Macroeconomic Reversal in India

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I am honoured to be receiving the Malcolm Adiseshiah Award for Distinguished Contribution to Development Studies. I consider the award for 2014 as a recognition of the importance of evidence-based research in the social sciences, and thank the Malcolm and Elizabeth Adiseshiah Trust for encouraging its practice. My address today is meant as a demonstration of the potential of such research in the area that I work in, namely, applied macroeconomics.

Macroeconomics is in riotous disarray. Some of the triumphalism that had accompanied the rise of the New Classical Economics, the practitioners of which school of thought had dominated the field for at least a quarter of a century, has dissipated after the global financial crisis. Their view of the economy, based on the premise of rational expectations and the axiom of instantaneous market-clearing had not only not even anticipated the crisis but was widely seen as useless for framing policy as the world stared at the possibility of the greatest contraction in output since the Great Depression.[2] It is by now agreed that the contraction since 2007, termed the Great Recession, has been contained due to activist policy, even though it has been argued that it could have been less had there been a willingness to make greater use of fiscal policy, proposed by Keynes for an economy mired in a liquidity trap.[3] More so, the outrageous stance of the adherents to the New Classical Economics that government is the only potential source of instability has been shown to be just that, i.e., outrageous.

[1] I thank without implication Ragupathy Venkatachalam, Ajit Ghose, Bharat Ramaswami, Chetan Ghate, Gurbachan Singh and Partha Ray for discussions.

[2] Much the same has been said of the New Keynesian macro model which succeeded the New Classical Economics, for which see Buiter (2009).

[3] See Krugman (2013).

However, we in India can take very little comfort from the fact that western intellectual circles are clogged with controversy. In my view, we are facing something far worse here, which is a lack of an accepted framework within which to analyse macroeconomic outcomes peculiar to India. The peculiarity of these outcomes arises from the structure of the economy, level of development reflected in per capita income, institutions and the political economy that determines the form of government intervention. One implication of this peculiarity is that it calls into question the use of the Phillips Curve some version of which serves as the centrepiece of mainstream macroeconomics. Actually, interpretations of the Phillips Curve have moved away from Phillips' own in ways that have been strongly criticised by leaders of the profession but this has not prevented India's public authorities from presenting it as useful to understanding the Indian situation.[4] The point of my lecture today is to try and convince you that we don't need to undertake such a transfer, i.e., borrow dubious interpretations of the mainstream macro model as there is a coherent approach that can fully account for the outcomes of interest in India. This is the structuralist approach. I have in the course of my professional life worked largely within its contours. I have done so because of its superiority over its rivals in accounting for the Indian reality and when it comes to guidance in improving the functioning of the economy. In this lecture I hope to demonstrate this. I first present the structuralist approach, sketching the associated macroeconomic model. I then put it to work in analysing the most recent macroeconomic history of the Indian economy, namely the "reversal" of this lecture's title. Finally, I compare its capabilities to that of the globally dominant macro model today, namely the New Keynesian dynamic stochastic general equilibrium (DSGE) model.

[4] See Solow (2009) and RBI (2014), respectively.

I. A macroeconomics for the tropics

In the history of ideas structuralism as a theoretical approach had come late to the analysis of the economy.[5] As a theoretical paradigm it asserts is that a system is to be analysed in terms of the structural relations between its elements. Its use in economics was spawned at a particular stage in world history and designed for a specific purpose. The time was the 1950s and the geography South America. It emerged out of sense of dissatisfaction with the dominant economic approach, emanating from the northern hemisphere notably the United States which after the Second World War was no longer merely the leading economic power but also the world's leading centre of ideas. Mainstream economics was seen as deficient on two counts. Of these the first was its prescription for the under-developed regions of the world. South American economists saw the recommendation of classical trade theory that the underdeveloped country should specialize according to its comparative advantage as a recipe for perpetuating their underdevelopment. In their perception, as exporters of raw material such specialisation would not only leave them wedded to low-productivity agriculture, but their already low level of income was likely to be further threatened by the tendency of the terms of trade to decline if they were to step-up their exports. Raul Prebisch, the leading light of this uprising, and his colleagues at the UN's Economic Commission for Latin America were quite clear that industrialization was the solution for underdevelopment. Note that this would have meant going against the prescriptions of the dominant economic ideas of the time. It came to pass though that among the then underdeveloped regions of the world it was not in south America but in East Asia that this strategy was to come to full fruition. The reasons for their relative achievements, I might suggest, lie more in the political economy of the respective

[5] See Palma (2008).

regions and not in the choice of the industrialization objective *per se.* While I believe that such an understanding is useful to an appraisal of India's own development experience, it is in the second of the ways in which the Latin American structuralists had found the mainstream theory deficient that interests me and will constitute much of my talk today. It interests me not so much as a distinct school of economic thought as it does due to its lasting relevance to macroeconomic analysis of the developing economies.This strand of Latin American structuralism too had emerged out of the historical context in which the countries of this region found themselves. The industrialisation drive in these economies had released inflationary forces that appeared not to subside. Geographical and cultural proximity to the United States meant that south American economists would first access economics as practiced there. However, in the nineteen fifties they are unlikely to have found it particularly useful to understanding their own economies. First, the western economies did not experience much inflation in the decade following the War which meant that inflation did not figure much in the discourse. Secondly, both the major strands of economic theory at that time, namely, the Keynesian and Monetarist, saw inflation as the outcome of efforts to expand income beyond full employment. On the other hand, inflation in Latin America was seen to be led by the rising price of food, suggesting to the structuralists that a sectoral imbalance underlay it. Mainstream economic theory could not accommodate an explanation of inflation driven by sectoral imbalances. In Walrasian general equilibrium theory where sectoral imbalances determine relative prices, there was no provision for relative price changes to affect the general price level. Moreover, a rise in the relative price of a relatively scarce good, it was held, would only encourage its expanded production. Therefore, the market mechanism would in time extinguish a temporary imbalance.

