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ABSTRACT

This paper examines the apparent conflict between the classical assumption of a bargaining agricultural sector wage and the neo-classical assumption of a competitive wage in the context of a labor surplus developing economy. It concludes that the relatively inelastic supply of labor hours offered by low income small or landless farmers in the static micro-economic leisure/work context is perfectly consistent with the persistence for some time of an institutional real wage offered to the non-agricultural sector of the dual economy. Empirical evidence is brought to bear in support of that position.

Keywords: Institutional vs. Competitive Real Wage, Labor Surplus Economy, Neoclassical vs. Classical Labor Markets

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The issue of "surplus labor" remains unresolved in the development literature. With unskilled rural labor the abundant resource in many developing countries, especially at an early stage of development, what determines the price of labor has been a controversial issue. Economists in the classical tradition[1] adhere to the notion of "surplus labor" -- the presence of disguised unemployment -- with wages for a time determined institutionally in a bargaining context. In contrast, neoclassical economists accept the concept of universally competitive labor markets, with labor supply decisions always grounded in individuals' solution to the utility maximization problem based on a labor/leisure tradeoff.

In this paper we propose to examine these two views and try to determine whether they are mutually exclusive -- as the neoclassical school claims -- or if they can be reconciled. We first briefly explore the classical view of rural labor markets and real wages in the context of the labor surplus model (Section I). We then examine the neo-classical evidence brought to bear against this and examine the argument on the basis of its own assumptions (Section II). Section III presents our response to their critique. Section IV contains empirical evidence to aid the evaluation of these two apparently contradictory views and defends the institutional wage hypothesis. Section V concludes.

[1] e.g. Lewis (1954), Fei and Ranis (1964).

I. THE CLASSICAL VIEW

A main feature of the labor surplus model is that there exists initial heterogeneity between commercialized (or modern) and non-commercialized (or traditional) sub-sectors of the economy[2] in terms of both production and organization.[3] This heterogeneity manifests itself in a relative initial "overabundance" of the rural population, given fixed land, leading to the absence of labor market clearance in the traditional sector. The empirical reality seems to be consistent with this theoretical construct since from 50 to 80 percent of the labor force in some developing countries, e.g. in Asia, is initially located in the traditional agricultural sector. The defining characteristic of that sector is that the output is jointly generated by the owner-operated farm family, the village, or the commune. Given a large labor supply relative to the fixed available land, a neoclassical wage equal to the marginal product of labor is not able to satisfy subsistence or institutional requirements, a facet of traditional sharing arrangements. With, say, family labor in place at the outset -- not hired up to the point where MR = MC -- an equilibrium or competitive wage is not realized. In other words, an institutional wage above the very low -- possibly even zero -- marginal product of labor may be necessary to meet subsistence requirements. This institutional or bargaining wage emphatically does not imply that labor is totally redundant, only that some individuals receive a return in excess of their low marginal product. This wage, in a sector where household and production activities are

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[2]In distinguishing between the traditional and commercialized sectors, it is implicit that the traditional sector correlates highly with agriculture and the commercialized sector correlates highly with industry. However, certain agricultural activities, e.g. capitalist plantations, can be considered commercialized, while small-scale services and household production of non-agricultural items can be considered non-commercialized.

[3]Our model of dualism thus differs explicitly from the original Lewis model which focused only on organizational heterogeneity. For a full discussion of this difference, see Ranis and Fei (1982).

fused and where individuals cannot be dismissed, is therefore not based on the normal tenets of neo-classical economics but on sharing conventions, social attitudes, subsistence requirements, and bargaining. It serves as a proxy for a consumption or income standard that determines the price of labor.

Since, by definition, an institutional wage in non-commercialized agriculture cannot be derived analytically from first principles, it is not satisfying to most economists. However, historical evidence pointing to an only slightly rising real wage in the traditional sector over time, even during periods of rapidly increasing agricultural labor productivity, is a reality (see Section IV). There is wide-spread anthropological and economic evidence supporting the existence of such a disequilibrium wage, at least for a time. The neoclassical commercialized sector's wage is "tied to" the traditional sector's institutional wage as long as the labor surplus condition persists -- probably at some premium reflecting the necessary inducement to move, plus an additional "gap" due to government or union interventions in the organized labor market. A critical goal of development in such a society is to move towards labor market equilibrium via the reallocation of labor over time, as synchronized investment and innovative efforts in the two sectors combine to achieve balanced growth at a pace exceeding population growth. In time, dualism consequently disappears as the traditional sector loses its characteristic labor surplus condition and converges toward the homogeneous one-sector neoclassical model.

A central issue is the speed of convergence to such a homogeneous one-sector neoclassical "equilibrium" when the initial conditions yield the dualistic system just described. That adjustment process is, at any rate, clearly not instantaneous because "surplus labor" from

the traditional sector can only be gradually reallocated into alternative employment in the commercialized sectors, where it is able to make a larger contribution to aggregate output.

Diagram 1 illustrates this dynamic labor reallocation process. Assuming an initial endowment L' of labor initially "in place" in agriculture at the institutional wage w, with MP_L the marginal product of labor, the portion (L"-L') of the labor force whose marginal product is below the institutional wage represents the underemployed or disguisedly unemployed. The so-called "unlimited" supply of labor to the commercialized sector is drawn from this segment and it is the reallocation of such labor to the commercialized sector over time that traces the ultimate transition to neoclassical equilibrium.

As more labor is demanded by the commercialized sector -- due to the twin forces of capital accumulation and technological change -- and as the productivity of workers remaining in the traditional sector rises -- due primarily to technological change, the pool of individuals in the traditional sector paid a wage above their marginal product shrinks.[4] Technology change shifts the marginal product of agricultural labor curve to the right (MP_L to MP_L' to MP_L") while the increasing demand for labor by the commercialized sector shifts labor quantity still in agriculture to the left (ALS to ALS' to ALS") until all of the disguisedly unemployed are "squeezed out" (at A for a given population). Such a balanced growth process terminates once commercialization is achieved -- when the wage equals the marginal product of labor -- indicating that the remaining agricultural workers (OL*) are fully commercialized. Supply curves are now upward-sloping as wages rise to induce individuals to change jobs or to

[4]For convenience we are assuming a constant population. In the more realistic case, the reallocation rate must exceed the population growth rate if the pool of the underemployed is to decline.

offer additional hours, and the factor payment/marginal product divergence noted above no longer exists.

