SPATIAL IMPACT OF OVERSEAS FILIPINO WORKERS' REMITTANCES ON THE PHILIPPINE ECONOMY ; A COMPUTABLE GENERAL EQUILIBRIUM APPROACH

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Remittance inflows from overseas Filipino workers have become the second largest source of foreign exchange for the Philippine economy. In view of this, the paper assesses the vulnerability of Philippine households to an exogenous shock which takes the form of a five percent decline in overseas Filipino workers' remittances. It utilizes a spatial computable general equilibrium model with a five region social accounting matrix as database . A three level production function is specified namely, Cobb Douglas between labor and capital to produce value-added; then Leontief between non-transport inputs and value-added to produce output net of transport, which is then combined with transport inputs at the third level, using again a Cobb-Douglas production function. Capital and labor income accrue to the households, which then goes to consumption and savings with a constant marginal propensity to consume. Overseas remittances enter as transfer payments to households . Consumption is divided among different commodities, using a Cobb-Douglas utility function. Final demand is then built up in a standard way. Results indicate that in absolute terms, Northern Luzon middle and low income household groups in Northern Philippines bear the highest percentage reductions in income. On the other hand , Mindanao households in Southern Philippines are the least vulnerable. These results are then juxtaposed with those of a two region model using single level Leontief production function and Cobb Douglas utility function.

Key words : *spatial impact, remittances, computable general equilibrium modeling*

I. INTRODUCTION

Remittance inflows to a number of emerging market economies have increased substantially as the stock of overseas workers has grown and shifted towards more skilled jobs. The subject has, therefore, received much recent attention.[1] In the Philippines in particular, second to exports of goods and services, remittances have become the largest foreign exchange source.[2]

Past studies of the impact of remittances on the economy have relied either on econometric estimation, which yield partial equilibrium estimates, or survey approaches. This paper uses an economy-wide (general equilibrium) approach that allows for interactions between all major sectors in economy, while ensuring consistency of results. A major feature of the paper is its inter-regional approach, which gives a spatial dimension to the analysis. The basis is of the approach is the social accounting matrix, a version of which, covering the year 1994, was especially constructed for several papers authored by C. Dakila.

The framework is of the applied general equilibrium (AGE) type. A general equilibrium is described, which consists of a set of 'economic agents' (like consumers and producers), each of which demands and supplies goods or services, with each agent aiming to solves its own optimization problem. Agents are assumed to be price takers. Equilibrium is defined as a state of the economy in which the actions of all agents are mutually consistent and can be executed simultaneously. [3] In the model, adjustment to equilibrium is implemented by specifying that markets adjust to minimize the sum of

[1] One of the latest comprehensive studies is World Bank, Global Economic Prospects 2006: Economic Implications of Remittances and Migration (World Bank, 2006).

[2] Studies of the impact of OFW remittances include Chami, Fullenkamp and Jahjah (2005), Burgess and Haksar (2005), and Asian Development Bank (2004).

[3] See Shoven and Whalley, 1992 or Ginsburgh and Keyzer, 1997 for more details on applied general equilibrium models.

excess supplies.[4] It can be noted that although several AGE models have been estimated for the Philippines, all previous models were national in scope. This is thus the first model to offer a spatial dimension to the analysis. It is also the first attempt to analyze the impact of remittances in the Philippines using an economy-wide approach. An earlier version of transport-oriented spatial computable general equilibrium model developed for the Philippines by C Dakila was presented in a series of papers which showed the model's various applications

A three-level production function, is specified - Cobb-Douglas between labor and capital to produce value added, then Leontief between non-transport inputs and value added to produce output net of transport, which is then combined with transport inputs finally using a Cobb-Douglas production function. Capital and labor income accrue to households, which then goes to consumption and saving, with a constant marginal propensity to consume. Overseas remittances enter as transfer payments to households. Consumption is divided between different commodities using a Cobb-Douglas utility function. Final demand is then built up in a standard way.

Empirical results indicate that the main beneficiary (measured in peso terms) of remittance increases are the middle income classes across all regions. The second best beneficiaries are the low income household, again for all regions, with the notable exception of the National Capital Region, where the high income households are the second highest beneficiary of remittances. The paper highlights the data requirements

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[4] Quantities adjust in the model; prices follow to equate the notional and effective demands for labor.

for the modeling approach, which is instructive for emerging economies in similar situations.