In short, inflationary pressure stemming from sectoral shortages was unlikely to persist.

In due course, however, structuralist macroeconomics was to develop a theory of inflation based on relative price shifts. I recount briefly how this was done. A defining feature of structuralist models is the disaggregation of the economy into its principal sectors. Two were recognized based on observable features of output and price determination mechanisms in a developing economy in the short run. These output and price determination mechanisms themselves were related to the type of productive activity peculiar to each sector and the market structure prevalent there. Thus in agriculture short-run output is treated as given in the sense that it is determined by natural factors. In industry, where excess capacity is assumed to exist, output is characterized as demand determined. The demand for industrial goods is related inversely to the relative price of agricultural output and directly to government purchases, with the latter treated as exogenous. Exactly as the output determination mechanisms are seen as being based on the supply conditions in the two branches of the economy the price determination mechanisms are based on the market structure in these branches. Accordingly, the market for agricultural goods is seen as being competitive, with producers as price takers. With supply given in the short run this market is demand-determined, and therefore flexible. On the other hand in the industrial goods market, characterized by oligopolistic structures, firms are price setters and set the price as a mark-up over prime costs, notably wages. The price may be thought of as cost determined, with the mark-up relatively constant for demand variations within a range. Though industrial firms also use agricultural raw materials, which provides a direct route for the transmission of inflation, the Latin American structuralists had emphasized the role of wage determination in the propagation of inflation. Workers' unions are the counterpart of oligopolistic firms in industry. Wage movements, which

constitute a large part of prime costs of industry, are related to changes in the price of food either directly where indexation exists or via the wage bargain centred on changes in their price.

Within a model structure of the kind described, persistent excess demand in the agricultural goods market will be inflationary. Too see why this must be so, note that with cost-determined industrial prices the shift in the relative price can be brought about only via a rise in the absolute price of the agricultural good. In fact, inflation here reflects the persistent attempt of the system to shift the relative price or the terms of trade in favour of agriculture as long as there is excess demand for its product. The ability of firms in the industrial sector to pass on rising agricultural prices and of workers in resisting an erosion of their real wage ensures that inflationary pressure stemming from the agricultural market is propagated across the economy.

A rise in the relative price of food, principal among agricultural goods, may be expected to have an effect on industrial growth. Implicitly in the story sketched above, rising real incomes of the agricultural producers combined with the substitution effect holding across households in the economy are expected to give a fillip to industrial production. But there is also an income effect to be expected given the essential nature of food. Non-agricultural households attempt to maintain their consumption of food even as the price of food rises. Where the share of food in household budgets is high this must crowd out expenditure on industrial products. The net effect of the rising relative price of agriculture is therefore an empirical question, but we do have evidence of its negative impact on industrial growth.[6] This must slow industrial growth. As the negative supply shock would have already slowed agricultural growth overall growth of the economy must slow

[6] See Balakrishnan (1995).

down . Continuing inflation would require that this slowing growth and employment generation does not erode industrial mark-ups and real wages, respectively. To the extent that these may sag the degree of inflationary passthrough and therefore inflation will be lowered. So the structuralist model predicts an inverse relation between an agricultural shock and the growth-inflation combine.

The structuralists had recognized that an inflation triggered and sustained by a rise in agricultural prices can only be controlled by treating it at the source, i.e., by attending to its original cause to speak. There is no lasting monetary cure to such an inflation.[7] It may temporarily be curtailed by reducing aggregate demand and thus industrial growth. However, with a low elasticity of demand for food at low levels of per capita income the reduction in income may have to be large indeed to achieve this outcome.[8] But, and above all, such a measure can only be temporary as inflation may be assumed to revive soon as aggregate demand is restored.

Note that an external sector can quite easily be incorporated into the structuralist model by including the price of imported raw materials as the third element in the industrial price equation complementing labour and domestically-produced raw material inputs. Now both changing international prices and fluctuations in the exchange rate would affect the inflation rate.

Formalisation of the structuralist view of macroeconomics was to follow the early discursive approach in Prebisch, notably by Taylor (1983). A model incorporating the main features of the original structuralist approach and featuring a direct relationship between the relative price and inflation has been developed by me. I have also demonstrated that an econometric model of inflation in India based

[7] See Prebisch (1961).
[8] This refers to the so-called ‘sacrifice ratio’.

on the structuralist explanation encompasses the monetarist alternative widely in use by central banks at that time. The econometric model itself had been constructed bottom-up so to speak, i.e., based on estimated price and wage equations that had first been tested for conformity with the structuralist presumption on nature of these relationships as outlined above. [9] I now proceed to an investigation of the principal macroeconomic development of the last decade in India using the structuralist approach.

II. The Macroeconomic Reversal

Over the past decade in India historically-high growth rates have been replaced by persisting higher inflation. Thus, we find that the period 2003-04 to 2012-13 may be divided into two more or less equal phases, the first one a period of high growth with low inflation and the second one of low growth with high inflation. If the Phillips Curve is really a reflection of the relationship between inflation and resource use it cannot be of much use in trying to make sense of this reversal. On the other hand, I shall demonstrate here that the framework of analysis provided by the structuralist approach in macroeconomics can explain it to a substantial degree.

