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THE RIVALRY BETWEEN OIL AND COMMODITY PRICES^{*)}

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ABSTRACT

This paper examines the price linkages among food commodities (rice and wheat), bio-fuel commodities (soybean, CPO, maize, and sugarcane), and crude oil based on monthly data between 1980 and 2010. The modeling framework incorporates several aspects of the time series econometric literature including unit roots, Granger causality, error correction, and co-integration.

We find that (i) there is strong rivalry between food/bio-fuel commodities and crude oil prices, well above the co-movement observed between these two prices and prices of other primary commodities; (ii) crude oil prices have a stronger effect on bio-fuel commodity prices compared to food commodity prices; (iii) price shocks originating in the crude oil market are transmitted at much higher speed to the food market than vice-versa. The most important implication that can be drawn is that the food security system should be an integral part of the energy security system.

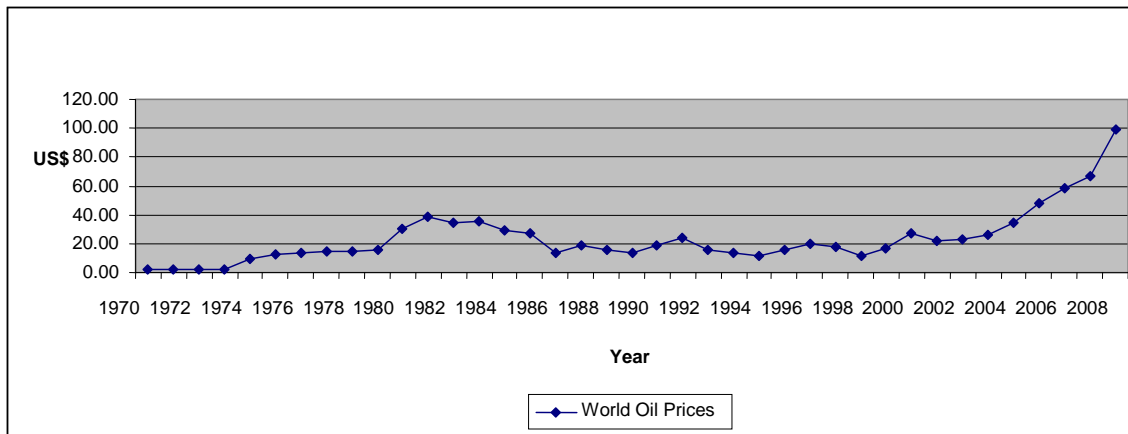
INTRODUCTION

Oil has been historically an important commodity in every economy. It is not surprise, therefore, that the price of oil changes attracts a considerable degree of attention for many decades. Various attempts have been undertaken to explain the behaviour of the oil price as well as to assess the macroeconomic consequences of oil price shocks especially since oil crisis in 1970s.

The oil price shocks repeated in early 2000s. The wide price fluctuations in 2000s, when crude oil price index has increased by 272 per cent between January 2000 and March 2008, and fluctuations by more than US\$ 20 a barrel in mid-2008 reinforce the idea that oil prices are volatile (See: Figure 1). The volatility of oil prices has prompted governments — especially in developing countries — to intervene in the oil market in various ways, including price-smoothing schemes for end users, fuel tax adjustments, price controls, and incentives for diversification away from oil.

At the same period, the world witnessed the most marked commodity price boom of the past century. The price of metals, food grains, and other commodities rose sharply, and over a sustained period. Like earlier commodity booms, this one was associated with strong global growth, but was exceptional in its duration and in the range of commodities affected. By mid-2008, metals and minerals were 296 per cent higher and internationally traded food prices 138 per cent higher — mainly due to higher grain prices.

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Source: IMF (2010)

Figure 1
Price of World Crude Oil, 1970 to 2008

The high food commodity and oil prices have significant political impacts. Haiti, for example, faced serious internal governmental problems. China, Vietnam, and India imposed some protections to their international trades. Indonesia, among others, desired to develop the national food and energy security (Sugiyanto, 2008). Coupled with the financial crisis that erupted in September 2008 and the subsequent global economic downturn, some developing countries have suffered dramatic increase in poverty incidence (World Bank, 2009).

The concurrence of the sharp increases in oil and food prices raises the question as to the nature (permanent or temporary) of the relationship between the crude oil with food commodities prices. The main objective of this paper is to investigate if the crude oil price has a significant role in shaping the dynamics of selected food commodity prices by exploring if there are causal and long run features linking the two markets.

The rest of this paper proceeds as follows. The next section describes the oil and commodity prices behaviour. This is followed by exploring linkage oil and food commodity prices. The methodological framework and the data are delivered in the proceeding section; the penultimate section discusses empirical results; and the last section concludes and points to some directions for future research.

OIL PRICE BEHAVIOR

Various attempts to explain the behaviour of the oil price have been undertaken in the past few years. Three main approaches can be identified in this vast literature: first, Hotelling's (1931) notion of oil as exhaustible resource; second the ascertainment that the global macroeconomic situation is an important factor, and, thirdly, the notion that additional factors such as OPEC announcements as well as speculation affect the price of oil.

Regarding the first approach, Hotelling's (1931) seminal paper proposes the notion that oil is exhaustible and that the price of oil, in optimum, grows at the rate of interest. Various extensions of this rule have been suggested and are still subject of scientific debates, see e.g. Sinn (2008). In particular Krautkraemer (1998), however, provides evidence of frequent failure of empirically testing Hotelling-type hypotheses. Dvir and Rogoff (2009) epitomize this skepticism; they apply storage rather than a Hotelling resource extraction model in order to model oil price behaviour.

Papers such as Slade (1982) and Pindyck (1999) deal with oil price behaviour in the very long run. These papers deal with the question as to whether the price of oil follows a deterministic trend. While Slade (1982) finds evidence of quadratic trends in real oil prices, Pindyck (1999) argues that

the oil price fluctuates around a long-run trend. The trend itself is - due to changes in demand, extraction costs and new site discoveries – stochastically fluctuating over time.

In contrast to this line of research, Krichene (2002) and Dees et al. (2007) argue that the price of oil is determined by global economic conditions and employ demand and supply frameworks in order to explain the oil price. Krichene (2002) uses a structural multiple equation model of the global oil market and focuses on the calculation of demand and supply elasticities. Among the more salient findings of this paper is that short-run demand and supply of oil is very price inelastic and that long-run oil supply elasticity significantly decreased after the first oil crisis 1973/74.

Dees et al. (2008), in contrast, use a country-by-country approach and explicitly incorporate geological factors as well as OPEC behaviour in their oil supply function. The model is generally able to reproduce responses of the global oil market to changes in OPEC behaviour. The papers by Kaufmann et al. (2004) and Dees et al. (2008) also focus on the role of OPEC behaviour, but do not explicitly model oil supply. Both papers make use of an error correction approach and show that variables such as OPEC capacity utilization and OPEC quotas Granger cause real oil prices but not vice versa.

While these results are more of very general character, Lin and Tamvakis (2009) show that the effect of OPEC announcements depends on whether the price of oil is high or low. Kaufman and Ullmann (2009), furthermore, show that the 2008 oil price hike can be explained by a combination of fundamental factors and speculative behaviour, and Miller and Ratti (2009), finally, provide evidence of the existence of oil price bubbles.

To summarize, the price of oil is affected by numerous factors and subject to a considerable degree of volatility. Hamilton (2008) nicely summarizes these findings: “Changes in the real price of oil have historically tended to be (1) permanent, (2) difficult to predict, and (3) governed by very different regimes at different points in time”. Thus, deriving future predictions is a very difficult task. In any case, expecting the oil price to begin a stable increase in the near future would definitely be hazardous.

COMMODITY PRICE BEHAVIOUR

The literature on the long-run behaviour of commodity prices, particularly, dealing with terms of trade shocks either begins and/or end with the work of Prebisch (1950) and Singer (1950). The Prebisch-Singer Hypothesis (PSH) postulates that there is a secular decline in the terms of trade of primary commodities relative to manufactured goods. The driving force behind this observation is the propensity for developing countries to export primary commodities and import manufactures.

Some of the explanations that have been offered for this decline include productivity differentials between countries, asymmetric market structure, and high income elasticity of demand for manufacturing goods relative to that of primary commodities (Slade, 1991). One corollary of these findings is that developing countries, to the degree that they export primary commodities and import manufactures, will be subject to a secular deterioration in their net barter terms of trade.

Spraos (1980) presents evidence of a stable declining commodity terms of trade. Grilli and Yang (1988) devised several series for the period 1900-86, and found that non-fuel primary commodities prices (instead of term of trade) had fell 0.6 per cent per annum relative to manufactures. The works of Cuddington and Urzúa (1989); Powell (1991); Bleaney and Greenaway (1993); Lutz (1999); Cashing and McDermott (2002); and Ocampo and Parra (2003) had tried to confirm Grilli and Yang results. The general picture that emerges from these papers is that negative growth rates tend to prevail in the very long run.

Recent empirical studies have found evidence against the PSH. Notably, Cuddington (1992) examines the 24 commodities that comprise the Grilli-Yang index (plus oil and coal) and found that

13 of these 26 commodities can be modelled as difference stationary (DS) processes for the period 1900-83, with the remainder being modelled as trend stationary (TS) processes. Just five of the TS models had the negative trend predicted by the PSH, while the other TS models had zero or positive trends. Overall, 21 of the 26 commodity prices exhibited a zero or positive trend, implying a strong rejection of the PSH in most cases.