II. THEORETICAL FRAMEWORK

The model accounts for the interregional linkages of the Philippine economy. The model was originally developed to address the issue of the spatial impact of transportation; thus the transport component of the production sector of the model is relatively well-developed. Table 1 summarizes the sectoral structure of the model. The model distinguishes between seven main production sectors, which are further differentiated according to the five regions of origin. These five regions are an agglomeration of the current 17 administrative regions in the Philippines. Since the National Capital Region has an insignificant agricultural sector, there are therefore 34 production sectors. For each region, households are differentiated into three income classes. There are, therefore, a total of 15 household categories. To ensure consistency with official standards, low income households are defined as comprising all households that earn below the regional poverty thresholds as determined by the National Statistical Coordination Board. The high income households are those who earn ₱250,000 and above annually, which is the income bracket in the FIES. All the households with incomes between the regional poverty threshold and the highest income bracket in the Family Income and Expenditure Survey are classified as middle income households. Mizokami, S. and Dakila, C. (2005) contain a detailed description of the database utilized in the model.

Insert Table 1. Sectoral Disaggregation in Five Region Model

A. HOUSEHOLD SECTOR

The model distinguishes between 15 representative households, with 3 household types (representing the low, middle, and high income classes) for each of the six regional groupings distinguished in this paper. The preferences of each household type are summarized by a corresponding Cobb-Douglas utility function:

$$U_h = \prod_i C_{ih}^{\delta_{ih}} \tag{1}$$

where δ_{ih} is the elasticity of the utility of the h^{th} household with respect to consumption of the i^{th} good. Each representative household maximizes its utility subject to its income constraint, which we describe below.

For each region, household labor income is assumed to be equal to the sum of the labor incomes that each household income group earns from supplying labor within the region. The endowments of labor of different income classes within a region are taken to be a constant; this then determines how labor income is distributed within each region.

Since capital is fixed, then each household income group is assumed to own a fixed share of total capital, and this ratio is maintained through the policy experiments. Household income is calculated as the sum of labor income ($w_i L_i$) plus that portion of capital income that accrues to the households ($\lambda_h \Sigma_i r_i K_i$), plus transfers from government and from the rest of the world. The latter two are exogenously determined.

Thus, if we partition the indices h and i so that the r^{th} partition belongs to the rth region, then we obtain total income per household type as:

$$Y_{h,r} = \omega_{h,r} \sum_{i \in r} w_i L_i + \lambda_{h,r} \sum_i r_i K_i + Tr_{GOV,h,r} + Tr_{ROW,h,r} \tag{2}$$

where the ω's are the labor income distribution parameters, and, as indicated, the summation is for industries belonging to the rth region. Total disposable income is found by subtracting direct taxes imposed on the household from the foregoing quantity:

$$Yd_h = Y_h \left(1 - \tau_h\right) \tag{3}$$

where Y_d is disposable income and τ_h is the direct tax rate imposed on household h. Note that the summation now runs within each household type, so that we have dropped the subscript r referring to the partitioning across regions.

Each household type is assumed to consume a constant proportion of its disposable income. Thus, households maximize utility subject to the budget constraint

$$\sum_i pd_i C_{ih} = c_h Yd_h \tag{4}$$

where pd_i is the domestic price of the good and c_h is the average propensity to consume of household h. Given the Cobb-Douglas utility function, the first order conditions yield the following consumption demands for each commodity by each household type in each region:

$$C_{i,h,r} = \delta_i c_{h,r} \left[\omega_{h,r} \sum_{i \in r} w_i L_i + \lambda_{h,r} \sum_i r_i K_i + Tr_{GOV,h,r} + Tr_{ROW,h,r} \right] \left(1 - \tau_{h,r}\right) / p_i \tag{5}$$

B. PRODUCTION SECTOR

Production is modeled assuming a three-stage production function. At the first stage, capital and labor are combined to produce value-added, using a Cobb-Douglas production technology.

$$V_i = A_i K_i^{\alpha_i} L_i^{1-\alpha_i} \qquad (6)$$

where for sector i and region r, V = value added, K = capital, L = labor, α = share of capital in value-added, and 1-α = share of labor in value-added. This specification of the Cobb-Douglas function assumes constant returns to scale. Capital is assumed to be immobile across sectors while labor is mobile.

