

Theoretical origins and evolution of the Purchasing Power Parity in Gustav Cassel's economic thought

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Abstract

In this article I review the main aspects underlying the development of the Purchasing Power Parity (PPP) theory by Swedish economist Gustav Cassel. A careful review of the writings of the author reveals that the formulation of the theory and how Cassel himself interpreted the theory went through significant changes. From a rather dogmatic definition of PPP as a positive theory of exchange rate determination under free floating inconvertible monetary paper standards, as first advanced in 1916, it would evolve to much more nuanced expositions with the introduction of a series of caveats and restrictive assumptions. While, on the one hand, these adjustments made his formulation of the theory more internally consistent. On the other hand, it insulated the core proposition from falsification by empirical counter examples. Concomitant with these developments, in the early 1920's there is a shift in his focus and application of the PPP. In these later texts Cassel's main use of the PPP would assume a more normative stance, in which the PPP would consist of an objective guide to calculate new gold parities in the post-war period and, thus, contribute to the stabilization of the international monetary system at the time.

Introduction:

In general terms, Purchasing Power Parity (PPP) is a concept which depicts the relation between domestic and foreign commodity prices, and the exchange rate. Although the origins of this idea have been traced back to the XVI century and to the workings of the Salamanca School, the development of the Purchasing Power Parity concept has been closely associated with economic thought of Swedish economist Gustav Cassel, who first coined the term in 1918. During the course of the First World War (WWI) and throughout the 1920's Cassel wrote extensively on the subject of determination of exchange rates, as well as on related topics such as the determinants of inflation during and after the war, functioning of the international monetary system, the long-term viability of the gold standard, among others.

This article traces the evolution of Cassel's work from 1916 to the end of the 1920's as it relates to his presentations of the Purchasing Power Parity theory and how his policy prescriptions in the context of 1920's international monetary system was shaped by it. In this process this paper shows that for Cassel himself the meaning attributed to the Purchasing Power Parity actually evolved from a categorical formula of an equilibrium condition, as defined in his initial articles, to increasingly modified definitions throughout the 1920's. In these later works he progressively introduced an increasing number of necessary conditions for the PPP theory to hold, as well as described a range of possible situations which would lead to deviations from the PPP, both in the short and in the long-run¹. Concomitantly to these adjustments, Cassel's advocacy for the use and relevance of the Purchasing Power Parities was shifting. From mainly advocating that PPP was to be regarded as a positive theory of exchange rate determination, his main focus turned into defending the use of PPP as a useful guide for a normative policy prescription. In which, the calculated PPP should be used as reference points to the establishment of new gold parities for countries to come back to Gold Standard, which was a major policy issue in the forefront of the debate in the early 1920's². In his view, even the calculated PPP might only be a rough approximation of the 'true' exchange rates consistent with international trade equilibrium, they would be much better suited for the stabilization of international trade, than an alternative in which countries pursued a deflation policy to achieve pre-war gold parities.

In this process I will relate the changes observed in Cassel's expositions of the PPP theory with the contemporary ongoing debate after the end of WWI, addressing uses and abuses made by others of PPP theory at the time, as well as with historical events occurring during the 1920's. It is necessary to disclaim, however, that these connections are, to a certain extent, inevitably speculative, as unfortunately Gustav Cassel was not known to cite other authors, neither tended to acknowledge contributions or to directly respond to criticisms received from specific commentators, in most cases.

¹ A fact that was already highlighted by contemporary critics, such as Agnell (1922) and Teleborgh (1926).

² It is important to highlight, however, that Cassel was in fact very sceptical of the desirability of the return to a gold standard and the feasibility of the maintenance of the gold standard in the future. His interpretation of the gold standard was merely a special case of free paper standard, in which supply of money was bounded to gold reserves. However, the stabilization of prices and of the 'value of money' was not intrinsically due to the gold standard but could be achieved through correct management of the discount rate by central banks, and in this sense, Cassel can be viewed as a pioneer advocate of what became standard practice of Central Banks decades after. However, due to the high inflation rates observed during the prevalence of free paper standards since the beginning of the war, he thought it was best to stick to fixed exchange rate regimes given by new gold parities (see Cassel, 1922; 1928a).

Moreover, it's argued that as one trace the evolution of Cassel's view and presentations of the PPP with the adjustments, clarifications and the progressive introduction of new assumptions it becomes clear that Cassel was engaging in what can be framed as a Conventionalist approach to the methodology of economics (Latsis, 1976), in which one starts with an idealised, 'pure' assumption which can be falsified in isolation and proceed to qualify or 'weaken' the hypothesis, by supplementing it with suitable auxiliary assumptions. In this light, the question then becomes whether these manoeuvres were genuine, serving the purpose of making PPP theory more realistic and widening its applicability, or if the auxiliary assumptions introduced are to be considered *ad hoc* ones, acting as 'protective belt', which prevents the falsification of the 'core proposition' of the theory. That is, in Cassel's case, Purchasing Power Parity as *the* theory of exchange rate determination under free floating monetary paper standards.

Therefore, the following section briefly summary the main methodologies of economics. With them in mind the third section proceeds with a presentation of the evolution of PPP as presented by Cassel, drawing connections with the contemporary literature to better understand the introduction of auxiliary assumption in subsequent formulations of PPP theory by Cassel. The paper wraps up with a concluding remarks section.

Methods of appraisal in Economics

Before we turn to the direct review of Cassel's work it is useful to briefly discuss the different approaches with which methodologists of economics have analysed the research programmes and core ideas in the history of economic thought. It is with these approaches in mind that I propose to guide the reflection of the development of PPP theory by Cassel. Consciously or not economic science have mostly (loosely) adopted (and sometimes combined) three alternative methodological approaches to the philosophy of science, as defined by Latsis (1976), namely: Apriorism, Falsificationism and conventionalism.

As a methodological approach, apriorism has been adopted in the core of Lionel Robbins definition economics as a science based on a system of logical deductions from axiomatic principles, from which fundamental propositions are taken as necessarily true, independently of vagaries of experience³. In this framework, what would be required, for theory to be regarded as scientific, is internal logical consistency of the conclusions derived from a set of predefined axiomatic conditions. On the other hand, a falsificationism approach to economic theorising is guided by empiricism, with the criteria of appraisal being the degree of falsifiability of two competing theories and their ability to survive non-trivial empirical attempts to falsify the theory. As such, to be regarded as scientific a theory should provide testable hypothesis which could be falsified.

