "an economist cannot get on with his or her own task if he or she ignores the spill overs into the domains of neighbouring disciplines" (Dorfman, 1997, p. xxv).

Later in life, Dorfman was still working on the technical basis for public decision-making. Thus, throughout his time in academia, cost-benefit analysis and public policy have dominated his research and publications.

*Brookings Institution Conference on Measuring Benefits of Government Investments*

Dorfman did not only attend the PAS Study Week in 1963. He also attended a conference in Washington a month later, from the 7<sup>th</sup> to the 9<sup>th</sup> of November in 1963. The conference was organised by the Brookings Institution, which invited experts for a three-day discussion session on the topic of *Measuring Benefits of Government Investments*. The aim of this conference, as phrased by the President of the Institution was "to assist in the development of new techniques for measuring the benefits and costs of public investment" (Calkins, 1966, p. vii). This corresponds to one of the two main principles of the Institution, namely "to aid the development of sound public policies" (The Brookings Institution, 1966, p. v). Researching several different contexts in order to examine as to what extent the measurement of benefits and costs works out pursued this aim. Due to the increase in the proportion of government expenditure devoted to public policy plans, the need for allocations of limited resources on an objective and consistent criteria increased

In the published editorial introduction, it becomes apparent that the theme and specific topics are very much related to the paper presented at the PAS Study Week. In the first sentence Dorfman (1966) notes "the papers and discussions in this volume were presented in a conference held at the Brookings Institution in

November 1963 to explore the problems of appraising the benefits that are likely to accrue from proposed public investment projects” (p. 1).

Both academicians and practitioners were invited to this conference on *Measuring Benefits of Government Investments* to insure a pointed discussion. It turned out that it actually led to a pointed discussion. It became clear that on the one side academicians were rather “hopeful that the benefits of government investment project could be appraised objectively and even quantitatively” (Dorfman, 1966, p. 2). On the other side, the practitioners “were very sceptical and inclined to doubt whether the most important social effects of government investments could ever be appraised quantitatively by cost-benefit analysis or any other formalised method” (Dorfman, 1966, p. 2). These stances show quite a distance between both academicians and practitioners. In addition, the state of the practice was not quite the same as of the theory.

Arguments by practitioners on the side of the government were stating that there were external effects that can be adjudged only to some extent and subjectively. Therefore, a quantitative analysis would not seem worthwhile. Advocates of the benefit-cost analysis agreed on this part, but it was still worthwhile to pursue research and development in benefit-cost analysis. It would sharpen the process of political decision significantly by removing aspects from the realm of emotive rhetoric and unsupported opinion (Dorfman, 1966).

Furthermore, the debate was also centred on the cooperation among economists, statisticians and political scientist as to how they could devise means for quantifying a large proportion of the consequences of public investment decisions. As Dorfman stated in the PAS Study Week article, he stresses again that cooperation among different disciplines is needed for the greater good, namely: improving the decision process in public investment undertakings.

By discussing papers centred on different situations in different contexts, this conference was a serious attempt to try and forge knowledge together in order to work towards establishing a logical and clear model to be used in the benefit-cost analysis. At this moment of time, 1963, this was still an undiscovered field of the discipline. Thus, what was discussed could be regarded as one of the first attempts to progress the benefit-cost analysis method.

In this editorial, Dorfman uses the same analogy as he used in his paper for the PAS Study Week. He states that the benefit-cost analysis is closely analogous to the methods used in the private sector to grant appraisal or not to investment projects.

In the conclusion of the conference, it is stated that the field is still rather new and there are still opportunities that remain for the development of the field. In particular, focus should be directed to conceptual problems and the comparative neglect of technical methodology. Further research needs to be done on these matters after the conference.

It interesting to see the similarities in the words and ideas as presented by Dorfman on the one hand in this conference as chairman and editor, whereas on the other hand as a participant of the PAS Study Week with his article. In order to explore these similarities in further detail, a summary will be given of Dorfman his article for the PAS Study Week.

#### *Summary of Econometric analysis for assessing the efficacy of public investment*

First, this summary will be presented and from thereon, an analysis will be made of the article with regard to the discussion and the aim of the PAS Study Week.

