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Between the Engine and the Fifth Wheel

An Analytical Survey of the Shifting Roles of Agriculture in Development Theory

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2017

Document Version:

Publisher's PDF, also known as Version of record

[Link to publication](#)

Citation for published version (APA):

Rohne Till, E., & Andersson, M. (2017). *Between the Engine and the Fifth Wheel: An Analytical Survey of the Shifting Roles of Agriculture in Development Theory*. (Lund Papers in Economic History: Development Economics; No. 163). Department of Economic History, Lund University.

Total number of authors:

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Lund Papers in Economic History



No. 163, 2017

Development Economics

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Lund Papers in Economic History
ISRN LUSADG-SAEH-P--17/163--SE+25

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Orders of printed single back issues (no. 1-65)
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Full-text electronic issues (no. 58, 60, 61, 66--)
www.ekh.lu.se

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Between the Engine and the Fifth Wheel: An Analytical Survey of the Shifting Roles of Agriculture in Development Theory

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Abstract

Over the last decade, attention to agricultural development in less developed countries has increased. However, two opposing views on its role in economic development exist within the scholarly debate, either as a potential engine for economic growth or as a fifth wheel unlikely to generate transformative growth. Taking these contrary opinions as a point of departure, this paper reviews the origins of prominent views of the role of agriculture in development theory. Next it bibliometrically assesses the pattern of fluctuating scholarly attention to agriculture, and attempts to understand the reasons behind this pattern. The paper identifies four influential views on agriculture in development theory; five distinct phases of ups and downs in the scholarly attention to agriculture and discusses five potential reasons behind these fluctuations.

Key words: Agriculture; Economic Development; Development Theory; Bibliometric Analysis

JEL codes: N50, O13, Q17, Q18

1. Introduction¹

Over the last decade, agricultural development in less developed countries has increasingly become the talk of the town. International donors and national governments have increased their attention to the rural economy, agriculture has attracted raising commercial investments and the interest among scholars, media and the public seems to have risen, leading some to predict an “agricultural renaissance” in the twenty-first century (Pingali 2010). However, two diametrically opposing views on the role of agriculture in economic development exist within the scholarly debate. According to the agro-proponents agriculture plays a crucial role for both aggregate and pro-poor growth (Adelman 1984; Ravallion and Chen 2007; Timmer 2009; de Janvry and Sadoulet 2010; Christiaensen et al 2011; Lipton 2012). They hold that agricultural development has been essential for long-term growth and industrialization in the past (Timmer 1988; Mellor 1999; Gollin et al 2002; Diao et al 2007). Concurrently, the agro-skeptics argue that agriculture is unlikely to lift poor countries out of poverty and to stimulate sustained increase in income growth (Ashley and Maxwell 2001; Collier and Dercon 2009). They question that agricultural growth is generally efficient in reducing poverty (Hasan and Quibria 2004), that agriculture typically has been a precursor of development (Ellis 2004), and that agriculture was as an engine of growth historically in now-developed countries (Dercon and Gollin 2014). As such, in today’s scholarly debate, agriculture is seen as both the engine and the fifth wheel in economic development.

The purpose of this paper is to trace how the role of agriculture in theories of economic development has shifted over time, and explore possible reasons as to why scholarly attention viz-a-viz agriculture fluctuates. Methodologically, our approach is based on reviewing key literature in Development Economics, and in Agricultural Economics with regard to developing countries. The key source and principle guide to the literature on agriculture in economic development up to the early 1990s is the Survey of Economics Literature volume IV (1992), devoted entirely to agriculture in developing countries. For the general tendencies we based ourselves on the Handbook of Development Economics volume I-V (from 1988 to 2010); Handbook of Agricultural Economics volume I-IV (2001-2010); and World Bank Reports; as well as previous survey efforts (Johnston 1970; Reynolds 1975; Rao 1985; Eicher and Staats 1998; Federico 2005; Barrett et al 2009; Lains and Pinilla 2009; Dethier and Effenberger 2012). Further, we use a bibliometric methodology to estimate the shifting scholarly attention, which considers all economic literature published on EconLit, 1969-2015.

2. Perspectives on Agriculture in Development

Among the range of perspectives on the role of agriculture in development since the birth of Development Economics, four major views in the literature are identified as having been particularly influential.

2.1 Fifth wheel: duality and agricultural labour surplus

At the centre of early development theory is the idea of duality, typically between the modern industrial sector and the traditional agricultural. Two of the most influential perspectives on dualism are Boeke's (1953) study of colonial Indonesia and Lewis's classic Economic Development with Unlimited Supplies of Labour (1954). To Boeke, dualism was the different workings of the modern and the agricultural sectors, and of the developed and developing

¹ The authors benefitted from comments on an earlier version of this paper at seminars at University of Queensland and University of Zaragoza, as well as from Derek Byerlee, Vicente Pinilla and Henry Willebald. The authors also gratefully acknowledge research funding from Marianne and Marcus Wallenberg Foundation, The Wenner-Gren Foundations and The Crafoord Foundation.

world, respectively. To him, the social structures of developing countries were so different from Western countries, that Western development strategies were simply not applicable. This type of "cultural" dualism should not be confused with the dualism connected to Arthur Lewis. The fundamental difference between these two conceptualizations is that in Boeke's duality, labour supply is either backwards-bending or totally inelastic, whereas in Lewis's model it is perfectly elastic. Lewis's model is most relevant here, as it had a profound legacy on development theory. The model's duality meant that neoclassical assumptions had to be abandoned and thereby that the approach to the study of the economy of developing countries needed a particular kind of economics: Development Economics.

In Lewis's two-sector model (as in models of Fei and Ranis (1964) and Jorgenson (1961)), the subsistence sector holds unlimited supply of labour, readily transferrable at a relatively low cost to the modern industrial sector. While farmers in Boeke's world are content with a target income, for Lewis, subsistence farmers are ready to accept moving to other sectors for an income slightly higher than in agriculture but well below marginal productivity in the modern sector. In this view, agriculture's contribution to development is to reallocate labour and indirectly contribute to much needed savings and investments in the modern sector. As such agriculture is important but more implicitly, than explicitly, analysed.

While Lewis did not equate the agricultural sector with subsistence, his theory holds that it is the agricultural sector that typically holds the largest amount of subsistence labour. The surplus labour was conceptually close to for instance Rosenstein-Rodan (1943) and Nurkse's *disguised unemployment* in agriculture that meant that *agrarian excess population* could be removed from agriculture without reducing output. Since labour was a valuable yet underutilised resource it could be reallocated to the modern sector for the capital formation necessary for industrialization to evolve. This view, which is at the core of early development thinking, was classical economics applied to underdeveloped economies to which orthodox neoclassical economics made little sense. Although Lewis (1954:433) himself did not neglect the importance of the agricultural sector, holding that industrial and agrarian revolutions always go together, the legacy of this school is that agriculture does not drive industrialization and the development process. If neglected, agriculture might stifle the entire process, but by itself it does not stimulate economic development – rather acting as a fifth wheel.