It is undeniable that these approaches to conducting scientific research have strengths which help us understand their use (or advocacy for application) in the helm of economic inquiry. Nevertheless, certain elements of each can be regarded as inadequate, in short, "apriorism is too lax, while falsificationism too restrictive" (Latsis .1976, p.1). While a strict aprioristic deductive methodology can easily lead to forced inferences on the actual workings of the phenomena under inquiry in the real world, under a strict falsificationism methodology criteria, probably, the outlook of what economic science could assert with confidence would look

³ Where, according to Latsis (1976), the elevation of the rationalistic behaviour to human action to the status of priori true postulate being, perhaps, the best example.

disappointingly narrow. This, for Latsis (1976), has led the economic research profession towards what can be classified as a conventionalism approach to the methodology of economics, in which core idealised propositions of theory, which can be falsified in isolation, are supplemented with suitable auxiliary assumption/hypothesis that act as 'protective belt' insulating the core propositions from empirical counter-examples. Considering that the mere nature of economics does not easily lend itself easily to controlled laboratory experiments (and other definitive forms of testing) for many of the problems of interest in our subject unfairly narrow this conventionalist strategy could be justifiable, but equally abused. And, thus, the problem which one is faced with when appraising economic theory becomes how one "sort out the genuine (or justified) defence manoeuvres from *ad hoc* ones?" (Latsis, 1976, p.10).

Latsis alternative suggestion is to adopt Lakatos methodology of scientific research programmes (MSRP). However, a central distinction between MSRP and the methodological approaches just discussed is their different unit of appraisal. As the name points MSRP unit of analysis is a research program, which is seen as an organic unit containing both rigid and flexible components. Research programs would be, in Latsis terms, subdivided in its 'hard core' and 'positive heuristics' components. The former having a descriptive characteristic (i.e. stating fundamental behavioural assumptions), while the latter being understood as a *normative hard core*, which contains a set of imperatives that provide guidance as to how a program should evolve, how it should be defended and what falls within and what falls outside of its scope. Latsis emphasize though, that the 'positive heuristic' component is as essential as the 'hard core' for a research program, "it cannot be given up without giving up the program itself" (Latsis, p.16). Lastly, a research program would be complemented by a 'protective belt' of propositions, auxiliary hypothesis and assumptions which would constitute the flexible part of the research program, with non-essential elements which could be abandoned or replaced without giving up the specific approach as explanation or prediction of the phenomena at hand.

The criterion of appraisal is, then, the evaluation of the addition and/or modification of auxiliary hypothesis in the 'protective belt' which are made in face of empirical anomalies. If the changes in the protective belt can be seen as "theoretically progressive (i.e. the modification has independent testable content); and empirically progressive; e.g., at least part of the excess testable content is corroborated" (Latsis, p.13, 1976) then the conventionalist stratagem should be seen as valid. And is with this idea in mind that this article proposes assessments of the changes introduced by Cassel in his formulations of PPP during the course of over a decade in which he actively wrote and published on the topic.

3- Origin and evolution of Cassel's interpretation of the PPP theory:

Swedish economist Gustav Cassel (1866-1945), together with Knut Wicksell, David Davidson and Eli Heckscher, is considered to be one of the founding members of Swedish tradition in economic thought. Member of this distinguish group of scholars whose work influenced both economic theory and political debates, Cassel remained active, publishing for almost half a century. In this period, his contributions ranged from books and journal articles dealing with analytical issues relating to economic theory; policy memorandums for the Swedish and international institutions such as the League of Nations; books and articles to newspapers aimed primarily to the general public, bankers and businessman⁴.

⁴ According to Carlson and Jonung (2006), only to one of the main Swedish newspapers (*Svenska Dagbladet*) Cassel published 1500 articles. A feature that Cassel viewed as extremely important, as he

In this period Cassel came to be regarded as one of the world's leading economists, whose influence in the international debate could be considered only matched by that of John Maynard Keynes⁵. Throughout the 1920's Cassel's contributions tended to become more policy-oriented rather than purely theoretical (as his earlier contributions were⁶). However, as Kardochnikov (2013) argues, these were firmly grounded in the theoretical system developed by Cassel regarding the role of domestic policies in achieving price stability and the scope of international policy coordination to achieve stabilization of exchange rates and on the value of gold.

As the modern originator and one of the fiercest advocates of the Purchasing power parity (PPP), Gustav Cassel has been at the forefront of much of the criticisms directed towards the PPP, especially after WWII such as Balassa (1964) and Samuelson (1964). A movement that has met with reaction by some commentators that much of the criticisms was misdirected at Cassel, in the extent that these critics misinterpreted what Cassel actually put forward as his view on what the PPP actually meant⁷. Attributing this to Cassel's theoretical framework being largely fragmented by his contemporaries and more recent commentators. A trend that has been provocatively attributed by one of Cassel's advocates as due to the "lack of interest in the profession of reading history of economic thought" (Moosa, 1999).

Indeed, across time, the literature has presented PPP theory as different things, such as a theory of exchange rate determination, a short-run and/or long-run equilibrium condition, an arbitrage condition, a truism. Leading, as early as 1964, Bela Balassa to remark that "the PPP doctrine means different things to different people" (Balassa, 1964, p.584)⁸. A remark to which Moosa (1999, p.46) responds that, although Balassa was right, "for Cassel PPP meant one thing only, the operational theory that relates the nominal exchange rate to prices or inflation rates, and which can be approximated – if the other factors that may influence the exchange rate are of secondary importance-” by a formula that relates nominal exchange rate changes to inflation rate differentials.

Thus, rather than a generalization of the Law of One Price (Loop) as is often presented in modern literature, the PPP would be essentially the extension of the quantity theory of money (QTM) to the case of an open economy.

In light of the controversy, the purpose of this section is to review how Cassel defined Purchasing Power Parity and how his definition and assumptions made evolved throughout time in his writings. Although, both critics and defenders draw evidence for their interpretation of what Cassel really meant by the Purchasing Power Parity from Cassel's own writings, they tend to take Cassel's view in isolation and as immutable across the time span of over a decade. In doing so, previous contributions dismiss that Cassel's own understanding and main use of PPP had actually evolved in face of criticisms received and in light of the empirical facts. Leading him to clarify, adjust and include new assumptions to his formulation of the Purchasing Power Parity.

believed that scholars had a role in the public debate of educating the general public, exerting the voice of reason (which was the name he gave to his memoirs published in 1940) (see Myrdal, 1963[1945]).