Other important branch of this literature states that it is incorrect to discuss long run trends since in the short and medium term volatility dominates by far the behaviour of commodity prices. Many studies also have emphasized the existence of multiple turning points in commodity prices including Popkin (1974), Cooper and Lawrence (1975), Enoch and Panic (1981), Bosworth and Lawrence (1982) and Chu and Morrison (1984). According to Deaton (1999), what commodity prices lack in trend, they make up for in variance. In this respect, Cashin and McDermott (2002) find that volatility of commodity prices has increased notably since Bretton Woods breakdown at the beginning of the seventies.

Another issue in modelling commodity prices as stochastic trends relates to the persistence of shocks. Knowing whether shocks to commodity prices leave permanent or transitory imprints is important for the design of both short- and long-run policies. The design of structural adjustment programs will be different depending on whether export prices are expected to remain low for a short or long period of time. Furthermore, optimal management of stabilization policies depends, to an important degree, on the nature of the shock to commodity prices and the speed with which the shocks dissipate (Engel and Meller, 1993).

A number of studies have investigated the possibility of shifting deterministic trends in international commodity prices. Specifically, Leon and Soto (1997) extend the methodology of Cuddington (1992) by applying formal tests for structural change. Employing the Zivot and Andrews (1992) endogenous break point methodology to individual commodity prices in the Grilli-Yang index, they allow for one break in the deterministic trend. Of the 24 commodities, 20 are classified as TS models for the 1900-92-period, implying that shocks to commodity prices are, in several cases, less persistent than suggested by Cuddington (1992). Moreover, 17 commodity prices report a negative trend and thus provide evidence in support of the PSH.

OIL AND FOOD COMMODITY MARKET LINKAGES

While the evolution of commodity prices is relatively stable, that of oil prices is more volatile (Reigner, 2007). However, the existing literature connecting them is thin. Several seminal articles highlight the underlying relationship between crude oil and commodity prices. Due to the sharp rise of world crude oil prices since early 2000s, topic on commodity prices have been once again a researchers' concern. Baffes (2007) has done a study on crude oil price changes on 35 other commodities using annual data from 1960 to 2005. His results revealed that if the crude oil prices remain high, then the recent commodity price boom is likely to last longer than that of earlier boom, at least for the food commodities, fertilizer, and precious metal.

This evidence is in line with the study done by Awad and Fatimah (2008). However, their study is on the effect of vegetable oil prices (including soybean oil) by petroleum prices instead of crude oil prices. The results provide a strong evidence of long run equilibrium relation between the two product prices. Yu et al. (2006) examine the co-variability between crude oil prices and corn, sorghum, sugar, soybeans, soybean oil, and palm oil prices from 2003 to 2007 using a vector error correction model. Their co-integration results indicate that corn and soybeans prices are co-integrated with crude oil price during the 2006-07 period but not during the 2003-05 periods. Further results of Campiche et al. (2007) from the same study indicate that crude oil prices do not adjust to changes in the corn and soybean market.

Harri, Nalley, and Hudson (2009) examine the price relationship through time of the primary agricultural commodities, exchange rates, and crude oil prices. Using overlapping time periods,

they examine the co-integration relations between prices to determine changes in the strength of the linkage between markets through time. Using monthly data, they find that a co-integrating relation exists between corn, soybeans and cotton prices and crude oil prices starting from April 2006 and the exchange rates do play a role in the linkage of prices over time. They also find that crude oil prices Granger-cause the corn prices while the opposite is not true.

The increased integration of agricultural and energy markets likely has implications for agricultural input markets as well as markets for agricultural commodities. Oehmke, Sparling, and Martin (2008) recently examined Canadian fertilizer price risk and documented price shocks of greater than 70 per cent between the 2007 and 2008 crop years. They also report the monthly coefficient of variation (CV) of natural gas prices over 1994-2006 to range from 30 to 99 per cent with the greatest volatility in February.

The interdependence among markets has led to increased uncertainty and volatility in the futures market as some markets incorporate fluctuations from other markets. Harri, Nalley, and Hudson (2009) note that starting in early 2006 there is a significant change in the dynamics of corn and other agricultural commodity prices. These changes in the dynamics are present in the means as well as variances of the agricultural commodity prices. For example, the agricultural sector appears to be importing price variability from the bio-fuels sector, as corn prices are increasingly tied to bio-fuel production given the energy policies implemented by the U.S. government. At a secondary level corn prices influence other crop prices such as soybeans as they compete for acres and in other cases such as wheat can also act as a substitute in output markets.

While many of the relationships among crops and the transmission of risk are long standing, many other relationships among commodities and other markets are yet to be discovered as markets become increasingly interrelated. Cross-commodity and market correlations may have changed leading to a potential change in efficacy of traditional risk management strategies. Von Braun and Torero (2009) point out that the recent spikes in commodity prices were likely fuelled by demand-side factors (population growth, demand for bio-fuels, and the devaluation of the US dollar) as well as supply-side factors (increased use of petroleum-based products such as fertilizer, droughts, and low levels of investment in agriculture).

DATA AND ANALYTICAL RESULTS

The brief literature review above suggests the potential for some interesting hypotheses about potential linkages between agricultural and energy markets. The purpose of this section is to develop an analytical framework within which these can be clearly stated as a set of formal propositions. Besides of oil, crude palm oil, maize, soybeans, and sugarcane are selected in line with ethanol and bio-diesel production. The food commodity chosen is rice and wheat.

Data of world crude oil prices are presented by UK Brent in US\$ per barrel (fob). Crude Palm Oil price is derived from Malaysia and Indonesian CPO in European Community market (cif, US\$ metric ton). Maize and wheat prices are represented by United States maize and wheat (Gulf Ports) prices in US\$ per metric ton (fob). Thailand Rice (Bangkok) represents 5-percent-broken-rice prices (in USD per ton). The soybean price data come from international market in Rotterdam in US\$ per metric ton (cif). The sugarcane price data are counted in European Community import price in US\$ cent per pound (cif). The sample periods chosen for this study extend from January 1980 to the May 2010. The data is provided by the International Financial Statistics (IFS) online service (IMF, 2010).

Table 1 delivers the descriptive statistics of all variables under study covering mean, extreme, standard deviation, and also kurtosis values. Statistically, a variable is said to be volatile if its CV (ratio of standard deviation to mean) is more than 50 per cent. Based on the empirical rule, the oil price is the most volatile indicated by the highest CV. Other commodity prices are relatively stable

revealed by the moderate CV, ranging from 19.46 per cent (sugarcane price) to 40.56 per cent (rice price). This finding supports to the theoretical background in the previous section.

Table 1
Descriptive Statistics, 1980(01)-2010(05)

	CPO	Oil	Maize	Rice	Soybean	Sugarcane	Wheat
Mean	427.3906	31.9797	118.0778	304.1047	219.0184	25.3723	161.2377
Median	390.6334	25.6732	109.6405	276.0000	200.7640	26.4670	152.4862
Maximum	1146.8590	133.8991	287.1124	1015.2110	452.1932	34.3390	439.7161
Minimum	162.7940	9.5596	65.3512	162.0952	133.4899	13.4400	101.7800
Std. Dev.	169.5550	21.3969	32.5672	123.3478	57.7105	4.9378	49.0744
Skewness	1.4186	2.0118	1.7664	2.3444	1.4261	-0.4174	2.4230
Kurtosis	5.8632	7.4685	7.5244	10.5254	5.0652	2.2156	11.2474
CV	39.67%	66.91%	27.58%	40.56%	26.35%	19.46%	30.44%
Observations	365	365	365	365	365	365	365

Table 2 shows the results of Augmented Dickey-Fuller unit root tests for the underlying price series in levels and first differences. The null hypothesis of existence of unit root cannot be rejected for each of the variables (except soybean) in the level and thus it is concluded that the series are non-stationary. However, the null hypothesis is rejected even at the 1 per cent level of significance for all of them in their first differences. This indicates that stationary is achieved for them after the first differencing i.e. all the series are I (1). These results are in accordance with the early literature that subjected commodity prices to unit root tests. As discussed earlier, the non-rejection of the null of unit root may be the result of shifting deterministic trend.

Table 2
Unit Roots Test, 1980(01)-2010(05)

	Level		First Difference	
	t-stat	t-test 5%	t-stat	t-test 5%
CPO	-3.168249	-3.422391	-8.31753	-3.422391
Rice	-2.918973	-3.422286	-13.23233	-3.422286
Wheat	-3.002302	-3.422462	-7.56233	-3.422462
Soybean	-3.650139	-3.422252	-15.17956	-3.422252
Maize	-3.123074	-3.422252	-14.55752	-3.422252
Sugarcane	-2.172518	-3.422252	-14.50759	-3.422252
Oil	-3.051650	-3.422252	-12.15477	-3.422252

Figure 2 displays the evolution of log-prices time series during the last thirty years. Brief inspection suggests a co-movement among the seven variables. To make sure the degree of relationship, we analyse year-by-year correlations between monthly price changes of crude oil and those of maize, soybeans, rice, wheat, CPO, and sugarcane. We divide the total sample into three periods, 1980-1990, 1990-2000, and then after 2000. Before 2000, most of the correlations are not significant (Table 3). The evidence is weaker in the case of soybean, maize, and sugarcane, which are consistent with the substitution channel.

