CSE Working Paper

#1

An Approach to the Problem of Employment in India

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March 2018

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Abstract

The challenge of employment in the Indian economy, especially after it growth acceleration since the mid-1980s, relates to its quality rather than its quantity. While employment growth has kept pace with the labour force over the long run, what has grown is informal employment. The coexistence of rapid capital accumulation, robust output growth and lack of growth of formal employment can be understood using the well-known Harris-Todaro model of a dual economy. This framework highlights the key role of the wage gap between the modern and traditional sectors as a determinant of urban informal employment. Hence, one of the most effective and egalitarian ways to address the employment problem is to adopt policies to increase agricultural productivity and income, which can reduce the wage gap. Since crop yields in India are far lower than many other countries in the world, including China, Brazil, and Bangladesh, there is ample scope for land-augmenting and labour-absorbing technological change in Indian agriculture. Efforts to ramp up industrialization should be taken up in earnest only after the wage gap has been narrowed significantly.

Keywords: employment; India; Harris-Todaro; agriculture.
JEL Codes: J21; O10; O13.

1 Introduction

The issue of employment generation figures prominently in discussions of contemporary economic problems in India, and naturally so. One of the most reliable ways to ensure that the fruits of economic growth are distributed widely in a capitalist society is to ensure robust employment growth. On this count, the Indian economy has performed sub-par not only in recent decades but for most, if not all, of its post-independence history. We only need to revisit the discussion surrounding the draft Sixth Five Year Plan for the period 1978–83 put forward by the Janata Party government, or the actual Sixth Five Year Plan for the period 1980-85, created by the Congress government that was elected to office in 1980 after

the Janata experiment collapsed under its own contradictions. Recognising the failure of the first few decades of planned industrialization to create adequate employment or make any significant dent on mass poverty, the draft Sixth Five Year plan for the period 1978–83 included employment generation as one of its key objectives (Radhakrishna and Sarma, 1978). The focus on employment creation was carried over, albeit in reformulated forms, into the Sixth Five Year Plan for the period 1980–85.

One important element of the backdrop to discussions of employment generation in the late 1970s was the decade long industrial stagnation that had started in India in the mid-1960s. The progressive strand of economic thinking in India argued that one of the important reasons behind the industrial stagnation was insufficient aggregate demand arising, among other things, from an unequal distribution of income and wealth (Nayyar, 1978). This led to the conclusion that the problem of employment was caused by lack of investment, itself caused by insufficient aggregate demand, rather than rising capital intensity of production technologies, the latter factor being emphasised, instead, by official discourse (Indian School of Social Sciences, 1979).

There is widespread agreement among economists and policy makers that the growth rate of real output in the Indian economy witnessed significant acceleration since the early 1980s, accompanied by a steady rise in the share of saving and investment in gross domestic product (Kotwal et al., 2011). By all accounts, savings and investment picked up in the macroeconomy, and led to an acceleration of the growth rate of real output. While the debate on the causes of the growth acceleration continues, there is no disagreement that four decades of relatively rapid growth of output and rapid capital accumulation since the early 1980s has not made much of a dent on the problem of employment in India.[1] The problem of employment is still very much with us now, as it was four or even seven decades ago (Kotwal et al., 2011; Joshi, 2017, ch. 5). Therefore, it would not be inaccurate to state that neither the period of planned industrialization, nor the period of market-oriented reforms and a sharp move away from planning since the early 1990s, seems to have allowed India to solve its problem of employment.

In this paper I present a theoretical framework to make sense of the continuing 'employment problem' in the Indian economy. This theoretical framework is not novel. It draws on some insightful work on the problem of employment available in the development economics literature since the 1970s. While the theoretical framework is not novel, it is still useful for contemporary discussions because it helps bring back the focus on some neglected components of policy that can address the employment problem. The main area of neglect that the framework will help us to think about is the crucial role of agricultural, and in general rural development, in meeting the employment challenge in contemporary India.

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[1]One interesting question to investigate is whether the growth acceleration has been caused by an increase in aggregate demand, and if so, through which channels. An influential argument put forward by Nayyar (1978), as an explanation of the industrial stagnation of the mid-1960s, was that unequal distribution of income was the key culprit in reducing aggregate demand, and hence in causing industrial stagnation. In the period since the early 1990s, we observe acceleration of growth *and* an increase in inequality (Basole and Basu, 2015). This raises serious questions about the line of explanation outlined in Nayyar (1978) for understanding both stagnation and growth of the Indian economy.

To motivate the theoretical analysis, I will first review, in section 2, some well known trends about employment generation in the Indian economy over the past few decades. This review of long run employment trends helps me in posing the main problems that calls for theoretical explanation. Much of the discussion on problems of economic growth and employment in India use the Lewis model as a theoretical scaffolding. So, in section 3, I review the basics of the Lewisian framework and argue that it does not allow us to understand some key features of the employment problem. This sets the stage for the discussion of the Harris-Todaro model in section 4, which, I argue allows us to make sense of key features of the employment problem in India. I conclude the paper in section 5 by discussing some policy strategies that follow from the analysis presented in this paper. An appendix gives some results when informal urban employment is explicitly brought into the analysis.

2 Employment Trends

2.1 Long Run Trends

Table 1 summarises data about long run employment trends in the Indian economy over the past two decades and highlights the following trends. First, there has been a very slow movement of the labour force out of agriculture. In 1993-94, 64.6% of the workforce was employed in agriculture; in 2015-16, it had declined to only 46.9%, so that close to half of the workforce was still employed in agriculture. In terms of levels, total employment in agriculture increased from 241.5 million to 268.6 million between 1993-94 and 2004-05. It is only since 2004-05 that the absolute level of employment in agriculture has declined, from 268.6 million in 2004-05 to 219.3 million in 2015-16. Therefore, the continued employment of a large section of the workforce in agriculture is one the key characteristics of the employment situation in contemporary India.

Second, growth of employment has roughly kept pace with the growth of the labour force. To see this, note that the labour force is the sum of the workforce, i.e. those who are employed, and the unemployed. The unemployment rate, which is defined as the ratio of the unemployed and the labour force, can be also expresses as 1 minus the ratio of the workforce and the labour force. Thus, if the unemployment rate remains relatively unchanged over time, this would imply that the workforce (total employed) and labour force (sum of total employed and unemployed) change at roughly the same rate. That is more or less the trend we see from the data in Table 1. The unemployment rate remained relatively stable at around 2% of the labour force between 1993–94 and 2011–12, increasing only slightly from 1.9% in 1993-94 to 2.2% in 2011-12. Juxtaposed on to this long run trend of a relatively stable unemployment rate, we do see a shorter run fluctuation: the unemployment rate increased significantly from 2.2% in 2011-12 to 3.6% in 2015-16.[2]

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[2]It is possible that the rise in open unemployment indicates towards a new, structural feature of the Indian economy, rather than a temporary fluctuation. The growth in the share of the workforce with formal education, which typically has higher open unemployment, might be the reason for the rise in open unemployment at the aggregate level. We will be able to come to a firmer conclusion about this, i.e. whether

Before we draw the conclusion that all is well on the employment front in India - because the unemployment rate is low and stable - we should pay attention to the *kind of employment* that has been created. In a developing country like India, the unemployment rate is low because open unemployment is, perhaps paradoxically, unaffordable. Since social security or unemployment insurance is non-existent, working people cannot afford to be openly unemployed. They engage in precarious, low productivity and low-pay work, so that a large section of those who report themselves to be "employed" are, in reality, either underemployed or in disguised unemployment. Moreover, the vast majority of the underemployed and disguised unemployed workers show up in the count of informal employment, i.e. those who are employed in the unorganized sector or those who are informally employed in the organized sector (NCEUS, 2007).