2.2 Chicago school rationality and anti-distortion

A major influence on the perception of how agriculture functions in developing countries came with Theodore Schultz. He recognized neither cultural dualism nor surplus agricultural labour. Instead, Schultz went into depth to restore the neoclassical position that the marginal productivity of agricultural labour was not zero, using a microeconomic approach focusing on the behaviour of individual farmers. He convincingly argued that peasants were as rational as any other economic agent (a point already made by Bauer and Yamey in their 1959 study on Nigerian farmers), and that while farmers in developing countries might be poor they use the available resources efficiently. By implication the supply curve of labour is neither flat nor backwards-bending (Schultz 1964). Farmers were poor because traditional agriculture "tend to approximate the economic equilibrium of the stationary state" (1964:16) and it would require new knowledge or technology to break away from this equilibrium. As such, investment into farmers' knowledge and technology would support productivity increases in the agricultural sector. In Schultz's view, agriculture, if not upgraded will slow down overall growth. But if its productivity increases, which it will if proper incentives are given to it, agriculture can be as efficient as any other sector.

That rational behaviour and market incentives are applicable also to smallholder farmers might not be particularly controversial today. As Falcon (1988:199) points out, however, this was viewed as radical at a time when agriculture was largely seen as a passive sector populated by small farmers held back by traditionalism and inertia. For example, Myrdal's (1968) influential "Asian Drama" argued that smallholder agriculture lacked spread effects and that agriculture was not likely to develop without large scale land reforms.

A second policy legacy of Schultz, in addition to investing in public goods to improve farmers' access to knowledge and technology, is a strong hands-off attitude to agricultural regulatory policies, for example on price stabilization and international trade. This inference logically follows the rationality-perspective, and has been forcefully argued by Schultz and his followers. Proponents of this reasoning have shown the lack of economic reason for agriculture to be overly taxed in poor countries and excessively subsidized in rich countries, as this effectively closes the door for producers in the developing world (Bauer 1954; Schultz 1978; Johnson 1973; Krueger Schiff and Valdés 1988, 1991; Anderson 2009). However, it is less clear what this view suggests in terms of agricultural development after distortions are wiped away. The implication of this perspective is that Agricultural Economics is very much like regular economics, which functions the same in developing countries as developed ones.

2.3 Agriculture and trade: break or injection

A third main view concerns itself with the role of agriculture in trade, where agriculture is seen as either a break or an injection. Regarding the first, the works of Raúl Prebisch and followers have been particularly influential for the developing world. As most development economists of the 1950s/60s, they were concerned with rapid industrialization in the developing world, requiring substantial state planning to encourage needed capital formation and reallocation towards the modern sector. The core concept was the Prebisch/Singer-thesis, suggesting deteriorating Terms of Trade for primary products in relation to industrial goods. By implication, concentration on agriculture has long-term adverse effects on developing countries' ability to catch-up. The import-substitutive policies that followed had a clear anti-agriculture bias and were widely adopted in the developing world. This perspective did not regard agriculture to generate employment, to develop linkages to the rest of the economy, nor to play any major role in stimulating domestic industrial production. Instead, all agricultural labour needed to be transferred to industry due to its low marginal productivity (Baran 1952; De Janvry 1975).

In contrast to the strand seeing agricultural trade as a block to development, the opposite view was formulated by Myint's (1958) vent-for-surplus thesis. This states that increased effective demand from trade enable use of surplus resources (land and/or family labour) existing in developing countries. This particularly applies to countries where the land frontier is not closed. Rather than trade as a function of comparative advantage, this "surplus productive capacity" is a relatively inexpensive way to increase growth in poor countries.²

² A similar theoretical strand, emphasising the potential ability of agriculture to contribute to growth via exports, is staple theory, as developed by W. A. Mackintosh and Harold Innis. In this, demand for staple products (products that can be produced in surplus of domestic demand) is crucial for growth, together with a country's ability to reduce its cost to supply these products. If achieved, staple exports are seen to spur investments and consumption throughout the domestic economy. A main difference to "vent-for-surplus" is that staple theory emphasise different productivity-generating capacities of products, where staple products yield more output than focusing on a less export-oriented products. As such, it places more emphasis on agricultural productivity increase than "vent-for-surplus."

2.4 Agriculture as engine

The fourth main view sees agriculture as a potential driver – engine – of growth. Within this view, agriculture can play this role via a structural transformation; strengthening the domestic market; or productivity increase via improved technology.

The first strand has its roots in the structural change analysis understanding the relative decline of agriculture in the process of modern economic growth, and agriculture's contribution of food, labour and capital in this process (Clark 1940; Kuznets 1961; Chenery and Syrquin 1975). Within this, two angles exist, emphasising either the specific contributions of agriculture, or the wider linkages of agricultural growth in the rest of the economy. In the first, founded on Kuznets (1961), agriculture makes specific and significant contributions to the growth process through direct contribution of factors (labour, capital), commodities (food), and market expansion (via increased domestic demand). In the second, agricultural growth underpins aggregate and pro-poor growth through providing strong and varied linkages to the rest of the economy. This interaction creates linkages from the agricultural to the industrial and service sectors, via factor, commodity and financial flows, as first developed by Johnston and Mellor (1961); further strengthened by Peter Timmer (1988; 2002; 2005; 2009); and Nicholls (1964), King and Byerlee (1978), Mellor and Johnston (1984), Hazell and Haggblade (1993), Ranis and Stewart (1993), and Delgado et al (1994).

A second, closely related, strand, emphasize agricultural growth's potential to strengthen the domestic market, thereby stimulating aggregate growth - first advanced by Singer (1979), and further developed by Adelman (1984) and her concept "agricultural demand-led industrialization" (ADLI). Under ADLI, agriculture contributes through effective demand for non-tradable industrial goods created by rising agricultural incomes, induced by the ADLI-strategy. In this strategy, development should be agriculture-driven rather than export-driven, as increased agricultural growth leads to more domestic demand for domestically produced intermediate goods and commodities, than growth in other sectors (Adelman 1984).

The third strand seeing agriculture as an engine for growth, partly stems from Schultz's emphasis on technological change to get agriculture moving, as advanced by Yujiro Hayami and Vernon Ruttan. While they acknowledge the impact of Schultz's rational farmer-thesis and subsequent enthusiasm for investing in farmers' education, agricultural knowledge and technology, they found it to be an incomplete theory of agricultural change (Ruttan 2002). In response they developed the "induced innovation model," which has since become the dominant theory on how more productive technologies for low-income agriculture emerge (Ruttan and Hayami 1984). In this model, technical innovations are driven by changes in relative factor prices, which induce profit-seeking innovations either by private firms or the public sector. This is different from how Boserup (1965) viewed technical progress, who was more concerned with how changing factor prices in light of population pressure spur technological progress. As such, Ruttan and Hayami remain analytically quite close to Schultz, emphasizing the role that rationality and changing incentives play in the development of the agricultural sector, which in turn plays a role in economic development.

To conclude it seems that today's agro-skeptics are rooted in the fifth wheel-view, where agriculture is perceived as insufficient to generate transformative economic growth. Gollin (2010:3860), recognize this legacy himself, stating that "This general story - told convincingly in the early agricultural development literature - seems in large measure to be right." The agro-proponents on the other hand, have a closer tie to the 'agriculture as engine, via structural transformation' school. As the early scholars seeing agriculture as an engine for

growth, the current agro-proponents seek to show the tremendous growth potential that agricultural growth can have to aggregate economic growth, and especially pro-poor growth, via the sector's multiple linkages to the overall economy.

3. Patterns in Academic Attention to Agriculture

3.1 Bibliometric methodology

To explore the shifting levels of attention to agriculture in the scholarly debate, a three-pronged bibliometric approach is used, organizing and analysing the collective scholarly work in the field.