In stage 2 of the production process, value-added is combined with non-transport intermediate inputs under a Leontief technology, to produce a composite good, which is output net of transport.

$$X_i^{NT} = \min\left[X_{1i}/a_{1i}, X_{2i}/a_{2i}, \ldots, X_{NTi}/a_{NTi}, V_i/a_{V,i} \right] \qquad (7)$$

Finally, stage 3 combines output net of transport with transport intermediate inputs under a Cobb-Douglas production function to yield total output gross of transport of commodity i ($X_{T,i}$).

$$X_{T,i} = B_i \left(X_i^{NT}\right)^{\beta_{1i}} W_i^{\beta_{2i}} A_i^{\beta_{3i}} La_i^{\beta_{4i}} \qquad (8)$$

where W, A and La represent the different transport intermediate inputs that go into sector i, namely, water, air and land transport. This specification allows substitutability between the various transport modes. Total output of sector i (X_i) is found by summing together total output gross of transport of commodity i ($X_{T,i}$), indirect taxes on i ($T_{indirect,i}$), direct taxes imposed on firms in sector i ($T_{direct,i}$), imports of i (M_i), tariffs imposed on i (Tar_i), and net dividends from the foreign sector into sector i ($Div_{For,i}$).

$$X_i = X_{T,i} + T_{Indirect,i} + T_{Direct,i} + M_i + Tar_i + Div_{For,i} \qquad (9)$$

The firm is assumed to maximize profits. Because of the nature of the production function, profit maximization can be described in three stages. The bottom stage entails choosing the optimum levels of capital and labor so as to maximize the contribution of value added to profits. At the second stage, as noted above, value-added is combined with other intermediate non-transport inputs in a fixed coefficients (Leontief) technology to produce output net of transport. Finally, the top stage determines the optimal combination of transport inputs to deliver output to the region of destination. Then for commodity j, the optimization problem is

Maximize

$$\Pi_j = pd_j X_j - \sum_i pd_j Mat_{i,j} - pva_j V_j \qquad (10)$$

subject to

$$X_j = B_j {X_j^{NT}}^{\beta_{1j}} {W_j}^{\beta_{2j}} {A_j}^{\beta_{3j}} {La_j}^{\beta_{4j}}$$

$$X_j^{NT} = \min\left[X_{1j} / a_{1j}, \ldots X_{NTj} / a_{NTj}, V_j / a_{V,j} \right] \qquad (11)$$

$$V_j = A_j K_j^{\alpha_j} L_j^{1-\alpha_j}$$

where Π is total profits, Mat_{ij} is the matrix of intermediate inputs of each commodity into commodity j, V represents value added, and pva is its corresponding price.

At the top production level, the corresponding first order conditions (FOCs) for profit maximization are

$$pd_i * \frac{\partial X_i}{\partial X^{NT}{}_i} = p_{NT} \text{ or } pd_i \beta_{1i} \frac{X_i}{X^{NT}{}_i} = p_{NT} \qquad (12)$$

$$pd_i * \frac{\partial X_i}{\partial W_i} = p_w \text{ or } pd_i \beta_{2i} \frac{X_i}{W_i} = p_W$$

$$pd_i * \frac{\partial X_i}{\partial A_i} = p_A \text{ or } pd_i \beta_{3i} \frac{X_i}{A_i} = p_A$$

$$pd_i * \frac{\partial X_i}{\partial La_i} = p_L \text{ or } pd_i \beta_{4i} \frac{X_i}{La_i} = p_{La}$$

There are no corresponding FOCs for the second level production stage, since this is characterized by fixed coefficients technology, and marginal conditions are not defined. However, once output net of transport is determined, the different non-transport inputs as well as total value added can be derived using the fixed coefficients technology in Eqn (7).

At the bottom level, profit maximization entails choosing the least cost combination of labor and capital to produce the required value-added. Since capital is immobile, of particular interest is the first-order condition for labor, which is

$$pva_i * \frac{\partial V_i}{\partial L_i} = w_i$$

$$pva_i\left(1-\alpha_i\right)\frac{V_i}{L_i} = w_i \tag{13}$$

C. GOVERNMENT AND THE EXTERNAL SECTOR

The model incorporates a national government sector, i.e., the behavior of local government units is not considered. Government enters the economy in several ways: it purchases output from each sector, imposes indirect taxes on production and tariffs on imported goods, and direct taxes on income of each household type. Government expenditures on each commodity are taken as exogenous in the model, while taxes are endogenous.