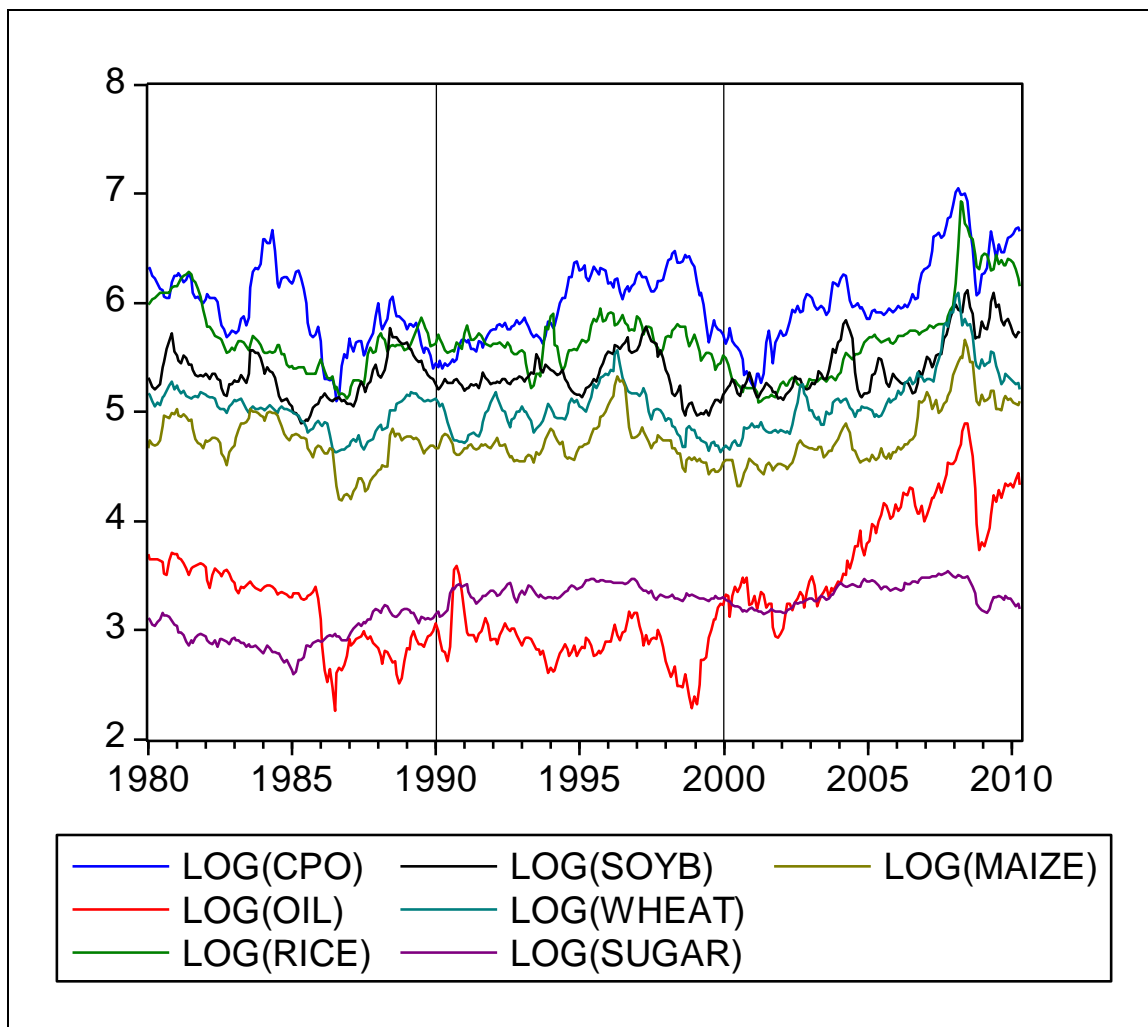


Figure 2
Log-prices Time Series

Table 3
Correlation between Commodity and Oil Prices

Period	1980-1990	1990-2000	2000-2010	1980-2010
CPO	61.47%	46.04%	85.08%	65.08%
Maize	57.10%	3.92%	84.61%	67.27%
Rice	66.23%	10.50%	80.70%	66.76%
Soybean	2.34%	19.98%	68.82%	58.07%
Sugarcane	34.92%	28.69%	64.29%	30.56%
Wheat	61.92%	1.78%	83.72%	74.78%

The correlation patterns do not disappear when we connect among primary commodity for all sample periods (Table 4). Moreover, we find a similar linkage for CPO, soybean, wheat, rice, and, importantly, maize. There is an insignificant correlation change for sugarcane, but it appears when we breakdown for the sub sample after 2000. The relationship is stronger for maize and soybeans than for sugarcane (significant only in 2008) which is consistent with a bio-fuels channel. These findings suggest a structural change in the relationship between oil and bio-fuel crops prices due to the emergence of bio-fuels.

Table 4
Correlation among Commodity Prices, 1980(01)-2010(05)

	CPO	SOYB	SUGARCANE	WHEAT	RICE	MAIZE
CPO	1.0000	0.6158	0.2754	0.7522	0.6668	0.7653
SOYB	0.6158	1.0000	0.3292	0.7354	0.6932	0.7630
SUGARCANE	0.2754	0.3292	1.0000	0.3654	0.1815	0.2358
WHEAT	0.7522	0.7354	0.3654	1.0000	0.7050	0.8597
RICE	0.6668	0.6932	0.1815	0.7050	1.0000	0.7730
MAIZE	0.7653	0.7630	0.2358	0.8597	0.7730	1.0000

So far, though, we have focused on correlations and not causality. Granger causality tests highlight the presence of at least unidirectional causality linkages as an indication of some degree of integration. Unidirectional causality inform about leader-follower relationships in terms of price adjustments. An optimal lag order of 6 was selected for the three VAR models by minimizing the Akaike Information Criterion, where a maximum of 12 lags is considered. On the basis of Granger causality test results presented in Table 5, long run unidirectional causality from oil price to cereals prices is detected. However, the presence of a similar relation in the opposite direction is not denied except soybean and sugarcane.

Table 5
Pair wise Granger Causality Tests, 1980(01)-2010(05)

Null Hypothesis:	Obs	F-Statistic	Probability
OIL does not Granger Cause CPO	359	3.96597	0.00075
CPO does not Granger Cause OIL		3.60795	0.00175
OIL does not Granger Cause MAIZE	359	3.02013	0.00685
MAIZE does not Granger Cause OIL		2.47231	0.02353
RICE does not Granger Cause OIL	359	7.41539	1.8E-07
OIL does not Granger Cause RICE		3.24743	0.00406
SOYB does not Granger Cause OIL	359	1.41078	0.20951
OIL does not Granger Cause SOYB		3.45321	0.00251
SUGARCANE does not Granger Cause OIL	359	0.86934	0.51756
OIL does not Granger Cause SUGARCANE		2.59918	0.01776
WHEAT does not Granger Cause OIL	359	6.63981	1.2E-06
OIL does not Granger Cause WHEAT		2.47710	0.02329

The results of Granger causality tests show that there exists a long run unidirectional causality from crude oil price to the three cereals prices, i.e., maize, rice and wheat. The said is not false for the reverse. These results suggest that oil price factor is growing in significance in the cereal complex. This is a plausible result since modern agriculture depends heavily on the use of fossil fuel in every stage of food production and marketing. The universal adoption of seed fertilizer technology is energy intensive; that is, production of food is heavily dependent on chemical fertilizers, which uses fossil fuel as its primary inputs. The increases in fuel prices have raised the costs of producing cereal crops.

Higher costs for fertilizer, fuel, and seeds could cause farmers without access to credit to produce less than they otherwise would have, or to shift to crops with fewer inputs requirements. Secondly, gasoline and diesel fuel are heavily used in sloughing, planting, cultivating and harvesting. Irrigation pumps use diesel fuel, natural gas, and coal-fired electricity. Thirdly, fertilizer production is also energy intensive as the mining, manufacture, and international transport of phosphates and potash all depend on oil. Lastly, with freight rates doubling within a one-year period beginning in February 2006, the cost of transporting food to importing countries also have been affected.

According to Engle and Granger (1987) the ECT (error correction term) acts as a force which causes the integrated variables to return to their long run relation when they deviate from it in all the cases. With regard to the causality results, the following points merit emphasis. First, the inclusion of an error correction term in these causal models ensures a proper test of the existence or absence of a material relationship between crude oil and commodity prices. Second, the error correction term not only measures disequilibrium, but also captures deviations from it.

Table 6
Estimates of Error Correction Model, 1980(01)-2010(05)

	Linear Model		Log-Linear Model	
	Price	ECT(-1)	Price	ECT(-1)
CPO	3.787737 (7.155249)	-0.034797 (-2.334362)	0.121713 (2.577069)	-0.029837 (-2.265053)
Rice	1.316036 (3.191638)	-0.056136 (-3.453187)	0.009020 (0.245515)	-0.031248 (-2.687201)
Wheat	0.591143 (3.714165)	-0.047276 (-2.662427)	0.046957 (1.510207)	-0.039900 (-2.795036)
Soybean	1.250736 (5.599373)	-0.054429 (-3.161427)	0.066916 (1.822254)	-0.044135 (-2.833098)
Maize	0.557211 (5.075651)	-0.054625 (-3.311732)	-0.000987 (-0.029575)	-0.045367 (-3.111900)
Sugarcane	0.054952 (5.624423)	-0.009045 (-1.200889)	0.061311 (3.711646)	-0.009238 (-1.304955)

Figure in parentheses is t-stat

According to the results presented in Table 6, the coefficients of the error correction term which measures the speed of adjustment of rice, soybean, wheat, and maize prices to their equilibrium levels equals to 0.05; that of CPO equals to 0.03; and that of sugarcane equals to 0.01, respectively, indicating that only 5 per cent, 3 per cent and 1 per cent of the disequilibrium is corrected each month for each of them, respectively, which is relatively low speed. However, the prices of rice (in the original model) and maize (in the logarithmic model) adjust at a higher speed compared to the others while sugarcane prices adjust at the lowest speed (even insignificant at 5 percent level). As for the short run causality, the results accept the existence of such relationship between oil prices and cereals prices.