By 2007-8 the economy had grown at over nine percent per annum for three consecutive years. The last time the economy had exceeded the nine-percent mark for growth was in the late 80s, and that too in a single year. At that time it was so unexpected, and its continuation so inconceivable, that it did not provide cause for comment. This time though, the repetition of the outcome over three years had given rise to the expectation in some circles that it was only a matter of time before the double-digit growth barrier would be breached. But this was not to be. In an

[9] See Balakrishnan (1991).

Table 1: Macroeconomic Outcomes 2003-13

Year	Growth	Inflation	Fiscal Deficit	Agricultural growth	Relative price of food	FDI
2003-04	8	5.5	4.3	10.8	100	198.3
2004-05	7.1	6.5	3.9	0.1	96.4	269.47
2005-06	9.5	4.4	4	5.5	97.7	394.57
2006-07	9.6	6.5	3.3	4.1	100.5	1026.52
2007-08	9.3	4.8	2.5	6.3	102.7	1394.21
2008-09	6.7	8	6	-0.3	103.7	1907
2009-10	8.6	3.6	6.5	0.4	115.1	1578
2010-11	8.9	9.6	4.8	9.5	121.5	1324
2011-12	6.7	8.8	5.7	5.3	119.6	1548.16
2012-13	4.5	7.4	4.9	0.9	122.5	1465.82

Note: *Inflation* is the rate of change in the wholesale price index; *relative price of food* is an index of the ratio of the wholesale price of food to that of all commodities computed by the author; fiscal deficit is that of the Centre in relation to GDP; FDI is in billions of rupees.
Sources: *FDI* inflows from Reserve Bank of India: 'Handbook of Statistics on the Indian Economy', Table 155, www.rbi.org.in, accessed on 19/4/14 and the rest from Planning Commission: Data Tables, Table 5, www.planningcommision.nic.in/data, accessed on 27/3/14.

unexpected reversal we now have a situation in which growth has been trending downwards and settled at less than 5 percent in 2012-13. At the same time, mid-way through the decade, inflation may be seen as having shifted gear forward.

Since 2008-09, headline inflation measured by the rate of change of the wholesale price index has mostly been much higher than in the first half of the decade.

So the principle stylized fact of the decade upto 2012-13 is that somewhere in the middle of it a macroeconomic regime switch took place. This would be evident from a viewing of the data on growth and inflation in Table 1, and is summarised by the mean values of growth and inflation for each half of the decade presented in Table 2.[10] This switch in regimes is graphically reproduced in Chart 1 by trend lines fitted to the annual data on these variables. The behavior of their time series prompt the following observations. First, the decline in growth since 2008-09, except over the period 2009-11 when it was possibly shored up by the 'Mukherjee Stimulus', suggests something systematic at work. Secondly, that the growth-inflation history of the second half of the decade is a mirror image of what it was in the first presents the possibility of a third factor having caused the reversal.

Table 2

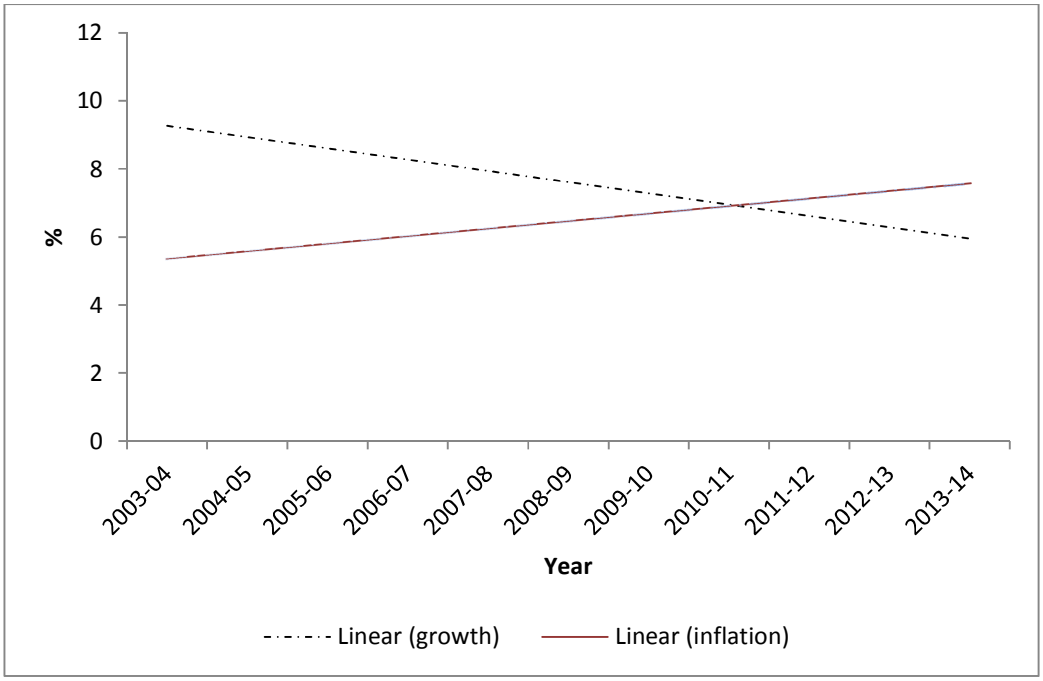
The Macroeconomic Reversal

Variable↓\ Period→	**2003-04 to 2007-08**	**2008-09 to 2012-13**
Growth	8.7	7.1
Inflation	5.5	7.5

Source: Calculated from the data in Table 1.