Tariff revenues per commodity equal the product of the tariff rates and import values:

$$Tar_i = tar_i\left(m_i\right) \tag{14}$$

where Tar_i and tar_i are total tariff collections from i and the tariff rate on commodity i, respectively. Indirect tax collections are given by the product of the indirect tax rate imposed on domestic production and the rate imposed on imports of the product:

$$T_{Indirect,i} = tind_i\left(d_i + m_i\left(1+tar_i\right)\right) \tag{15}$$

Direct tax collections per household type in the model are computed as:

$$T_{Direct,h} = Y_h - Yd_h \tag{16}$$

At this stage of model specification, imports and exports are taken as exogenous.

D. INVESTMENT-SAVING BALANCE

Total household savings in the model are given by the aggregate difference between household disposable income and consumption expenditures:

$$S_h = \Sigma_h \left(Yd_h - C_h \right) \tag{17}$$

One complication is that some of the measured consumption expenditures are of the nature of investments, including pension premia, pre-need plans and stock investments. Thus, we introduce a balancing factor (ϕ) to account for any discrepancies between measured savings and investments.

Total government savings are the sum of the various revenue sources minus total government purchases of the outputs of the various sectors, total government transfers to households, and total net transfers of the government to the foreign sector:

$$S_G = \Sigma_i Tar_i + \Sigma_i T_{Indirect,i} + \Sigma_h T_{Direct,h} - \Sigma_i G_i - \Sigma_h Tr_{GOV,h} - Tr_{GOV,FOR} \tag{18}$$

Total foreign savings, S_{FOR}, are given by the current account deficit minus net dividends to foreigners. Therefore, total savings are

$$S_{TOTAL} = S_h + S_{GOV} + S_{FOR} \tag{19}$$

Conceptually, total savings should equal total investment. As noted previously, our framework allows for statistical discrepancy by introducing a factor ϕ which transforms savings to investments. Investment distribution per sector is then modeled as constant proportion of total investment, with the distribution coefficients γ_i calibrated according to the sectoral distribution of investment in 1994:

$$I_i = \gamma_i \phi\left(S_{TOTAL}\right) \tag{20}$$

E. DEMAND

Total intermediate demand for commodities by the firm arises from its maximization of profits subject to the three-level production function. At the first level, the first order condition for profit maximization entails equating the marginal product to the marginal cost of labor.

$$pva_i * \frac{\partial V_i}{\partial L_i} = w_i$$

$$pva_i \left(1 - \alpha_i\right) \frac{V_i}{L_i} = w_i \tag{11}$$

where the marginal product of labor for each production sector is evaluated assuming that capital is immobile across sectors. For any given employment, equilibrium entails that the corresponding level of production equal the demand forthcoming at the employment level. Similar equations hold for the choice between output net of transport and the various transport inputs, at the third level of the production function.

This equilibrium condition together with (11) determines pva. We turn to this in greater detail in the section on prices.

At the second level, each production sector combines value-added and every non-transport intermediate input according to a fixed proportions technology:

$$Mat_{i,j} = a_{ij} X_j^{NT} \tag{21}$$

where i runs through all the non-transport intermediate inputs and value added for each sector, j runs through all the production sectors in the economy, Mat_{ij} is the matrix of interindustry flows in the economy, a_{ij} represents the fixed coefficients technology, and, as before X_j^{NT} is output net of transport for the jth sector.

Final demand in the economy originates from households (consumption demand), firms (investment demand), government spending, and the foreign sector (export demand). Consumption demand by households originates from the maximization of the utility function, as described previously in section IIA. Although, for simplicity, firms' investment demand are not described explicitly in terms of optimization, the level of investment is determined by the transformation of savings into such, as described in section IID. Government and export expenditures are taken to be exogenously determined.

The domestic demand for commodity i consists of the total intermediate demand, plus the total final demands for consumption, investment, and government purchases, while the total composite demand, represented by Q_i, is the sum of the domestic demand and exports:

$$Q_i = \sum_j \mathrm{Mat}_{i,j} + \sum_h C_{h,i} + I_i + G_i + \mathrm{Exports}_i \tag{22}$$