What do we observe regarding the level and share of informal employment in the Indian economy? Between 1999-00 and 2011-12, the number of informal workers increased from 361.7 million to 438.9 million. As a share of the workforce, this meant an increase in informal employment from 90.54% to 92.6% over the same period. Since a large part of agricultural employment would be considered informal employment, it is useful to track the share of informal employment in non-agricultural employment as well. The data in Table 1 show that informal employment increased from 75.28% to 85.7% of the non-agricultural workforce between 1999-00 and 2011-12. That is a staggering 10 percentage point *increase* over a decade.

The data summarized in Table 1 suggest that the main problem facing the Indian economy as far as employment in concerned relates to the quality, and not the quantity, of *non-agricultural* jobs. The problem is not that the economy is not generating enough jobs; it is. The problem is that the vast majority of the jobs that are being created are of extremely low quality. The employment problem in India is not about the quantity of jobs but rather about the quality of jobs. This means that the frequently used term 'jobless growth' is not an accurate description of the problem of employment in the contemporary Indian economy.

2.2   Short Run Trends

While the focus of analysis in this paper is the long run problem of employment generation, it is worth focusing attention briefly on the recent short run fluctuation in employment observed between 2011–12 and 2015–16. The data in Table 1 show an alarming trend: total employment declined, probably the first time in the last few decades, from 474.2 million in 2011–12 to 467.7 million in 2015–16 (Abraham, 2017). This decline in employment has contributed directly to the substantial growth of open unemployment over this period - from 10.6 million in 2011–12 to 17.6 million in 2015–16. When we study the sectoral pattern of employment changes over this period, we see from the data in Table 1 that the overall decline is the result of opposite movements in agriculture and manufacturing, on the one hand, and non-manufacturing and services, on the other. Employment declined in the agricultural and

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the rising open unemployment is a fluctuation or a permanent feature, only after we have data for several more years.

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Table 1: Employment Trends in India (PS+SS)[a]

	1993-94	1999-00	2004-05	2011-12	2015-16
Level					
Agriculture (millions)	241.5	246.6	268.6	231.9	219.3
Manufacturing (millions)	38.9	42.8	53.9	59.8	50.0
Non-Manufacturing (millions)	15.8	20.4	29.4	55.3	57.1
Services (millions)	77.7	89.8	107.3	127.3	141.2
Workforce (millions)	374.0	399.5	459.1	474.2	467.7
Labour Force (millions)	381.2	408.5	469.9	484.8	485.3
Unemployed (millions)	7.2	9.0	10.8	10.6	17.6
Share of Workforce					
Unemployment (%)	1.9	2.2	2.3	2.2	3.6
Agricultural Employment (%)	64.6	61.7	58.5	48.9	46.9
Informal Employment					
Level (millions)		361.7	430.5	438.9	
Share of Total Employment		90.54	93.8	92.6	
Share of Non-agri Employment		75.28	85.2	85.7	

[*] Note: PS=primary status; SS=subsidiary status. Sources: (1) Mehrotra et al. (2014); (2) Government of India (2016); (3) NCEUS (2007).

manufacturing sectors by about 14 and 9 million, respectively. On the other hand, employment increased in services and the non-manufacturing industrial sector (accounted largely by construction) by 14 and 2 million, respectively. An interesting question to investigate is whether the rather sharp decline in manufacturing employment between 2011–12 and 2015–16 is mostly accounted for by unorganised manufacturing, as had been observed over the period between 2004–05 and 2009–10.

2.3   The Questions

Let me summarize the main long run employment trends that we observe in the data. First, there is a gradual decline in the share of agriculture in total employment. Thus, the Indian economy is witnessing a steady but *very slow* structural change. Second, the resulting growth in the share of non-agricultural employment is primarily of the informal kind. Thus, a key feature of long run employment trends in India is the striking *absence* of growth in formal non-agricultural employment. Going hand in hand with these employment trends, is the fact of strong output growth and rapid capital accumulation in the industrial sector in India. For instance, over the two and a half decade period, 1991–2016, industrial output grew at an average rate of more than 7% per annum, and fixed investment in industry as a share of gross domestic product increased from below 12% to about 15% (Nagaraj, 2017).

The coexistence of robust capital accumulation and output growth in the industrial sector with the two key long run employment trends in the Indian economy highlighted above - slow movement out of agriculture and the preponderance of informal non-agricultural employment - raise two questions for us. First, do we have a coherent theoretical framework to make sense of and explain the observed long run employment patterns? Second, does this theoretical framework help us come up with some policy suggestions to make serious dents on the long run employment problem in India?

In this paper, I want to argue that the answer to both these questions is in the affirmative. The problem of employment is not new, and neither are we the first to confront these difficult but extremely important issues. In fact, roughly two decades after its birth in the early 1950s, the discipline of development economics grappled with exactly the same set of issues related to the problem of employment that we face today (Emmerij and Ghai, 1976). The pioneering work of scholars like Gary Fields, John Harris, Arthur Lewis, Michael Todaro, Amartya Sen, and Han Singer, among others, in the 1960s and 1970s, offers us a conceptual framework with which to think about the problem of employment in a labour surplus economy like India.[3]

In this paper I wish to draw on this well developed theoretical literature to provide a framework for thinking about the problems of employment in a labour surplus economy like contemporary India's. Therefore, the theoretical model that I present below is not novel. It was developed in the early 1970s and is now a regular part of discussions in the discipline of

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[3]For a collection of articles from the mid-1970s that explore these themes, see Cairncross and Puri (1976). Pioneering work was also done, among others, in Singer (1970); Harris and Todaro (1970); Sen (1975); Fields (1975).

development economics, having percolated down even into textbooks.[4] While the theoretical model is not novel, it does help throw light on some key areas of policy to tackle these long standing problems. In particular, the framework presented in this paper highlights the crucial role of agricultural development, and rural development more generally, in addressing the problem of employment in contemporary India.

3   The Lewisian Framework

3.1   Basic Set-up

Lot of contemporary discussions about the problem of employment in India, one way or the other, draw on the pioneering work of Lewis (1954), which offered a framework to understand the process of economic growth in a labour surplus economy. It remains a useful starting point for investigations of problems of employment and growth in developing economies. Hence, I start the theoretical discussion with a critical engagement with the ideas in Lewis' insightful paper.

The economy of a developing country is conceived of as a 'dual economy, i.e. as being composed of two sectors: a modern sector and a traditional sector. The typical production units in the modern sector are capitalist firms, whose primary motivation is the maximization of profit. The traditional sector, on the other hand, consists of a vast sea of non-capitalist production units, mostly composed of small scale family farms in the agricultural sector and small scale family run businesses in the non-agricultural sector, whether in rural or in urban areas. The key feature of the traditional sector is the existence of "surplus labour", which can be roughly understood as the presence of more labour than can be fruitfully employed.[5]

It is possible to understand the term surplus labour more precisely in at least two different senses. The stronger sense in which this term has often been used is that the marginal product of labour, i.e. the extra output created by employing an additional unit of labour, is zero. This would mean that withdrawing labour from the traditional sector would leave total output unchanged. There is a second, and less stringent, sense in which the term can be used, viz. to characterise the situation where the marginal product of labour in the traditional sector is lower than than the marginal product of labour in the modern sector. In this case the marginal product of labour in the traditional sector need not be zero. All

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[4]The theoretical analysis presented in this paper draws, in part, on the discussion in textbooks like Basu (1997) and Ray (1998).