[10] Data upto 2012-13 is presented, as those available for the succeeding year are provisional yet. However, such data for 2013-14 as we have access to at this time confirm that despite a slight increase in the rate of growth and a substantial reduction in the inflation rate we yet remain in a regime of lower growth and higher inflation.

Chart 1
The trend in growth and inflation



II.i The role of global factors

It could not have escaped anyone's attention that the commencement of the slowing of growth in 2008-09 followed closely in time the onset of the global financial crisis which originated in the US in 2007-08. So it cannot be ruled out that global factors dominate the domestic in terms of their significance. The experience of the rest of the world over this period may hold out a clue to separating out the impact of the crisis originating in the US economy on India's economy. With this in mind, annual data on growth and inflation in India and some selected regions of the world economy are presented in Table 3. Comparison can now be made over two points in time, being the year of the onset of the crisis and the most recent year for which comparable data for all countries was available to us at the time of writing. With respect to growth, we find that while growth had declined in all the regions it has fallen quite dramatically in China and even more

so in India. However, growth in India has contracted much more than in the rest of the world and in China taken on its own. This despite India's share of world trade being lower and the share of exports in its GDP being less than in the latter. With respect to inflation, on the other hand, we find that it has fallen in all parts of the world, including in China, but risen substantially in India. The data suggest the following. While global factors may well have impacted growth in India, we have reason to believe *prima facie* that domestic factors have been at work too. By comparison, we need entertain little doubt that the rise in inflation in India must owe largely to factors specific to this country as it has actually declined elsewhere.

Of course, that growth in India has slowed more than in other countries is not by itself clinching evidence that global factors cannot account for all of the decline. For instance, if following the global financial crisis international investment flows had diverted funds from India to the rest of the world then this would have slowed growth in India. In pursuit of this line of argument, data on investment flows into India have presented in Table 1 with the figures given in rupees as that represents the degree of demand injection when the rupee is depreciating**.** We find that it is only in a single year following the onset of the global crisis, i.e., 2010-11, that FDI inflows register a decline. So a systematic diversion of FDI from India to the rest of the world is not evident. However, it is the case that the rate of increase in these inflows declined after 2007-08.

Taking the evidence *in toto*, while we cannot rule out an external influence in the form of a slower rate of accretion of FDI, given its share in total investment in India this influence is unlikely to have been great.[11] But while on the issue of cross-border investment flows it may be worthwhile making the following point. It has repeatedly been suggested, especially in the media, that "policy paralysis"

[11] FDI inflows amounted to 7.3 percent of gross domestic capital formation and 2.9 percent of the gross national product, respectively, in the year 2007-08.

within the central government has led India's corporates to invest outside India. Now, while there certainly has been outward investment from India, its trajectory has actually been strictly downward since the onset of the global slowing. Thus, FDI outflow in 2012-13 was less than half of what it was in 2007-08, when it had peaked.[12] In fact, it has been slowing at an increasing rate. It may then be concluded that while it is not unimportant for India to retain potential investment outflows this form of capital flight is unlikely to have caused the growth slowdown.

Table 3: Inflation and growth cross-country since 2007

	2007	**2012**
Growth		
India	9.8	3.2
USA	1.7	2.9
Emerging Economies	8.9	5.1
China	14.2	7.7
World	5.4	3.2
Inflation		
India	6.2	10.4
USA	2.9	2.1
Emerging Economies	6.5	6.0
China	4.8	2.7
World	4.1	3.9

Source: See www.planningcommission.nic.in/data/database/1203/table_291.pdf, accessed on 27/3/14; source cited 'World Economic Outlook Database, IMF'.

So, if the contribution of external factors to both the growth slowdown and accelerating inflation is unlikely to have been substantial what could have contributed to the reversal? I now turn to an explanation.

[12] The source is the same as that cited for FDI inflow in Table 1, though the outflow is measured in dollars terms.

III. Accounting for the regime change

As said, the regime switch whereby a combination of high growth and low inflation is replaced by its mirror image, namely, low growth and high inflation attracts the question whether the reversal could have been determined by movements of an independent third factor. It is evident from the data presented so far that this factor could well be agricultural growth. Two observations may be made on the recent trajectory of agricultural growth on the basis of data presented in Table 1. First, the latter half of the period 2008-09 to 2012-13 had commenced with two years of near-zero agricultural growth. To be precise, the first year witnessed negative growth in output and the second a barely positive one. Secondly, this five-year period was also one of fluctuation in agricultural output. Thus, after a smart recovery mid-way through, the period ended with low growth once again. With such severe fluctuation it would be advisable to be circumspect while seeking a measure of average performance.[13] Nevertheless, a comparison between the two halves of the decade in terms of the average annual agricultural growth is yet made. When we go with the mean we find that it is 5.4 percent for the first period and 3.2 percent for the second. When we go with the median the difference is accentuated, being 5.5 percent for the first period and a mere 0.9 percent for the second. These statistics indicate a wide swing downward in the average growth of agriculture across the decade. Finally, to attempt another characterisation, there was only one 'bad' year in its first half compared to three in its second. So, howsoever it is viewed, the latter half of the decade is distinctly one of lower agricultural growth. As agricultural growth may be treated as exogenous in the short run, we may imagine the economy as having faced repeated

[13] This was considered to be less of a problem in the exercise underlying the exercise reported in Table 2 as both GDP and inflation have fluctuated less than has agricultural production, notably since 2008.