This article is built up of several parts. First, Dorfman notes several trends and phenomena in economics. After this, he sets out what the problem is and he analyses the cost benefit analysis by which the incommensurable benefits could be estimated. He then states three proposals from the point of view of an econometrician, with all the advantages and disadvantages of each proposal. He finalises the article with his view on how public policy should relate to the cost-benefit analysis.

Dorfman starts of by stating that the role of government activity has become more important over the past decades, in particular with regard to economic dimensions and intervention. This comes from the thought that intervention could create general prosperity and economic advancements. The process of how to decide in what project proposals, government investments, should be invested has changed over time. Nowadays, this process has become more self-conscious and it has become more formalised and bureaucratised. Proposals should be supported by

an elaborate economic and non-economic analysis, in order to appraise proposals on just and objective criteria. Therefore, it is rather appropriate to consider the application of quantitative methods of economic analysis to the assessment and judgement of proposed public investments.

Dorfman notes a strong analogy between the analyses of public investments to the problem of capital budgeting in a private firm. However, in the case of government undertakings, both the benefits and the costs, but in particular the benefits are far more difficult to measure and to establish than in the case of private investments. The expected results from the investments can be quite different than what is in the interest of the government. Nine different results in which governments are often interested were listed by Dorfman. However, he acknowledges that more than nine motives could prompt governments to undertake investments.

The government is rather likely to be concerned with the matter of discrepancies between the market prices and social values, in particular of certain factors of production. Dorfman intends to concentrate on the problems posed by benefit evaluation, by leaving the matter of social rate of discount aside.

The essential problem of the benefit evaluation is that the expected benefits that result from a public investment are rather diverse, non-monetary, incommensurable and difficult to measure in any unit. In practice, the benefit-cost analysis had been introduced and used most often compared to others methods, but this analysis is not flawless. The procedure on the appraisal of government investments is in essence rather similar as it is done in capital budgeting by private firms. There is one divergence from this method and that is with regard to various nonmonetary effects, so-called intangibles. There has not been an attempt as of yet in the 1950s and the 1960s to incorporate these intangibles into the analysis. The main objective of Dorfman is to consider the three suggestions that might be able to cope with this matter, from the viewpoint of an econometrician.

The first of his suggestions is that shadow prices should be established for various objectives in order to compute value sums, which could be used to assess and reflect upon the willingness of the community to trade off benefits. Despite this being a rather visionary proposal, in essence it contains and expresses that this



comparison is inevitable and made on a daily basis. As these decisions are made on a regular basis, once studied they could provide stable and reliable shadow prices for some period. However, these could adjust because of changes in political and economic climate. Furthermore, different variants in policy proposals tell very little about shadow prices, as the objectives are different in many dimensions. Dorfman argues that the strict distinction between spheres of economists and engineers, and the few proposal variants explored, might be unsuitable for analysing public investment projects. In addition, governments have a track record on technical economic concepts and can adapt quite quickly to sophisticated economic matters. The features they could incorporate in particular projects would be a constructive improvement in the decision-making process.

The second suggestion put forward by Dorfman is that projects might be designed from the very start to meet certain specified target values for the various objectives that they are intended to serve. It would require rethinking the whole design procedure by instructing designers to meet specified targets at minimum possible capital cost. Once the design specifications have been settled, the economic performance of the project should be determined. Some objections for this procedure could be raised. First, do ambitious production functions exist? Second, design specifications do not determine the outputs, and how are the various target levels to be established?

By a standard constrained minimising method it is possible to minimise the probability of distribution of outputs. The expenses of these computations are insignificant in comparison to the costs of gathering data. Despite the fact that project selection and design are at the centre of discussion, the determination of operating policy has in itself become a problem. Shadow prices are an instrument for appraising value to the specification of targets, from which the marginal cost of achieving each target can be induced. Dorfman proposes a process, which begins with any a priori plausible selection of target levels. As the marginal costs of achieving the target levels becomes clearer, these levels are revised and refined. This is an iterative process, in which the design and its objectives will evolve together. It generally fits the structure of the problem best to regard output in each dimension as a function of operating policy alone, and the design as setting limits to the choice

of operating policy. This new form provides empirical advantages. The formulation should be modified in order to fit particular circumstances of different projects but the logical structure of the model will remain the same.