The most important point to emphasize here is that this classical story is not based on a static, timeless model focused on the microscopic labor supply curve depicting an individual family's response to variations in the real wage. Instead, it is a long-run, dynamic picture, with the demand for labor by the developing commercialized sector interacting with an exogenous -- though not necessarily constant -- bargaining wage to determine the annual rate of labor reallocation. Whether and when labor surplus gives way to labor scarcity depends on the strength of the balanced growth process relative to the population growth rate. It is a process likely to play itself out over several decades of an LDC's transition growth effort.

II. THE NEOCLASSICAL CHALLENGE

The neoclassical school, represented most ably by Rosenzweig,[5] finds it difficult to accept the notion of an institutional or bargaining wage. The theoretical objection is that, by definition, an institutional wage cannot be derived from axiomatic first principles, employing the customary machinery of economics. Moreover, it is claimed that econometric evidence implementing the Becker tradition of household economics contradicts our conclusions. That evidence, however, is not focused on the aggregate supply of labor available to the commercialized sector over time. Instead, it is focussed on the comparative statistics of the individual rural household's consumption and production decisions, using the theory of rational choice and applying micro-econometric analysis. By solving the utility maximization problem for each household under market-clearing assumptions, an equilibrium solution can

[5]Rosenzweig (1988).

be found which traces out the individual family labor supply, which can then be aggregated with that of others. This is a perfectly legitimate approach but, as we will try to show, addressed to a problem different from ours.

Rosenzweig presents the basic neoclassical model applicable to the analysis of LDC rural labor markets. He assumes individual households of n members, with a single family welfare function and a fixed amount of land from which the family realizes a return when it is worked. With family agricultural production (A) a function of labor hours (L) and land (T):[6]

(1) A = Family Agricultural Output = f(L,T) ($f_L>0$, $f_T>0$, $f_{LL}<0$, $f_{TT}<0$)

Each family maximizes a neoclassical utility function of consumption and leisure:

(2) U = U(c,l) where c = consumption = A/n and l = leisure.

Rosenzweig's empirical analysis of rural labor markets concludes that the usual assumptions on preferences and the marginal disutility of labor yield an upward-sloping (not a horizontal) labor supply curve. Given variations in the real wage, the family labor supply can thus be expected to vary according to standard comparative static analysis and serves to demonstrate the inelasticity of the agricultural labor supply curve. Rosenzweig,[7] Lau, Lin, and Yotopoulos,[8] and Adulavidhya et al.[9] have found such a curve to be quite inelastic in a variety of developing countries -- including India, Taiwan, and Thailand -- based on a unitary

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[6]For the sake of simplicity we abstract here from possible additional non-agricultural or "Z" goods production by rural families.

[7]Rosenzweig (1988).

[8]Lau, Lin, and Yotopoulos (1978).

[9]Adulavidhya, Kurida, Lau, Lerttamrab, and Yotopoulos (1979).

elasticity between income and leisure. Barnum and Squire[10] along with Strauss[11] also found an inelastic labor supply curve for countries in Africa and Asia even when the assumed income-leisure elasticity differed from one. It is such inelasticity of the individual labor supply curve yielded by microeconomic evidence that has led neoclassical economists to reject the institutional wage/surplus labor hypothesis. However, as we shall try to demonstrate, the existence of an inelastic microscopic labor supply curve is quite plausible within a labor surplus economy.

III. THE CLASSICAL RESPONSE

An inelastic labor supply response to a wage change at the individual family level at a given point in time is not inconsistent with the classical position of a horizontal long run labor supply curve or, more realistically, one composed of a series of horizontal step functions over time. In order to reconcile these two apparently contradictory perceptions, we raise the question of whether, at an early stage of the development process, with a large percentage of the rural population still near subsistence levels, the concept of leisure via the application of the marginal disutility of labor as a labor supply determinant is likely to be a highly relevant criterion. As Booth and Sundrum[12] have pointed out, "most rural laborers in LDCs are desperately poor and are not inclined to reject any chance of extra employment in favor of leisure"; they are unlikely to exhibit the high preference for leisure necessary to account for the substantial unemployment documented in developing countries. The neoclassical mainstream

[10]Barnum and Squire (1978).

[11]Strauss (1983).

[12]Booth and Sundrum (1985, p. 245).

recognizes this for the case of landless workers, but maintains the existence of a positive income-leisure trade-off for landed families. In reality, even landed families near the subsistence level can be expected to supply close to the maximum possible number of labor hours in order to ensure survival. It should not be surprising that such families evidence an inelastic supply of additional man-hours in response to a wage change.

Turning to the analytical underpinnings of the controversy, given the normal case of heterogeneous land ownership, the population of any LDC's traditional sector can be partitioned into three classes: large landowners who work their own land and hire labor, small landowners who work their own land and sell some of their labor, and landless workers who sell all of their labor in the rural labor market. Diagram 2 illustrates individual family labor supply equilibria for each of the three classes of families with a given real wage. There are two distinct equilibria represented in Diagram 2: point E, the own-land production equilibrium, and point J, the individual/family work-leisure equilibrium. Landless families (Diagram 2c) have only the J equilibrium to worry about. A change in these equilibria in response to a higher wage is depicted by the shift from line w to w', with a steeper slope. For a given total product curve (TP), a rise in the real wage from w to w' changes both equilibria to E' and J'. From this, the labor demand curve for own-land production (ab) in the lower deck and the individual/family labor supply curve to the market (cd) can be generated for each type of family. Diagram 2a depicts families which hire in labor and diagram 2b families which hire in labor. Since in a small holder world most families can be assumed to be near their labor supply constraint, the increase in the quantity of labor supplied is slight and an econometrically measured labor supply response to a wage change across multiple families is

likely to be quite inelastic. The point is most clear for landless families but also applies to poor landed families.

The argument can be easily generalized for the customary heterogeneous land-holding population. Diagram 3 illustrates the own-land equilibrium labor demand for a given wage and varying quantities of land, affecting the total output (TP) curve. At the prevailing wage each tangency with the total product curve represents own-land labor deployment. The locus of tangencies in Diagram 3, depicting total product and quantity of labor combinations, traces out a constant average physical product of labor (APP_L) curve at the given wage.