⁵ See Carlson (2009) for a comparison between Cassel and Keynes influence in the public debate of the 1920's.

⁶ Such as the "Nature and Necessity of Interest" (1903) and his "Theory of the Social Economy (1918), translated into English in 1923, which is another indication of the rise of his influence in the international debate in the aftermath of WWI.

⁷ See for example Holmes (1967), Brems (1989), Moosa (1999) and Kardochnikov (2013).

⁸ A remark that remains valid to the present day.

References in the contemporary literature regarding the Purchasing Power Parity are, commonly, made to Cassel's 1918 paper- 'Abnormal Deviations of international Exchanges', which is where Cassel first coins the term. Nevertheless, it is in a paper published at *The Economic Journal* in 1916 – 'The Present Situation of the Foreign Exchanges'- where he first⁹ provides a concise formulation of the theory:

"(...) The theory of the foreign exchanges which I have given for some years in my lectures starts from the view that the rate of exchange is primarily an expression for the value in the money of one country put upon the money of another country.

If we consider two countries, A and B, with independent paper currencies, the money of A can have value in B only on the ground that it represents buying power, or more generally paying power, in A. The price in B of the money of A will, therefore, be broadly proportional to the buying power of the money of A and will consequently stay in inverse proportion to the general level of prices in A. Further, the price in B will, of course, tend to be proportional to the general prices in B. Thus, the rate of exchange between the two countries will be determined by the quotient between the general levels of prices in the two countries." (Cassel, 1916, p.62)¹⁰

From the outset the relation between the PPP and QTM of money was made clear as Cassel followed the above statement with a discussion about the relation between the PPP and the QTM.

"Now according to the quantitative theory of money the general level of prices varies, other things being equal, in direct proportion to the quantity of the circulating medium in a country. If this be true, the rate of exchange between the two countries must vary as the quotient between the quantities of their circulating media." (Cassel, 1916, p.62)

3.1-Cassel early modifications to PPP

It was two years into the war and with many countries *de facto* already out of the gold standard gave an initial opportunity to Cassel to test his theory and the results presented by him regarding the exchange rate between the Swedish Krona and the British Pound at that time left him hopeful. And the view put forward by Cassel received an endorsement in a footnote at the end of the paper from Keynes, then editor of the journal. The introduction of the Purchasing Power Parity denomination to define his foreign exchange rate theory, though, would come only two years after¹¹. In a very brief article published in 1918 in *The Economic Journal*, he writes:

⁹ At least in English language.

¹⁰ It is important to highlight that it is with a reference to the last phrase of this quotation that Balassa (1964) sustains that Cassel indeed formulate and proposed initially what has become known as the 'absolute' version of PPP hypothesis.

¹¹ At least in English, according to Magnusson (1991) in Swedish the term first appeared in an article published in 1917 titled 'Dyrtid och sedelöfverflod'.

“According to the theory of international exchanges which I have tried to develop during the course of the war, the rate of exchange between two countries is primarily determined by the quotient between the internal purchasing power against goods of the money of each country. (...) At every moment the real parity between two countries is represented by this quotient between the purchasing power of the money in the one country and the other. I propose to call this parity ‘*the purchasing power parity*’.” (Cassel, 1918, p.413, italics on the original)

If in 1916 results compiled by Cassel seemed to confirm his theory, results for the case of Sweden and other neutral economies were not so encouraging anymore by 1918. The evidence presented by Cassel in the end of 1918 shows that even though England had faced a lower inflation rate since 1914 than Sweden, the Swedish Krona had appreciated relative to pound rather than devalued, as it would be predicted by PPP theory.

This situation required further explanation from Cassel in defence in his theory. Therefore, Cassel starts to introduce further qualifications to his exposition. Cassel (1918) poses free trade as a sufficient condition for the exchange rates to converge to the value given by the parity, which evidently wasn't the prevailing situation during the war. However, Cassel highlights that even in the case of mutual (equivalent) restrictions to trade are imposed by both countries the exchange rates wouldn't be able to deviate from the purchasing power parity. It would be only in the case of restrictions to trade being imposed by one side that would cause exchange rates to deviate from the PPP:

“If the trade between the two countries is hampered more severely in one direction than in the other the rate of exchange will deviate from its purchasing power parity. If the imports of a country is more severely restricted than its exports the consequence will be that foreign money will sink in value, as claims in such money will be comparatively easy to procure, but difficult to make use of.” (Cassel, 1918, p.413)

That would be exactly the case of neutral economies *vis-à-vis* the belligerent countries during the war. As the war progressed the belligerent nations had increasingly imposed restriction on exports of commodities. This movement sought to increase available supply of goods to the domestic market and limit scarcity of commodities and this would explain, for example, the deviations from the PPP observed than in the exchange rate between the Swedish Krona and the British Pound¹².

In 1919, with another article on ‘*The Economic Journal*’, Cassel return to the topic of abnormal deviations of exchange rates to grant further concessions to situations where exchange rates would deviate from the PPP norm due to the developing sharp depreciation of the German Mark. In this paper, Cassel emphasizes that (i) in cases where governments must procure foreign exchanges, regardless of costs, in order to be able to face international debt

¹² To better understand the importance of this for Cassel one should bear in mind Cassel's view regarding the value of money. For Cassel demand for currency (either domestic or foreign) derives from their purchasing power of desired commodities. If country A, for example, imposes a restriction for buyers from country B to purchase goods produced in A the demand for that currency in the FX markets would, consequently, fall. If in the other hand demand from buyers from Country A for commodities produced in B remained high and unaffected by trade restrictions a mismatch between supply and demand for currency of country A would be inevitable and, therefore, the its value as measured in terms of currency of country B would fall.

payments, for example; (ii) the role of speculation; and, most interestingly, (iii) expectations regarding the currency's internal future purchasing power, exchange rates would deviate from PPP norm.

It would be in May 1920 that Cassel's views would first appear before the American academic publication, with an article of his published in 'The Annals of the American Academy of Political and Social Science'. The volume in which it was published contains a discussion section with a series of review papers drafted by several economists, ranging from academics to central and private bankers. While gathering some enthusiastic support from some, like Irwin Fisher, Cassel's theory was met with scepticism and criticisms by others primarily by what was seen as the reliance of the theory as exposed on the Quantity Theory of Money¹³.