The first approach maps all articles in the field of interest as share of all articles published in economics, using the Journal of Economic Literature (JEL) classification. The database is compiled from EconLit (American Economic Association's database of economic literature), and through drawing on Kelly and Bruestle's (2011) classification of the database per each JEL-code, 1969-2007 (extending this to 2015). The mapping calculates the share of articles published in each of the relevant JEL-codes, including the categories O (Economic Development) and Q (Agriculture and Natural Resource Economics).³ The database has two main caveats: adjustments made so that the extended database (for 2007-2015) is comparable with that of 1969-2007, and the change of JEL classifications in 1991. Firstly, every article may have up to 7 JEL-codes, meaning that a simple tabulation of JEL-codes may inflate the share of relevant articles. To avoid this, Kelly and Bruestle (2011) treats an article with n different codes as n different articles with each assigned a weight of $1/n$ of an article (for an article with 3 JEL-codes, each JEL-code is treated as $1/3$ (=0.33) article with that JEL-code). Through this, the total number of JEL-codes correspond to the total number of articles published. To make the extension (2007-2015) comparable, the same method is used. However, the extension does not have access to the exact number of JEL-codes for each article. Instead, the articles are weighted by the average number of JEL-codes. As the average number of JEL-codes are 2.73 (Kosnik 2016), each JEL-code is weighted by 0.366 ($1/2.73$). For 2005, 2006 and 2007, both techniques are used in order to test if the average JEL-codes give comparable results. Overall, they do⁴ and the method is accepted as strong enough to reveal the research trends that this paper is interested in, despite its drawbacks. The second caveat is the change in the classification system in 1991. Here, the paper relies on Kelly and Bruestle's (2011) effort to merge the two systems, which benefits from that in 1991-99, authors assigned both old and new codes. Using the shares from this double-entry, they develop a weighting scheme to track the development pre-1991. While this paper relies on this method, it should be noted that the stark trend-breaks around 1991 may have been inflated due to the recoding, and the pre- and post-1991 comparisons should be interpreted with care.

The second bibliometric approach tracks the shifting attention more tailored, by identifying specifically relevant journals. As Alafiatayo (1989) discusses, for any field there are a number of journals considered "core journals" and therefore referred to much more frequently than

³ The JEL-codes of relevance are:

O: Economic Development, Innovation, Technological Change, and Growth / O1 Economic Development / O13 Agriculture, Natural Resources, Energy, Environment, Other Primary Products

Q: Agricultural and Natural Resource Economics, Environmental and Ecological Economics / Q1 Agriculture / Q17 Agriculture in International Trade

⁴ The method generates a slightly higher number of articles for JEL-code O (1972 vs 1869, in 2005), and lower for JEL-code Q (514 vs 684, in 2005), but the difference is not enough to alter any trends in the three years when both versions are used.

other journals. Due to the multi-disciplinary nature of the topic of interest, “core journals” are identified across three disciplines: Development Economics; Agricultural economics, and Economics. The journals in each discipline are selected based on a qualitative assessment of the journals’ relevance, coupled with a consideration of their impact factor (in the Journal Citation Report). This was done by identifying the top-10 highest impact factor journals in each discipline; qualitatively assessing the relevance of these journals for this paper (Highly relevant/ Semi-relevant/ Not relevant); and selecting the journals with highest impact factor, among those that were assessed as “Highly relevant.” As such, these journals were selected:

- Agricultural Economics
 - *Journal Of Agricultural Economics* (Impact Factor: 1.545)
 - *American Journal Of Agricultural Economics* (1.436)
- Development Economics
 - *World Development* (2.438)
 - *Journal Of Development Economics* (1.837)
- Economics
 - *Quarterly Journal Of Economics* (5.538)
 - *American Economic Review* (3.833)

To trace the scholarly attention to the role of agriculture in these journals, the frequency of articles with certain keywords in the topic were mapped for each journal. For the journals in Development Economics and Economics, the keyword “agricultur*” was mapped. For the Agricultural Economics journals, the keyword “developing” was mapped instead, in an effort to trace the most relevant articles. However, as Silva and Teixeira (2009) highlight, bibliometric exercises always bare a limitation with regard to the chosen keyword’s inability to embrace the entire reality under analysis, which effects the analysis.

The third bibliometric approach is to select seminal articles and map the influence of these over time, via citation analysis. The seminal articles were selected through a qualitative assessment, based on the literature review covered in Section 2. One article for each main view identified in Section 2 was selected:

- Fifth wheel: Ranis and Fei (1961)
- Rational but distorted: Krueger et al (1988)
- Trade, as injection: Myint (1958)
- Trade, as break: Prebisch 1959)
- Engine, via structural transformation: Johnston and Mellor (1961)
- Engine, via technology: Ruttan and Hayami (1984)
- Engine, via demand: Adelman (1984).

Next, the citations of the selected articles were mapped over time, using the Web of Science’s (WoS) Social Science Citation Index (SSCI). This index was used instead of EconLit as it spans a longer time (from 1956), and because it offers more comprehensive citation data of the published literature.

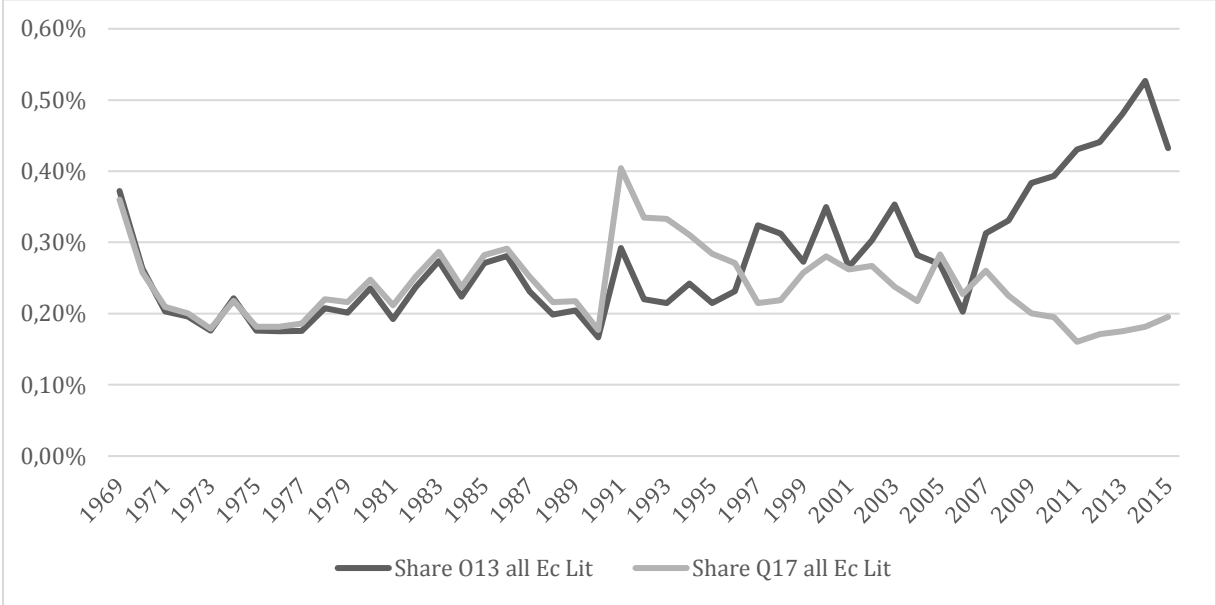
3.2 Bibliometric results

Graph 1 traces the relative attention to agriculture’s role in economic development (O13) and in international trade (Q17), as a share of all articles published on EconLit, 1969-2015. The share is the number of articles in the sub-discipline in a specific year, divided by all articles published that year available on EconLit. For reference, in 1969 the total number of articles is 4,474; 13,091 in 1992; and 42,298 in 2015.