Diagram 4 combines both own-land demand and total labor supply at a given wage with heterogeneous-sized land ownership. More land implies both additional labor needed for own-land cultivation and a higher rental income. Both the points E, own-land equilibria, and the points J, individual/family work-leisure equilibria, are represented in this graph for households of different-sized land holdings. The locus of all work-leisure equilibria, comprising a cross-section of the agricultural population, traces out the aggregate income-consumption (Y-C) curve at the prevailing wage. Families who demand additional labor to work their land have own-land labor supply equilibria positioned to the right of the Y-C curve, while families who sell their labor on the market have own-land labor supply equilibria located to the left of the Y-C curve.

If we now permit the wage rate to change, maintaining the heterogeneity of land ownership assumption, the APP_L curve, tracing out the E equilibria, shifts to the left and the Y-C curve, tracing out the J equilibria, shifts to the right, as illustrated in Diagram 5. In a relatively poor developing economy we assume that the Y-C curves have their origin near the subsistence level, where the labor/leisure indifference map is relatively flat. For each wage, the

intersection of the relevant APP_L curve with the relevant Y-C curve determines the actual quantity of labor supplied in rural labor markets. As demonstrated by the L^S curve in Diagram 5, the locus of all such intersections, based on the own-land and work-leisure equilibria generated, traces the aggregate labor supply curve. This curve is likely to be quite inelastic, the more so the more the families are of the small-holding or landless types.

We should therefore not be surprised by Rosenzweig's India findings. We would expect inelastic individual family labor supply responses at a point in time, not only from landless families, as Rosenzweig himself acknowledges, but from landed families as well. This, however, by no means invalidates our labor surplus hypothesis which addresses a fundamentally different question. The above neoclassical analysis is concerned with the comparative static response of individual households to hypothetical wage changes. We are concerned with tracing the path of the long term labor supply to the non-agricultural sector. We hope to show, moreover, that the empirical evidence is consistent with our explanation of balanced growth in the successful dualistic economy context.

IV. SOME EMPIRICAL EVIDENCE

Before reviewing the historical evidence from some successful balanced growth cases, it is necessary to recall that our model implies neither a strictly constant real wage as has been asserted by Papanek[13] nor a zero marginal product of labor as referred to by Rosenzweig[14]. As agricultural labor productivity rises over time, we recognize that there is likely to be some upward creep in the institutional real wage. The time path of the agricultural real wage is

[13]Papanek (1990).

[14]Rosenzweig (1988).

indeed more likely to approximate a step function, implying a statistically gently upward-sloping path until the so-called Lewis turning-point is reached. The important point is that until that happens, the assumption of an institutional wage above the still low marginal product of labor continues to hold and that this wage rises only slowly via bargaining adjustments but lags substantially behind agricultural productivity increases.

If agricultural real wages are found to lag markedly behind rising agricultural labor productivity change, such a pattern clearly supports the classical time-phased view. It certainly does not support the neoclassical position of instantaneous continuous market clearance.

Diagrams 6 and 7 present indices of the real wage and the marginal product of labor in the agricultural sectors of Taiwan and Japan during their respective well-known successful periods of transition.[15] The indices, normalized to begin at the same point, unambiguously illustrate that in both cases the marginal product of labor in agriculture rose significantly faster than the real wage.

Williamson[16] presents additional evidence based on historical data from the now developed countries. He shows that during the industrial revolution in Britain, the real wage was constant for nearly 40 years, with a commercialized/traditional wage gap of about 2 to 1. The observed phenomenon of rising agricultural productivity and nearly constant real wages after the Enclosure Movement represents additional supportive evidence. Williamson also comments that "[Lewis was] right in viewing the rural sector as an 'industrial labor reserve'

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[15]Data availability forces us to use an agricultural/non-agricultural instead of a traditional/commercialized sector breakdown.

[16]Williamson (1989).

such that the urban sector could draw on rural labor supplies during expansion." On a more disaggregated level, Huang[17] analyzed 1960s data in Malaysia at the province level. He found that in three separate regions the marginal product of family labor rose significantly faster than the real wage and that the wage/marginal product gap was only reduced later with the approach of commercialization. Huang's results are consistent with the initial existence of disguised unemployment and the ultimate equalization of the wage and marginal product once the economy approaches a one-sector neo-classical equilibrium.

Along with these trends in labor productivity and wages, other supportive evidence may be cited. One such is concerned with measuring surplus labor in terms of un- or under-employment. Mehra[18], by estimating the potential number of employment hours available in agriculture and comparing it to actual hours worked and the hours required, given prevailing production techniques, found a 17% agricultural labor surplus in India. Turnham and Jaeger[19] found 17.2% of rural Thai labor to be surplus in 1971-72 according to the income approach to unemployment based on productivity relative to remuneration.

Another set of empirical evidence rests on analyzing people's willingness to supply additional labor. Sanghvi[20] found that 28% of Indian unskilled male labor in agriculture could be considered "surplus" since male casual workers desired to supply, on average, 28.9 days of labor a month but in reality were able to work only 24.1 days a month. Raj Krishna[21] and

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[17]Huang (1971).

[18]Mehra (1966).

[19]Turnham and Jaeger (1971).

[20]Sanghvi (1969).

[21]Krishna (1973).

Ahuja[22] (1978) found that at the prevailing wage over 13% of the Indian agricultural population was willing to work additional hours. Booth and Sundrum[23] cite Indonesian government statistics illustrating that in the 1970s the Indonesian agricultural labor force had over 20% of its members either unemployed and looking for work or working part-time and willing to work more at the present wage.

It will also be useful to relate the results of two studies of Egypt as a labor surplus economy. Hansen[24] used extensive government survey data from Egypt to conclude that surplus labor was absent, with unemployment near 5% and ample work opportunities. He also showed that real wage constancy did not exist, as there was substantial variation in the daily wage in agriculture. However, Hanson[25] examined the same data set and argued that Hansen's analysis of absent surplus labor was incorrectly based on Western standards, specifically an eight-hour workday. Adjusting for the seasonality of agricultural production processes, he found that substantial surplus labor was present (especially during the slack season) and that there were few outside work opportunities, thus rendering the labor/leisure tradeoff irrelevant and unemployment not voluntary.

Finally, while most economists are understandably reluctant to venture beyond customary disciplinary boundaries, there is real evidence emanating from anthropological and sociological sources supporting the notion of a bargaining wage at an early stage of the

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[22]Ahuja (1978).