The final approach suggested by Dorfman is closely related to the second suggestion. This approach is not built on meeting specified targets at minimum cost, but rather to pose the problem of maximising performance with respect to an objective, subject to meeting targets with respect to other dimensions of performance. This would reduce the number of target outputs that have to be specified and set in advance of a cost-benefit analysis. It would also lead to some obscurity about the proper costs to minimise. Furthermore, this approach also leads to shadow prices, which would facilitate inter-project comparisons and allocations. Dorfman has focused on incommensurable benefits but it has to be mentioned that incommensurable costs estimation could be handled in the same manner.

Dorfman, as an econometrician, contemplates that the assessment of a public investment needs to be based on a model of investment. This investment must recognise its consequences in multiple dimensions and that exhibits the full range of choice and substitutability among these dimensions. Only when the best design is feasible and this design takes all significant dimensions into account, a final adoption or rejection of the proposal could be decided upon.

This approach would require new cooperation among economists, engineers and policy advisors. It would become a more integral appraisal and decision process. This cooperation would result in an analysis that does not simply provide a single benefit-cost ratio with several comments but it would rather result in a model of investment, in which performance can be ascertained with regard to any targets that have been set out by policy.

Some suggestions are given by Dorfman to make this ambitious approach possible and practicable. In order to analyse a proposed investment project, performance functions will be used. These functions are full of hidden complexities. To overcome these complexities, two ways to proceed are given. The first way is to impose drastically simplified functional relationships, as to have the simplest expressions that state the problem in a meaningful way. This could lead to rather

unreliable results. However, it does not provide a decision or a design but it rather establishes plausible ranges of values for design and operating parameters.

The second way to proceed on this would be to consider simulations. As simulations are now cheaper and more feasible to carry out, it helps to obtain points in order to get more reliability of the models. This provides a possibility to determine iteratively the solution to the problems expressed. All the procedures have the property of producing the shadow prices, which are required for testing the pre-assigned target level along the solution for each target assignment.

Dorfman acknowledges that these approaches do not solve all problems in decisions on public investment plans. There are many open questions left. However, this procedure provides a format into which the best current understanding of the conceptual issues at hand can be inserted. Dorfman has dealt with problems of design and with problems of assessment of efficacy. These two problems are inseparable: "A fair appraisal of a project requires a good design, a good design must be based on the standards to be applied in making the appraisal" (Dorfman, 1965, p. 205).

#### *Summary of the following discussion*

A small summary will now be presented of the discussion session after the presentation of this paper. The focus will be on the most interesting remarks made during this session.

Participating in the discussion were the following professors: Maurice Allais, Robert Dorfman, Ragnar Frisch, Gale Johnson, Tjalling Charles Koopmans, Wassily W. Leontief, Prasanta Chandra Mahalanobis and Erich Schneider.

Mahalanobis starts of the discussion by asking on what the complications are as a mixed economy is considered. Dorfman replies that it is rather useful that there is a private market as it helps to establish market prices, which in turn helps to establish the real costs and benefits to aid in the process of appraising public investments. Mahalanobis responds by stating that it is more difficult to programme the public investment in a mixed economy than in a fully planned economy. Dorfman agrees that it presents certain difficulties but presses that those difficulties are also present in a fully collectivised economy. In his response he argues that a

genuine economy cannot be planned and directed by one centre, collectivisation is not the answer; it rather presents these problems for planning- and decision makers. Mahalanobis responds by stating that he does not wish to express any political views but rather stresses the question of imperfection of competition. The further comments by the two illustrate that they are rather in agreement and now understand each other fully.

Johnson makes two comments on the procedure as presented by Dorfman in his paper, with a special focus on cases in which government output is comparable to private output. It appears that Dorfman appears to set the procedures for all sorts of government investments. One is that the procedure ignores the return on social gains by private investment in comparison to government investment, which seems to be a bias in favour of government investments. Furthermore, Johnson questions whether taxes paid by private firms are taken into account in the analysis. Dorfman responds by agreeing that these are relevant points and answers that private investments displaced by public investment should be valued in the exact same manner as public investment, even by using the same rate of discount as in public investment valuations. In addition, taxes should be taken account of in the same way as in dealing with public investment that does not generate taxes.