[5]While the traditional sector has often been identified with the urban sector, and the modern sector with the urban sector, there is no theoretical necessity to do so. In fact, Lewis (1954) was quite clear that part of the traditional sector existed in urban areas too. "Several writers have drawn attention to the existence of such "disguised" unemployment in the agricultural sector ... The phenomenon is not, however, by any means confined to the countryside. Another large sector to which it applies is the whole range of casual jobs - the workers on the dock, the young men who rush forward asking to carry your bag as you appear, the jobbing gardener, and the like. These occupations usually have a multiple of the number they need, each of them earning very small sums from occasional employment; frequently their number could be halved without reducing output in this sector. Petty retain trading is also exactly of this type..." (Lewis, 1954).

that is required is that it be lower than in the modern sector. This has often been referred to as 'disguised unemployment' to distinguish it from the stronger usage of 'surplus labour'. The development economics literature in the 1960s and 1970s came to conclusion that the first usage was an unnecessarily strong one. It was not needed for making the important theoretical point that moving labour from the traditional to the modern sector would increase total output.[6]

An important feature of this 'dual economy' is the existence of an *exogenous wage gap*, i.e. the average wage rate in the modern sector is higher than the average wage (or income) in the traditional sector. There can be various ways to explain the existence of the wage gap. For instance, a wage premium might be needed to draw workers away from their traditional work and compensate them for the trouble of migrating out of the villages. That is why the real wage has to be higher in the modern sector. Another line of explanation could be that legal regulations or trade unions ensure that the real wage in the modern sector is high and does not fall to the level of the average income in the traditional sector. Yet another line of explanation that has developed out of the economics of information is that firms might have incentives to offer higher wages than what would clear the market. This is because higher wages increase worker morale and productivity, ensuring higher profits for capitalist firms. Without taking a position as to which of these is the 'correct' explanation, I would like to just note the existence of the wage gap as an important feature of a dual economy like India's.

3.2   Employment and Income in the Two Sectors

We can capture important features of this dual economy in a simple diagram like Figure 1. In this diagram, the distance $O_M O_R$ on the horizontal axis represents the total labour force in the economy. The size of the labour force employed in the modern sector is measured from origin at O_M, going from left to right. On the other hand, the size of the labour force employed in the traditional sector is measured from the origin at O_R, going from right to left. Workers can be employed in either of the two sectors. Hence, any point on the horizontal axis represents a distribution of the total labour force between the two sectors. The real wage rate in the modern sector is denoted by $\hat{w}$ and m denotes the subsistence level of income, with $\hat{w} > m$. The demand for labour in the modern and traditional sectors are denoted by the curves MPL_M and APL_R, respectively. The former should be read with reference to the origin at O_M, and the latter with respect to the origin at O_R.

The demand for labour in the modern sector arises from the profit maximizing behaviour of capitalist firms. These firms take the real wage rate as given and choose to employ the amount of labour at which the cost of employing one more unit of labour, i.e. the real wage rate, is equal to the marginal product of labour. MPL_M represents the marginal product of labour as a function of the level of employment. With a given capital stock, the marginal product falls as more labour is employed. This imparts the downward slope to the MPL_M curve. The amount of labour hired in the modern sector is given by the intersection of the

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[6]Important work on surplus labour was done by Amartya Sen; for instance, see Sen (1975).
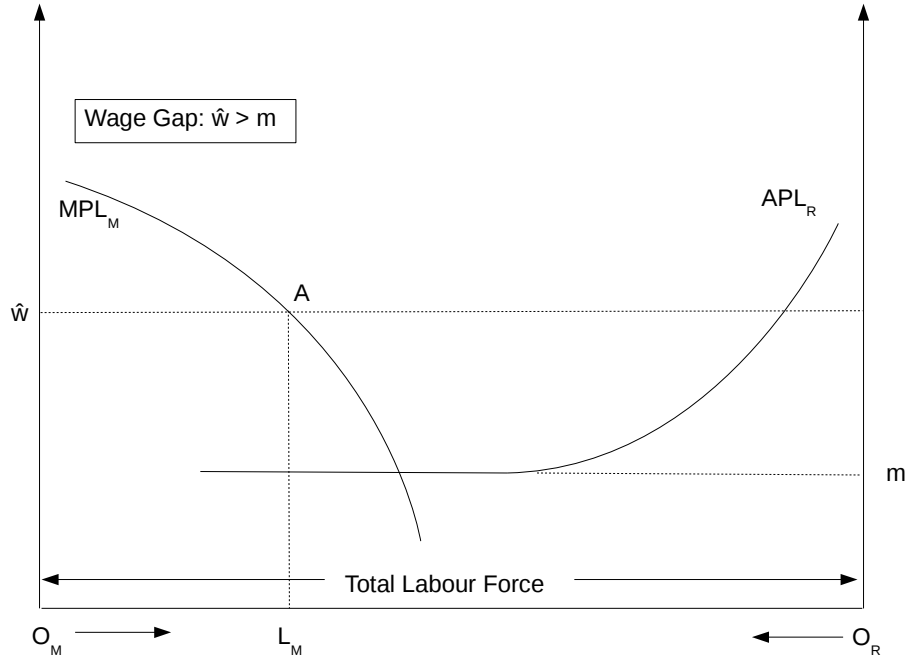
Figure 1: Basic set up of the Lewis model

horizontal line representing the real wage rate, $\hat{w}$, and the MPL_M curve. In Figure 1, the level of employment in the modern sector is represented by the length $O_M L_M$. Since the labour force can be employed in either the modern or the traditional sector, the level of employment in the modern sector also determines the level of employment in the traditional sector: those who could not be absorbed in the modern sector continue to be employed in the traditional sector. Thus, the level of employment in the traditional sector is a residual, determined ultimately by the ability of the modern sector to absorb labour. In Figure 1, therefore, the level of employment in the traditional sector is represented by the length $O_R L_M$.

While the level of employment in the traditional sector is determined by forces external to it, i.e. as the residual labour force that is not absorbed in the modern sector, average income is determined by production conditions within the sector. Unlike the modern sector, production units in the traditional sector do not operate on capitalist lines because capitalist relations of production do not prevail in the traditional sector. The typical production unit is a family farm or a family run business. In such an organization, the level of employment is not determined by considerations of marginal calculations, as in the case of a capitalist firm that maximizes profit. Rather, every person available for work is employed and the total income generated by production is distributed among them. Thus, the typical production

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unit in the traditional sector operates on the principle of *income sharing*. Without more information about how the total income is distributed among the family members working in a family farm or business, I will assume equal division, as a first approximation. Hence, the income earned in a typical production unit in the traditional sector will be the *average product of labour*, i.e. the total output divided by the total number of persons involved in production. This is represented in Figure 1 as the curve APL_R.