[23]Booth and Sundrum (1985).

[24]Hansen (1969).

[25]Hanson (1971).

development process. For example, Ishikawa,[26] an astute long-time observer of Asian economic development, advances the concept of a "minimum subsistence level of existence" (hereafter MSL) based on an institutional real wage. His theory parallels ours by focusing on the transition process in which "the state of the [traditional] economy's underdevelopment changes in the direction of a more developed market economy." With families in developing nations grouped into distinct economic classes, a large class can be characterized as MSL, which implies income and consumption at the MSL level and some uncertainty about the ability to maintain MSL. The actual concept of MSL includes the minimum means necessary for existence -- food, clothing, shelter -- along with the means to acquire some minimum standard of "human capabilities" in a socio-economic sense, including education, basic social abilities, and job skills. Ishikawa documents "a desire of the people in an agricultural society jointly to secure a minimum subsistence level of living" for all individuals (p. 457).

The application of this classical view of the rural labor market must be seen in an historical context. In a labor surplus economy non-commercialized farm families will not supply labor to the commercialized sector at a wage below w, the MSL wage, since prolonged work at a lower wage will not allow the individual to "stay" in the market or possibly even to survive. Hence real wages in this sector are downwardly rigid at w. This implies a horizontal labor supply curve at any point in time and a step function over time -- until the labor surplus has been "squeezed out." At that point the labor market behaves neoclassically, with a rising wage necessary to induce additional supplies of labor. Upon complete commercialization of both sectors, in other words, the MSL wage disappears and the market principle of employment and income distribution replaces the sharing principle.

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[26]Ishikawa (1975, 1981).

Ishikawa finds that empirical evidence for Asia as a whole indicates the prevalence of "a community principle of employment and income distribution which promises all MSL families in the community employment, with an income not less than MSL" (p. 474). In pre-war Japan, all working villagers, regardless of social position, were "assured a means of maintaining their livelihood" (p. 465). Pre-Communist Chinese villages "performed important functions in sustaining the economic life of its member families via group management/relief and by providing cooperative public goods" (p. 467). Finally, in India, landowners "were obliged to provide at least a minimum of subsistence to dependent families" (p. 471).

In other studies, Hayami and Kikuchi[27] found that in Indonesia, "wages do not adjust on the basis of labor's marginal product, but according to subsistence requirements of the time and social conventions" (p. 217). Only over time is there a tendency to adjust towards the neo-classical equilibrium.[28] Scott also documents the fact that most Asian villages have "informal social controls in existence which assure that the minimum needs of all individuals are met."[29]

The transition process en route to full commercialization is thus observed to be strongly influenced by something like the MSL concept. As an economy develops, increasingly strong competitive pressures force changes in the prevailing institutions and the

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[27]Hayami and Kikuchi (1982).

[28]Yet this does not always occur by altering wages to equal the marginal product of labor, which could reduce the wage below the MSL level. Instead, the adjustment occurs institutionally and the MSL wage is not threatened. For example, in Java and the Philippines harvest contracts began to include weeding duties without a complementary rise in the wage rate, thereby not threatening the MSL but making institutional adjustments towards a commercialized economy.

[29]Scott (1976, p. 41).

ultimate breakdown of the non-commercialized sector. While the notion of an institutional wage may be troubling to some economists, the empirical reality of its existence and validity in the developing world is difficult to deny.

V. CONCLUSION

We claim no inherent conflict with the neoclassical view of LDC agricultural labor markets at the static, microscopic level since our model focuses on dynamic time paths at the macro-level. However, neoclassical economists have taken issue with our results and have claimed that these two propositions are mutually exclusive. This paper is not intended to uphold our position by invalidating the neoclassical model. It is, rather, our intent to demonstrate that we are talking about two different issues. Rosenzweig's empirical findings are inherently reasonable, given his own neoclassical machinery, especially when the individual family's leisure/work trade-off is viewed in its proper low income LDC perspective. But they do not contradict our view of an institutional real wage gradually yielding to a competitive real wage in the context of the dualistic economy's transition growth process.

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Diagram 1: The Transition Process