Johnson refers back to one of the reasons for government investments is that it is a way to improve the distribution of income by providing certain goods at lower prices, or even below the marginal costs to several low income groups. Johnson questions to what extent the decision-making should be taken on this matter. Dorfman responds by giving two examples of why he has motivated this reason, namely: public housing and education. These are clear examples of external economies of consumption as it provides a benefit to the community as a whole.

Now, Koopmans enters the discussion by complimenting Dorfman and noting that Dorfman described the proposal by Tinbergen of an iterative procedure by which to get both shadow prices and the optimising quantities in line. He questions the rate of return as to how these are estimated and determined, and also asks for the problems that might arise if this is part of discussion in the iterative process of dialogue. Dorfman answers in two-fold. First, he states that it is essential that there

should be a rate of discount to make comparisons. Secondly, he states that often an implicit rate can be discovered and can be used for evaluations.

Mahalanobis and Dorfman get into a small definition question on education. What should be noted is that Dorfman stresses the importance of education and scientific research as they provide important external economies.

Mahalanobis also raises the matter of steel plants and questions on when to regard this as desirable or undesirable. Furthermore, he agrees on the principle of shadow prices but wonders whether it is rather practicable. The important point that should be made is what the time horizon would be, as he doubts the usefulness of shadow prices without a time horizon. Dorfman settles the question on the steel plants rather simply by giving economic arguments as to when it will work. On the matter of the time horizon, he stresses the importance of the choice of an appropriate rate of time preferences. This rate will allow the possibility to evaluate the consequences of expenditures over time. The shadow price is simply a tool to put a comparative value on consequences, which occur on different dates. Mahalanobis responds in agreement but stresses the need for setting certain targets in order to establish greater objectivity in calculations. Dorfman seems to be in agreement as long as there is a near complete agreement on a way to approximate the consequences of a project. In practice, only proximate consequences to the project itself can be estimated, whereas the rather remote consequences are far harder to estimate and should be left for judgment. Mahalanobis stresses that both are not in a disagreement but he would like to stress what the proper period of time taken into account should be, in order to establish a proper model. Dorfman responds by stating that they perhaps do not understand each other very well. He again responds by explaining and stressing the need for a time period and a time sequence.

Schneider joins the discussion by stating that he regards the question and problems on shadow prices of no real importance, in particular in comparison to developing countries or centrally planned economies. Dorfman agrees to some extent but stresses the need for shadow prices in particular situations in which no market prices exist and could therefore not be valued. Schneider responds by stating

that if it the additional cost would be called shadow price there is an agreement of thoughts.

Koopmans states that the concept of shadow prices has quite caught on. However, the full theorem and conditions are not always covered in the theory, very little literature has been published on this topic. The concept could and should be more elaborated. He then also provides and suggests a paper to Mahalanobis on the matter of steel plants.

Frisch joins the discussion and delves deeper into the concept of projects. He denotes several points, which could be included without difficulties. The economist comes into play because some of these effects can only be described in relation as a part of the whole economy. Some of these effects, in particular indirect effects, are difficult to trace and to estimate. He makes the link to his own model and states that there should be made a distinction between good and bad effects, but that it should be made by political authorities.

Leontief asks several questions in relation to the mathematics and statistics of the process. Furthermore, he remarks that the scheme can be judged best in terms of the nature of factual information, which is available and required.

Allais makes a remark on the fact that it is rather difficult to choose the right indicative prices without some connection with the market. He presents two examples, which clearly illustrate the difficulties in this assessment.

The final comments by Dorfman start of by great appreciation and acknowledgment of the valid problems presented to his ideas. He agrees with Allais that it is rather difficult to evaluate projects by estimations that are not reliant on market prices. Market prices are more reliable indications of social worth than shadow prices established by politicians or experts. Shadow prices should fill up the gap where market prices are not available. All inputs and outputs should be assigned values and incorporated in to the analysis.

Dorfman finalises his comments by stating that his contribution is merely a way forward to discover certain aspects of the social welfare function. As this development is still not researched to a great extent, it would make sense to start by trying out some proposals and see how the public and institutions react on these

proposals. In this organic way and in an iterative process, discoveries will be made which could be used to design and appraise investment projects.

*Analysis of the discussion with regard to the context*

In order to comprehend this discussion session in more detail, it would be necessary to provide the context. As the focus of the discussion is on the concept of shadow prices, at first shadow prices and its connotations will be elaborated upon. Therefore, we go back to the beginning of the Cold War and build upon what earlier has been stated on McCarthyism on page eighteen.