The rise to prominence of Cassel as an international authority on monetary issues is exemplified by the role Cassel arguments displayed in the discussion held in the Brussels International Financial Conference organized by the League of Nations in September 1920, to which Cassel contributed with the most widely read and discussed memorandum on "The World's Monetary Problem"^{14 15}. This memorandum, together with a second drafted by Cassel for the 1921 League of Nations meeting would be reprinted in book format in the following year (Cassel, 1921) and would be the base material of the views exposed in his famous 'Money and Foreign Exchange after 1914', published in 1922.

In this latter book that Cassel's would provide important responses and clarifications to criticisms received. For our purposes this paper three aspects deserve closer attention: (a) his reliance of the Quantity Theory of Money on his explanation of inflation after the outbreak of the War and consequently the movement of exchange rates, but also misuses of PPP, which included (b) his explicit detachment of what today would be considered the 'Absolute' version of the PPP¹⁶ and (c) Non-tradable commodities and changes in relative prices.

Possibly because of the opposition to the QTM as the key driver of price levels that Cassel might have felt compelled to introduce in "Money and Foreign Exchange after 1914" a novel reformulation of the QTM. While granting that the Quantity Theory as it had been generally formulated was untenable, as the banks "cannot force upon the public more currency than trade requires" (Cassel, 1922, p.26), the reason why a rise in prices was still to be found in the 'creation of fresh purchasing power', a concept that has briefly appeared in his early works and would gain centre stage in his analysis of inflation throughout the 1920's. However, it would be the case of the extension of loans either to the government or the private sector to a higher extent than available funds accruing from actual savings:

¹³ See Anderson (1920) and Scott (1920), for examples.

¹⁴ Originally published in Vol. V. of the Proceedings of the Conference, this memorandum, together with a second drafted by Cassel for the 1921 League of Nations meeting would be reprinted in book format in the following year, see Cassel (1921).

¹⁵ The success of Cassel's memorandum is also exemplified by Siepmann (1920) account that the version in English of the memorandum was already out of print, with no more copies available, when the time came for it to be used in Brussels. For a brief, but thorough, overview of the issues discussed, and positions defended by delegates at Brussels's conference, see Siepmann (1920).

¹⁶ What Pigou (1922) referred as the 'positive part of the doctrine' as opposed to the 'comparative part', which would relate to what today is referred to the 'relative' version of the PPP.

“rise in prices must occur when extra purchasing power is put on the hands of government, or in fact, of whomsoever it may be who directly takes advantage of this purchasing power. The heightened competition for the non-increased supply of commodities which the newly created purchasing power evokes cannot help having this effect. To what height the rise in prices will go cannot be determined theoretically (...). This rise in prices in its turn manifestly brings about an increased need for currency. Obviously, one must expect that the quantity of currency required by trade grows in proportion to the rise in prices.” (Cassel, 1922, p.27)

However, the conflict between the QTM, as normally stated, as a theoretical basis for PPP in Cassel’s work becomes increasingly odd when he expresses his views regarding monetary policy¹⁷. For Cassel the general means to keep creation of purchasing power in check and keeping the value of a currency stable would be through an appropriate discount rate policy, which in his view was due to the necessities of governments during the war were kept at a lower rate than needed to prevent inflation:

“The general means of keeping up a monetary standard is the sufficient limitation of the supply of means of payment in that standard. The regulator of this supply is the rate of discount. In the whole world rates of discount have been too low during the war. The real scarcity of capital would have commanded a much higher interest than 5 or 6 per cent which have generally prevailed (...)” (Cassel, 1920, p.264)

With the main goal of monetary policy for Cassel being to pursue a stability of prices, something that Cassel would forcefully advocate throughout the 1920’s, in accordance to other Swedish economists such as Wicksell, Davidson and Hecksher¹⁸ (Magnusson, 1991)

“The only rational and at the same time practically useful rule to go by, therefore, is that *demand for capital must, by means of the rates of interest of the banks, be limited to the amount of funds supplied by current saving, so that no artificial purchasing power, with its accompanying rise in prices, will be created.*” (Cassel, 1922, p. 104, italics on the original)

The resemblance of Cassel’s proposals for a basis for monetary policy and inflation targeting policy adopted by modern monetary policy is startling. However, more fundamental here is how Cassel’s re-statement of QTM in an economy dealing with credit instruments and his approach to monetary policy and price stabilization reveals a great connection with the theory advanced by Wicksell’s (1898) and the acceptance of money as endogenous,

¹⁷ Cassel’s departure from the QTM original framework becomes clearer in his 1928 book ‘Post-War Monetary Stabilization’. In this book, which compiles a series of three lectures given by Cassel in the University of Columbia in the United States, he admits that causality between increase in the supply of money and increase cannot be precisely determined. Cassel also denies the symmetry between increase in money supply and prices, claiming that changes in the velocity of circulation would play major roles in the context of high inflation rates: “We cannot tell how much prices will rise. The endeavours which the old quantity theory of money made in this direction were doomed with failure.” (Cassel, 1928, p.6)

¹⁸ Advocacy that according to Jonung (1979) was key for the establishment of a price-level targeting by Swedish Central Bank in 1931 once Sweden abandoned the Gold Standard.

3.2- From introducing minor caveats to fundamental changes

By 1922, with a widespread discussion of the theory, multiple calculations, by supporters and critics, of Purchasing Power Parities, using different sources and price-indexes, from multiple countries were becoming more usual. With deviations being justified by supporters as special cases, which initial conditions failing to (or inadequacy of the coverage of existing price-indexes¹⁹) and critics who used deviations as evidence of the fallacy of PPP as a theory of exchange rate determination. This wide debate may have led Cassel to respond to some of the criticisms that his theory had received and comments about misconceptions that he had identified in some of the works at the time that have calculated PPP, although as usual he does not make direct reference to none of them:

“People want to determine by direct means the quotient of the purchasing power parity of money in the respective countries, and to regard this quotient as the normal level of the exchange rates. But the problem is not so simple. It is only if we know the exchange rate which represents a certain equilibrium that we calculate the rate which represents the same equilibrium at an altered value of the monetary units of the two countries. Now the exchange rates prevalent during the gold standard régime before the War manifestly correspond on the whole to a certain general equilibrium of international trade.” (Cassel, 1922, p.142)

Here it becomes clear the reference to another new condition set by Cassel to his theory to be valid, which is that in the base period (from which one want to extrapolate for another period by means of calculating the PPP) need to be one where a certain equilibrium of international trade had existed, as Cassel referred²⁰. An exchange rate would only be stable to the extent that it was consistent with a balance in trade, whether the exchange rate levels consistent with the appropriately calculated Purchasing Power Parities would bring balance in international trade would be the central issue.