On the far left, the APL_R curve is relatively flat, or mildly rising, because of the existence of surplus labour. Thus, when labour is withdrawn from the traditional sector, the average output changes by very little (which is captured by the curve being relatively flat).[7] Since requirements of basic survival cannot be met below what we can consider a *subsistence* income, m, the APL_R curve is bounded below by the subsistence wage. Since we measure the amount of labour in the traditional sector with reference to the origin at O_R (read from right to left), as we move to the right, the amount of labour employed in the traditional sector falls, i.e. it is drawn into the modern sector. At some point, the supply of labour would be reduced to the the extent that the average product of labour starts rising. This is what imparts the upward slope to the APL_R curve as we come closer to the origin at O_R.

Figure 1 shows one configuration of the distribution of labour between the two sectors. The intersection of the MPL_M curve with the modern sector real wage line at A determines the level of employment in the modern sector as $O_M L_M$. This determines the level of employment in the traditional sector as $O_R L_M$, which is just the total labour force less the level of employment in the modern sector. The intersection of this level of employment with the APL_R curve then determines the average income in the traditional sector as m, in this case the subsistence income.

3.3 Economic Growth with Structural Transformation

Lewis (1954) offered an analysis of the process of economic growth in such a dual economy, and we represent this dynamic process in Figure 2. Profit maximising capitalist firms in the modern sector invest their profits to stay ahead in the competitive struggle. The resulting accumulation of capital increases the marginal product of labour at every level of employment. Hence the MPL_M curve, which represents the demand for labour in the modern sector, shifts to the right. The increased demand for labour is met at the existing real wage rate by drawing on the surplus labour in the traditional sector. For instance, if the demand for labour curve in the modern sector shifts to MPL'_M, then the level of employment in the modern sector increases from $O_M L_M$ to $O_M L'_M$. Employment in the traditional sector falls by exactly the amount of increase of employment in the modern sector. Thus, the process of economic growth gradually moves labour from the low productivity traditional to the high

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[7]Note that the graph of the average product of labour is not exactly flat, it is only mildly rising. When labour is withdrawn from agriculture, the average product would rise if output remained unchanged. Hence, the curve would be exactly flat if agricultural taxation removed the excess from the agricultural sector. The mildly rising curve is just meant to highlight the fact that average output does not change by much when labour is withdrawn, which is the key insight of the existence of surplus labour. For some discussion on this issue, see Ray (1998, pp. 367–368).

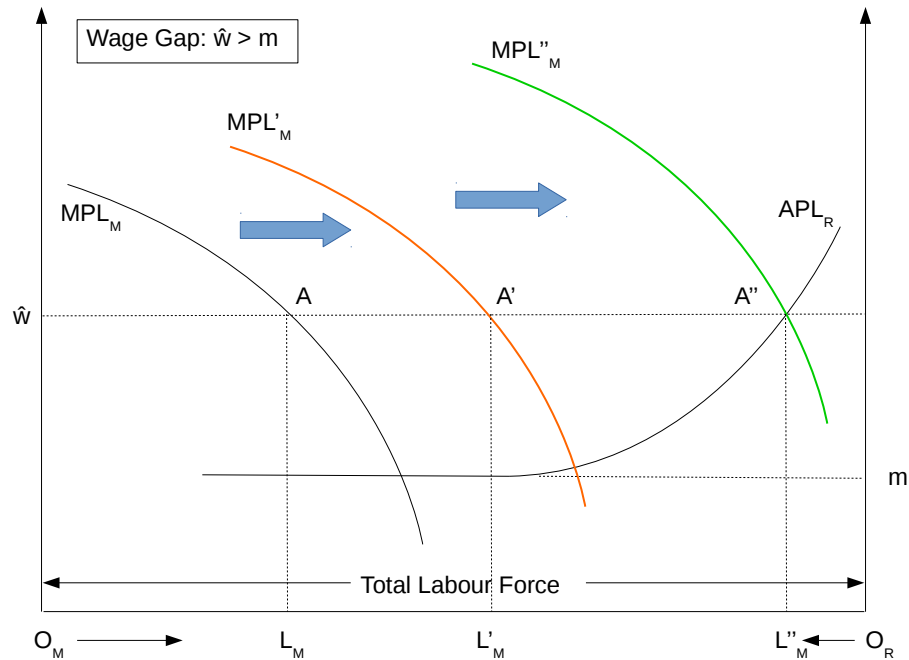productivity modern sector, so that economic growth is accompanied by structural change.

Figure 2: Capital accumulation and economic growth in a Lewis model

This process of Lewisian growth, which rests crucially on the existence of surplus labour and investment by capitalist firms of their profit incomes, will encounter two turning points, as indicated in Figure 2. Suppose the economy starts in a situation where the MPL_M curve, the demand for labour in the modern sector, intersects the real wage rate in the modern sector at the point A. As capitalists invest their profit income, the labour demand curve starts shifting rightward. When the MPL_M curve shifts all the way to intersect the modern sector real wage rate line at A', the traditional sector employment falls to $O_R L'_M$ and the economy reaches the first turning point. This turning point is defined by the possibility of a *significant* increase in the average product in the traditional sector.[8] If the process of capital accumulation pushes the marginal product of labour curve in the modern sector further to the right, the average product in the traditional sector will start rising above the subsistence level, m. The second turning point is reached when the process of capital accumulation in the modern sector has has managed to absorb all the surplus labour in the traditional sector.

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[8]Since the average product curve is always mildly rising, other than if there is taxation of agricultural income to drain the excess average product, as pointed out earlier, this turning point is really defined by a relatively sharp rise in its slope. Hence, it is defined by the first instance of a *significant* rise in real wages in the traditional sector.

Thus, this turning point is defined by the exhaustion of surplus labour, the disappearance of the wage gap between the sectors, and therefore also, of the structural transformation of the dual economy into a modern economy. This is represented in Figure 2 by the point A'', where the level of employment in the traditional sector has fallen to $O_R L_M''$ and the real wage rate is equal in both sectors.

3.4 Economic Growth without Structural Transformation

If the Lewisian process worked itself to completion as a rapid pace, that would be rather happy outcome. Not only, in that case, would the economy experience economic growth, but it would also witness structural transformation, most notably the movement of significant shares of the labour force into high productivity, high income employment. But the Indian economy has not witnessed such a transformation over the past several decades, as the evidence in Table 1 shows: a large part of the workforce remains caught in low productivity, low income work? Hence, we need to ask the question: what might impede the Lewisian dynamic process of economic growth from running its course?

One assumption implicit in the whole analysis is the absence of what early development economists called the wage good constraint. If the agricultural sector is not able to increase the production of food at the pace that is necessary to meet the demands of the workers who have shifted to the modern sector, then the price of food might rise, leading to a worsening of the terms of trade for the modern sector's output. This might lead to fall in the profitability in the modern sector and reduce the pace of capital accumulation. If this were to happen, then one of the crucial sources of growth in the Lewis analysis would be choked off: slowing down of capital accumulation would reduce the growth of demand for labour in the modern sector. Thus, surplus labour would not be drawn out of the traditional sector, and the dynamic process of economic growth and structural change would be stalled. These concerns figured prominently in discussions of the decade long industrial stagnation in the Indian economy from the late 1960s onwards (Nayyar, 1994).