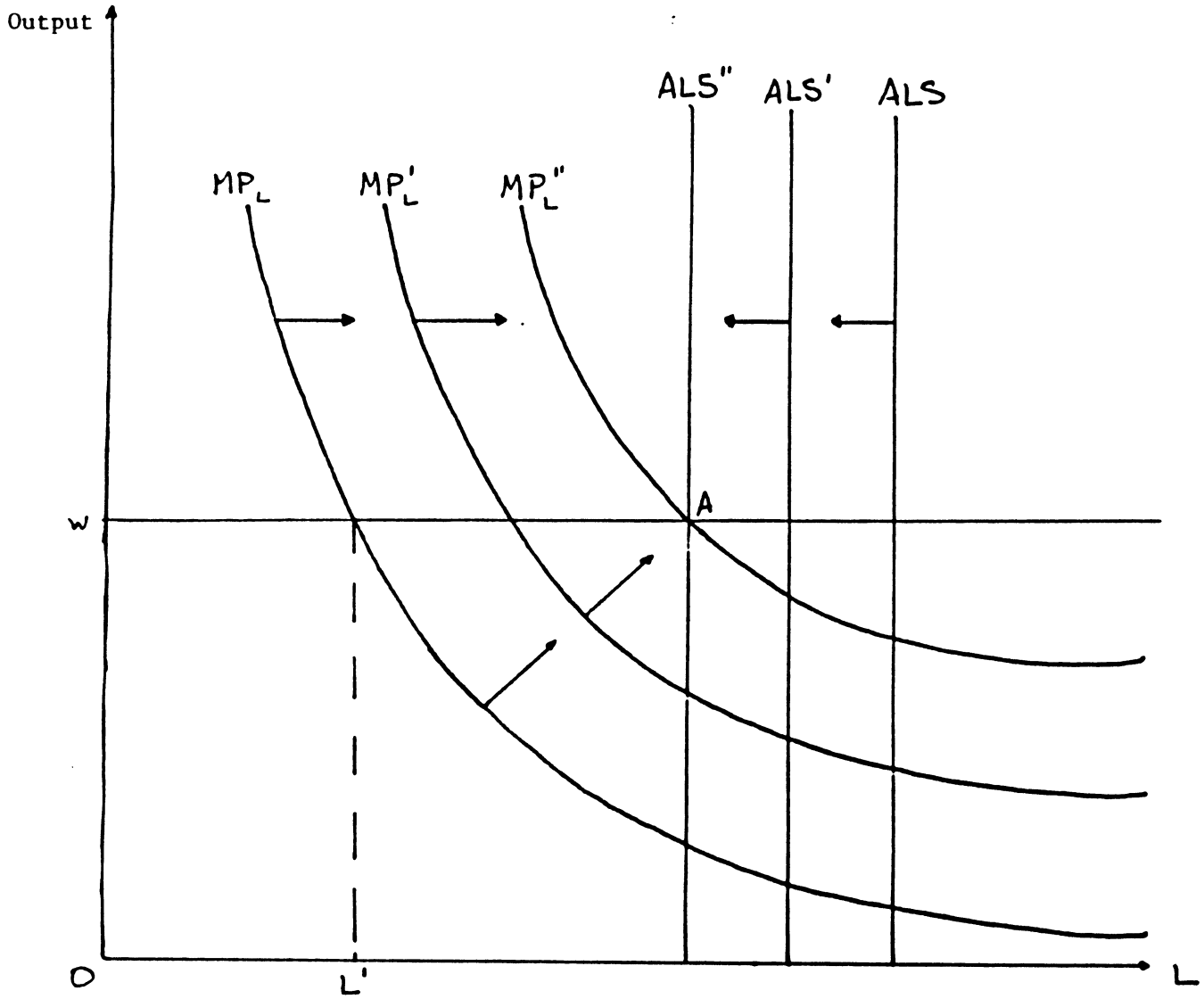


Diagram 2: Household Labor Supply

- Fixed Land Size, Changing Wage

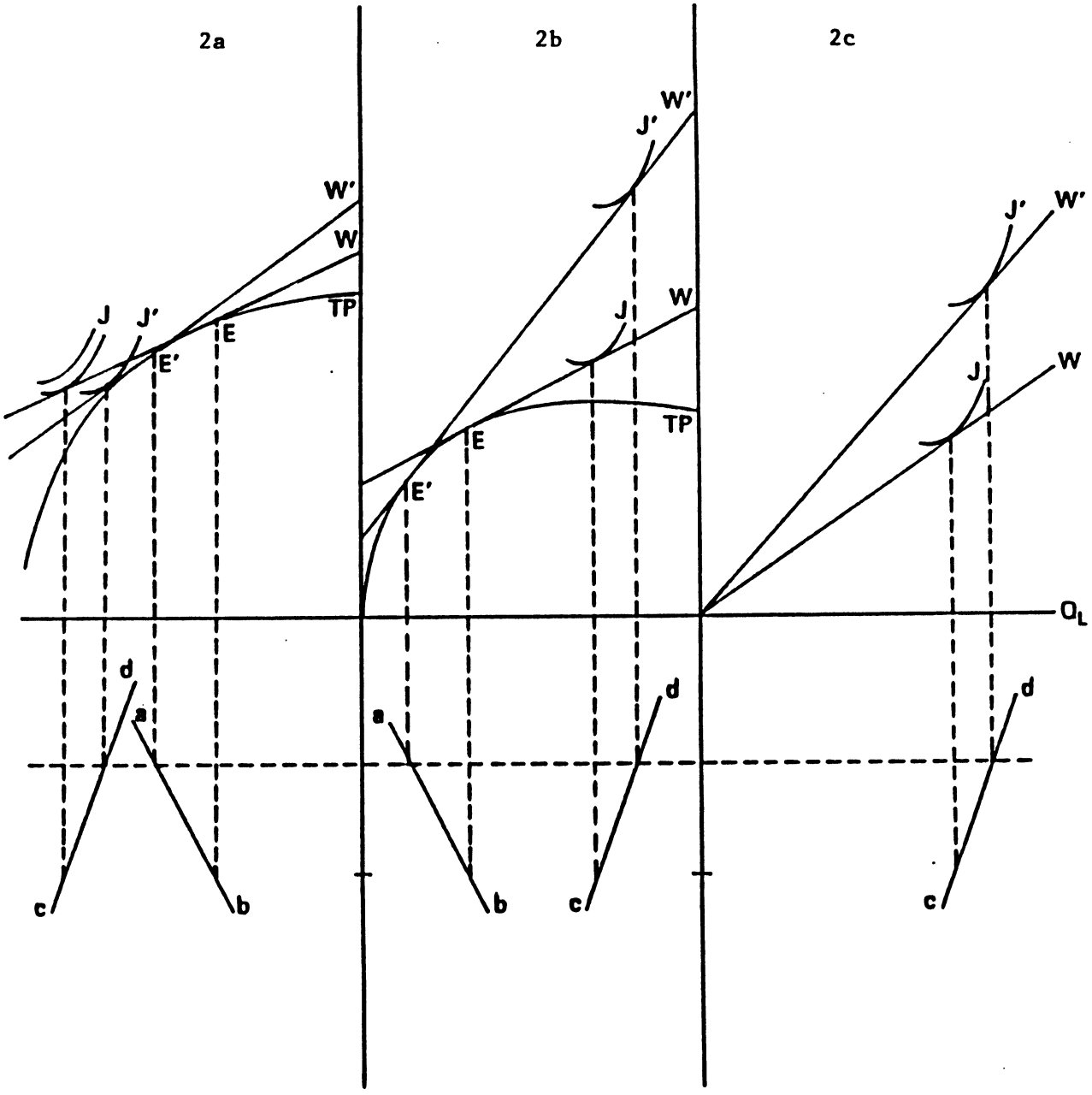


Diagram 3: Household Own-Land Labor Demand