However, in a reply by Cassel (1920b)²¹ in *'The Economic Journal'* to criticisms made by Van Dorp (1919), Cassel acknowledged that if prices of exports had risen more than the general price level, exchange rates would lie below the ratio given by PPP calculations. The full implications of this effect to his theory would only be more thoroughly acknowledged in 1922:

“If in each country prices are unaltered in their relation to one another, but have only undergone a common rise, then there is nothing to prevent our supposing the balance of trade between the countries to be unaltered. The equilibrium of the exchanges must, then, have been dislocated in the manner shown by the ratio of the deterioration of money in the two countries. If, on the other hand, the different prices have moved in their relation to one another, this circumstance may possibly in itself have affected the equilibrium of international trade and have caused some dislocation in the equilibrium of the exchanges.” (Cassel, 1922, p.141 and 142)

¹⁹ A point raised by Pigou (1920) which would receive subsequent attention in the literature in the early 1920's.

²⁰ Which can be interpreted as a relative equilibrium in the Current Account.

²¹ The reader is here referred to a note written by Cassel which is appended at the end of his main article.

Therefore, if relative prices change within one country and if these changes in relative prices between countries were to differ, then equilibrium exchange rates would be different from the rate calculated based on the old parity adjusted for relative inflation as professed by his PPP calculations. Contrary to other factors, previously highlighted by Cassel, this would be a case in which exchange rates would deviate persistently from the rate given by the PPP:

“Our calculation of the purchasing power parity rests strictly on the proviso that the rise in prices in the countries concerned has affected all commodities in a like degree. If that proviso is not fulfilled, then the actual exchange rate may deviate from the calculated purchasing power parity.” (Cassel, 1922, p.154)

Although, Cassel doesn't make specific reference to the role of non-tradable, he must have been well aware of the argument which would become the cornerstone of the contributions of Harrod, (1933), Balassa (1964) and Samuelson (1964). Afterall, the distinction between tradable and non-tradable price movements was at the core of Van Dorp (1919) criticisms²², as well as in Pigou's (1920, 1922) presentation of PPP theory²³. The proposition that PPP ratios should be calculated solely on the basis of tradable commodities would, however, never be endorsed by Cassel:

“Some people believe that Purchasing Power Parity should be calculated exclusively on price indices for such commodities as form the subject of trade between two countries. This is a misapprehension of the theory. There is never any definite group of commodities that can be exported. Even a small alteration in the rate of exchange restrict the group of exportable goods. (...) The whole theory of Purchasing Power Parity essentially refers to the currencies concerned and variations in this value can be measured only by general index figures representing as far as possible the whole mass of commodities marketed in the country” (Cassel, 1928, p.33)

The reliance on using general price indexes, reveals once more that the theoretical basis for Cassel was his adherence to the QTM, i.e. change in price levels accrues primarily from changes in the quantity of means of payment. This would contrast to the interpretation given to the PPP by Van Dorp (1919), Pigou (1920, 1922), and latter Keynes (1922, 1923), which would be view PPP as an arbitrage condition, a generalization of the Law of One Price. Nevertheless, this position sustained by Cassel was at odds with his one explanation of why foreign currencies are demanded in the first place:

“(...)What is the principal reason for a foreign currency being in demand, and what effect has an alteration in the intrinsic value of that currency upon the demand for the same?

²² “we have to divide the price-level in each country in two sections: one section represents the prices of those commodities which are still an object of international trade, the other the prices of those goods which cannot be exported or imported. These latter prices move quite independently in every country. If we want to measure the fall of exchange by the index number, we can only use the prices of the former commodities. This may answer for the anomaly which Prof. Cassel observed.” (Van Dorp, 1919, p.501)

²³ All three published in *The Economic Journal*, to which Cassel was a consistent contributor at the time.

Our willingness to pay a certain price for foreign money must ultimately and essentially be due to the fact that this money possesses a purchasing power as against commodities and services in that foreign country. On the other hand, when we offer so and so much of our own money, we are actually offering a purchasing power as against commodities and services in our own country." (Cassel, 1922, p.138)

If the demand for foreign currency arise from demand for commodities which can be imported, wouldn't be the price of these tradable commodities that would affect the demand for foreign currency? Moreover, while discussing PPP²⁴, Cassel reduces the demand for a foreign currency to a demand for commodities, completely disregarding demand for foreign currency by investors and speculators, which would demand a foreign currency based on the purchasing power that this would grant them against a stock of assets, securities in this foreign country. And, thus, demand by this group would take into consideration profits possibilities, taxes paid, and risks associated with the investments made in the foreign country, not what purchasing power it possesses against a flow of commodities and services (Keilhau, 1925).

Although, this neglection may at first seem trivial, it is quite important for Cassel's explanation of the market mechanisms which ensure that exchange rates converge was that an exchange above the PPP ratio (an overvalued exchange rate) as it stimulates imports and reduce exports, would increase demand for foreign currency while reducing its supply (due to lower receipts from exports). This would lead to a devaluation of the exchange rate, re-establishing the exchange rate at the level consistent with the PPP²⁵. Implicit in Cassel's argument was the assumption that imports, and exports could not be financed through credit and, thus, don't generate counteracting capital flows, which would prevent the movement of the exchange rate. This is a point raised by Van Dorp (1919), which sets up a simple example where excess imports were funded by a foreign loan. Wicksell (1925) and Keilhau (1925) also emphasize the lack of treatment of Capital Flows in Cassel's analysis of exchange rates, leading Keilhau (1925, p.225) to suggest provocatively that PPP theory should be rebaptise as "*the doctrine of commodity parity*"²⁶.