As the US and the Soviet Union were two dominant world powers, which were entangled with each other in the Cold War, there was also the battle for economic world order. Whereas the US was equipped by a market economy, the Soviet Union was based on a planned economy. As the Soviet Union and its ideas were regarded with the highest suspicion by leading figures in the US, the idea of a planned economy was also regarded with suspicion. Therefore, the word *planning* got a negative connotation, also within the science of economics. Economists had to use the concept of planning rather carefully.

There was a certain tendency in the post war scientific world of economics to distance itself from politics, in particular in the climate of political suspicion, McCarthyism. Interests in economic planning were best left unmarked; de-politicisation in economics was needed (Düppe & Weintraub, 2014). Despite this tendency, there was still a debate on the possibility of reaching the same efficient outcomes as the market economy might produce. It needs to be reminded, that the war economy was necessarily a central planned economy but that has seemed to be forgotten rather quickly once the threat of communism appeared to be real (Düppe & Weintraub, 2014).

In a planned economy market prices are non-existent and should therefore be estimated in what would be called accounting prices, or shadow prices. An administrative process that decided the proper allocation of goods would construct this concept. In particular for underdeveloped countries, where there is a lack of sufficient reliable data and of market prices, shadow prices provide a solution to this problem. This would be particularly helpful in the appraisal of a project or program

as these would represent the true values needed to make a proper evaluation of the costs and benefits (Boumans & De Marchi, 2018).

In the discussion session it becomes apparent that the planned economy issue is at hand, in particular in the discussion between Mahalanobis and Dorfman. Mahalanobis even stresses that he does not wish to express any political views; it is just a matter of theory. This illustrates the hesitation and considerate words used by scientists at that time because of the connotation to the word and concept *planning*.

Furthermore, the concept of shadow prices is in principle accepted and thought to be a proper. However, there remain questions on the practicability of the concept. There was a lack of focus on the practicability, the discussion focuses more on the time horizon for which the projects should be evaluated and discounted.

Shadow prices are important, in particular in underdeveloped countries in which sufficient reliable data is usually non-existent. However, in the discussion on practicability not much attention has been paid to this aspect. Though this is important in general, the discussion does not evolve into practical matters to aid policy makes in these underdeveloped countries to help in the appraisal of government investments.

This raises questions as to whether the PAS has invited the right persons for the aims of the PAS and of the Holy See for this Study Week. For the PAS, there was to some extent accordance to its aim of researching what “econometrics could bring to the knowledge of development problems and of economic analysis” (Salviucci, 1965, p. xi). In particular with regard to the knowledge of development problems, the article by Dorfman made a contribution towards the difficulties of estimating the costs and benefits in order to appraise public investment proposals. With regard to the scientific context and works, there was a valiant effort to make progress on this topic.

However, considering the view of the Holy See that econometrics should be regarded and used as a means, this discussion illustrates that the focus with regard to this article was rather focused on the science and the difficulties of the context at that particular time. However, there was no clear focus on the practicability of the concepts and approaches that are induced from this article for the underdeveloped economies, to progress their economy and thereby also human prosperity in the



broadest sense. Therefore, it could be stated that the results of this Study Week in relation to the vision of the Holy See might not have been as favourable as they had expected and might even be described as a missed opportunity. Despite the thorough scientific work, it could be stated that more reaps could have come from this Study Week if more research had been done beforehand on the invitees to see whether there were to some extent shared aims for a more fruitful discussion.

## Conclusion

This paper has shed a light on the context in which this Study Week was organised. Due to several trends in the economy and the science of economics, the organising PAS noted an opportunity to organise a Study Week on a topic they themselves were not familiar with. The topic was on the *Econometric Approach to Development Planning*. The PAS has understood that econometrics provided a better understanding of economics and was tested rigorously as it had the same characteristics of the traditional natural sciences. It was seen as an opportunity by both the PAS and the Holy See to achieve their aims by the means of the results of this Study Week.