Using Johansen's maximum likelihood approach, we test the bi-variate relationship between oil and each of the major commodities with 4 lags in all the cases. The trace and Max-eigen value (λ_{max}) statistics for testing the rank of co-integration are shown in Table 7.

Table 7
Co-integration Test, 1980(01)-2010(05)

Trend assumption: Linear deterministic trend

Series: OIL CPO MAIZE RICE SOYB SUGARCANE WHEAT

Lags interval (in first differences): 1 to 4

Unrestricted Co-integration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Per cent Critical Value	1 Per cent Critical Value
None **	0.149996	171.8417	124.24	133.57
At most 1 **	0.102447	113.3365	94.15	103.18
At most 2 *	0.069633	74.42667	68.52	76.07
At most 3 *	0.054853	48.44307	47.21	54.46
At most 4	0.042491	28.13387	29.68	35.65
At most 5	0.029483	12.50263	15.41	20.04
At most 6	0.004792	1.729203	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level

Trace test indicates 4 co-integrating equation(s) at the 5% level

Trace test indicates 2 co-integrating equation(s) at the 1% level

The results of both tests deny the absence of co-integrating relation between crude oil and primary commodity prices series. Furthermore, both tests suggest the presence of one co-integrating equation at 5 per cent level or better between the non-stationary prices of crude oil and each of the four commodities which means that the linear combinations of them are stationary and, consequently, prices tend to move towards this equilibrium relationship in the long-run.

CONCLUDING REMARKS

In this paper, we have examined some models relating oil and food commodity prices. The models analyse the relationship between world crude oil prices and CPO, rice, wheat, soybean, maize, and sugarcane prices. Those models used time series econometric method including unit roots, Granger causality, the error correction model which is developed by Engle and Granger (1987) and multi co-integration which is developed by Johansen (1988) and Johansen and Juselius (1990).

The results of the ECM bound testing confirmed the presence of co-integration in the model of CPO, rice, wheat, soybean, maize prices but not in the sugarcane prices. Over the long run, only the CPO prices are affected. This is supported by study of Chaudhuri (2001) where he suggests that real primary commodity prices and real oil prices are co-integrated. Nevertheless, in line with the study of Yu, et al (2006), our result on long run relationship between crude oil prices and sugarcane prices is not proven. Furthermore, in the short run, both models have not significantly correlated between dependent and independent variable.

The increase in oil price has added a new dimension in the cereal equation, that is, the demand for bio-fuel particularly ethanol which utilized maize as a feedstock. This in turn has increased maize production at the expense of wheat and, consequently, led to the current price hikes of these two commodities. This explains for the relatively faster response of maize and wheat to changes in petroleum price compared to rice. Rice is being consumed largely for food purposes worldwide.

Clearly, further analysis on the workings of the cereal markets will have to incorporate crude oil prices as one of the major market determinants as well as the understanding of the structural and behavioural aspects of the industry. Finally, the most important implication for developing countries that can be drawn is that the food security should be an integral part of energy security system.

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A COMPARATIVE STUDY OF THE DAY LABOUR MARKET IN THE UNITED STATES, SOUTH AFRICA AND INDIA¹

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ABSTRACT

Recent literature have documented the (re)emergence of day labour and informal hiring sites in a diverse group of countries in Africa, Asia, Europe, and North America. The economic conditions that give rise to this include, *inter alia*, rapid industrial restructuring and worker dislocation from sectors of the economy that previously provided ample employment opportunities; the breakdown of firms' internal labour markets and increasing reliance on casualized employment arrangements; employer evasion of labour legislation; the drive for labour market flexibility and labour cost-cutting; and uneven development at the regional, national, and international level (Theodore, Valenzuela Jr and Meléndez 2009: 423).

Day labourers encounter a highly unstable labour market that provides low and uncertain wages and little prospect for continuing employment. As a result, many day labourers, and their dependents, tend to live in poverty. The aim of this paper is to conduct a multi-country study of day labour in the United States, South Africa and India to compare some of the fundamentals and dynamics of the day labour market in each country.

In the United States, day labour work has been an entry point into the labour market for migrant workers. In South Africa on the other hand, the day labour market acts as a catchment area for labour fall out, displaced from the formal sector of the economy.

INTRODUCTION

Recent academic and popular literature have documented the (re)emergence of day labour and informal hiring sites in a diverse group of countries in Africa, Asia, Europe, and North America. On any given day in the United States, approximately 117 600 workers are either looking for day labour jobs or are working as day labourers. The estimated figure for South Africa is also measured in tens of thousands, with Pretoria alone having almost 3 000 people involved in this activity on a daily basis (Schenck and Blaauw 2008).

Various studies investigated the phenomenon of day labourers in the United States (Valenzuela Jr. et al. 2006; Theodore et al. 2009). In South Africa research on this informal labour market was done by Schenck and Louw (2005) as well as Blaauw et al. (2006) and Blaauw (2010). It is estimated that in 2005/2006 at least 45 000 people, mostly male and African, congregated at more than a 1 000 places in order to seek casual employment (Blaauw 2010).

Other countries where observation of this phenomenon has been reported are Egypt, Greece, Hong Kong, United Arab Emirates, Canada, India, Russia, Kazakhstan and El Salvador (Theodore 2009: 1; Theodore et al. 2009: 423).

There are even reports of the visibility of day labourers in Iraq since 2004, where at the time men were hoping to earn the equivalent of about £2 for a day's labour (Wood 2004). The impact of the war in Iraq had a negative effect on day labourers in Jordan, and there was also a general decrease in the demand for their services (Gatehouse 2003: 1). In India, day labour work is also

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not a new occurrence. After years of debate, Indian politicians have agreed to a “hands off” policy to regulate this informal labour market (Valenzuela Jr. 2010: 1).

Some of the economic conditions that give rise to this phenomenon include, *inter alia*, rapid industrial restructuring and worker dislocation from sectors of the economy that previously provided ample employment opportunities; the breakdown of firms’ internal labour markets and increasing reliance on casualized employment arrangements; employer evasion of labour legislation; the drive for labour market flexibility and labour cost-cutting; and uneven development at the regional, national, and international level (Theodore et al. 2009: 423).

Day labourers encounter a highly unstable labour market that provides low and uncertain wages and little prospect for continuing employment. As a result, many day labourers, and their dependents, tend to live in poverty (Blaauw et al. 2006; Theodore et al. 2009). Literature on the similarities and differences across different geographical areas and levels of economic development is limited, however.

The aim of this paper to conduct a multi-country comparison of day labour in the United States, South Africa and India to compare the different fundamentals and dynamics of the day labour market in each country. Data on the demographics, employment history and income earned by day labourers will be analysed to identify differences in the economic rationale for the existence of this phenomenon against a backdrop of different socio-economic circumstances prevalent in each country.

METHODOLOGY

Valenzuela Jr. et al. (2006) conducted a nation-wide study among day labourers in the United States. The study entailed a country-wide survey of 2 660 day labourers. These workers were randomly selected at 264 hiring sites in 139 municipalities in 20 states and the District of Columbia (Valenzuela Jr. et al. 2006: i). This study can therefore be regarded as a very good proxy for the typical situation of most American cities. The results of this study will be compared to a similar survey conducted in South Africa in 2007 (Blaauw 2010). The South African survey followed virtually the same methodology as the American study. The fieldwork was conducted from the end of February 2007 and was completed by the end of November 2007. A total of 3 830 questionnaires of good quality were accepted for the study, representing no less than 8.5 per cent of the research population (Blaauw 2010). In this study day labourers were interviewed across South Africa after a detailed recognisance and sampling process (See Blaauw 2010 for a detailed discussion of the research methodology that was followed).

This provides a unique opportunity to compare the dynamics of this informal labour market in a developed and developing country context. Available secondary data sources on day labour in India were consultant to provide a further developing economy context to the comparison.

DEMOGRAPHIC FEATURES OF DAY LABOURERS IN THE UNITED STATES, SOUTH AFRICA AND INDIA

Day labouring in India has been along for quite some time. Breman (1977) already documented the daily dynamics of this informal labour market in India. Young and old day labourers gather from the towns or cities or from surrounding areas waiting for prospective employers (Breman 1977). In a cross sectional study conducted by Gurav et al. (2005) at the Chivaji Chowk Naka in Kalyan in Maharashtra it was found that of the 288 respondents a 172 (59.72 per cent) was male and 116 (40.28 per cent) was female). In India there are a significant proportion of day labourers that are female. This is not the case in South Africa.

The gender distribution of day labourers in South Africa is 96.4 and 3.6 per cent respectively for the male and female day labourers in 2007. Blaauw et al. (2006) found similar results in their 2004 survey in Tshwane. The distribution in Tshwane was 97.5 per cent and 2.5 per cent respectively at the time. The unprotected nature of the lives of day labourers can to a large extent explain this trend (Blaauw 2010: 93-94).

The racial composition reveals that it is principally Blacks and Coloured members of the population that engage in day labouring as an informal economic activity. Just over 92 per cent of the respondents were Blacks, 7.3 per cent were from the Coloured population and the remaining half a per cent consisted of Whites and Indians (Blaauw 2010: 93-94). This reflects the overall racial composition of the broader informal sector in South Africa as identified by Saunders (2005).