- Fixed Wage, Differing Land Size

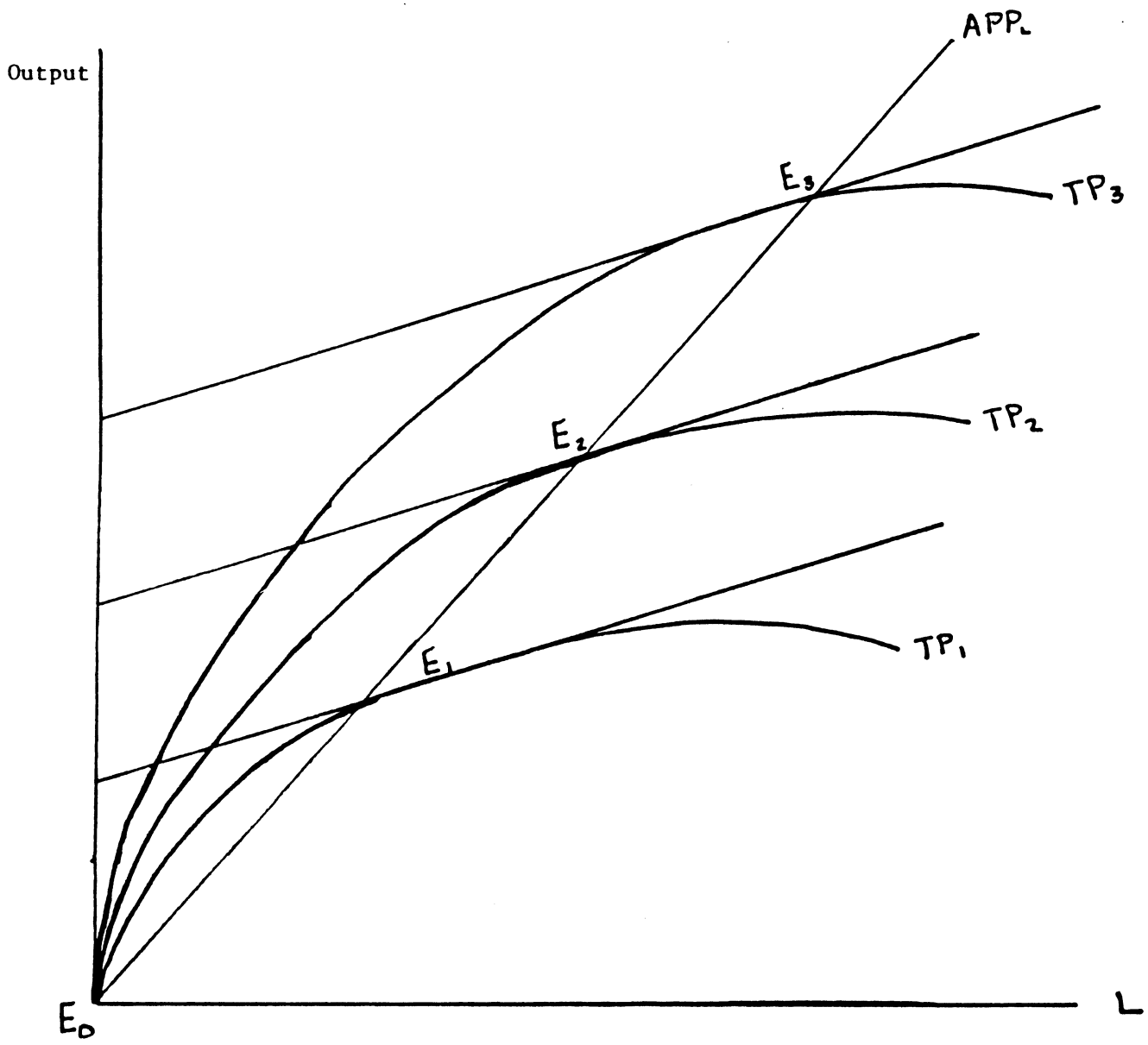


Diagram 4: Household Labor Supply

- Fixed Wage, Differing Land Size

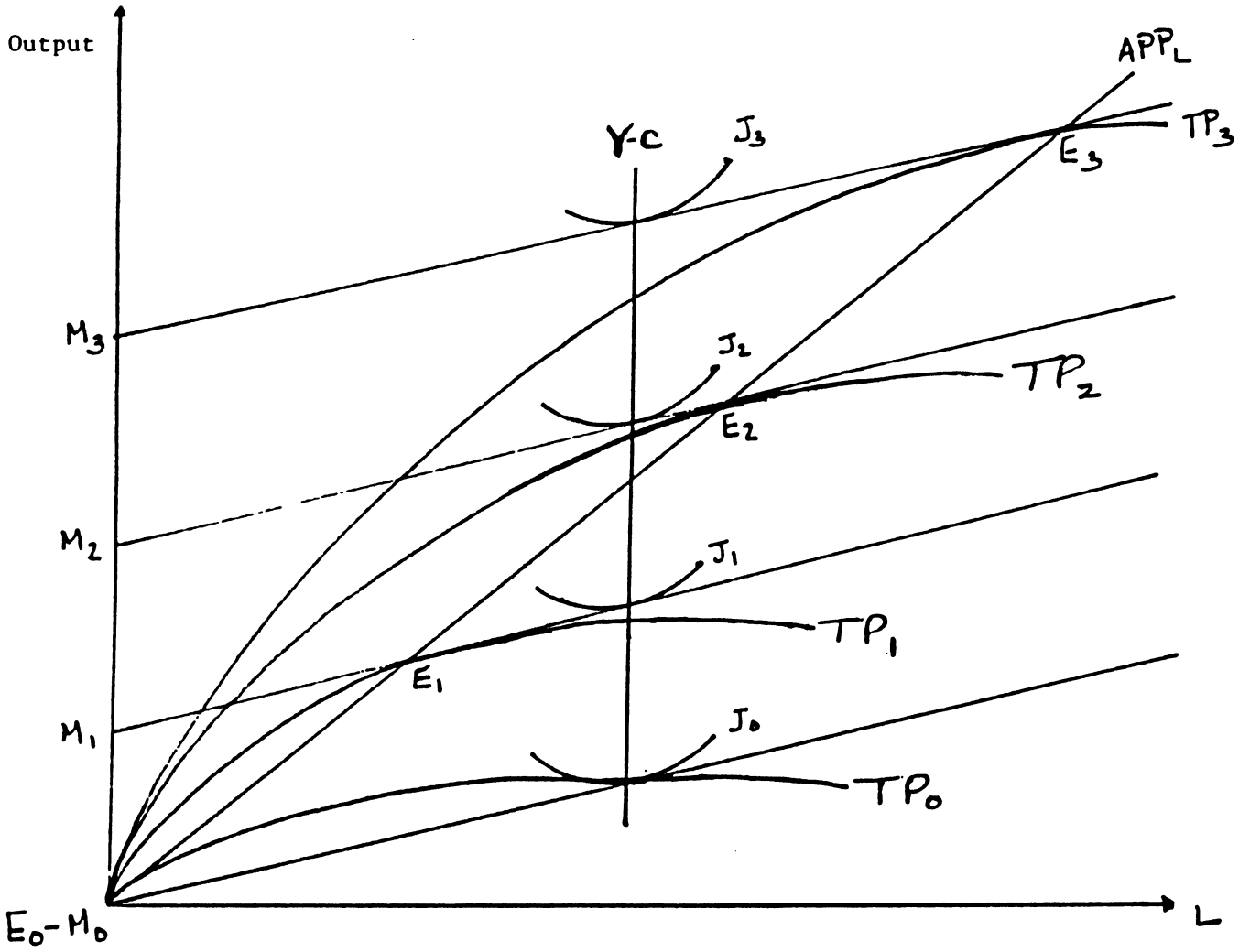