Robert Dorfman contributed to the Study Week by the use of his skills and motivation by providing several approaches to quantify the intangibles in the cost and benefits for the appraisal of public policy investment proposals. This in turn will aid in setting objective criteria to appraise the increasing amounts of government expenditure on these investments. As a result, more efficient use of public money would progress the whole of the economy. The concept of shadow prices is in particular important for developing countries, as market prices and reliable data are not available. By mentioning shadow prices, it became clear that there were some political tensions at that time, with the difficulty of the concept of planned economic policy in the Western world. The article by Dorfman was not just a contribution on its own, a month later at a conference on *Measuring Benefits of Government Investments* he was the chairman of the proceedings. Therefore, it illustrated that at that time this was a pressing issue to be examined in further detail.

Furthermore, this paper has helped to understand the relationship between economists and the Holy See as it became clear that catholic social thinking and some of the econometrists were concerned about the same problems of poverty in the world. Whilst the Holy See regards econometrics as a means, some econometrist might share the same social progression as pressed by the Holy See but rather on a scientific level. Other econometrists might focus more on the abstractness of their models, without regard to the real world or difficulties in developing countries for the practicability. Thus, for *The Economy of Francesco* it would be interesting to see this dynamic relationship as to whether the focus of the meetings will be on the aim

itself and that economics is at the service of humans or that it will focus on scientific works and how to progress the science itself, thereby perhaps losing focus of the aim of the meetings. For future events or activities concerning economics, both the PAS and the Holy See could learn from this past experience by examining the invitees thoroughly to see whether they share to some extent the same aims and commitments, in order to have a fruitful discussion and to further aid in achieving their aims.

Some limitations with regard to his research have to be made. Due to time constraints, the focus of this paper was on one specific article. Therefore, no overall conclusion can be made on the entire Study Week, as there are still some undiscovered areas in the transcripts. Furthermore, some suggestions are made by interpretation by the literature on hand. However, in order to fully comprehend as to why some professors are invited, archive research might need to be done. Due to the time constraint for this paper, no archive research was possible. Only by the use of literature at hand and the argumentation following from that, some statements have been made. As the context is now sketched, it provides a foundation for further research on other subjects that have been discussed on the Study Week and on what has been achieved as a result of this Study Week.

## References

Boumans, M. J. (2016). Econometrics. In Faccarello, G. & Kurz, H. (Eds.), *Handbook on the History of Economic Analysis Volume III: Developments in Major Fields of Economics* (pp. 106-116). Cheltenham, UK: Edward Elgar.

Boumans, M. J. & De Marchi, N. (2018). Models, measurement, and “Universal Patterns”: Jan Tinbergen and development planning without theory. *History of Political Economy*; 50 (S1): 231–248. doi:10.1215/00182702-7033956.

Boumans, M. J. & Dupont-Kieffer, A. (2011). A history of the histories of econometrics. *History of Political Economy*, 43(suppl\_1), 5-31. doi:10.1215/00182702-1158781.

Dorfman, R. (1965). Econometric analysis for assessing the efficacy of public investment. In *Semaine d'étude sur le rôle de l'analyse économétrique dans la formulation de plans de développement* (Vol. 28, Scripta Varia, pp. 187-224). Vatican City: Pontificia Academia Scientiarum.

Dorfman, R. (Ed.). (1966). *Measuring benefits of government investments: Papers presented at a conference of experts held november 7-9, 1963*. Washington, DC: The Brookings Institution.

Dorfman, R. (1997). *Economic theory and public decisions: Selected essays of Robert Dorfman*. Cheltenham, UK: Edward Elgar.

Dupont-Kieffer, A. (2019). The Vatican conferences of October 7–13, 1963: Controversies over the neutrality of econometric modelling. *History of Political Economy*, 51 (3), 515-534. doi:10.1215/00182702-7551900.

Düppe, T. & Weintraub, E. (2014). Siting the new economic science: The Cowles Commission's activity analysis conference of June 1949. *Science in Context*, 27 (3), 453-483. doi:10.1017/S0269889714000143.

Economist Dorfman dies at 85. (2002, July 18). Retrieved from <https://news.harvard.edu/gazette/story/2002/07/economist-dorfman-dies-at-85/>.

Forshaw, B. (2003). Holy See. In *New Catholic Encyclopedia* (2nd ed., Vol. 7, p. 44). Detroit, MI: Gale. Retrieved from <http://link.galegroup.com/apps/doc/CX3407705349/GVRL?u=tilburgb&sid=GVRL&xid=2aea27c7>.