It would be, only, in 1928, in a lecture delivered at the University of Chicago as part of series of lectures by invited speakers on Foreign Investments²⁷, that Cassel would explicitly acknowledge the requirement of an extra assumption of no capital flows for the validity of his Purchasing Power Parity theory. The formulation presented then by Cassel (1928b) can be seen as his final take on what PPP theory meant, with a rather similar exposition of the main aspects

²⁴ Although, in other parts of his work he would refer to possibilities of financing of trade balances through deferral of payment, discounting liabilities and proper loans (Cassel, 1923 [1918], p. 488-489)

²⁵ References to this classic mechanism of equalization can be found in almost all of Cassel's texts regarding PPP. For an example, "*It is likewise obvious that every deviation of the true exchange rates from the purchasing power parities must cause considerable disturbances in international trade. The export from A to B must be largely checked if B's currency is valued lower in A than what would correspond to the general price level in B compared with the price level in A. At the same time the import from B to A would be artificially stimulated by such a valuation. Indeed, both these influences would tend to raise the value of B's currency in A, and to restore it to the purchasing power parity, which shows that this parity is the true equilibrium of the exchanges.*" (Cassel, 1922, p. 157 to 158).

²⁶ Italics in the original

²⁷ The series of lectures organized by the Harris Foundation would be published in the same year by the University of Chicago Press.

of the theory being incorporated in 2nd English edition²⁸ of *The Theory of Social Economy*, published in 1932²⁹. In this formulation, Purchasing Power Parity would be assigned the role of fundamental factor determining exchange rates with all other factors seen as reasons, that can lead to exchange rates to deviate from PPP levels, considered to be of secondary importance, as “disturbances”, which Cassel grouped under three groups:

“The first comprises the monetary disturbances caused by processes of inflation or deflation. The second is formed by all sorts of artificial hindrances to international trade. The third group contains those disturbances that may be caused by international movements of capital. When the currencies concerned are kept at an invariable purchasing power on their internal markets, when the trade between the countries is not hampered by artificial hindrances, and when no capital movement the rate of exchange must stand at the equilibrium level represented by the Purchasing Power Parity and cannot show more than small and quite temporary deviations from this level.” (Cassel, 1928b, p.17)

As such, when ruled out these three main sources of disturbances PPP as a theory of exchange rate determination would hold. It is important to note that the three set of conditions would have different impacts if not met. With the first assumption, Cassel is ruling out the change in relative prices which could cause a shift in the exchange rate consistent with equilibrium in international trade from the level calculated by PPP (as previously discussed). While, with the second and third group of restrictions would be factors that prevented actual exchange rates from converging to levels consistent with calculated PPP.

3.3-Historical Context with relating the methodological section

From 1916 to 1932 Cassel wrote extensively on the topic of foreign exchange rates. His views gained prominence in the both policy and academic debates and consequently were thoroughly analysed and criticised by his contemporaries. Throughout this time span of a decade and half, his formulation and presentation of Purchasing Power Parities as a theory of exchange rates evolved significantly. From a crude formulation of PPP as positivistic theory of exchange rate equilibrium under conditions of free trade presented in his 1916 article, valid under fairly general conditions, the PPP theory as defended by Cassel evolved to a theory which would explain the exchange rates levels that would consistent with balanced trade and only valid under an increasing number of specific assumptions. And with this it’s only fair to wonder whether PPP if in the short-run temporary, transitory, factors may cause exchange rate to deviate from PPP and in the long run domestic prices are certain to fluctuate in relation to one another, leading (equilibrium) exchange rate also to deviate (most probably in a non-transitory way) from the value given by the PPP, wouldn’t the theory be stripped of its utility?

²⁸ “*We assume that all commodities are immediately paid for; in other words, that the one country extends no credit to the other, at least not for a period longer than is technically necessary for adjusting the mutual payments.* This position [Purchasing Power Parity], then, represents the equilibrium position for the rate of exchange, for in any other position a constant scarcity of foreign currency would be felt in one of the countries, and the price of this foreign currency would of necessity rise. Only a rate of exchange at which the balance of trade is in equilibrium can possess a permanent stability. This rate of exchange is termed the purchasing power parity.” (Cassel, 1932 [1918]) (italic added for emphasizes)

²⁹ Translated from the 5th German Edition, the 1932 edition brings a complete independent section on International Trade (Book V), which was not present in the 1st English edition published in 1923. In it, Cassel expands to great extent the chapter on International Payments and Adjustment of the Balance of Payments under free independent monetary standards contained in the section regarding Money (Book III).

Cassel's (1928a) defence on this matter would be grounded on his vision of what economic inquiry method should be. The role of the economic theorist in studying a problem would be to disentangle the influence of each of the causes affecting the problem of interest, with the first task being of identifying the most important factor and study its effect separately; and in the case of exchange rate this dominant factor was to be sought in the PPP and in the role of relative domestic inflation rates, at least during this period.

This approach was very much in line with what constituted the 'positive heuristics'³⁰ neoclassical research program prevalent in the 1920's.

That is, develop general theories, constructing static models; in which the situational assumptions are set up in in such a way that a unique determinate equilibrium arises³¹. Then, starting from a given initial equilibrium condition and analysing the effect of change in one variable (relative inflation rates) under *ceteris paribus* conditions. And as such, on the one hand, the introduction of caveats that Cassel can be seen as him specifying the adequate conditions under which the theory would be valid, giving it internal consistency³². On the other, the changes made doctrine of much of its original force and empirical applicability, insulating from fallibility, much in line with conventionalist approach discussed in the methodological section.

Lastly, when analysing Cassel writings, one needs to bear in mind that he formulated and developed PPP theory during a period marked by a high volatility in prices and exchange rates. First, a steep inflation that spread around the world following the outbreak of the First World War; and the breakdown of the exchange rate parities set under the gold standard. But also latter by violent deflation in the early 1920's. The period is also marked by the creation of the League of Nations, which in a manner represented an early attempt of establishing a forum of discussion in order to set up policy coordination at an international level. As discussed by Karadochnikov (2013) international economic conferences and various other discussion forums set up by institutional bodies of the League of Nations were instrumental in shaping the discussion of this period. While the problems of the post-war debts had a higher political nature, problems of global trade imbalances and exchange rate instability represented deeper economic theory problems, with major policy implications. Cassel took an active part in these discussions contributing with two policy memorandums³³.

In these forums the key discussion was not so much whether exchange rate should be fixed or not³⁴ but rather a matter of at what level should them be fixed back to gold. As mentioned by Cassel (1922) the restoration of currency values was identified as a first condition for the reconstruction of the international monetary system by the expert panel at the international conference at Genoa in early 1922. To Cassel discontentment, however, the

³⁰ I.e. the prescription and accepted 'scientific' practices how to develop the programme from both a theoretical and empirical standpoint (see Coats, 1976).