agricultural supply shocks in this period. There is substantial guidance from structuralist macroeconomics on what to expect in such situations. For instance, we know from the first set of models developed in the 1970s to understand the macroeconomic impact of the oil shocks of the time that a negative supply shock in the agricultural sector of the economy can, in the presence of real-wage resistance in the non-agricultural sector, give rise to a higher inflation rate[14]. We know from the work of Kaldor (1976) that slow growth of agriculture in relation to the demand generated from the non-agricultural sector of the economy leads to inflation and an eventual slowing of the latter sector. It works via the rise in the agricultural terms of trade. Thus, a positive terms-of-trade shock can slow the growth of the economy due to its distributional consequences. For households whose income growth does not keep pace with the rising price of food, higher expenditure on food must crowd out spending on industrial goods. We cannot over look this possibility in recent years when the real price of food has steadily risen. The data on industrial production show that having steadily declined from 2010-11 it has more or less ground to a halt by now. Of course, it is not necessary that all of this is related to the slower agricultural growth. In fact, we may state right away that this is unlikely for the slowdown in industrial growth is far too dramatic.[15]

The upshot of the argument so far is that the slower growth and higher inflation economy-wide are related to the adverse supply shocks in agriculture. The feature that gives us most confidence in this explanation is the behavior of the relative price of food which, it will be noticed in Table 1, has risen sharply from 2008-09 onwards. Of course, supply shocks need not be the whole story, either for inflation or for growth, and I shall now turn to other factors that may have

[14] See Gordon (1975).
[15] http://mospi.nic.in/Mospi_New/upload/iip/IIP_main.htm?status=1&menu, accessed on 24/9/14.

mattered. Before that, however, the following is worth narrating. If it at all comes as a surprise that agriculture continues to exert such a strong influence in India even as its share is continuously declining, it may be noted that for the 17 years since 1991 annual changes in the economy-wide growth rate are more closely aligned with changes in the annual rate of change of output in agriculture than of any other sector. [16]

Altogether then, we find that the structuralist macro model is able to explain the trajectory of growth and inflation over the past decade quite well. Data constraints had forced me to confine the analysis to the period upto 2012-14. However, provisional data for 2013-14 suggest that my analysis extends to this year too as the macroeconomic outcomes are consistent with the prediction of the model. They show that growth has increased very slightly and the inflation rate has declined while agricultural growth recovered from a negative shock in 2012-13.[17]

III.i The role of macroeconomic policy

We have so far investigated the likely impact on growth and inflation of agricultural supply shocks, but could there have been a role for macroeconomic policy itself in bringing about reversal? I start with fiscal policy.

As a component of aggregate demand, the fiscal deficit merits attention. However, in this period its role could actually have been no more than passive in a

[16] See Balakrishnan (2010). As for inflation, the episode just analysed suggests that it would be premature to accede to the view "While agricultural supply shocks were the main driving factor of domestic inflation from mid 80s to mid 90s, their explanatory power went down substantially post-reform.", for which see Goyal (2012) though the author herself does not appear subscribe to it.

[17] See Table 1 of the 'Economic Survey 2013-24', New Delhi: Government of India and 'Highest Ever Production of Many Crops is Likely to Break Earlier Records, 3rd Advance Estimates of Crop Production Released', Indian Council for Agricultural Research; http://www.icar.org.in/en/node/7665; accessed on October 18, 2014.

manner to be explained below. Note from Table 1 that the deficit is distinctly higher on average since 2008-09, but appears to not have had any success in buoying-up growth, except perhaps briefly. As for inflation, the rising relative price of food signals an inflation originating in a sectoral imbalance rather than in an 'inflationary gap' due to excess aggregate demand, for we would expect that the latter would affect all prices equally, thus leaving the relative price unchanged. Even if we are to ignore this line of reasoning, we would find that over the decade year to year changes in the inflation rate are related far more closely to the contemporaneous decline in agricultural growth than to the change in fiscal deficit in the same direction. This is particularly true in the second half of the decade, when the inflation rate had accelerated.[18] In any case, a positive relationship between the fiscal deficit and the inflation rate is fully compatible with a fiscal deficit that is endogenous with respect to inflation. For, as inflation gathers pace public expenditure tends to rise almost immediately while revenues increase only with a lag. Despite this possibility, it can be seen from Table 1 that year-on-year movements in the deficit are mostly inversely correlated with inflation after it accelerates in 2008-09, weakening further the case for an inflation driven by the fiscal deficit. However, the question of why a higher fiscal deficit was unable to shore-up the growth rate remains and we turn to it now.

Once we become aware of its composition, we would no longer be surprised that the higher on average fiscal deficit since 2008 has not had the effect of halting the slide in growth. In fact, a change in the composition of the deficit may have actually contributed to the very slide itself. The one element of macroeconomic policy across the decade that is most closely linked to growth is public capital

[18] See Table 1. Thus the popular diagnosis that accelerating inflation reflects an "overheating" economy appears to be off the mark. See Goyal (2013) where such an account of inflation in the period that we studying provided by the IMF is contested by the author on grounds that contemporaneous growth had fallen sharply.

formation. Note from Table 4 that public capital formation rose sharply upto 2007-08, fell sharply in the next year, and has remained depressed since. Two further observations may be made on the basis of the data in the table. First, while private capital formation has declined from 2009 onwards its fall is not as precipitous as that in the public. Capital formation in the private sector actually more than revived by 2012-13, when it exceeds its previously attained peak by over 20 percent, without being able to make a difference to the overall growth rate. Secondly, the steep decline in capital formation in the public sector in 2008-09 took place as the fiscal deficit expanded by over one hundred percent[19]. So, at this time, government expenditure could not have been not financially constrained in the aggregate. Only further research can establish then whether the government was primarily motivated by the desire to increase consumption, both its own and of the private sector via subsidies, or by that of supporting growth. Whatever be the case, the steady decline in public capital formation signals that the government may have seriously misjudged the growth dynamics in assuming that growth would continue regardless of the composition of the spending. Its macroeconomic policy stance failed to reckon with the truism that for the economy as a whole consumption cannot continue to grow without growth in income and that income does not usually continue to grow without investment**.** It is of interest that private capital formation did not fall as steeply as capital formation in the public sector. In fact, in no year did it fall to a level below the lowest one registered during the period of fast growth over 2003-08. Overall, there is strong evidence to suggest that the public sector may have contributed more to the growth decline by reducing its capital formation after 2007-08. The magnitude of the reduction is brought

[19] See Tables 3 and 4.

home by the statistic that by 2012-13 public capital formation as share of GDP was less than half of what it was in 2007-08.