Diagram 5: Aggregate Labor Supply Curve

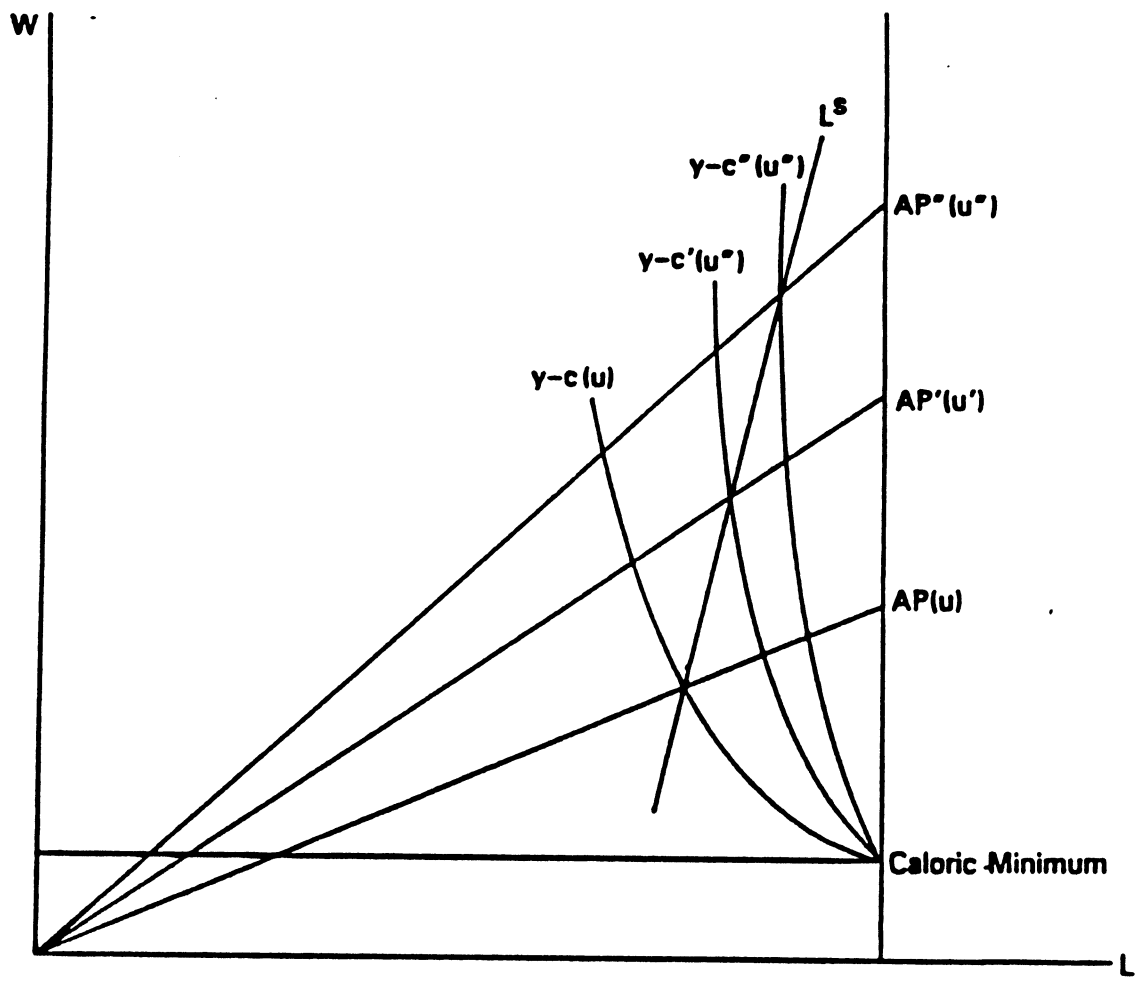
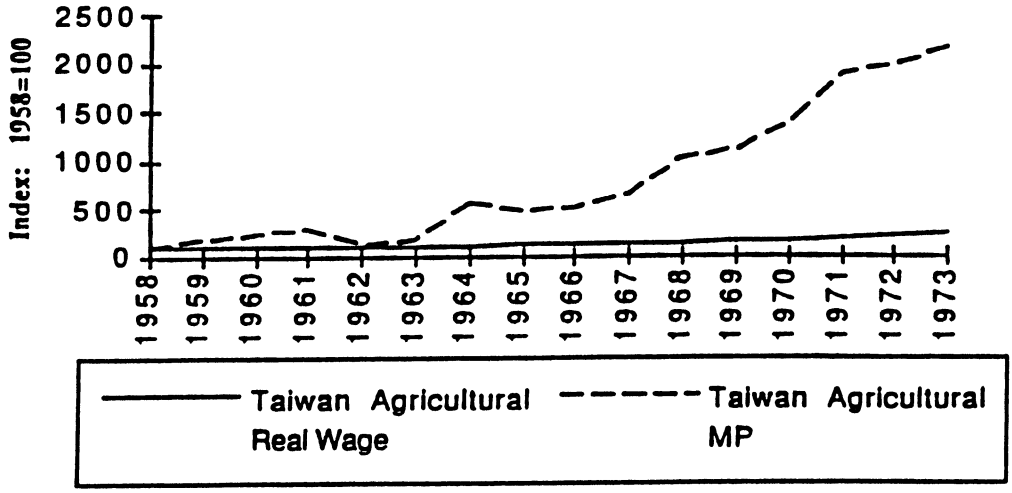
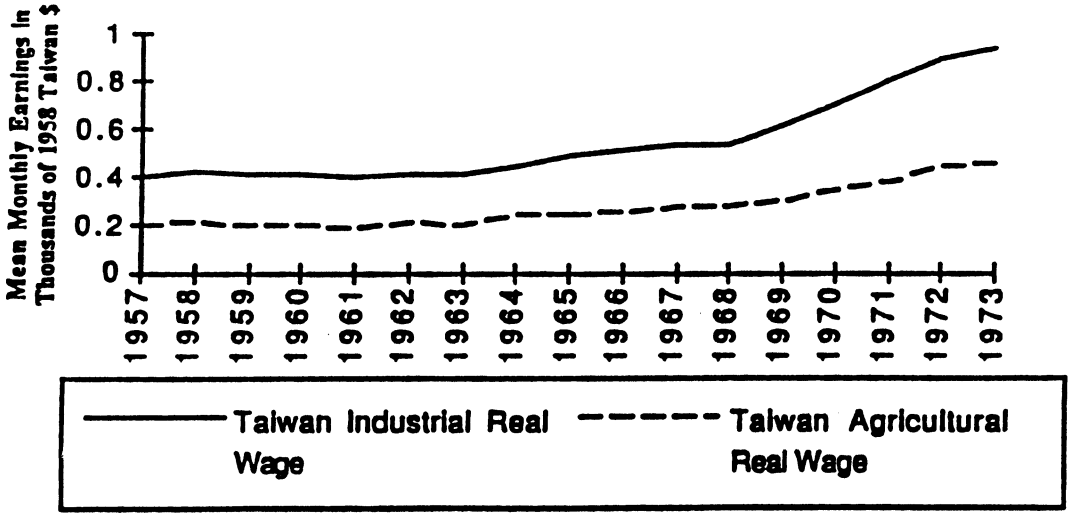