³¹ And if the model yields no determinate equilibrium, modify the situational assumptions until a solution becomes possible (Latsis, 1976)

³² However, Neoclassical research programme in microeconomic theory general propositions were mostly always stated in terms of 'directions of change' rather than specifying a given 'amount of change', as Cassel tended to do with PPP theory. Which can be seen as a reason why Cassel's PPP was a much easier target for criticisms based on empirical anomalies, as his remarks of 'direct proportionality' would entail a much wider set of potential outcomes which would falsify his theory. Something, that would be appear in a much more nuanced way.

³³ Which would be latter reprinted as a book, see Cassel (1921).

³⁴ The resistance to floating exchange regime and free paper standards would be explained by Cassel by the trauma felt by the international community of the high inflation rates that occurred under this system.

answer to which rate countries should establish their gold parities were left to each country's choice.

Given the policy discussion, the focus of his contributions shifts from merely explaining movements of exchange rates since the break-up of the gold standard to a broader discussion regarding the means to achieve monetary stability in the post-war period. It is in this political and institutional context that Cassel's texts of the 1920's should be analysed. In this context, for Cassel, other influences such as changes in relative prices and changes in tastes and composition of consumption baskets were likely to be statistically very small when compared to the magnitude of inflation in domestic prices. This exactly the defence provided by Myrdal (1963 [1945])³⁵ for Cassel's, at times, oversimplified exposition of his theories:

"Cassel's theories were sometimes conspicuously stamped by their time and were even designed to come to grips with specific practical problems. Hundreds of theoretical pedants in many countries have had the opportunity of flaunting their knowledge of elementary international trade theory by demonstrating that Cassel's theory of purchasing power parity has no universal validity. Nothing could be easier—it is now done by first-year students. But in a deeper, pragmatic sense Cassel was nevertheless right for, when monetary stability was to be restored after the First World War, nothing could have been more important than to impress upon politicians and bankers precisely this approximate but nonetheless fundamental relationship between price levels and exchange rate. Cassel himself, however, did not clearly realize this limitation of his theory, which may perhaps excuse the excessive pedantry of many of his critics." (Myrdal, 1963 [1945], p.2)

³⁵ Gunnar Myrdal was a student of Cassel and eventually succeeded him as Professor of Economics at Stockholms Högskola in 1933. Despite their profound different view regarding economics and politics both deeply respected each other relation. For more detail concerning their relation, see Carlson and Jonung (2006) and Myrdal (1963[1945]).

Concluding Remarks:

In this essay the main writings of Cassel dating from the middle of the war until 1932 were covered. Throughout these years the presentation of the PPP theory and the conditions under which exchange rates would converge to the rates given by PPP were greatly polished. While initial empirical corroboration was heralded as general validity of the main proposition of his approach (Cassel, 1916), later lack of empirical corroboration was initially treated as anomalies. This would be explained, by Cassel and other advocates of PPP theory, either as temporary fluctuations, non-conformity of the case under inquiry with the theory underlying assumptions (e.g. hindrances to trade in one direction) or inadequacy of the coverage of the available price indices to properly evaluate the theory³⁶. As theoretical questioning mounted, though, the scope of the problem that PPP theory had aimed to explain had to be subtly changed by Cassel with the adoption of convenient restrictive assumptions, such as (i) constancy of relative prices; (ii) no capital flows; (iii) if PPP indexes could be calculated departing from index-numbers of base year in which there had been a certain equilibrium in international trade.

The review of the reactions to empirical anomalies and of the evolution of Cassel's expositions of PPP highlight what can be framed as a rather common Conventionalist strategy to the methodology of economics, in which the direct empirical confrontation of the postulate of PPP theory was avoided by the inclusion of suitable auxiliary assumptions, which acted as 'protective belt'. However, in this process the empirical usefulness of PPP theory faded away. Rather than a general theory of exchange rate determination under free trade, with negligible transaction costs, PPP as theory would assume different meanings, valid to much narrower set of cases. Under restrictive assumptions (i) and (ii) it could still be regarded a theory of exchange rate movements determination (but valid only under specific conditions). And empirically applicable only under the restrictive assumption (iii), i.e. to a case where an initial equilibrium in international trade could be found and in as much as one agrees with 1914 pre-war period as one of equilibrium in international trade valid mainly to the circumscribed historical period of Cassel writings.

As the existence of capital flows and foreign loans were prevalent (thus relaxing (ii)), Cassel, at times, would put emphasis on PPP as theory of exchange rate determining equilibrium, rather than actual current behaviour of exchange rates. It would, then, be theory of what rates of exchange should be seen as normal after the massive inflation that had occurred in most countries after the outbreak of the war and, as such, a reference against which actual exchange rates could be evaluated (as over or undervalued). However, once relaxing restrictive assumption (i), even the notion of PPP as a theory of exchange rate equilibrium would lose its general validity, but at this point Cassel's defence would resort to historical experience at the time, where inflation would have been by far the greatest cause of dislocation of the rates of exchange. And, finally, under the political debate of return to the gold standard in the 1920's his main advocacy was for of the of PPP as a benchmark to establish new gold parities without having to go through the perils of deflation, and, thus, would assume more a normative connotation than being attributed a weight of a positive theory able to explain actual long term-movement of exchange rates.

Taking stock, at the end of 1920's, PPP theory as formulated by Cassel could be seen as internally consistent, with its main proposition been valid under its stated assumption and in coadunation with what can be considered 'positive heuristics' of the neoclassical research

³⁶ See Pigou (1920), for an example.

program prevalent at the time. That is, analysing the problem of interest from a given initial equilibrium condition and analyse the effect of change in one variable under *caeteris paribus* conditions. However, as he introduced the necessary restrictive assumptions the empirical applicability and relevance faded away, with the core proposition of the theory becoming unfalsifiable, with the auxiliary assumptions being difficult to test. It would take decades of evolution of econometric theory and methodology, as well as evolution of computer science, together with historical opportunity with the break down of the Bretton-woods international monetary system, to the PPP to become a fashionable theory, with testable propositions.