While these issues are probably no longer as urgent today as they were in the 1960s, there are other problems in using a strictly Lewisian framework to think about the problems of employment in contemporary India. This is because there is a serious discord between the Lewisian account and important facts about employment in contemporary India. The Lewisian dynamic, if it were to have been playing out, would have led to steady depletion of surplus labour from the traditional sector, drawn into the modern sector by the demands of capital accumulation. But this is not what we observe in India and much of the developing world. What we see, instead, is the coexistence of rapid capital accumulation and tepid employment growth in the modern sector. It is not that demand constraints or adverse terms of trade movement, factors which had been highlighted in previous work, have put a brake capital accumulation. Rather, capital accumulation is taking place apace but without the absorption of labour into the modern sector. To explain this seemingly paradoxical state of affairs, we need to turn to the pioneering work of John Harris and Michael Todaro, whose analyses represent a natural extension of the Lewis framework (Todaro, 1969; Harris and Todaro, 1970).

4   The Harris-Todaro Framework

4.1   The Basic Set-up

By extending the analysis of the Lewisian model, Todaro (1969) and Harris and Todaro (1970) offer a framework for understanding the phenomenon of urban unemployment (and informal urban employment) in a dual economy even when there is rapid capital accumulation in the modern sector.[9]

The basic set-up of the Harris-Todaro model is similar to the Lewis model. The economy is composed of two sectors: an urban, modern sector characterised by capitalist relations of production; and a rural, traditional sector characterised by small scale family labour-based production units. In line with the basic assumptions of a dual economy model like that of Lewis (1954), there is an *exogenously* given wage gap.

The key novelty introduced by Harris and Todaro (1970) is an explicit analysis of the decision making process of worker-peasants with regard to the sector in which they decide to work. For any worker, there is the choice between working in the traditional sector in rural areas and migrating to urban areas to work in the modern sector. If *expected* urban income > *expected* rural income, then workers in rural sector will decide to migrate to the urban sector. The only situation of *migration equilibrium* will arise when expected urban and rural incomes become equal. This implies unemployment, in the urban, modern sector, either in the form of open unemployment or in the form of informal employment.

To see this, let us start with the traditional (rural) sector. The existence of surplus labour means that there is a guarantee of employment, but only at low wage (or average income). Hence the expected income in the traditional sector, which is the product of the probability of finding employment and the rural income (or wage), is the average rural income itself. This is because the probability of finding employment is unity.

Turning to the modern (urban) sector, we begin by noting that the existence of a wage gap implies that the average real wage in the modern sector is higher than the average income in the traditional sector. If the probability of finding a job in the modern sector was unity, then the expected urban income would be the modern sector wage. But this cannot be a situation of equilibrium because, in this situation, expected urban income is higher than the expected rural income. The only way the economy can attain the migration equilibrium, in the presence of the wage gap, is if the probability of finding employment in the modern sector is less than unity. But the probability of finding employment in the modern sector is the ratio of the total number of jobs in the modern sector and the total number of workers looking for those jobs. Since migration equilibrium requires the probability of urban employment to be less than unity, this means that there has to be more workers looking for jobs than there are

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[9]As I have noted earlier, Lewis (1954) explicitly recognizes the existence of what we today call urban informal employment, or what Todaro (1969) called the urban traditional sector. But what the Lewisian framework does not allow us to explain is the simultaneous existence of rapid capital accumulation in the modern sector and, at the same time, a steady or increasing share of urban informal employment. This is what the Harris-Todaro analysis allows us to explain. In later work, Lewis did recognize this aspect of the problem of employment in developing countries (Lewis, 1976).

jobs in the modern sector. This implies that there will be unemployment in urban areas, i.e. some workers who migrate from rural areas will not be able to find jobs, but will be part of the pool of unemployed workers in urban areas.
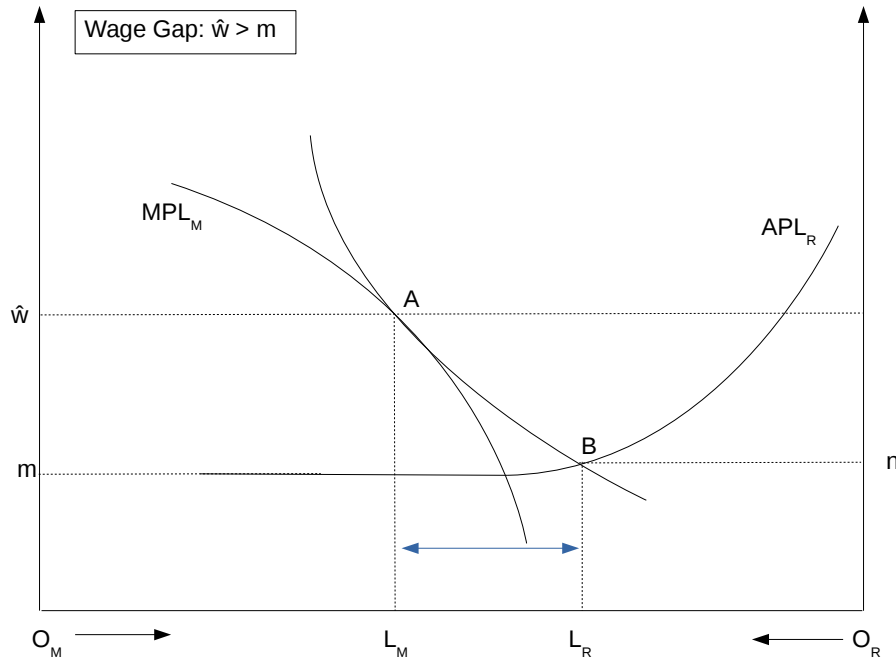

Figure 3: Basic set up of the Harris-Todaro model. Employment in the modern sector is represented by the length of the segment, $O_M L_M$; employment in the traditional sector is represented by the length of the segment $O_R L_R$. Thus, there is unemployment in the urban sector represented by the length of the segment $L_M L_R$.

This basic insight of the Harris-Todaro model - that there has to exist unemployment in the urban areas - can conveyed with the use of Figure 3. The elements of the Figure are the same as in the representation of the Lewis model in Figures 1 and 2: MPL_M and APL_R denote the marginal product of labour in the modern sector and the average product of labour in the traditional sector, respectively; $\hat{w}$ and m denote the real wage rate in the modern sector and the subsistence income level in the traditional sectors, respectively. To find the levels of employment in the two sectors, we start with the modern sector. The intersection of the MPL_M curve with the real wage line at A determines the level of employment in the modern sector: $O_M L_M$. To find the level of employment in the traditional sector, we draw a rectangular hyperbola through point A. The point of intersection of the hyperbola with the APL_R curve, B, gives the level of employment in the traditional sector: $O_R L_R$. This shows that the level of unemployment in the urban areas is given by the length of the segment

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$L_M L_R$.