Of the 3 830 respondents, almost 85 per cent were born in South Africa. The remaining portion was born in Zimbabwe (9.5 per cent), Mozambique (2.6 per cent) and Lesotho (1.4 per cent). Fifteen respondents, 0.4 per cent, did not want to specify the country of their birth. It is expected that these men were also born outside the borders of South Africa. The distribution is again similar to the 2004 findings in Tshwane. At the time the corresponding figures were 88 per cent for South Africa, 7 per cent from Zimbabwe and 2.9 per cent from Mozambique (Blaauw et al. 2006: 462).

The situation in a developed country like the United States is completely different. Day labourers born in America only comprise 7 per cent of the total day labour workforce. Day labourers in the United States are predominantly immigrant and Latino. Most of the day labourers there were born in Mexico (59 per cent). A further 28 per cent hails from Central America (Valenzuela Jr. et al. 2006: iii).

This difference in origin of day labour between the United States and South Africa already provides a premonition that other differences in the economic rationale and dynamics within the day labour market exists between countries with different levels of development. For many day labourers in the United States this market fulfils a variety of possible roles. Valenzuela Jr. et al. (2006: 1-2) summarised this as follows: *“For many workers in cities with declining employment prospects, day labor provides a chance to regain a foothold in the urban economy. For others, it is a first job in the United States and an opportunity to acquire work experience, skills and employer contacts. For still others, it represents an opportunity to earn an income when temporarily laid off from a job elsewhere in the economy. As a result of these and other factors, many workers have come to rely on day-labor hiring sites for job opportunities.”*

For South Africa the picture is markedly different. Day labouring in South Africa is a supply side phenomenon that is growing in numbers as a result of a formal economy which is unable to absorb the number of new entrants into the market. It is furthermore a catchment area for people that have lost their formal employment. The prospects for a return or progressing to the formal sector in South Africa is just as limited for immigrant as well as local day labourers. This explains why the origin (local or immigrant) of day labourers in South Africa and the United States are the total opposite of each other.

In terms of other demographic aspects, it emerged that almost 70 per cent of the respondents in the South African study (Blaauw 2010) were less than 35 years old. In fact, 47.1 per cent of the day labourers involved in the survey was less than 30 years old. In terms of South African legislation the term youth includes people aged between 15 and 34 (Vakalisa 2005: 53). The vast majority of day labourers can therefore be classified as young. This is a manifestation of the persistent unemployment and under-employment among the young of South Africa (Vakalisa 2005: 53). The situation in India and the United States seems to be very similar in terms of age (Valenzuela Jr. et al. 2006; Gurav et al. 2005).

No fewer than 2 148 (56.1 per cent) of the respondents indicated that they had never been married or were single at the time of the interview. Twenty-six per cent were married, either in the form of a Western or traditional marriage. Three hundred and seventeen (9.9 per cent) of the day labourers were living with a partner and 5.6 and 1.5 per cent were separated or divorced and widowed respectively (Blaauw 2010: 98-99). The figures in terms of the above for the United States in 2004 were slightly different at 36 per cent married, 48 per cent unmarried and 15 per cent divorced (Valenzuela Jr. et al. 2006). In India the percentage of married day labourers seems to be much larger (Gurav et al. 2005).

Comparing the educational attainment of day labourers in the various countries yielded interesting observations. In South Africa in 2007, no fewer than 6 per cent of the respondents have never attended school at all. About 20 per cent of the day labourers only have some primary schooling. Only 14.8 per cent of the day labourers completed their secondary schooling. This has a definite impact on their chances of obtaining a position in the formal sector of the labour market (Blaauw 2010: 101). These results are practically the same as those obtained by Blaauw et al. (2006) in the Tshwane survey of day labourers in 2004. Looking at the results of Gurav et al. (2005), the educational attainment of day labourers in India seems to be even worse. In their study more than two thirds (67.36 per cent) were illiterate, 18.05 and 7.99 per cent completed primary and secondary schooling respectively, and 6.6 per cent completed a college qualification. This portion of the respondents consisted only of males (Gurav et al. 2005: 116). This compares well with the 7 per cent of American day labourers who had 13 or more years of schooling in 2004 (Valenzuela Jr. et al. 2006: 19).

Given the lower demand for unskilled workers in South Africa (Loots 1998), day labourers here were basically forced into the informal economy by their socio-economic circumstances. Blaauw (2010) regards their current situation as a by-product of a labour market where the focus is more and more on skills that they never had the opportunity to obtain. This illustrates an important difference between South African day labourers and their international counterparts. For day labourers in the United States, day labouring is generally a first step towards eventual integration into the formal economy (Valenzuela Jr. et al. 2006). For many South African day labourers, this option was already eliminated by the socio-economic circumstances of their childhood (Blaauw 2010: 103).

In summary, day labourers in both South Africa and the United States were found to be mainly male, fairly young and generally very low skilled. In India the scholastic attainment is lower and more so for women. There are also more women taking part in this informal economy activity in India and day labourers in India are mostly married, which is not the case in South Africa and the United States. Day labourers in the United States are mostly immigrant as opposed to South Africa and India where the majority were born in those respective countries.

The next section analyses the dynamics of day labourers in South Africa compared with their counterparts in the United States and India in terms of employment history, income earned and future prospects.

EMPLOYMENT DYNAMICS OF DAY LABOURERS IN SOUTH AFRICA, UNITED STATES AND INDIA

Determining how many of the current day labourers had full-time employment before becoming day labourers can provide valuable insight into the stocks and flows of this informal labour market (Blaauw 2010: 110).

In his 2007 study in South Africa Blaauw (2010: 120-121) found that a significant 1 919 respondents maintained that they in fact had permanent employment in the formal sector of the

economy before becoming day labourers. This represented a significant 50.2 per cent of the sample.

The situation in a developed country like the United States is similar, but some important differences are obscured by the information. In 2004, more than half or 57 per cent of the day labourers in the United States have held a permanent job previously. This was mainly in the construction industry, restaurants and the manufacturing industry (Valenzuela Jr. et al. 2006: 20). For many of these people, day labour may offer a source of income, while they search for another permanent job elsewhere in the local economy (Schenck and Blaauw 2008).

One of the biggest differences in the dynamics of day laboring occurs in terms of the time that day labourers in the United States and South Africa are involved in this informal sector activity (Schenck and Blaauw 2008). In 2004, 74 per cent of American day labourers were involved in this activity for less than three years (Valenzuela Jr. et al. 2006: ii). This suggests that the opportunity for them to make the transition into the formal sector of the economy is far better than for their counterparts in South Africa. It is much more difficult for the day labourers to obtain alternative employment opportunities in the formal sector of the economy in South Africa, where unemployment exists at sustained high levels (Blaauw 2010). Economic factors, as reflected in cyclical influences, only affect the labour market at these high levels of unemployment (Schoeman et al. 2010; Schoeman and Blaauw 2009).

The hiring patterns of day labourers are highly irregular. This makes the task of calculating the number of employed days per week a very difficult one. The past hiring history has very little bearing on the number of days of employment in a current week. This statement must however be qualified to some extent (Blaauw 2010: 136). Examples exist in the United States of corporations that have institutionalised a degree of loyalty on the part of the workers. One corporate chain, Labor Ready, gives labourers who have worked more than 400 hours for the company a “premium card” which they may use to “identify” themselves in the company’s day labour halls across the country (Bartley and Roberts 2006: 48).

In the United States repeats are a central mechanism through which this highly infrequent form of employment is made more stable. It provides greater predictability for both the company who hires day labourers as well as day labourers themselves (Bartley and Roberts 2006: 49). Bartley and Roberts (2006: 50) found a positive and statistically significant relationship between repeats and real wages in the United States, controlling for organisational form and human capital. This confirms the notion that repeats are an important form of currency in the market for day labourers in the United States.

The study of Blaauw (2010) revealed that day labourers in South Africa who were often rehired earned almost 30 per cent more on average. This provides some validation for the argument of Bartley and Roberts (2006). However, only 562 day labourers (14.7 per cent of the sample population) often get hired by the same employers more than three times in South Africa. For almost half of the day labourers interviewed, this seldom happens and for one in every ten it never occurs (Blaauw 2010: 137). This paints a different picture from known findings in the United States. More than two-thirds or 69 per cent of day labourers there are hired repeatedly by the same employer, suggesting a pattern of satisfied employers and willing workers (Valenzuela Jr. et al. 2006: 9).

Day labourers in all of three countries perform a variety of different tasks. The nature of the activities of day labourers reflect the varying skills levels of the people involved in this labour market. Table 1 contains the results in terms of the type of employment accessed by day labourers in the United States in 2004.

Occupation	TOTAL (%)	West (%)	Midwest (%)	Southwest (%)	South (%)	East (%)
Construction laborer	90	92	92	88	92	88
Mover	83	87	75	81	86	79
Gardener/Landscaper	83	86	77	89	89	72
Painter	80	82	85	80	83	75
Roofer	66	67	81	67	67	62
House cleaner	64	62	67	72	67	60
Carpenter	56	54	69	55	67	55
Drywall installer	58	60	68	56	64	53
Farm worker	51	51	80	42	55	50
Dishwasher	39	38	53	32	51	39
Car washer	35	34	47	37	43	31
Electrician	21	24	20	18	25	16
Cook	17	18	27	7	22	16
Other	39	41	21	49	48	26
Type of Employer						
Contractor	43	40	41	41	46	50
Private individual	49	52	38	55	45	42
Company	6	4	20	3	9	7
Other day laborers	1	2	1	1	1	1

Tab 1: *Top Occupations and Employers of Day Laborers in the United States in 2004*
Source: Valenzuela Jr. et al. (2006: 9)

The day labourers in South Africa perform similar tasks. Figure 1 provides a breakdown of the tasks that were done by the respondents when they found employment as a day labourer.