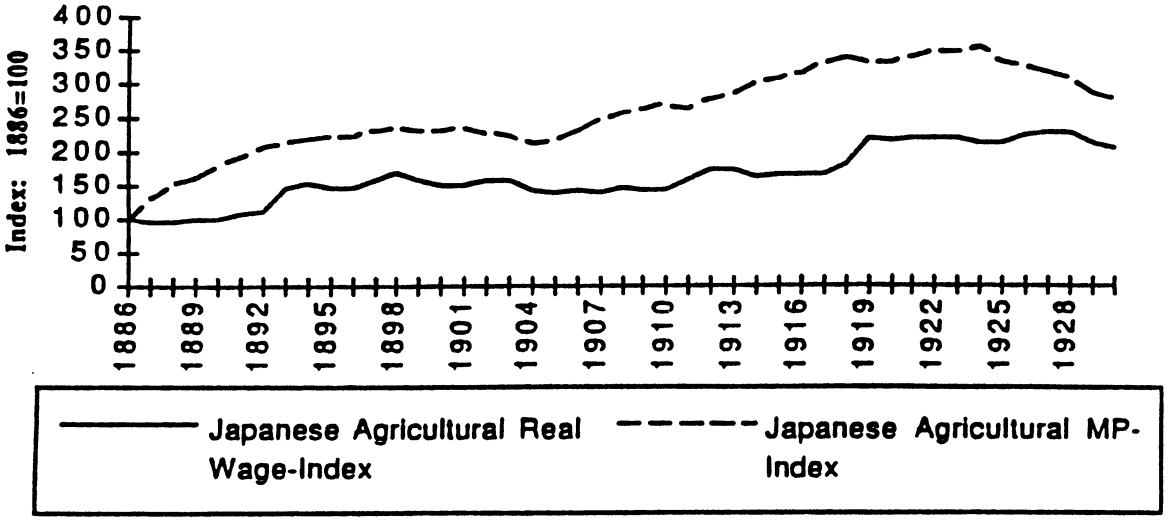
Diagram 6: Taiwan

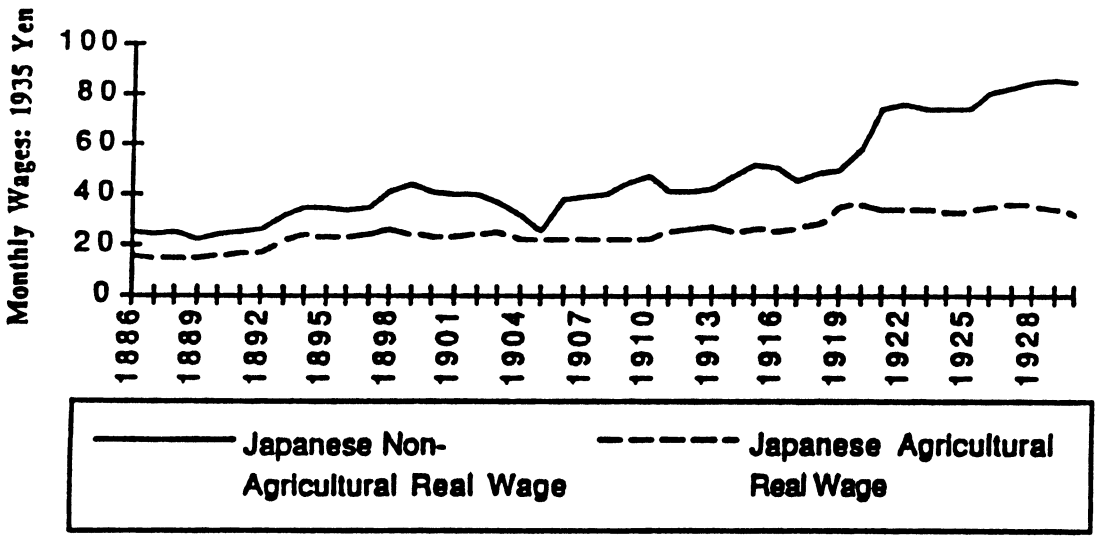




Source: Data for Taiwan was obtained from the U.N. Food and Agricultural Office (1955-1987), the U.N. Statistical Yearbooks, Ranis & Fei(1992), Taiwan Statistical Data Books, Taiwan Demography, and Taiwan Monthly Statistics.

Diagram 7: Japan





Source: Data for Japan was obtained from Minami(1968) and Ranis & Fei(1992).