Why do we draw a rectangular hyperbola through point A? This geometric device is used to incorporate the migration equilibrium into the diagrammatic analysis and to correctly determine the level of employment in the traditional sector. To see this, recall that the equation for a rectangular hyperbola is of the form

$$xy = k$$

where k is some fixed real number, and x and y refer to the two variables related to each other through the relationship given by the equation for the rectangular hyperbola. Hence, since points A and B both lie on the rectangular hyperbola (read with respect to the origin at O_M), we have

$$\hat{w} \times O_M L_M = n \times O_M L_R.$$

The left hand side of the above equality is the product of the real wage earned in the modern sector and the employment in the modern sector; the right hand side is the product of the average income earned in the traditional sector, n, and the line segment $O_M L_R$. The above equality implies that

$$\frac{O_M L_M}{O_M L_R} \times \hat{w} = n. \tag{1}$$

Note that the length of the segment $O_M L_R$ represents the part of the labour force that is not employed in the traditional sector. Since workers can be present in either of the two sectors - the traditional and the modern - $O_M L_R$ represents the total number of workers present in the modern sector. Similarly, the length of the segment $O_M L_M$ represents the labour force employed in the modern sector. Hence the ratio, $O_M L_M / O_M L_R$, represents the ratio of the number of jobs in the modern sector (which is equal to the number of employed workers) and the number of workers available for work, i.e. the total number of workers present in the modern sector. Hence, this ratio is the probability of finding employment in the modern sector. Thus, the left hand side of (1) is the expected income in the modern sector because it is the product of the urban real wage and the probability of finding a modern sector job. The right hand side of (1) is, of course, the expected income in the traditional sector. Hence, (1) is a representation of the migration equilibrium.[10]

4.2   Two Implications

There are two important implications of the Harris-Todaro model that are worth noting. The first implication is that there *has to be* unemployment in the urban sector, i.e. the probability of finding employment in the modern sector has to be less than 1. This means that there will always be more workers in the modern sector looking for jobs than the number of jobs, so

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[10]There are many limitations of the Harris-Todaro analysis. For instance, since expected incomes are equated to get the migration equilibrium, the implicit assumption is that workers are risk neutral, which might not be valid. Again, equating the probability of employment in the modern sector with the ratio of jobs and workers might be restrictive. A more flexible specification would allow the former to be a *function* of the latter. For these and other criticisms of the Harris-Todaro analysis, see Sen (1975); Basu (1997).

that some of the workers will remain unemployed, hoping to find a job when the next spurt of growth occurs. In this context we can think of unemployment broadly so that it includes two categories of workers: (a) workers in open unemployment, and (b) workers in informal employment. While open unemployment means zero income, informal employment in the urban sector can be seen as giving some positive income (that is lower than the average real wage in the formal sector). Thus, the Harris-Todaro analysis shows that some workers will always be caught in low income employment or zero income unemployment in the modern sector.

The second implication of the Harris-Todaro model is that narrowing down of the wage gap will be accompanied by lower rates of unemployment in the modern sector. To see this, let us return to the migration equilibrium captured by (1). If we denote by L and U the number of employed and unemployed workers in the modern sector, with unemployment understood broadly, then we can define the *unemployment rate* in the modern sector as

$$u = \frac{U}{L + U}. \tag{2}$$

Using this definition of the unemployment rate, we can re-write the migration equilibrium condition in (1) as

$$u = 1 - \frac{1}{w_g}, \tag{3}$$

where $w_g = (\hat{w}/n)$ is the wage gap, i.e. the ratio of the real wage in the modern sector, $\hat{w}$, and the average income in the traditional sector, n.[11] Hence, the re-written migration equilibrium condition in (3) shows that the unemployment rate in the modern sector is positively related to the wage gap in the economy.[12] A straightforward but important implication is that if the wage gap in lowered, say by some policy intervention, the unemployment rate - broadly construed - in the modern sector will also go down.[13]

4.3   Economic Growth with Growing Unemployment

We can now use the Harris-Todaro model to make sense of the paradoxical scenario we observe in India today: coexistence of rapid capital accumulation and stable or increasing unemployment, broadly understood, in urban areas.

The economy we wish to analyse is represented in Figure 4. The economy starts with a level of employment of $O_M L_M$ in the modern sector, a level of employment $O_R L_R$ in the traditional sector, and a level of unemployment in the urban sector represented in Figure 4 by the horizontal segment $L_R L_M$. Suppose now there is capital accumulation in the modern

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[11]The migration equilibrium condition is given by: $(L/(L + U)) = (n/\hat{w})$, which can be written as $1 - (U/(L + U)) = (n/\hat{w})$, which gives: $1 - u = (n/\hat{w})$. Since $w_g = (\hat{w}/n)$, we get $u = 1 - (1/w_g)$. Note that since $w_g \geq 1$, $0 \leq u \leq 1$.

[12]One can easily extend the analysis to explicitly incorporate informal employment in the urban sector. For some details of such an analysis, see the Appendix.

[13]This idea is not novel. In fact, it can be found in standard textbooks of development economics. For instance, see Basu (1997, ch. 8) and de Janvry and Sadoulet (2016, ch. 12).

sector. This would push out the marginal product of labour curve to the right. The new marginal product curve, MPL'_M intersects the urban real wage line at A', giving $O_M L'_M$ as the level of employment in the modern sector. Using the same geometrical device as before, we draw a rectangular hyperbola through A'. The rectangular hyperbola intersects the average product of labour curve in the traditional sector at B', so that the level of employment in the traditional sector is given by $O_R L'_R$. This means that the level of unemployment, broadly construed, in the urban sector is now given by $L'_M L'_R$. There is no guarantee that either the level or the rate of unemployment will fall with capital accumulation. In fact, for plausible shapes of the marginal and average product curves in the two sectors, the level and rate of unemployment can not only remain unchanged, it can also increase along with capital accumulation. Hence, we are now able to make sense of the coexistence of rapid capital accumulation and rising unemployment, the latter broadly construed, in an economy like India's.
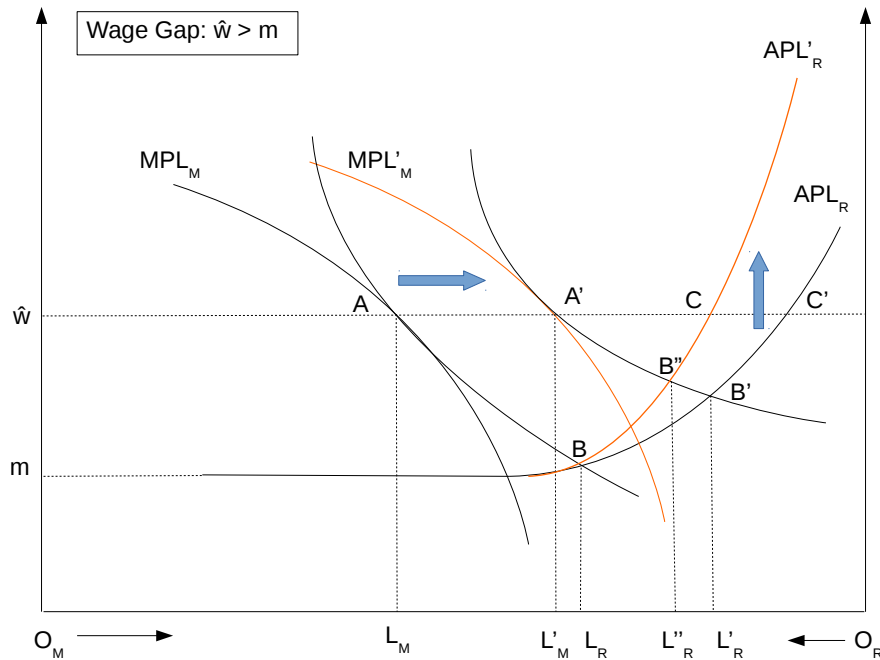

Figure 4: Capital accumulation and urban unemployment in the Harris-Todaro model

What is the intuition for this seemingly paradoxical result? The key factor that drives the result is the existence of the wage gap. As long as the wage gap exists, there will be migration from the traditional to the modern sector so as to equalize the expected incomes in the two sectors. This means that when there is rapid capital accumulation in the modern sector, which leads to an increase in the demand for labour, migration of labour from the

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traditional sector will also take place. In plausible scenarios, the migration will completely swamp the increased demand for labour, leaving a net increase in the unemployment level (and even in the rate of unemployment). Note that the result does not rely on increasing capital intensity of production, a factor that has often been attributed as the reason for the problem of employment. If capital accumulation is accompanied by technological change that increases the capital intensity of production methods, the problem highlighted by the Harris-Todaro analysis will only worsen.