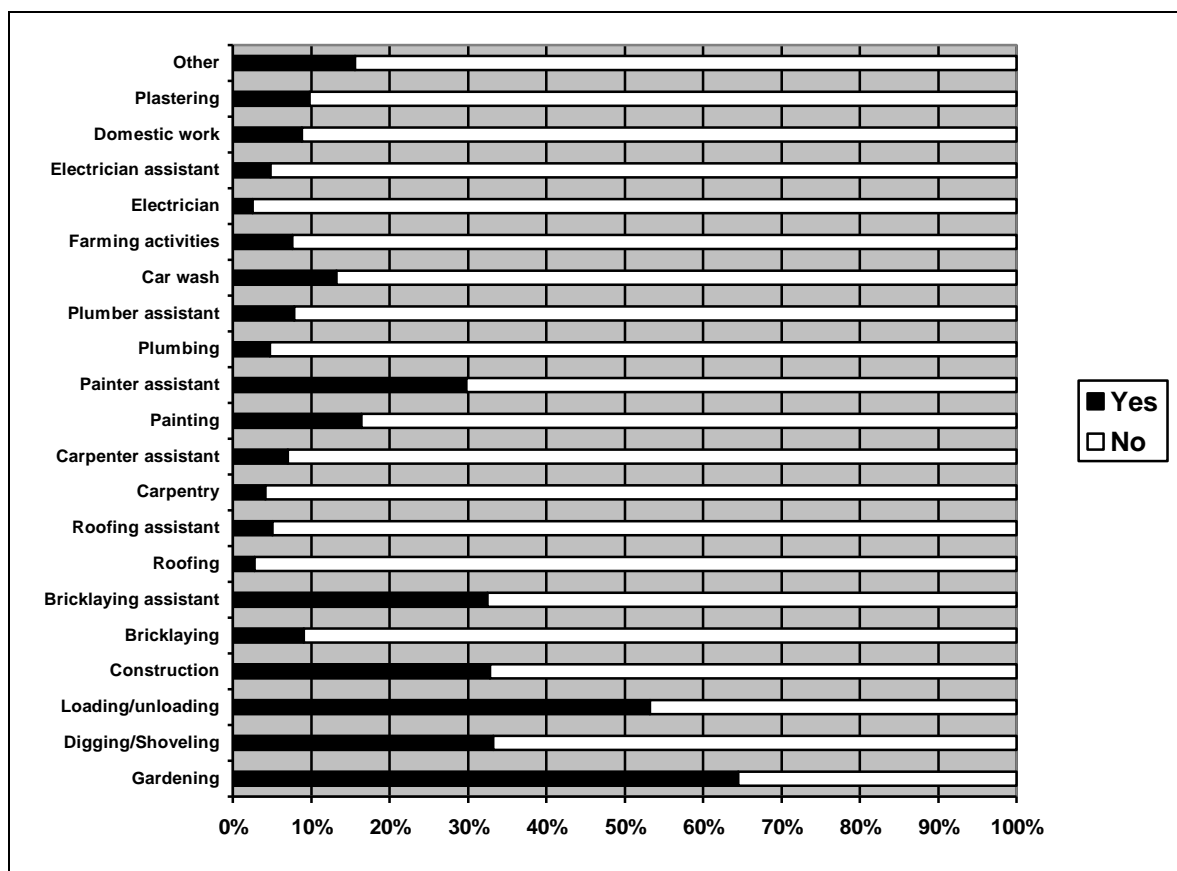


Fig 1: *Breakdown of tasks expected of day labourers in South Africa, 2007*
Source: Blaauw (2010)

The vast majority (83 per cent) of day labourers in the United States relied solely on day-labour work as their only source of income in 2004. Seventy per cent of day laborers search for work for five or more days. There is also 9 per cent that seek work one or two days a week. Presumably

this transpires mostly on weekends or when they have a day off from another job (Valenzuela Jr. et al. 2006: 9). The day labour market in South Africa has a similar appearance in terms of the hours worked. Here there are also day labourers who supplement their income by doing day labour work on weekend or in leave time from their regular employment. For the vast majority the income obtained from this activity is their only means of survival.

The next section provides an analysis of the income generated by this informal labour market activity in the three countries under discussion.

THE INCOME GENERATED BY DAY LABOURERS IN SOUTH AFRICA, UNITED STATES AND INDIA

Literature on day labourers in all three countries indicates that day labourers receive low levels of income (Blaauw 2010; Mishra and Lyngskor 2003). Not surprisingly, studies of day labourers find that the vast majority live in poverty (Blaauw et al. 2006; Theodore et al. 2009).

Given the rapidly expanding informal sector and increased informalisation of workers in India, the daily wages of casual workers in the informal sector is a key aspect that determines the standard of living, as well as the degree and scale of poverty among casual workers in general, and urban casual workers in particular (Karan and Selvaraj 2008: 13).

The estimated average daily wage of casual workers in the informal sector in 1999-2000 was Rs 60.80⁴. There was virtually no variance between the level of average daily wages paid to casual workers across rural and urban areas, although even within the informal sector, the daily wages of rural casual workers were slightly lower than that of the urban workers. Furthermore, female workers in both rural and urban areas received significantly lower wages than the male workers. In rural areas, the estimated average male daily wages were 1.7 times higher than that of females. The corresponding figure for urban areas was 1.6 times. (Karan and Selvaraj 2008: 14).

In their study of the casual labour market in Shillong India, Mishra and Lyngskor (2003: 7) determined the wage rate (of a general casual wageworker) to be about Rs. 60 per day. In the case of an unskilled worker it drops to only Rs. 47. The hourly wage rate was calculated at Rs. 7.0 or less, which is not enough to buy one kilogram of rice in terms of the ILO's 1996 benchmark for subsistence. These labourers in Shillong furthermore have no claim to the ILO's Social Security (Minimum standard) Convention, 1952 in terms of medical care, sickness and maternity benefits, family benefits, unemployment benefits, employment injury, invalidity and survivors' benefits, and old age benefits (Mishra and Lyngskor 2003: 8).

Valenzuela Jr. et al. (2006) studied the wages earned by day labourers in the United States in 2004 as part of their country wide study of day labourers. Table 2 yields the results of the estimate of monthly income for day labourers in the United States in that year.

⁴ The Indian Rupee (INR) and the South African Rand (ZAR) traded at and INR 46.45 and ZAR 7.62 respectively for 1US\$ on 30 June 2010.

Earnings	June/July 2004	Good Month	Bad Month
\$400 or less	25 percent	4 percent	42 percent
\$401 to \$800	36 percent	16 percent	44 percent
\$801 to \$1,200	22 percent	26 percent	11 percent
\$1,201 to \$1,600	9 percent	21 percent	2 percent
More than \$1,601	7 percent	34 percent	1 percent
Median	\$700	\$1,400	\$500

Tab 2: *Monthly Earnings of Day Laborers, Full-Time Workers in the United States in 2004*
Source: Valenzuela Jr. et al. (2006: 11)

The low levels of income received by day labourers in are not their only problem. The uncertainty in terms of the income that can be earned in this informal labour market is a major concern (Schenck and Blaauw 2008). Even in a developed country such as the United States the hourly wages and monthly/annual incomes of day labourers tend to be extremely volatile (Valenzuela Jr. et al. 2006: 9). Figure 2 illustrates this volatility graphically.