F. PRICES AND EQUILIBRIUM

For any given employment level, equilibrium entails that the corresponding level of production should equal the demand forthcoming at the employment level. This requirement, together with the first order conditions for profit maximization by the firms, determines the price levels in the economy, relative to the price of labor. The labor price is assumed to be the numeraire, and is thus taken to be fixed. Since capital is a fixed factor, we take returns to capital as a residual determined by the identity:

$$r_i = \frac{\left(\mathrm{pva}_i * V_i - w_i^0 L_i\right)}{k_i^0} \tag{23}$$

The total product cost can then be built up from the components in a standard way. Thus, average cost per unit is

$$AC_i = \frac{\Sigma_j \mathrm{pd}_j \mathrm{Mat}_{j,i} + \mathrm{pva}_i V_i}{X_i} \tag{24}$$

where pd_i is the domestic (tax-inclusive) price of i. In equilibrium, the average cost equals the composite price pq_i of the commodity (the composite price is the peso price of both domestically produced and imported commodities).

The excess supply for each commodity is given by:

$$ES_i = X_i - Q_i \tag{25}$$

The model treats all the foregoing relationships as constraints in a nonlinear programming problem. Markets are assumed to operate so as to minimize the value of sum of squared excess supplies for all commodities; i.e., the objective of the programming problem is to minimize the quantity

$$\Omega = \Sigma_i \left(pq_i * ES_i^{\,2} \right) \qquad (26)$$

In equilibrium, therefore, the unit cost is divisible into three parts: (1) $\frac{\sum_j pd_j q_{ji}}{X_i}$, where the j's are the non-transport inputs give the cost of non transport intermediate inputs per unit of X; (2) the same formula with the j's taken to be the transport inputs yields the transport margin; and $\frac{w_i L_i + r_i K_i}{X_i}$ is the cost of value added per unit of X.

III EMPIRICAL RESULTS: REGIONAL IMPACT OF OVERSEAS WORKERS REMITTANCES

3.1 Five-Region Model

With overseas remittances accounting for a significant portion of foreign exchange inflows, the sensitivity of economic activity to any disruption in such flows becomes a relevant policy question. Remittances from overseas workers are the most important component of transfers from abroad, and it is thus the latter variable that we subject to a shock, in the magnitude of 5 percent that of 1994 levels. We apply this evenly across household types. The incidence of the shock depends upon household dependence on foreign income. This absolute incidence is summarized in Figure 2 (in MP), and the relative incidence, in terms of the percentage fall in income, in Figure 3. In absolute terms, N. Luzon middle-income households are the most vulnerable, although a greater concentration of the impact of reduced transfers falls on NCR households, particularly the high and middle income classes. N. Luzon households generally bear the highest percentage reductions in incomes. The results generally validate the characterization of N. Luzon households as being most prone to migrate.

Insert Fig. 2 Reduction in Transfers & Fig.3 Reduction in Transfers as Percent Of Total Income

Lower income levels will induce reductions in consumption, and therefore on output, which then lead to second round impacts on the foregoing variables in a multiplier process. The final impacts will depend on the initial incidence of the income reductions across the different household groups, the consumptions patterns of such households, and the linkages between the different sectors of production (i.e., the transactions matrix, in an input-output analysis). Figures 4 and 5 show the final reductions in output, both in absolute and percentage terms. In peso terms, it can be seen that the impacts are largest for industry and services other than transport, for NCR and S. Luzon. Percentage-wise, however, agriculture and industry for S. Luzon take the greatest hit. Interestingly, there appears to be some relatively minor increase in output of other services for S. Luzon and N. Luzon; this may validate the observation that the services sector tends to serve as employer of last resort in case of slowdown in the economy.

Insert Fig. 4 Reduction in Output & Fig. 5 Percent Reduction in Outpu

Insert Fig.6 Household Equivalent Variation & Fig. 7 Percent Reduction in Utility From 5% Fall in Transfers

Although Figures 2 and 3 show the initial incidence of the fall in transfers, the final impact on utility can be quite different, and in general will be further influenced by the successive round effects on regional output, plus the successive impacts on incomes and consumption patterns. Figure 7 shows that the impact can be especially hard on low income classes across regions, except the NCR and Mindanao, where the impact is greatest on the middle income class. The latter result agrees with the finding shown in Fig. 3 that foreign transfers are a comparatively insignificant source of support for the poorest families in Mindanao. Alternatively, one can look at the absolute welfare reduction across household categories. One measure of this is equivalent variation, defined as the amount of money a household would have to be compensated for in order to bring it to the original level of utility before the shock being considered. Using this measure, results (Figure 6) indicate that the main costs of remittance declines are the middle income classes across all regions. The second best highest costs are the low income households, again for all regions, with the notable exception of the National Capital Region.