Friedman, M. (1953). *Essays in positive economics*. Retrieved from <https://bit.ly/2FCpJdt>.

Frisch, R. (1933). Editor's Note. *Econometrica*, 1(1), 1-4. Retrieved from <http://www.jstor.org/stable/1912224>.

Hands, D. W. (2012). The positive-normative dichotomy and economics. *Handbook of the Philosophy of Science*, 13, 219-239. Retrieved from <https://bit.ly/2JaiMBp>.

Hosch, W. (2009). Green revolution. In The Editors of Encyclopaedia Britannica (Eds.), *Encyclopaedia Britannica*. Retrieved from <https://www.britannica.com/event/green-revolution>.

John XXIII. (1961). *Mater et magistra* [Encyclical letter]. Retrieved from [http://w2.vatican.va/content/john-xxiii/en/encyclicals/documents/hf\\_j-xxiii\\_enc\\_15051961\\_mater.html](http://w2.vatican.va/content/john-xxiii/en/encyclicals/documents/hf_j-xxiii_enc_15051961_mater.html).

John XXIII. (1962). *Pacem in terris* [Encyclical letter]. Retrieved from [http://w2.vatican.va/content/john-xxiii/en/encyclicals/documents/hf\\_j-xxiii\\_enc\\_11041963\\_pacem.html](http://w2.vatican.va/content/john-xxiii/en/encyclicals/documents/hf_j-xxiii_enc_11041963_pacem.html).

Paul VI. (1967). *Populorum progressio* [Encyclical letter]. Retrieved from [http://w2.vatican.va/content/paul-vi/en/encyclicals/documents/hf\\_p-vi\\_enc\\_26031967\\_populorum.html](http://w2.vatican.va/content/paul-vi/en/encyclicals/documents/hf_p-vi_enc_26031967_populorum.html).

*Semaine d'étude sur le rôle de l'analyse économétrique dans la formulation de plans de développement, 7-13 octobre 1963* (Vol. 28, Scripta Varia). Vatican City: Pontificia Academia Scientiarum.

Sorondo, M. S. (2003). *The Pontifical Academy of Sciences: A historical profile*. Pontificia Academia Scientiarum. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.596.2871&rep=rep1&type=pdf>.

Storrs, L. (2015). McCarthyism and the second red scare. *Oxford Research Encyclopedia of American History*. doi:10.1093/acrefore/9780199329175.013.6

The Economy of Francesco. (2019, May 14). *The economy of francesco: Young people, a commitment, the future* [Press release]. Retrieved from [https://docs.wixstatic.com/ugd/296762\\_51da5e0e89584153aa9c4c132d0e7cbd.pdf](https://docs.wixstatic.com/ugd/296762_51da5e0e89584153aa9c4c132d0e7cbd.pdf).

## **Appendix**

### Appendix A

Attendance list of participants Study Week

Prof. Maurice Allais

S.E. Prof. Marcello Boldrini

Prof. Robert Dorfman

Prof. Franklin M. Fisher

Prof. Ragnar Frisch

Prof. Trygve Haavelmo

Prof. Walter Isard

Prof. Gale Johnson

Prof. Tjalling Charles Koopmans

Prof. Wassily W. Leontief

Prof. Prasanta Chandra Mahalanobis

Prof. Edmond Malinvaud

Prof. Michio Morishima

Prof. Luigi Pasinetti

Prof. Erich Schneider

Prof. John Richard Nicholson Stone

Prof. Henry Theil

Prof. Jan Tinbergen

Prof. Herman O. A. Wold

### Appendix B

All Study Weeks organised by the PAS upon till *Study Week on the Econometric Approach to Development Planning*

6 – 13 June 1949 Semaine d'Etude «Problème biologique du Cancer»

19 – 26 November 1951 Semaine d'Etude «Problème des Microséismes»

24 April – 2 May 1955 Semaine d'Etude «Problème des Oligoéléments dans la vie végétale et animale»

20 – 28 May 1957 Semaine d'Etude «Problème des Populations stellaires»

23 – 31 October 1961 Semaine d'Etude «Problème des macromolécules d'intérêt biologique avec référence spécial aux nucléoprotéides»

1 – 6 October 1962 Semaine d'Etude «Problème du rayonnement cosmique dans l'espace interplanétaire»