Table 4: Savings and Capital Formation

Year	Capital Formation		Public Savings	Fiscal Deficit (combined)
	Public	Private		
2004-05	10.3	7.4	2.3	7.2
2005-06	13.6	8.0	2.4	6.5
2006-07	14.5	8.3	3.6	5.4
2007-08	17.3	8.9	5.0	4.0
2008-09	11.3	9.4	1.0	8.3
2009-10	12.1	9.2	0.2	9.4
2010-11	13.4	8.4	2.6	6.9
2011-12	10.6	7.9	1.3	8.1
2012-13	8.4	11.5	1.1	7.2

Note: Figures are as a percentage of GDP. Source: Planning Commission, 'Macroeconomic Balances', Data Table 9, www.pc.gov.in/data/datable, accessed on 16/4/14.

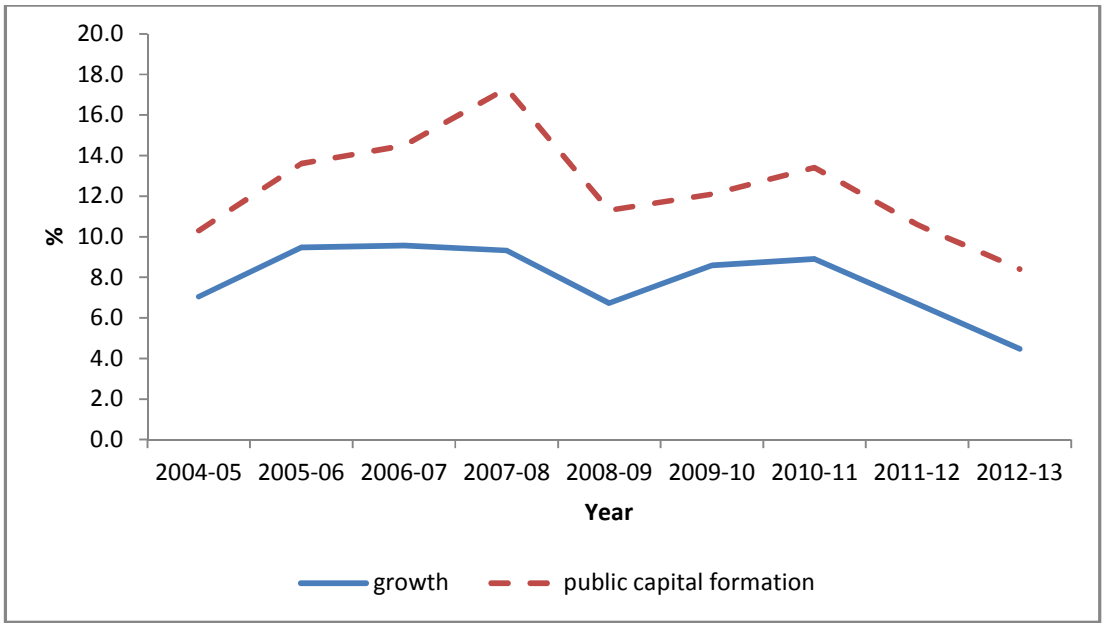
If it is *crowding in* that characterises the working of the Indian economy, this steady decline in public capital formation would have acted as a drag on the private. To emphasise a point already made, the decline in public capital formation took place at a time when the fiscal deficit expanded substantially (see Table 4), suggesting that the government just chose to prioritise consumption expenditure[20].

[20] It is important to note that the capital formation figures under scrutiny here is of the entire public sector – that is inclusive of the public enterprises - and not just of the government. Therefore it would be not be appropriate to conclude that the reduced public capital formation is directly related to increased spending on the welfare programmes introduced under UPA II. For evidence that spending on the NREGS, the government's flagship welfare programme, though substantial had peaked by 2009-10 see Himanshu, Mukhopadhyay and Sharan (2014). However, it would be correct to say that UPA II was less engaged with capital formation than UPA I. The increased government expenditure showing up as a rising fiscal deficit in the second half of the last decade was very likely due to the food, fertilizer and oil subsidies.

Finally, in Chart 2 have been plotted the annual movements in growth and public capital formation as a share of GDP. The closeness of the relationship is striking.