The final judgement whether the introduction of these auxiliary assumptions is to be appraised as done in 'ad-hoc' basis or not, and as such if PPP theory by the late 1920's had become a degenerative research program, remains a matter of one's individual judgement. Nevertheless, the fact was that Cassel's and PPP theory influence faded away through the 1920's, after exerting a great influence on the public and political sphere, as well as in academic circle in the years after the first world war. Not even the new demise of the Gold Standard and fixed exchange rate system, which had elevated Cassel and PPP to fame in the aftermath of the First World War, would bring them back into fashion. The world and international trade economic research had moved on. Nevertheless, Cassel's influence would still be felt, but through the works of his student, with Bertil Ohlin in the fore front of the developments of international trade theory.

References

- Anderson, B. M. (1920). "Some Observations on Professor Cassel's Paper", *Annals of the American Academy of Political and Social Science*, 89: 268–73.
- Balassa, B. (1964). "The purchasing power parity doctrine: A reappraisal". *Journal of Political Economy*, 72 (6): 584–96.
- Brems, H. (1989). "Gustav Cassel revisited". *History of Political Economy*, 21 (2): 165-78.
- Bunting, F. H. (1939). "The Purchasing Power Parity Theory Reexamined". *Southern Economic Journal*, Vol. 5, No. 3 (Jan., 1939), pp. 282-301.
- Carlson, B. (2009). "Who was the world most famous economist- Cassel or Keynes? *The Economist* as a Yardstick, *Journal of the History of Economic Thought*, 31 (4): 519-530.
- Carlson, B. and Jonung, L. (2006). "Knut Wicksell, Gustav Cassel, Eli Heckscher, Bertil Ohlin and Gunnar Myrdal on the role of the economist in public debate". *Econ Journal Watch*, 3 (3): 511–550. Retrieved from http://www.econjwatch.org/file_download/119/2006-09-carlsonjonung-char-issue.pdf
- Cassel, G. (1916). "The present situation of the foreign exchanges". *The Economic Journal*, 26 (101): 62–5.
- Cassel, G. (1918). "Abnormal deviations in international exchanges". *The Economic Journal*, 28 (112): 413–5.
- Cassel, G. (1919). "The Depreciation of the German Mark". *The Economic Journal*, 29 (116): 492-496.
- Cassel, G. (1920a). "Further observations on the world's monetary problem". *The Economic Journal*, 30 (117): 39–45.
- Cassel, G. (1920b). "Some leading propositions for an international discussion of the world's monetary problem". *Annals of the American Academy of Political and Social Science*, 89: 259–67.
- Cassel, G. (1921). *The World's Monetary Problems*. London: Constable and Co.
- Cassel, G. (1922). *Money and Foreign Exchange After 1914*. New York, The Macmillan Company
- Cassel, G. (1923). "The restoration of the gold standard". *Economica*, (9): 171–85.
- Cassel, G. (1928a). *Post-War Monetary Stabilization*, New York, Columbia University Press
- Cassel, G. (1928c). "The Rate of Interest, the Bank Rate, and the Stabilization of Prices." *Quarterly Journal of Economics* 42 (August): 511–29.
- Cassel, G. [1918] (1932). *The Theory of Social Economy*, Vol. II. London: Ernest Benn Ltd.
- Harrod, R. (1933). *International Economics*, Cambridge, Cambridge University Press.
- Holmes, J.M. (1967). "The purchasing power parity theory: in defence of Gustav Cassel as a modern theorist", *Journal of Political Economy*, 75, 686-695.

- Humphrey, T. M. (2002). "Knut Wicksell and Gustav Cassel on the Cumulative Process and the Price-Stabilizing Policy Rule". Federal Reserve Bank of Richmond *Economic Quarterly* Volume 88/3 Summer 2002
- Kadochnikov, D. V. (2013). "Gustav Cassel's purchasing power parity doctrine in the context of his views on international economic policy coordination". *The European Journal of the History of Economic Thought* Volume 20, 2013 - Issue 6: Special issue in collaboration with The European Society for the History of Economic Thought.
- Keilhau (1925). "The Valuation Theory of Exchange", *The Economic Journal*, 35 (138), 221-232.
- Keynes (1922). "The Stabilization of European Exchanges. A Plan for Genoa", in *Reconstruction of Europe*, Issue 1, *The Manchester Guardian Commercial*, 20th of April, 1922.
- Keynes (1923). "A Tract on Monetary Reform",.....
- Latsis, S. J. (1976). "A Research program in Economics" in *Methods and appraisal in economic*, edited by Latsis, S. J., Cambridge University press, United Kingdom.
- Magnusson, L. (1991) "Gustav Cassel, popularizer and Enigmatic Walrasian" in *The History of Swedish Economic Thought*, edited by Bo Sandelin, Routledge, New York.
- Myrdal, G (1963 [1945]). "GUSTAV CASSEL IN MEMORIAM (1866-1945)", *Oxford Bulletin of Economics and Statistics*, Vol. 25, Issue 1, February 1963, pages 1-10.
- Officer, L. (1982). "Purchasing Power Parity and Exchange Rates: Theory, Evidence and Relevance", JAI Press, 1982.
- Pigou, A. C. (1920). "Some Problems of Foreign Exchanges", *The Economic Journal*, 30 (120), 460-4.
- Pigou, A. C. (1922). "Foreign Exchanges", *Quarterly Journal of Economics*, 37 (1), 52-74.
- Scott, W. A. (1920), "Discussion of Professor Gustav Cassel's 'Prices and the Monetary Problem'", *Annals of the American Academy of Political and Social Science*, 89: 277-279.
- Siepmann, H. A. (1920). "The International Financial Conference at Brussels", *The Economic Journal*, 30 (120): 436-439.
- Samuelson, Paul A. (1964). "Theoretical notes on trade problems", *Review of Economics and Statistics*, vol. 46, no. 2, pp.145-54.
- Terborgh, G.W. (1926). "The purchasing power parity theory", *Journal of Political Economy*, 34, 197-208.
- Wicksell, K. [1898] (1936). *Interest and Prices*. Trans. R. F. Kahn. London: Macmillan.
- Wicksell, K. [1919] (1969). "The riddle of foreign exchanges". in *Selected Papers on Economic Theory*, New York: Augustus Kelley, 1969.
- Wicksell, K. [1925] (1936). "The Monetary Problem of the Scandinavian Countries." *Ekonomisk Tidskrift*. Reprinted in *Interest and Prices*. London: Macmillan: 197-219.
- Van Dorp, E. C. (1919). "The Deviations of Exchanges", *The Economic Journal*, 29 (116): 497-503.