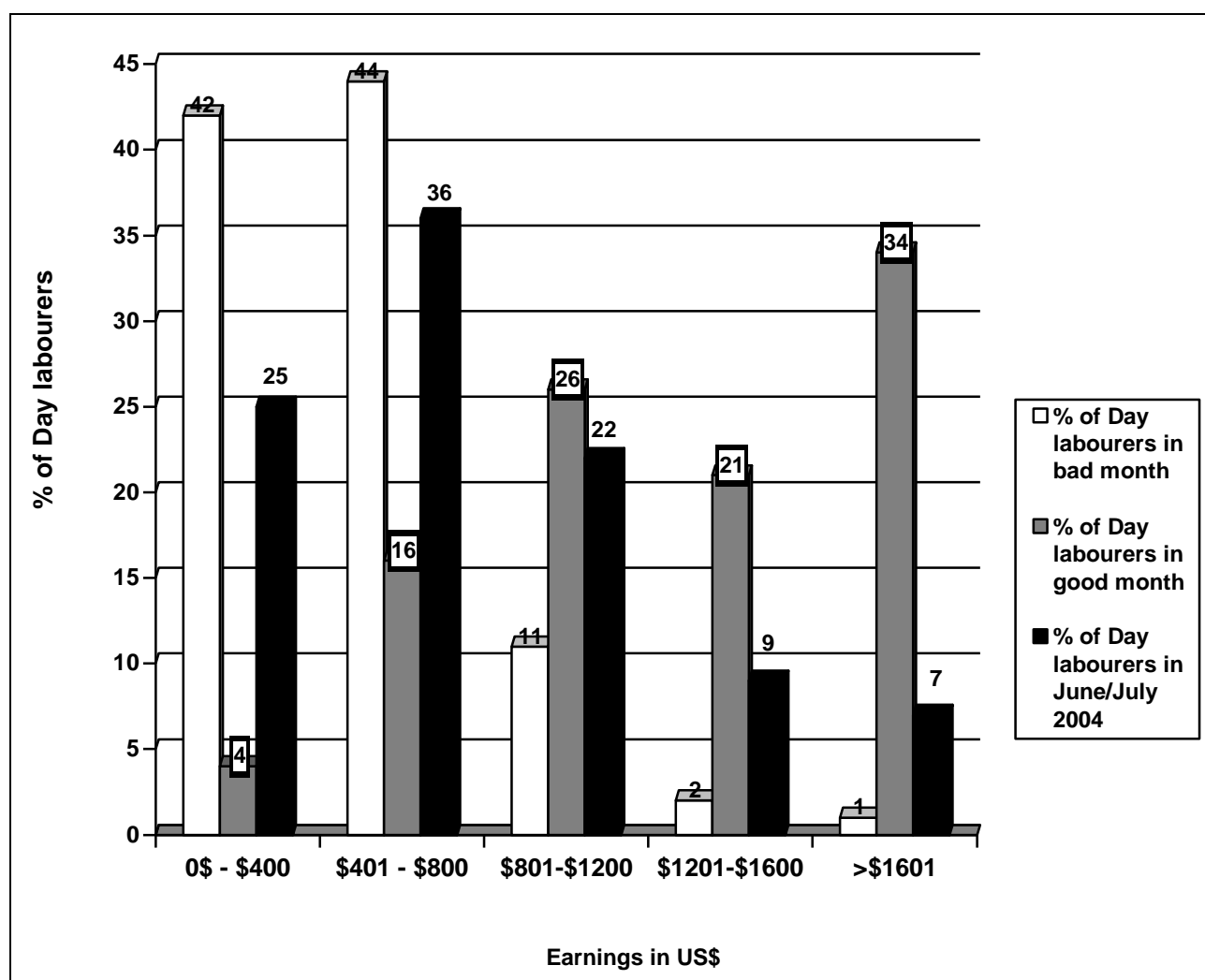


Fig 2: *Monthly earnings of day labourers in the United States in June/July 2004, a good month and a bad month (2004)*

Source: Adapted from Valenzuela Jr. et al. (2006)

Valenzuela Jr. et al. (2006: 11-12) analysed the level and volatility of United States day labourers' income and concluded the following: "Workers who search for day-labor jobs on a full-time basis

(i.e., four or more days a week) had median monthly earnings in June/July 2004 of \$700. However, one-quarter of full-time day laborers earned \$400 or less in that month. Monthly earnings of just \$400 for one-quarter of full-time day laborers are disturbing given that summer months are considered the optimal time of the year to secure day-labor work. On the upper end of the earnings scale, 7 percent of day laborers earned more than \$1,600 in that month. The volatility of monthly earnings can best be observed by comparing the earnings distribution of day laborers' peak (i.e., good months) and slow (i.e., bad months) periods. The median earnings level in a good month rises to \$1,400. However, in a bad month, median earnings fall to just 36 percent of peak-period levels, or \$500. Therefore, even in cases where day laborers have many more good months than bad months, it will be unlikely that their annual earnings will exceed \$15,000, keeping most workers in this market at or below the federal poverty threshold."

The day labourers in South Africa are faced with a similar challenge on two fronts. There are the unfulfilled expectations in terms of their reservation wage and resultant seemingly low levels of daily income to contend with. The variance in the daily wages earned highlights the uncertainty experienced by the day labourers in terms of their income if they do find employment (Blaauw 2010: 149-150). Figure 3 illustrates this.

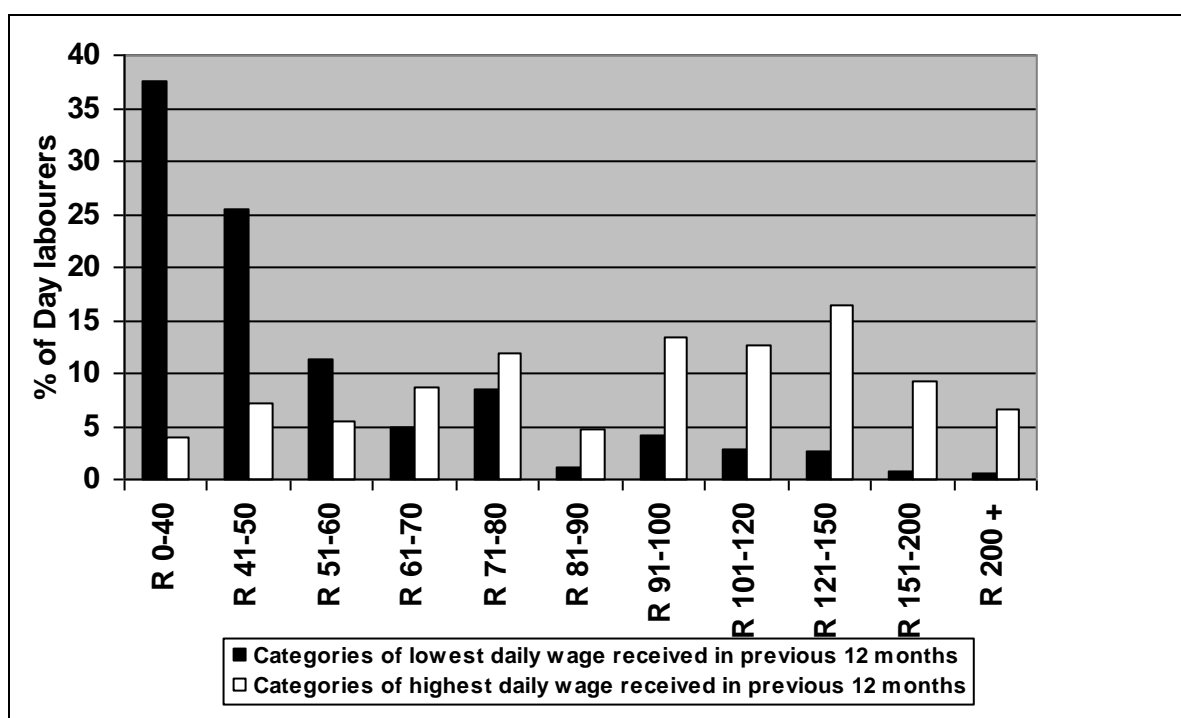


Fig 3: The lowest versus the highest daily wage earned during the 12 months prior to interviewing day labourers in South Africa, 2007

Source: Blaauw (2010)

The same variation is found in the observed level of income earned by day labourers in South Africa in a good week and a bad week in 2007. This is shown in figure 4.

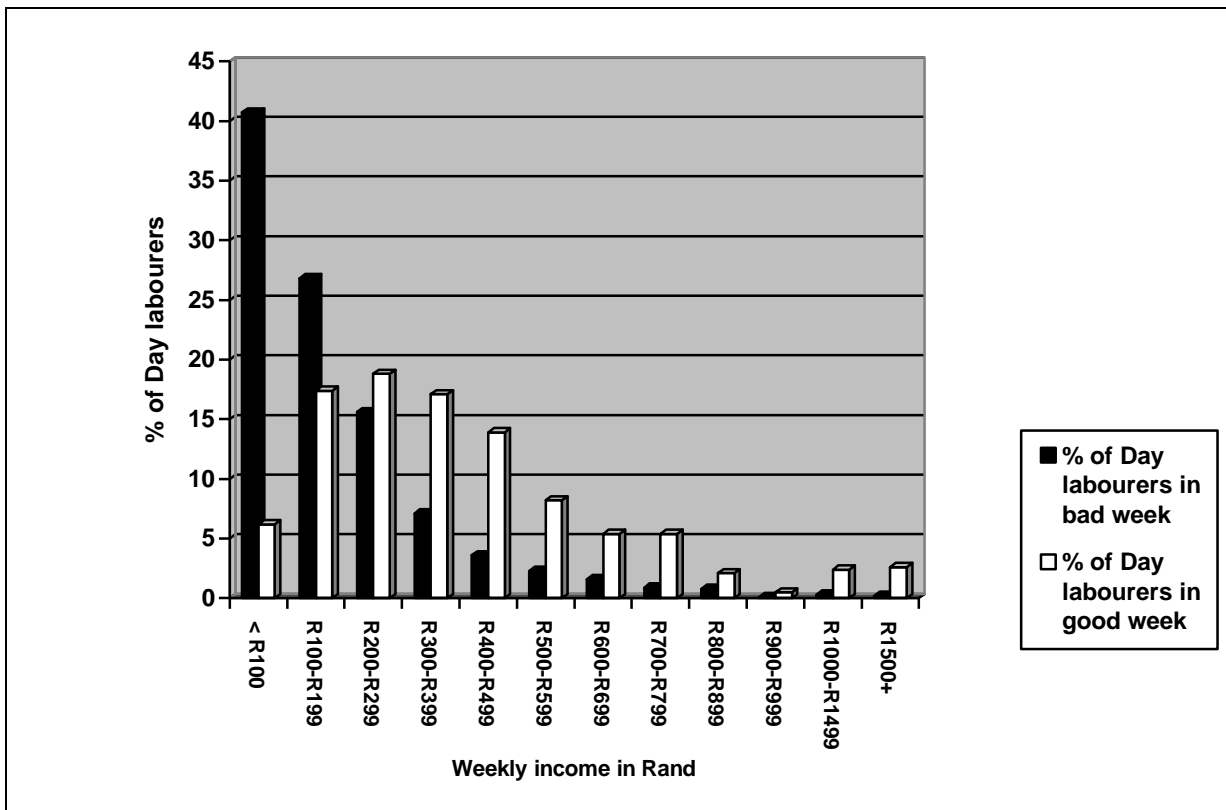


Fig 4: *The income earned by day labourers in South Africa in a good week versus a bad week, 2007*

Source: Blaauw (2010: 151)

Figure 4 confirms the variance, established in the existing literature, in the income of day labourers. The observed variance in day labour income in both the United States and South Africa confirms the inability of day labourers to hedge them against the risk and operation cost of obtaining an employment opportunity. Any unfavourable event, such as illness or other reasons for not being able to stand at the street corner, will markedly influence their chances of obtaining informal employment as a day labourer (Blaauw 2010: 149-150).