If the key factor driving the continued existence of urban unemployment, even in the face of rapid capital accumulation, is the wage gap, we need to understand reasons for its existence and track its evolution over time. What maintains the wage gap? While labour legislation and the power of unionised workers in the modern sector, especially the component of the modern sector that is under the direct control of the State, could be contributing factors, there are other reasons as well, as I have mentioned above. It is often in the interest of employers in the modern sector to keep the real wage rate higher than what would be dictated by market clearing considerations. A large literature in information economics has pointed out that higher wages reduce worker turnover and increase worker effort. Thus, it is very much within the profit maximizing calculus of capitalist firms that they would refuse to let the real wage fall so as to reduce the wage gap.
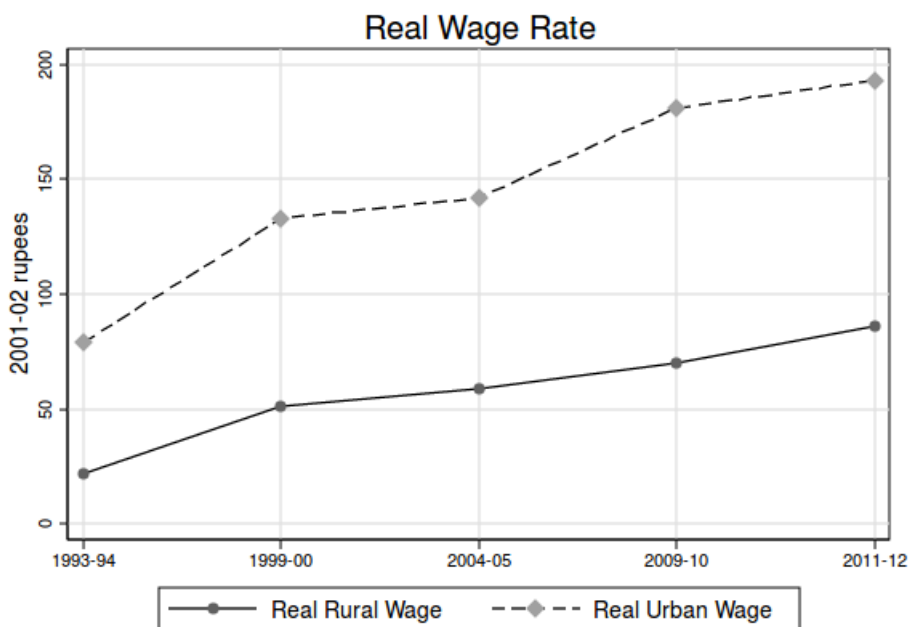

Figure 5: The wage gap in the Indian economy, 1993–94 to 2011–12. Source: The real wage data are from Mehrotra et al. (2014).

If we accept the importance of the wage gap, a natural question to investigate is its evolution over time. Figure 5 shows time series plots of the average rural and urban real wage, measured in 2001–02 rupees, over the past few decades. The data in Figure 5 show

clearly that the wage gap has not narrowed down over the past three decades since the early 1990s. In fact, it has widened in absolute terms. If we return to our discussion of the migration equilibrium condition of the Harris-Todaro model represented by (3), we recall that the wage gap and the unemployment rate in the modern sector are positively related. Using the data in Figure 5, we would then conclude that the unemployment rate in the modern sector (in urban areas) must have remained unchanged or increased. Since this is what we have observed for the Indian economy (see the evidence in Table 1), this provides us with one lens through which to understand the problem of employment in contemporary India.

5   Conclusion: Some Policy Implications

What policies can be adopted to make a dent on the problem of employment? The preceding analysis suggests a two pronged policy strategy.

The first component of the policy framework must deal with the adoption, enactment and implementation of a set of measures that can significantly reduce the wage gap. Since the wage gap can be reduced in either of two ways, i.e. by decreasing the urban wage, holding the average rural income constant; or by increasing rural incomes faster than the urban real wage, the question would arise as to which of these is more desirable. There are many reasons, I wish to argue, to recommend the latter, i.e. narrowing the wage gap by *increasing rural incomes* and not by reducing urban incomes. First, the increase in rural incomes while holding urban wages from falling would impart an overall impetus to the levels of aggregate demand in the economy. This will be beneficial in sustaining rapid economic growth in the macroeconomy, as has been pointed by other scholars (Nagaraj, 2017). Second, the relative increase in rural incomes will reduce levels of overall inequality in the distribution of income even as average incomes of the poorest and most vulnerable rise. This would be construed as an overall increase in economic welfare by most economists and policy makers.

What are the concrete policies that might be used for reducing the wage gap in the way that I am advocating? There are at least four concrete policies that can be used for this purpose. First, a step up in public investment in agriculture related to soil improvement, irrigation, extension services, and other related aspects of agricultural production can help in increasing the productivity and incomes in the sector. Second, increasing the outlays for the generation of public employment through the MGNREGA can push up the subsistence income level in rural areas and improve the fall back position of peasant-workers. Third, direct income subsidy to the rural poor, in the form of a better public distribution system and other such measures would also be of use. Fourth, infrastructural investment in rural areas, like the building of roads, electrification, storage facilities, and transportation networks would also be beneficial.

The first and the fourth measures, acting in conjunction, will lead to an increase in the productivity of agricultural production. The second and third measures will increase the average income levels in rural areas for every level of employment.[14] In terms of the analysis

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[14]Since there has been an inclusion of a clause for MGNREGA work to also be done on private land, that

presented in Figure 4, all these sets of policies would shift the average product of labour in the traditional sector (or at least in a large segment of the traditional sector, viz. agriculture) upwards. As can be seen from Figure 4, this will imply lower levels of unemployment in the urban sector for every trajectory of accelerated capital accumulation in the modern sector.

One such alternative scenario is depicted in Figure 4. The starting point of the analysis is represented by the points A and B, which pin down the levels of employment in the modern and traditional sectors, as also the level of broad unemployment in the modern sector. These are represented by lengths of the line segments, $O_M L_M$, $O_R L_R$, and $L_M L_R$, respectively. Stating from this initial situation, there is capital accumulation in the modern sector, which shifts the marginal product curve to MPL'_M. Unlike the previous scenario, there is a simultaneous upward shift of the average product of labour curve in the traditional sector - due to implementation, for instance, of the above four policies. Due to the upward movement of the average product curve in the traditional sector, its intersection with the rectangular hyperbola occurs at B", instead of at B'. Hence, the level and rate of unemployment in the modern sector is lower than in the absence of the policies.[15]

One key implication of this strategy that might generate scepticism is that it will increase employment in agriculture. This is because it has been widely accepted as a 'fact' that Indian agriculture cannot absorb more labour. While there will be limits to how much labour can be absorbed in agriculture, the Indian economy seems to be far off from such a scenario. How do we know this? One way to address this concern is to look at *land yields*, i.e. output per hectare of land, of key crops in the Indian economy and compare it with other areas of the world. Not only compared to countries like the United States, China, and Canada, but also in comparison to countries like Brazil and Bangladesh, average yields for many crops in India is quite low (Nagaraj, 2017). The implication is that there is still lot of scope for land-augmenting technological progress in agriculture, which might absorb labour. Hence, there is lot of merit, apart from demand-side considerations, to develop a concerted policy to increase agricultural productivity.