Chart 2

Growth and Public Capital formation



I have so far investigated the role of fiscal policy, now I turn to monetary policy. We know from the theory (see Gordon 1975) that failing to accommodate inflation caused by a supply shock can lead to output loss. The sector of the economy mostly likely to have been affected by the increases in the policy interest rate – the repo - is manufacturing. The growth of industrial production has steadily contracted from 2010-11 onwards and has been barely positive in the past two years.[21] While this bears the unmistakable signature of restrictive monetary policy following a supply shock, we cannot be sure as to how much of the impact can be credited to monetary policy. It can be seen from Table 4 that a contraction of

[21] See footnote 15.

public capital formation, which may be expected to have an even immediate impact on industrial production than a restrictive monetary policy, had been in place for at least two years by then, and continued apace. As already stated, by 2012-13 annual public capital formation had more than halved. However, some impact of the restrictive monetary policy too may be assumed, as there is evidence of a rise in the weighted-average lending rate[22] over 2011-12. But this is not the most interesting thought that should remain with us after having studied the episode. It is that if macroeconomic policy has brought about a decline in the inflation rate by engineering a growth slowdown then the inflation rate may be expected to rise as growth resumes. Supply-side inflation must be tackled at the source. Aggregate demand management cannot serve as a permanent solution in the context.

Finally, in my explanation of the recent inflation I have limited its driver to fluctuations in agricultural growth. This was deliberate and intended to illustrate the relevance of the structuralist approach in the context. In actuality, however, other factors are likely to have mattered.[23] Of them government intervention in the markets for agriculture and energy may be emphasised. During the last decade the government has at times intervened aggressively in the foodgrains market both by raising the procurement price more than the inflation rate and stockpiling grain

[22] See http://rbi.org.in/scripts/AnnualPublications.aspx?head=Statistical Tables Relating to Banks in India, Table 11.4, accessed on 16.04.14. Here it is worth noting, however, the view of one of India's leading commercial bankers that the connection between the banks' base (lending) rate and the repo is tenuous as the former depends upon the deposit rate. Thus when there is competition for deposits the lending rate will rise irrespective of what happens to the repo. (See "Lending rate hinges on deposits and not on repo rate: Chaudhuri", an interview with Pratip Chaudhuri, Chairman SBI,'The Hindu', Thiruvananthapuram Edition, 1 October 2013.) If Chaudhuri is right then observing a rise in the lending rate following a rise in the repo rate cannot by itself constitute clinching evidence of the transmission having taken place as the former may merely reflect a tightening of the market for loans.

[23] For an explanation of inflation covering a wider set of factors, though confined to a shorter period, than what is considered here see Rakshit (2011).

well above its own pre-announced buffer stock norm. So while UPA II may have been unlucky with the weather it has also stoked inflation in an effort to woo special interests. More research is necessary to establish the precise role of farm-price setting in the recent bout of inflation in India, but both the mechanism involved and the facts of the case are well known[24]. With respect to the government intervention in the market for energy, there has been a concerted move towards aligning the domestic price of petrol and diesel to the global price with a view to fiscal correction. As their global prices have mostly been higher than the domestic price the latter has been raised steadily. This is likely to have an effect on the price of food, with inflationary consequences.

III.ii Is India's monetary authority learning?

Though inflation targeting has only recently been brought into the public consciousness by the RBI, India's central bank is known to have been concerned about inflation always. But this time round it had responded with alacrity. Quick on the heels of the second consecutive year of near-zero agricultural growth the policy (repo) rate was raised in March 2010. Over the next 20 months it was raised 13 times in succession. The increase in the policy rate was unable to prevent an acceleration of inflation in 2010-11, after which it has softened somewhat but yet remains far higher than it was in the first half of the decade. This need not surprise us as it is only to be expected when an economy is hit repeatedly by supply shocks.

With reference to the efficacy of monetary policy in controlling inflation in recent years in India it has been pointed out that the increases in the policy rate have been quite mild given the inflation rate leaving the real rate more or less the same. It is indeed correct that the real rate has not increased very much in India

[24] For data on the increase in minimum support prices for foodgrains in recent years see Singh (2014).

over the past five years but the fact of inflation accelerating exactly as the economy slowed strongly suggests that the loss of output that may be engineered via a monetary policy more hawkish that what has been pursued thus far would have to be much greater for it to lead to a taming of inflation. It is germane to this speculation that having declined steadily since 2008-08 in 2013-14 industrial output, the economic activity most likely to be affected by monetary policy, contracted by -0.1 percent.[25] While inflation has abated somewhat, as stated above, there has at the same time occurred an agricultural turnaround, making it difficult to disentangle the impact of monetary policy on inflation from that of the structural factors that drive it.

It would be of interest to know what the monetary authority may have learned from this episode of growth and inflation. Judging by its most recent report on monetary policy the answer appears to be 'very little'. It is proposed there that the RBI's should adopt of inflation targeting[26]. Interestingly, this is more or less what the Bank seems to have been doing so far anyway, though without much success. In the literature on monetary policy inflation targeting implies the adoption of an explicit view of how the economy works. This is represented by the New Keynesian DSGE model. I believe that my account of the recent trajectory of growth and inflation must leave us somewhat sceptical of its depiction of the workings of the Indian economy. I shall keep my comments to the minimum. Inflation in the generic DSGE model used by the central banks reflects output exceeding its natural rate. It is instructive to recall how Robert Solow has summed up the reasoning implied by such a view[27]. First, it is asserted that inflation reflects

[25] Source: Government of India, Ministry of Statistics and Programme Implementation; http://mospi.nic.in/Mospi_New/upload/iip/IIP_main.htm?status=1&menu; accessed on 24/9/14.
[26] See RBI (2014).
[27] See Solow, op.cit.