As depicted, the scholarly attention to agriculture’s role in development was high in the initial part of the period (1969-1970), lower during 1970s-1990s, and increased for a short period

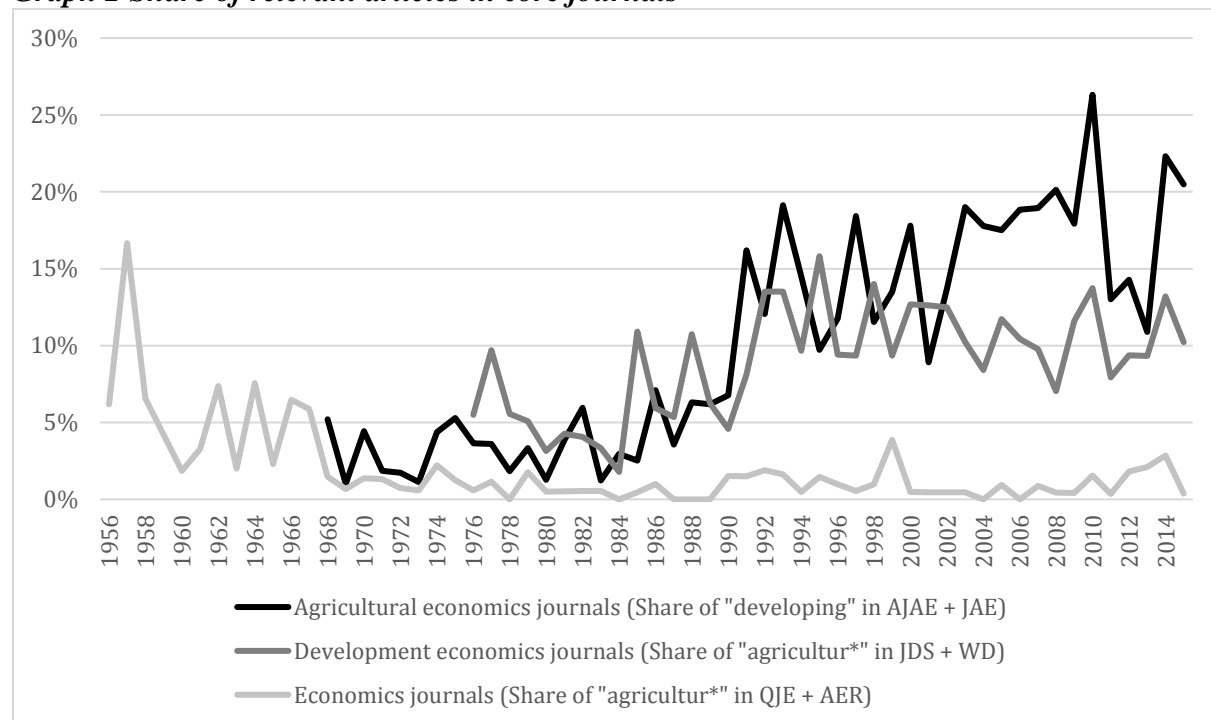
after 1991 before stagnating around 1995-2005. Regarding the last decade, the graph confirms that the attention to the role of agriculture in economic development has increased sharply, while the attention to the role of agriculture in international trade has decreased to some of the lowest levels in the period.

Graph 1 Relative importance of Sub-disciplines O13 (Development Economics: Agriculture) and Q17 (Agricultural Economics: Agriculture in International Trade) in total articles in Economic Literature (published in EconLit), 1969-2015



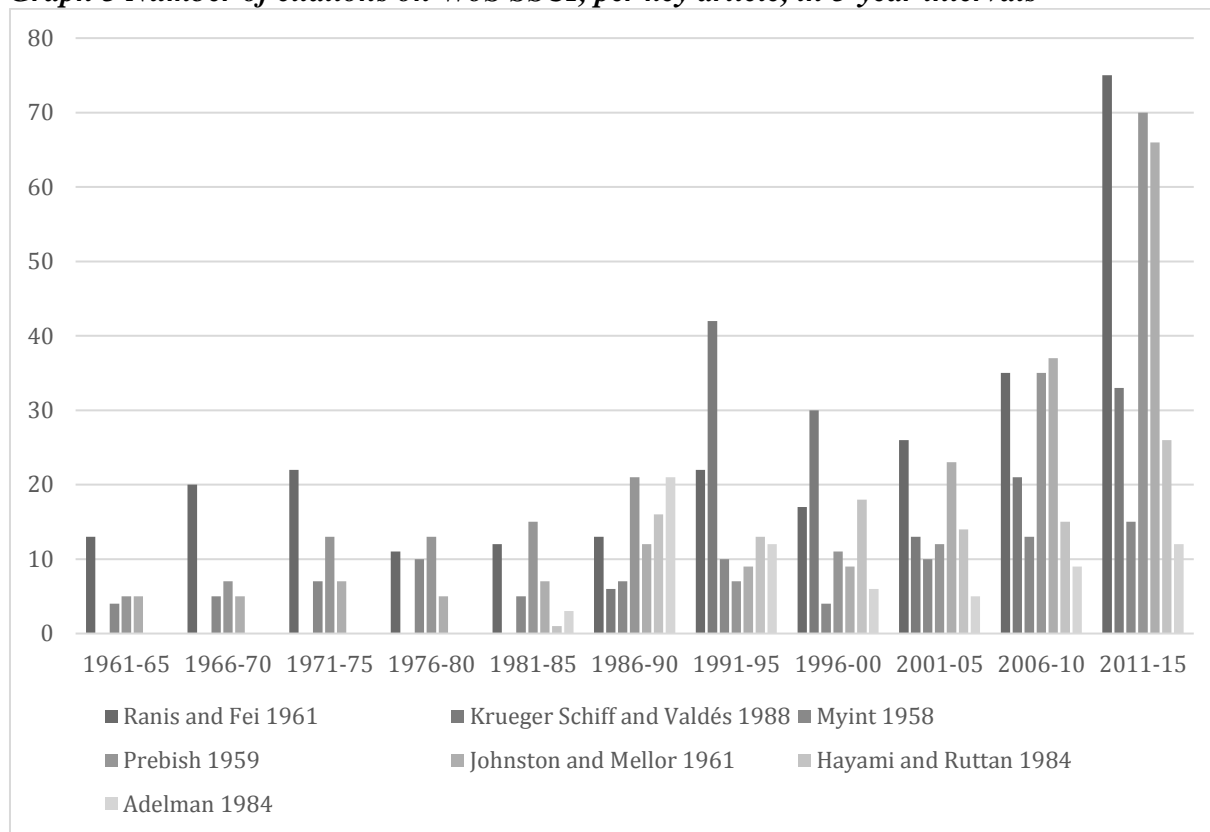
Graph 2 displays the attention in the core journals to the agricultural sector (development and economics journals), or to developing economies (agricultural journals). As showed, agriculture enjoyed a relatively high share of attention in high-impact Economics journals in the 1960s, but has since received less attention. For Development Economics journals, agriculture received more attention from the 1990s onwards, at the same time as development has received even more attention in high-impact agricultural journals.