The second component of the strategy must include policies to create incentives for capital accumulation in the urban sector because the ability of the agricultural sector to absorb labour is limited. Thus, capital accumulation and shifting of labour from the traditional to the modern sector must take place, as emphasized by Lewis (1954). But the rigours of the transition - from the current state with surplus labour to a state with the vast majority of labour employed in the modern sector - can be significantly reduced in terms of human costs if rapid capital accumulation in the modern sector is stepped up *only after the wage gap has been narrowed down significantly.* The current focus on directly creating jobs in the modern sector by stepping up capital accumulation might be self defeating and increase human misery. A better strategy, suggest the Harris-Todaro analysis, is to start at the rural

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has the potential to increase agricultural productivity as well.

[15]Countries like South Korea, Taiwan, and China, which have managed to successfully industrialize along with structural transformation of their economies witnessed serious land reforms and rapid agricultural growth prior to sustained industrial take-off. It seems that the wage gap was narrower in these countries when they embarked on rapid industrialization. Hence, they could address the problem of urban unemployment and informal employment much more successfully than countries like India.

end of the economy, increase incomes in that sector, narrow down the wage gap and *only then* move towards the urban end.[16] The amount of capital accumulation that would be required to absorb the surplus labour in this second approach will be significantly lower than what would be required in a strategy with a singular focus on the modern sector. Contrast, for instance, the points C and C' in Figure 4, both of which represent absence of the wage gap. In the case of C', it is only the marginal product of labour curve in the modern sector that shifts out due to capital accumulation. In the case of C, the average product of labour in the traditional sector also rises up (in addition to the outward shift of the marginal product curve in the modern sector). In the case of the intersection at C', the marginal product of labour curve in the modern sector would need to move out by a far larger magnitude than in the case of C. Such massive rates of capital accumulation in the modern sector might not only encounter traditional supply side constraints, but also, much more importantly, environmental constraints.

Thus, what we need, in my opinion, is a radical reorientation of the focus of the existing development strategy: from the current state of neglect, we need to bring back the focus on the agricultural sector. This reorientation is the key to addressing the problem of employment in contemporary India without also worsening environmental problems and hitting supply constraints. The additional advantage of this strategy is that it will ensure that the process of economic growth is broad-based and relatively equitable.

Appendix: Informal Employment

It is easy to extend the analysis in section 4 to explicitly include informal employment in the urban sector. Suppose worker-peasants in the traditional/rural sector earn average income n. If they migrate to the urban sector, they can be in either of the following three states: formal employment, informal employment, and open unemployment. Let $L = L_F + L_I$, where L refers to all the workers who are employed in the urban sector, L_F and L_I refer, respectively, to formal and informal employment in the urban sector. Suppose the wage rate in formal employment is given by w_F and average income in informal employment is given by w_I. Let us represent workers in open unemployment in the urban sector, as before, with U. Thus, in this setting, the "broad" unemployment rate would be defined as

$$u = \frac{L_I + U}{L_F + L_I + U} = 1 - \frac{L_F}{L_F + L_I + U}, \tag{4}$$

and our interest is in understanding the effect of wage differentials on the unemployment rate represented by (4).

What is the relationship between the average rural income, and the wages for formal and informal urban employment? It is intuitively clear that wages in formal employment will be higher than average income in informal employment, i.e. $w_F \geq w_I$. It also seems reasonable to assume the following: (a) average income in informal urban employment, w_I, will be lower

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[16]In addition to increasing agricultural productivity, fostering growth of the rural non-farm sector would be an important part of this strategy.

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than the average income in the traditional sector, n; and (b) formal sector wage, w_F, will be higher than the average rural income, n. Hence, let us summarize the relationship between the three income levels as follows:

$$w_I < n < w_F. \tag{5}$$

Let p refer to the probability of remaining in open unemployment in the urban sector, so that

$$1 - p = \frac{L_F + L_I}{L_F + L_I + U},$$

and let q refer to the chance of finding formal employment *conditional on being employed in the urban sector*, so that

$$q = \frac{L_F}{L_F + L_I}.$$

This shows that the broad unemployment rate defined in (4) can be represented as

$$u = 1 - \frac{L_F}{L_F + L_I + U} = 1 - \left(\frac{L_F}{L_F + L_I} \times \frac{L_F + L_I}{L_F + L_I + U} \right) = 1 - q\,(1 - p). \tag{6}$$

Let us now consider the conditions for migration equilibrium in this setting with informal employment. Expected earning in the traditional sector is, as before, equal to average income in that sector: n. What is the expected earning in the modern sector? A worker can remain unemployed with a probability p and earn zero income. On the other hand, the worker can find employment with probability $(1 - p)$. Conditional on being employed, the worker can find formal employment at a wage w_F with probability q and informal employment at wage w_I with probability $(1 - q)$. Hence, expected earning in the urban sector is given by $0 \times p + (1 - p) \times [q w_F + (1 - q)\, w_I]$. In migration equilibrium, expected incomes in the traditional and modern/urban sectors must be equal, i.e., we must have

$$n = (1 - p) \times [q w_F + (1 - q)\, w_I].$$

Algebraic manipulation of this condition gives us a new version of the migration equilibrium as

$$u = 1 - \frac{1}{w_g}, \tag{7}$$

where $u = 1 - q\,(1 - p)$ is the rate of broad unemployment in the urban sector as defined in (4), and

$$w_g = \frac{w_F}{n - (1 - p)\,(1 - q)\, w_I} = \frac{1}{\frac{n}{w_F} - (1 - p)\,(1 - q)\, \frac{w_I}{w_F}} \tag{8}$$

is the *revised wage gap*.[17] Using (7), we get the same qualitative result as in the main text of the paper: reducing the revised wage gap will reduce the broad unemployment rate.

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[17]The condition in (5), i.e. that the average income in the urban informal sector is lower than average incomes in the rural sector, ensures that the revised wage gap is a positive quantity. In some contexts, it might be realistic to drop this assumption and instead allow the average income in the informal urban sector to be higher than the average income in the rural sector. This scenario can be accommodated in this analysis, and will not change the results as long as the average income in the informal urban sector is not "too high". In particular, as long as $n < w_I < \lambda n$, where $\lambda = (1 - p)^{-1}\,(1 - q)^{-1} > 1$, the results presented in this section will remain unaltered.

The revised wage gap, in turn, depends on two wage-income gaps: (a) the ratio of the wage in formal employment in the urban sector and the average income in the traditional sector; and (b) the ratio of the wage in formal employment wage and average income in informal employment, both in the urban sector. The expression for the revised wage gap in (8) shows that the best and most egalitarian way to reduce the revised wage gap and address the problem of broad unemployment is to increase average incomes in the traditional/rural sector relative to the wage in formal employment holding the wage-income gap between formal and informal employment in the urban sector fixed. The alternative strategy of trying to increase average incomes in informal urban employment, holding everything else the same, is not a good strategy. It will draw in more workers into informal employment in the urban sector and worsen the problem of broad unemployment.

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