Day labourers mostly cannot afford any economic loss. Labour is in fact locked in by survivalist considerations that hamper market operation and market development and perpetuate a system of inter-generational transfer of poverty (Mehrotra and Biggeri 2007: 13). This is further reflected by the shallowness of the labour market in the form of variable income, the absence of arbitration and equalising of wages in different geographic areas and the difference in what is needed and expected in terms of wage and what in fact materialise. Little economic optimality is therefore observed in this market in South Africa (Blaauw 2010: 160).

Disaggregating the income figures for day labourers in South Africa does reveal that Income seems to increase with increased educational attainment in good and bad days, as well as in good and bad weeks. There is also a tendency of increased reservation wages with increased levels of education (Blaauw 2010: 169). Figure 5 illustrate the mean values of the daily income measures at each of the categories of educational attainment.

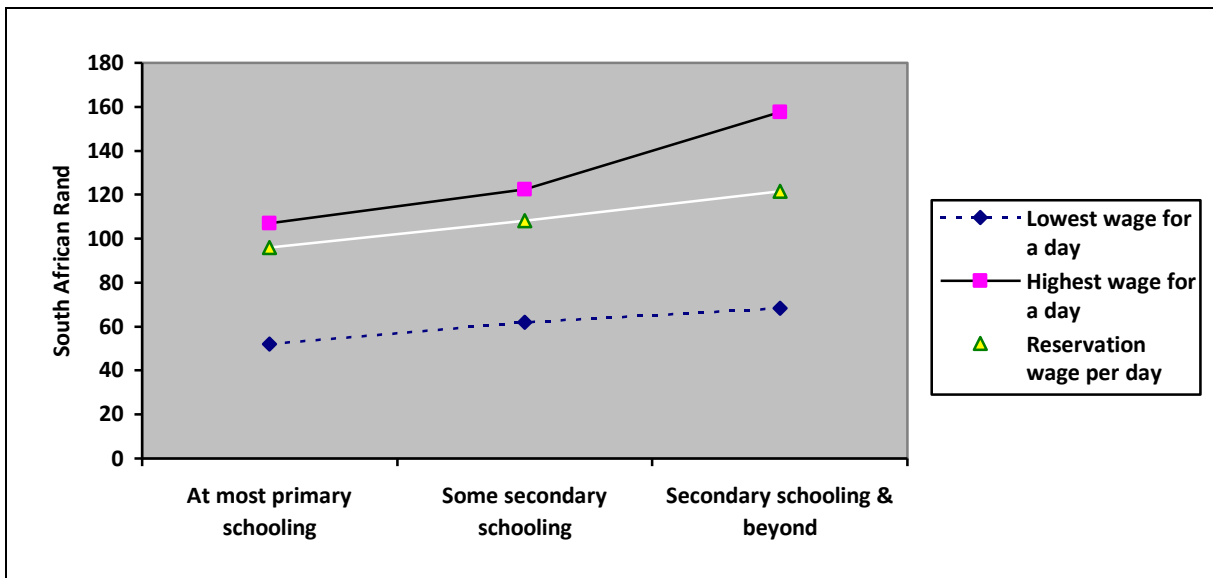


Fig 5: Mean values of daily income measures across categories of educational attainment for day labourers in South Africa, 2007
Source: Blaauw 2010: 170

Figure 5 illustrates the positive correlation between the levels of income and educational attainment. The increase in wages is more marked when the category of secondary schooling and beyond is reached. Although the available data for India is not pertinently limited to the day labour market, it does make an interesting observation. In India the role of education has not been that important in the case of casual workers. However, there is a still a possibility that even among casual workers, the more educated ones are in a better position to ask for the minimum wages announced by government. This is reflected by the fact that up to secondary level of education, casual wages show a steady increase in both rural and urban areas (Karan and Selvaraj 2008). Table 3 illustrates this.

Level of education	Males	Females	Persons
Rural			
Not literate	50.25	34.38	43.21
Literate but below primary	55.15	36.88	51.12
Primary	58.90	36.40	54.60
Middle	63.34	36.76	59.20
Secondary	61.67	36.16	58.37
Above secondary	61.96	37.59	59.66
Urban			
Not literate	67.52	43.09	58.37
Literate but below primary	75.01	48.42	71.06
Primary	75.41	43.34	70.09
Middle	80.85	43.53	76.85
Secondary	83.28	46.97	81.06
Above secondary	83.06	49.91	79.73

Table 3: Average daily wages (Rs) for casual workers in India by levels of education, 2004-05
Source: Karan and Selvaraj (2008: 16)

The above comparison, in spite of being very crude one, does seem to support the notions that the development of the level and quality of human capital for day labourers must be part of any policy recommendation in dealing with this growing phenomenon.

OTHER LABOUR MARKET EXPERIENCES OF DAY LABOURERS IN SOUTH AFRICA, UNITED STATES AND INDIA

Day labourers in all three countries under investigation experience similarly negative experiences in terms of their search for employment. Delayed payment, non-payment and being paid wages far below any stipulated minimum wages are common issues with day labourers in India, making the notion of 'decent work' a distant dream (Menon 2009). Menon (2009: 1) cites several case studies supporting the above experience: *"We could have managed if we could get the work and payment for all the 100 days," says Punki Bhai of Upli Subri village of Kotra block who had worked for 45 days, but paid only for the first 15 days and that too at the rate of Rs 45 per day when the minimum wage is Rs 100."*

In the United States day labourers also regularly suffer violations of their labour rights. The high incidence of labour-law violations is directly related to the economic marginalization of this workforce. Often, unscrupulous employers stand ready to capitalize on day labourers' urgent need for work, as is reflected in extraordinarily high rates of wage non-payment and exposure to unsafe working conditions (Valenzuela Jr. et al. 2006). Moreover, employers often threaten to turn workers over to federal immigration authorities, or other forms of retaliation, if workers speak out against substandard conditions (Mehta and Theodore 2006).

In South Africa the picture is very similar in terms of the vulnerability of day labourers, both economically as well as physically (Blaauw et al. 2006; Blaauw 2010). An area of additional vulnerability in the South African context is the role of criminal elements in misusing these people. In the study of South African day labourers there were several fieldworker reports that indicated that in both Johannesburg and Cape Town day labourers are being hired by criminals to offload goods that are present on trucks that were stolen and also that day labourers are being used to move stolen goods obtained through housebreaking and theft. (Blaauw 2010: 68).

In the United States, day labourers are also much more organised than their South African counterparts. In many cases this organisational endeavour is managed by the day labourers themselves. The National Day Laborer Organizing Network (NDLON) was founded in 2000 to enhance collaboration between eighteen local day-labourer organising groups in the United States (Blaauw 2010: 67). The mission of the NDLON is to strengthen and expand the work of local day-labourer organising groups. Initiatives of this nature would theoretically enable day labourers to address own risk in a more organised and endogenous fashion and, if successful, further reduce the variance in income. The empirical evidence again contradicts this view (Valenzuela Jr. et al. 2006: 11). Very little evidence of similar structured efforts is to be found in South Africa. In South Africa an organisation called "Men on the Side of the Road" was founded in Cape Town in 1999. Its activities have recently been extended to other cities such as Johannesburg (Blaauw 2010: 67).

CONCLUSIONS

The comparison of day labouring in South Africa, India and the United States identified several similarities between day labouring in South Africa and other corners of the globe. The unregulated nature of the informal labour market, the fierce competition for scarce jobs that occurs at street corners and the vulnerability to exogenous influences in the United States of America and India is

similar in many respects to the situation in South Africa. Other similarities include inadequate formal schooling, harsh working conditions and very little legal protection.

Another similarity between the day-labour market in the United States of America and in South Africa is the vulnerability of day labourers to the risks associated with this informal labour market activity. An example is employers who either do not pay these workers for the tasks that they perform or who underpay them.

The uncertain and low levels of income are another characteristic common to the lives of day labourers in the United States, India and in South Africa. It is also important to note that many of the day labourers in both the United States and South Africa previously held formal sector employment.

There are however, some important demographic and other differences in the day labour market situation within these countries. One of the biggest differences between the situation in the United States and that of South Africa is in terms of the time that day labourers in the United States are involved in this informal-sector activity. The length of the time period that day labourers are involved in this activity tends to be much shorter in the case of day labourers in the United States as compared with their South African counterparts.

The most important difference stemming from the comparison of the situation in the United States with that of South Africa and India is in terms of the future prospects for day labourers. A day labourer in the United States has a much better chance of making the transition into the formal sector than those living in South Africa and India. For many day labourers in the United States this is an intermediate phase and eventual entry point into the formal economy. This is not the case in South Africa and India. Long spells of unemployment and low skill levels make it extremely difficult for day labourers to get back into the formal sector.

In these countries the day labour market represents a manifestation of a formal economy that is unable to clear the supply of labour, as predicted by classical labour market theory. Day labouring is a catchment of this overflow, permanent in nature and with every possibility that the participants will become more and more isolated from the formal economy. The extent to which this informal labour market can provide a safety valve for the inadequacies of the formal labour market is limited.

Day labour is a complex phenomenon, and a number of problems, violations and abuses may be found in this sector of the informal economy. In order to address these issues effectively, the particular set of conditions facing day labourers in different areas must be accounted for. The similarities, but more importantly the differences, between the manifestations of the day labour phenomenon in various countries must be clearly understood. Policy actions that might be suitable in country might cause severe hardship to day labourers in another country where the rationale and dynamics in this informal labour market is significantly different.

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