Graph 2 Share of relevant articles in core journals



Graph 3 displays the number of citations for each selected article, over time. The pattern indicates relatively frequent citations in the 1960s; decline after the mid-1970s; relatively low level of citation during the 1980s; sharp increase 1991-1995; to then again increase after 2005. More specifically, the graph indicate that Ranis and Fei (1961) – as an article within the “agriculture as fifth wheel” - was frequently cited in around 1965-75 and again post-2005. We see that Krueger et al (1988) within the “agriculture as rational but distorted” enjoyed only a short time of attention 1991-95. Citations to Adelman (1984) and “agriculture as engine via demand” have increased since 2000. Further, Johnston and Mellor (1961) and the “agriculture as engine via structural transformation” was most cited during the 1960s and post-2005; while Myint’s (1958) view of agriculture as an injection to trade has been moderately cited throughout the period. Prebisch’s view on agriculture as a break via trade was the most cited key article in the late 1970s and the 1980s, and has again been cited in the last decade. Lastly, concerning Ruttan and Hayami (1984), representing the “agriculture as engine via technology,” this was well-cited during the 1990s but has since lost ground to both Johnston and Mellor (1961) and Ranis and Fei (1961).

Graph 3 Number of citations on WoS SSCI, per key article, in 5-year intervals



In addition a regional analysis is conducted, estimating the articles published concerning the three major regions Africa, Asia and Latin America.⁵ This shows that before 1980 there was no pronounced difference in interest in agricultural research between the regions, and that the interest in agriculture in Africa has outpaced that of the other regions since the mid-1980s, and with a slight acceleration of the gap in the last 10 years. Since the 1990s there has been some increased interest also in agriculture in Asia (possibly driven by an interest in South Asia), whereas the interest in agriculture in Latin America has been stagnant.

Analysing the results, we find that there have been five main phases of interest: higher interest in the late 1960s, early 1990s and post-2005, and lower in the 1970/80s and around 1995-2005. In the late 1960s and early 1970s, the scholarly attention to the subject was relatively high, indicated by relatively high scholarly attention to articles on the role of agriculture in economic development (JEL-code O13) and the role of agriculture in international trade (JEL-code Q17) as a share in all economic literature published on EconLit. Further, this was also a time of a relatively high attention to Agricultural Economics within high-impact Economics journals, and relatively frequent citations of seminal articles. From the mid-1970s until end-1980s, the scholarly attention to the role of agriculture was low, both in the overall economic literature, and within relevant high-impact journals. Further, among the selected key articles, only Ranis and Fei's (1961) article on 'agriculture as fifth wheel' remained relatively well-cited, whereas the other seminal articles were limitedly cited. There was a break around 1989/1990, as the scholarly attention to agriculture saw an upswing during 1989-1995. Graph 3 indicates that this was driven by attention to Krueger, Schiff and Valdés (1988)-type

⁵ The analysis traces the share of articles published with the keyword "agriculture*" and a specific geographic region (Africa, Asia, Latin America), out of all the articles with the keyword "agriculture*" in WoS SSCI, 1957-2015.

literature, on the need to treat agriculture as a rational sector and to eliminate distortions. This is also reflected in that this period saw an upswing of attention to the JEL-code Q17 (agriculture in international trade). However, this upswing was relatively short, and 1995-2005 saw lower scholarly attention to agriculture, as seen from the decreasing share of agricultural-related articles within the Development Economics literature, the stagnant share of relevant articles in high-impact journals, and the decreasing number of citations of all selected key articles. In the last period there is a marked shift towards more scholarly attention, with a high share of articles with JEL-code O13; high share of articles on developing contexts in Agricultural Economics journals, and frequent citations to Fei and Ranis, Johnston and Mellor, and Hayami and Ruttan.

4. Explaining the Shifting Academic Attention to Agriculture

To explore why the shifts in scholarly attention have taken place, we put forth five explanations that are featured as possible drivers in the literature on the role of agriculture reviewed for this paper. Each potential driver is explored below, in an effort to identify the extent to which they represent reasonable explanations behind shifts in attention to agriculture. Our assessment is based on how these five explanations align with other notable trends in the development discussion.

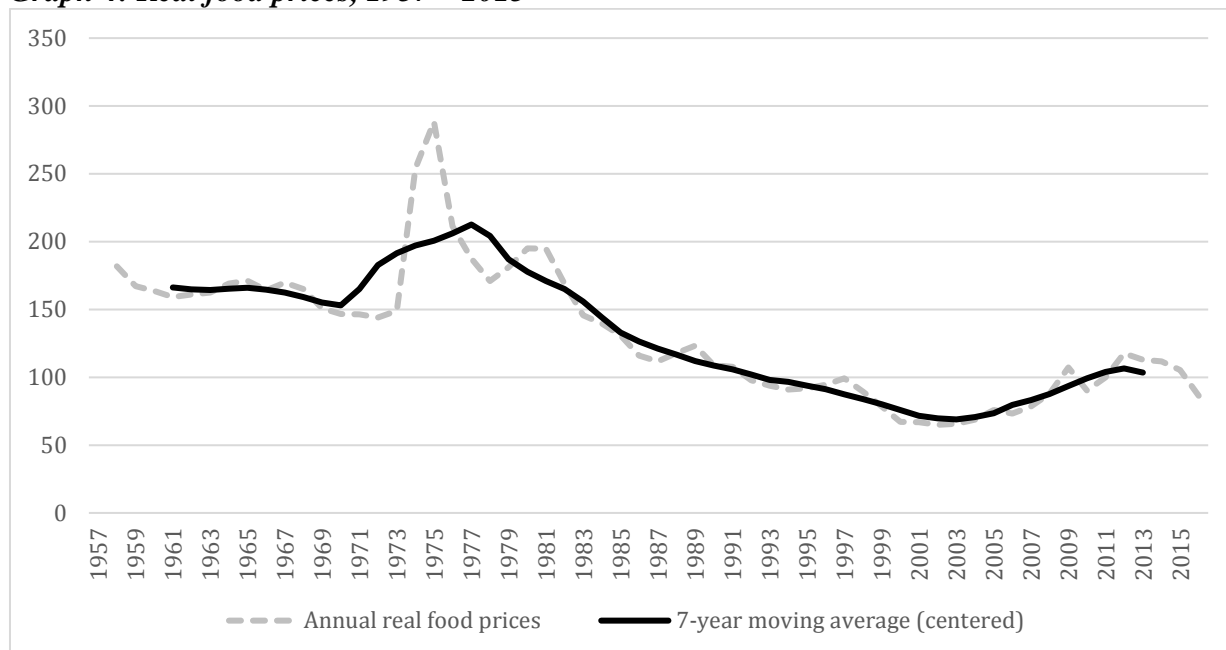
4.1 Fluctuations of agricultural commodity prices

In much of the recent literature on agriculture in development, there is a perception that the resurgence of interest of agriculture in the last decade, is driven by increased world food prices since the early 2000s. Due to a combination of structural changes in world demand (increased demand from emerging economies, continued urbanization) and supply (increased competition for water and land; slowing down of growth of agricultural R&D investments), and exacerbated by weather shocks and rising energy prices, global grain consumption exceeded global production for most of the early 2000s, depleting stocks worldwide. Subsequently the global food prices spiked around 2008 and have since remained at a higher level than pre-crisis (Diaz-Bonilla and Robinson 2010).