the actual rate of output exceeding its natural level. As the natural level of output is unobservable, when it is queried how it can be inferred that the actual rate actually exceeds its natural level it is pointed out that this must be so as there is inflation. The approach is self-referential, and therefore not particularly useful in understanding the origins of inflation. Coming back to the episode that I have been speaking about here, while it cannot be ruled out that actual output can remain higher than its natural level even as growth is slowing it appears to me wholely implausible as a representation of what we are experiencing in India today. I am not sure if it necessary to go further and observe that the New Keynesian model is unsuited to address inflation in agricultural prices. For a start it is not clear how an output gap of the kind imagined in the model can emerge in an agricultural market. To this query it may be pointed out that commodity prices should be treated as exogenous. This takes us to the crux of the matter. While it may have made sense to treat the price of energy as exogenous to the US economy, at least until shale gas was discovered, it makes little sense to treat agricultural prices as exogenous for the Indian economy. At least in structuralist macroeconomics agricultural prices are determined within the model. Secondly, as there is only one good in the New Keynesian model, the relative price has no significance for either inflation or, via distributional effects, for output determination. We may next run to the visualisation of the output gap in the model. It is asserted within the model that the output gap itself reflects the fact that the market rate of interest is higher than the natural rate. Now, the natural level of output is an unobserved and the actual level of output can be pinned down only if it is assumed that the natural level of output does not change. Finally, the policy recommendation that emerges from the New Keynesian model is that the rate of interest must be raised to curb inflation. The mechanism imagined is a contraction in output. It is only by maintaining that the

economy has been returned to the natural rate of unemployment that any welfare loss due to the contraction of output be disclaimed.

It would be difficult to reconcile the recent inflationary episode with the DSGE model of the kind favoured by the RBI. First, the rise in the inflation rate in the second half of the past decade can be explained only by recourse to a growing output gap. This is implausible in a slowing economy, as it would require the natural level of output to shrink at a rate faster than the reduction in growth of the actual. Moreover, in relation to the actual experience in the past decade, as the real policy rate has not changed very much there is no reason within the model for the output gap to have changed leave alone grown over time. The inescapable conclusion is that it is not clear that the RBI currently has a useful model for analysing macroeconomic outcomes in India. I have emphasized some features of the Indian economy that lead us to this conclusion. However, the DSGE model has also been challenged on grounds of the highly questionable methodology that it relies upon apart from the fact that it does not adequately represent the advanced capitalist economies of today[28].

IV. Reversing the reversal

If the revival of growth is on the agenda of the government at all, then, increasing public capital formation would have to be part of the plan. The decline in public capital formation since the end of high growth in 2007-08 has been steep. But so, as may be seen in Table 3, has been the decline in public saving. Therefore, any plan for substantially increased capital formation in the public sector would require the government to increase its saving, requiring in turn a combination of increased revenues and reduced expenditure on subsidies. The rationalisation of

[28] See Buiter (2009).Willem Buiter was an independent member of the Monetary Policy Committee of the Bank of England.

public foodstocks and the permanent elimination of regressive subsidies such as those on petrol and diesel would work in the direction of the latter objective. The government may also be losing revenue due to the practice of foregoing taxes once levied. This needs to be reviewed. Generally speaking, improvement of the public finances would have to be part of a credible strategy if a revival of public investment is to contribute to the reversal of the reversal that is being addressed here.

Poor agricultural performance over the past five years points to the relevance of agriculture being brought into the centre of public policy. Of course, this would require the use of both macro and micro approaches. The macroeconomic element would, once again, revolve around public capital formation. There has been long-term decline in public capital formation as a share of agricultural GDP even as, in a cross-country comparison, it is already low in India. It is not known widely enough that public capital formation in agriculture has been on a downward path for over two decades, and by 2010 had collapsed to less than a third of its level in 1993.[29] It can hardly come as a surprise then that agricultural growth is less than that warranted for steady growth of the economy leave alone macroeconomic stability, which has been the focus of my lecture today. At the same time, however, it is effective governance that will determine whether increased spending will translate into capital assets on the ground.[30] Here far superior micro-level management of infrastructure projects is required.

The question of food production is important. Note that the relative price of food has increased by over 20 percent over the past decade. This is unusual for an economy that embarked on a developmental strategy over 60 years ago. As pointed

[29] See Planning Commission: 'Gross Capital Formation in Agriculture and Allied Sectors', Data Table 9; www.pc.gov.in/data/datable; accessed on 16/4/14.
[30] See Balakrishnan, Golait and Kumar (2010) for evidence on how substantially increased spending on irrigation has not translated into commensurate expansion of area irrigated.

out is at least partially the outcome of government intervention in the grain markets. But there is consumption beyond foodgrain, and this component has been ignored in the public policy. The consequence has been that the production of high-valued products linked to protein has lagged beyond the growth of demand and contributed to inflation. It can safely be assumed that agricultural production is going to remain an important factor determining growth and inflation in the economy for some time to come. Policy interventions have focused mostly on prices, they need to address the cost of production.

V. Conclusion: the importance of theory

While this lecture may have mostly been an investigation into the factors underlying the macroeconomic reversal we are witness to presently, my objective in it was to actually to convey the importance of economic theory in understanding the workings of the economy. I have presented the structuralist approach to macroeconomics and believe that I have demonstrated that a model based on it can account for the reversal to a reasonable degree. I believe that I have also shown the macroeconomic model currently ascendant in the world of Anglo-American economics can do so, if at all, only by inviting our credulousness. That agencies of the Government of India such as its monetary authority base their policy on such a model should be a matter of concern to its citizens.

The need for a framework that helps us understand the aggregate outcomes in an economy should be obvious. Households and businesses care deeply about developments in inflation, employment and other economy-wide variables as these determine the opportunities available to them for maintaining their standard of living and growing their activity, respectively. This places a major challenge upon macroeconomists to provide a coherent account of how the economy works. I am grateful to have been granted this opportunity.

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