Turning to the data however, the correspondence between high food prices and high attention does not hold for any of the other periods identified in Section 3. As seen in Graph 4, food prices were high in the end of the 1950s to mid-1960s, in the 1970s, and relatively high (after a long period of decline) after the mid-00s.⁶ Recalling that agricultural interest was found to be high in the late 1960s, first half of the 1990s and after 2005, it does not appear that high food prices itself is driving the shifts between high and low attention to agriculture, even if expecting that food price changes would affect attention to agriculture with a certain lag. The high food prices in the 1970s cannot be connected to an increased interest in the 1970s or 80s, and neither the periods of high interest on the late 1960s or early 1990s were marked by increasing prices.

⁶ The graph displays food prices based on IMF IFS annual data to provide an indication of the long-term trend. This trend is similar to that of agriculture's terms of trade, which strengthened in the 1970s, followed by a long decline, until it turned upwards in the early 2000s (Ocampo and Parra-Lancourt 2009). For a more thorough assessment of the price development of agricultural commodities since the 1950s, see Serrano and Pinilla (2011).

Graph 4: Real food prices, 1957 – 2015



Note: Following the approach of OECD (2015, p. 12), nominal food prices are deflated by seasonally adjusted GDP deflator for the US, to convert to real prices. Source: Author's calculation based on IMF IFS database 2016.

However, prices' role should not be understated: the extended period of declining food prices in the 1980s and 1990s (associated with slumping world growth, increased agricultural support in developed countries lowering demand, and continued expansion of the Green Revolution increasing supply) led to that many developing countries started to discourage domestic production of staples and investments to agriculture (Diaz-Bonilla and Robinson 2010). This indicates that extended periods of low or high prices affect the general trend in attention to the role of agriculture in development, but it is not sufficient to confirm that world food prices is a main driver, historically and universally, for the shifts in attention to the role of agriculture.

4.2 Concern for food security

The second potential driver discussed relates to the most elementary role of agriculture: the ability to deliver food and nutrition to an expanding global population.

In the 1960s and 1970s, the view on food security gradually shifted from rather widespread Malthusian concern, to optimism that food security could actually be achieved, in light of the Green Revolution across Asia. Its success to both help avoiding famines and contributing to aggregate growth (Lipton 1989), possibly led to less concern with food security. However, from the 1980s onwards, food security was no longer seen as a primary concern, but instead seen as something that could be achieved via trade, targeted development programs, or urban migration – not via strengthening the agricultural sector (De Janvry 2010). During this time, agriculture was neglected in policy, and public investments to agriculture diminished. That said, the period did see some increased attention to access (rather than production) of food with Sen's (1981) influential writings emphasising the need to understand the demand and distributional side of food security, and in light of the 1968-74 Sahelian drought and the Great African Famine 1984-85.

After 20 years of playing second-fiddle, food security again became a central policy concern from 2005 onwards. The re-emergence as a central policy concern is mainly rooted in the new global challenges, and a resurgence of optimism that food security can be achieved via technological improvements. In terms of the challenges, the changing patterns of global food production and consumption, changing diets, new technologies, and liberalization of trade and FDI vis-à-vis agriculture is putting enormous pressure on the largely small-scale and relatively low productive agriculture that predominates agriculture in most developing countries. Among the 3.38 billion people living in rural areas in the world, 3.16 billion live in low- and middle income countries, and a vast majority of them are small-scale farmers relying on agriculture for food and income (WDI 2017). Unless these small-scale farmers are enabled to cope with the pressures that the new global food system is putting on them, it might be premature to write off the Malthusian concern, common among pre-Green Revolution scholars, as invalid. However, at the same time as the increased challenges to food security is placing it on the agenda, technological improvements and renewed optimism towards achieving food security have also supported the recent increased attention to agriculture. The technology for it is already in place, and for some a Green (or Gene) Revolution in Africa is no longer unrealistic wishful thinking but a process that has already started (The Economist 2016a; 2016b). In addition to the challenges and opportunities for agriculture in the developing world, the global concern for food security has also increased in connection to the drive to examine agriculture's role in energy and environment concerns, for example its ability to provide biofuel and to economically sequester carbon (Pingali 2010).

Overall, it appears as the fluctuating interest in food security is reflected in the scholarly attention to agriculture in economic development.

4.3 Influence of historical development experiences

A third potential driver is the perception of the role of agriculture in historical development experiences, particularly that in England in the eighteenth and nineteenth centuries; in the Soviet Union in the twentieth century's first half; and the various experiences within the developing world in the twentieth century's second half.

As summarized in Lains and Pinilla (2009), there was a general consensus among European economic historians in the 1950s until 1980s, that the agricultural revolution was a crucial factor for industrialisation and economic growth in England and Europe. The industrial revolution in England had been preceded by an agricultural revolution - increasing agricultural productivity and enabling modern manufacturing to emerge – by several decades. Although this understanding later has been questioned by for example Allen (1994) and Clark (2007), it was influential in shaping the understanding of the scholars such as Lewis and Nurkse that industrial and agrarian revolutions always go together. According to Timmer (1988), this understanding of the English development experience contributed to the view of agriculture as a fifth wheel, as it does not see the agricultural sector itself as actively driving economic development.

The interpretation of the role that agriculture played in the Soviet experience from the 1930s to the 1950s, further came to strengthen the views of agriculture as a fifth wheel (Timmer 1992). The apparent success of the forced industrialization campaign, relying on the state's capacity to extract surpluses from agriculture, offered support to the views that neglected the role of agriculture, such as most interpretations of Lewis's 1954 model, the structuralist views of Prebisch, as well as Gerschenkron's understanding of the role of agriculture in Soviet's development. However, after the collapse of the centrally planned economies in Eastern Europe and the Soviet Union, the understanding of the role of agriculture in the

Soviet Union has instead contributed to that an extractive view of agriculture has lost support.

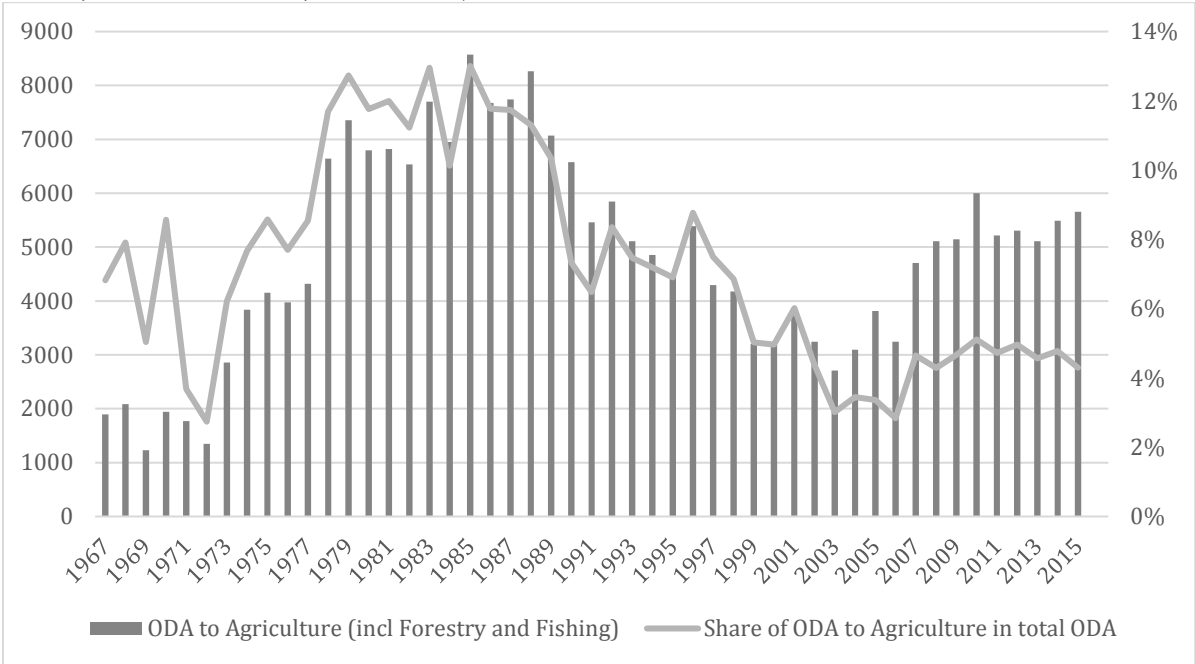
In second half of the twentieth century, development experiences within the developing countries may have contributed to the shifting attention to agriculture. The rapid development experience of East Asia likely contributed to a positive view on agriculture, as agricultural growth is seen to have provided a foundation for the rapid growth from the 1960s onwards. Drawing especially on Taiwan, the agricultural sector is seen to have played an important role in the early development phase through the land reforms of the 1950s, the strengthening of rural cooperatives in finance, credit, and marketing in the 1960s, and the market-oriented reforms that were introduced for agriculture in the late 1970s and 1980s. Coupled with the adoption of high-yielding varieties and use of chemical fertilizers, pesticides, and irrigation, agricultural growth was rapid in the region (Fan and Brzeska 2010). As for Latin America, the early approach to agriculture was heavily influenced by Prebisch and the theory on deteriorating terms of trade, leading to an environment of protectionism and neglect of agriculture, implemented through overvalued currencies; limitation of exports via export taxes, export quotas and embargos; limited investment into agricultural R&D and rural education; and food price manipulation (Schuh and Brandão 1992:567, 571, 586). The failure of these development policies to yield the desired economic development may have contributed to the increased attention to agriculture in the last decade. As for Africa in this period, agriculture was largely overshadowed by concerns for industrialization, as well as for education, aid and nation-building (Eicher and Baker 1992:22). The underperformance of both agricultural and aggregate economic growth in this period (Binswanger-Mkhize and McCalla 2010), and agriculture's substantially larger share of GDP in Africa than the other regions (WDI 2017) may have contributed to the increased interest in agriculture in development in Africa, as shown in the regional analysis in section 3.2. Overall, the understanding of the role of agriculture in previous development experiences, may have contributed to the broad shifts in scholarly attention to agriculture, towards a more prioritized role in the twenty-first century.

4.4 Shifting paradigms in development assistance

The fourth potential driver is that changes in development assistance may have affected scholarly attention to agriculture. Overall, this assistance has reflected the movements of the field of Development Economics (usefully synthesised by Thorbecke 2006). The early development assistance of the 1950s, with the exception of US aid to East Asia, was guided by the general development objective of the time: to achieve growth via industrialization, largely subordinating agriculture to the needs of industrialization; the 1960s and 1970s kept with the framework of industrialization and import-substitution, where support to agriculture were mostly viewed as a way to reach poverty-stricken groups. This concern for poverty was mostly crowded out in the 1980s and 1990s (De Janvry 2010), although the 1980s was also when the international organizations, led by the World Bank, started to increase its attention to the role of agriculture in economic development (WDR 1982; WDR 1986). Around 2000, poverty returned as a major policy concern for the international community, as exemplified by the Millennium Development Goals. As most of the world's poor are in agriculture, the sector received increased attention, for example illustrated by the 2008 World Development Report – fully dedicated to the role of agriculture for economic development. In this last period, new actors promoting the role of agriculture in development have also emerged, such as the Bill and Melinda Gates Foundation, which has committed more than US\$2 billion to increase agricultural productivity (Gates Foundation 2016).

To illustrate how these paradigm shifts in development assistance have influenced the attention to the agricultural sector, Graph 5 tracks development assistance directed at agriculture, 1967-2015, exploring if “donors’ interest” has mirrored “scholarly interest” to agriculture. As displayed, agricultural aid increased throughout the 1970s until it peaked in the mid-1980s. It then decreased for almost two decades, until it starts to increase after 2007, albeit with a period of plateaued or even slight recovery of aid level around 1993-1997.

Graph 5: DAC Official Development Assistance to Agriculture, 1967-2015 (Constant Prices, 2014 US Dollar, in millions)



Source: OECD.stat

In addition to the development of DAC-aid, the landscape of development agencies has also shifted in the last decade with the entrance of former aid recipients, as aid donors - China being the largest of these new players. As China has opted out of global aid reporting systems, information on this is scarce (Parks 2015). Beyond concluding that Chinese agricultural aid has become more influential in the last 6-10 years, and that it focuses on Africa – based on the data available from AidData (china.aiddata.org), it is beyond the scope of this paper to assess its influence.

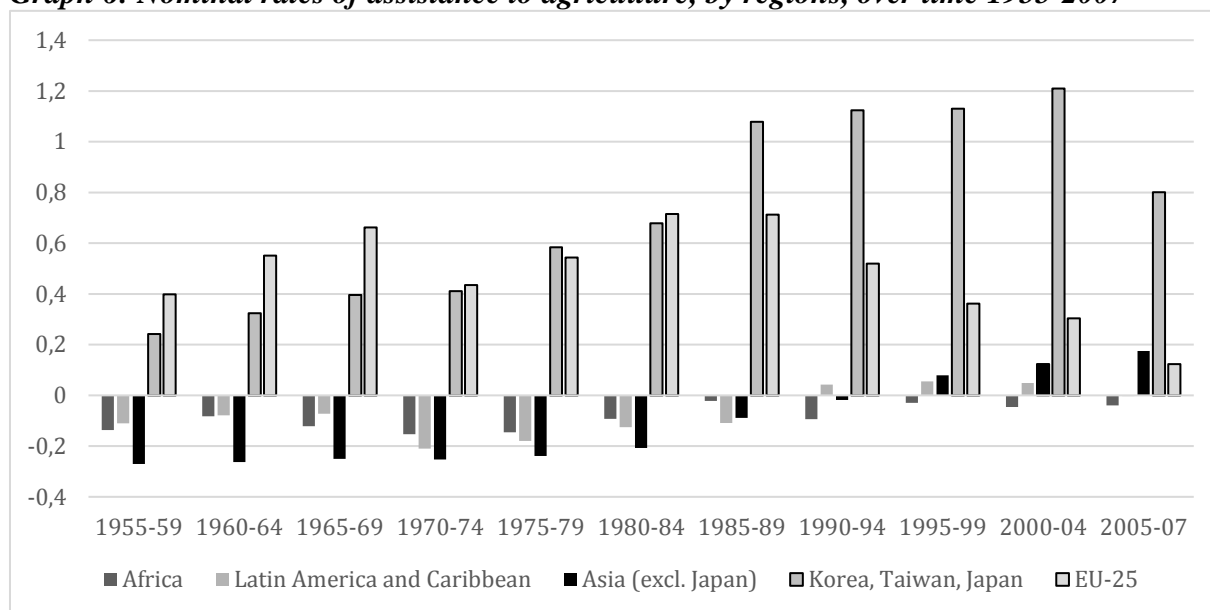
Overall, the attention to agriculture by development agencies has moved in tandem to the scholarly attention, rather than preceding it. One exception may be the upswing of scholarly attention to agriculture around 1990-1995, which was preceded by the decade of higher attention to agriculture among development agencies, starting from about 1985. This decade saw high agricultural aid flows, and an increased interest among development donors to agriculture, indicated by the World Bank Reports on agriculture in 1982 and 1986. Both scholarly attention and agricultural aid then waned after the mid-1990s, and increased again after a 10 year slump in the mid-2000s – perhaps partly driven by China’s emergence as a donor. However, the development assistance did not precede the shift in scholarly attention at these times, and the high interest of development agencies in agriculture in the 1970s does not correspond to the level of scholarly attention at that time.

4.5 Changing policy environment

The fifth potential driver is that the shifts in scholarly attention to agriculture have been driven by the policy environment for agriculture, in terms of subsidies and taxes.

Graph 6 depicts the average agricultural support or dis-support to agriculture, over time, based on Anderson and Nelgen's (2013) database on distortions to agricultural incentives, 1955 to 2011. The graph depicts the Nominal Rate of Assistance for all primary agricultural products, where a positive rate of assistance indicates that agriculture is subsidized and a negative number indicates that it is taxed.

Graph 6: Nominal rates of assistance to agriculture, by regions, over time 1955-2007



Source: Anderson and Nelgen (2013)

Note: Weighted average for each country, including non-product specific assistance and estimates for non-covered farm products, with weights based on gross value of agricultural production at undistorted prices.

As shown, there has been a general shift from discrimination towards support for agriculture, albeit with regional differences, where the developing regions tax substantially more than the developed regions. In Africa, taxation of agriculture has been persistent, while Latin America and Asia have eased the burden on agriculture since the 1990s. However, the most successful Asian countries – Korea, Taiwan and Japan, have been net supporters of the agricultural sector throughout the post-war era (mostly driven by Japan's high support). The graph indicates that tax policies towards agriculture was discriminatory in the developing world from 1950s until the mid-1980s, and even still today in Africa; that the developed and the successful developing countries have supported agriculture instead of taxing it; and that the discrimination towards agriculture has gradually decreased. As such, there seems to be some correlation between the heavy taxation of agriculture in the developing world during the period of low attention in the 1970s and 1980s, and less taxation in the last decade during the increased attention. One could argue, however, that the changing policy environment should not be seen as a driver of scholarly attention, but rather as the result of the scholarly debate. The correlations that can be identified between the long period of low scholarly attention and high taxation of agriculture, and recent scholarly attention and less taxation are more likely to be the result of the scholarly debate affecting policies, rather than the other way around.

4.6 Discipline specific-developments in Agricultural and Development Economics

In addition to the above five identified and explored potential drivers of the shifting attention, the analysis of the source material revealed that the view on agriculture has developed differently within the sub-disciplines Agricultural Economics and Development Economics. Within Agricultural Economics, efforts to understand agriculture's role in developing countries has increased over time. Comparing the volumes in the Handbook of Agricultural Economics, volume 1 (2001), has an explicit focus on the development of the agricultural sector itself, rather than how the agricultural sector can play a role in economic development. In volume 2 (2002), 2 of total 21 chapters are devoted to agriculture in economic development, and by the publication of Volume 4 in 2010, almost all chapters are devoted to the role of agriculture in economic development, rather than to agricultural development per se. Turning to the changing attention to agriculture within Development Economics, no such strengthening can be discerned. In both the latest Handbooks of Development Economics (Volume 4 in 2007, and Volume 5 in 2010), no chapter is specifically devoted to the role of agriculture in economic development. Volume 5 explicitly aims to design research agendas that are informed by policy questions – but yet, agriculture did not qualify. This might be a sign of the current state of Development Economics, in which there has been a significant re-orientation towards microeconomic issues, as seen particularly in Volume 4. As Meier (2002:14) has stated, this perspective struggles to deal with development as a dynamic process and historically contextualized, and as such it could be reason for why the discipline has not been able to address the complex issue of the role of agriculture in development.

5. Conclusions

Taking as a point of departure the contrary opinions of the role of agriculture for future development, this paper set out to trace influential viewpoints of the role of agriculture in development theory, as well as assessing and explaining the pattern of fluctuating scholarly attention to agriculture over time.

The paper identified that there have been four main influential views on agriculture: agriculture as fifth wheel; as a distorted sector with rational economic agents; as important via trade (as injection or break); and as an engine of economic development. Today's agro-skeptics appear rooted in the fifth wheel school of thought, while the agro-proponents have a closer legacy from the 'agriculture as engine, via structural transformation' school. It seems as if this view has been reinforced by the overall shift of objective within the development debate, from aggregate growth to pro-poor growth.

In terms of the shifting attention to agriculture, the paper identified that there have been five main phases: two short periods of higher attention in the late 1960s, and the first half of the 1990s; two longer periods of lower attention around 1970-1990, and 1995-2005; and one long period of higher attention from 2005 onwards. Among the five explored potential drivers to explain the ups and downs, our analysis supports the perception that the most elementary role of agriculture - the ability to deliver food and nutrition to an expanding global population - has played an important role. As such, the shifts in food security concern, in combination with food price fluctuations, appear as a possible driver of the shifting attention. The first period of higher scholarly attention in agriculture was concurrent to food security optimism in the wake of the Green Revolution; the long downturn of attention in 1970-2005 coexisted with a weaker concern for food security and almost three decade long decrease in food prices; and the latest increase in scholarly attention was again connected to increased concern for food security coupled with the trend break towards increasing food prices in the early 2000s. However, the short upswing of interest around 1990-1995, do not seem connected to these

food aspects, but may instead be related to the shift in development assistance objectives among international organizations.

The paper has also noted that it appears that the discussion of agriculture in economic development have shifted from being rooted in Development Economics earlier in the period, to that the recent attention to agriculture in developing countries is increasingly driven by Agricultural Economics.

In the end of the 1960s when agriculture received attention it did not last as the food security concerns were less acute in light of the successful start of the Green Revolution. When agriculture regained attention in the 1989-95 period development theory was dominated by the neoclassical reasoning of the ‘agriculture as a sector with rational economic agents’-view, prescribing that no special attention needed to be given to agriculture, and that the low productive sector of agriculture should not be prioritized. In the last period of increased attention, since around 2005, there seems to have been a strong association between pro-agriculture theoretical views, particularly the structural transformation perspective, and increased concern for food security. Further, the other forces discussed may be reinforcing the interest in this period, through the learning from historical experiences, the emphasis on agriculture within development assistance as part of poverty reduction objectives, and the lessened policy discrimination of agriculture in developing countries. This apparent consolidation of forces viewing agriculture as an important sector in economic development, may lend weight to Pingali’s (2010) prediction that we are indeed moving towards an “agricultural renaissance” in the twenty-first century.

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