3.2 Two-Region Model

To further examine the robustness of the five region model results, a separate two-region model was devised with different sector disaggregation. A more detailed disaggregation is shown in the table below.

Insert Table 2 Disaggregation of Two Region Model

The Philippines was divided into two main regions, the National Capital Region, the center of economic and social activity , and the rest-of- the-Philippines Region. This dichotomy takes off from the center-periphery theory of development. On the other hand, the regional production sector is divided into nine sectors with a more detailed breakdown of the industrial sector (mining, manufacturing, electricity, gas & water and construction). and a separate financial sector from the other services sector. The rationale for this disaggregation is to look at the impact on the formal banking sector and specific industrial sector of the decline in OFW (overseas Filipino workers) remittances brought about by the current global recession.

This two-region model utilizes a simple one-level Leontief production function at the regional level. Furthermore, the regional consumption function of four types of households (low income and high income households in the National Capital Region) and (low income and high income households in the rest-of –the Philippines is of Cobb Douglas type. In a parallel manner, the impact of a bigger decline in OFW remittances is estimated on critical regional macroeconomic variables like output and welfare.

The results in terms of changes in output in the two regions namely, NCR and the rest-of –the-Philippines are shown in Fig.8 and Fig.9 below

The figures below show that the biggest losers in terms of total regional output are the rest-of-the-Philippines manufacturing and agricultural sector which rank first and third biggest decline plus NCR manufacturing sector which ranked second. This maybe a manifestation of lower consumption demand for both finished goods and raw material goods brought about by lower income of households . In terms of percentage values, most of the relative output losses were experienced by NCR production sectors namely its small agricultural sector, manufacturing, mining, utilities sector (EGW). For the ROP, slack in final demand of output of its ,agricultural sector is the most severe result of the exogenous shock..

Insert Fig. 8 Absolute Decline in Output

Insert Fig. 9 Percent Decline in Output

In term of welfare effects, the biggest absolute decline in welfare was experienced by high income households in the rest-of-the Philippines and followed by high income households in NCR. However, in terms of relative decline in welfare, low income households in the prime urban area of National Capital Region experienced the biggest decline in welfare followed by the high income households in the rest-of-the-Philippines. This demonstrates the inequitable impact of lower OFW remittances brought about by the current global recession. (See Fig. 10 & Fig. 11 below)

Insert Fig. 10 Percentage Change in Utility

Insert Fig. 11 Absolute Change in Utility

IV. CONCLUSION

Assessing household vulnerability to shocks is an important aspect of policy design. An applied general equilibrium framework can be an important tool is quantifying the spatial dimension of such shocks. In view of the increasing importance of remittances as a source of foreign exchange, this work can be seen as a first attempt to fill a void in our knowledge of the impact of instability in such flows on the various sectors of the economy.

This paper presented the results of two models with different levels of sectoral and regional production and household disaggretation. Aside from this , different functional forms were used for each type of model. The five region model utilized a three-level production function (Cobb-Douglas--Leontief--Cobb Douglas) ; whereas the two region model utilized a Leontief single level production function. The comparative results showed that the functional specification of the production function and the level of disaggregation of the regional production sector exert a significant influence on the empirical results. Moreover, the detrimental effect of a decline in overseas Filipino workers' (OFW) remittances had different magnitudes of adverse impact on delineated production sectors and household income groups across the Philippines.

The quantitative results presented in this paper can be subject to further refinement-. In this regard, timely and detailed information on resource flows in the economy are essential, especially an updated transactions matrix, survey of family income and expenditures, and flow of funds in the Philippines. On the other hand, this paper hopes to contribute to the growing stock of empirical work on spatial dimension of economic activity; which in this case is focused on the spatial impact of a decline in foreign transfers to Philippine households.

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Note : Manuscript has two tables and 11 figures as shown below in separate sheets

Table 1 Sectoral Disaggregation of Five Region Model

PRODUCTION SECTORS	REGIONS	HOUSEHOLDS
Agriculture (Ag) Industry (Ind) Water transport (Wtr Tr) Land transport (Land Tr) Air transport (Air Tr) Other services (OthrSr) Government (Govt)	National Capital Region(NCR) Northern Luzon (NOL) Southern Luzon (SOL) Visayas (VIS) Mindanao (MIN)	Low income Middle income High income

Figure 1 Map of Five Region Delineation

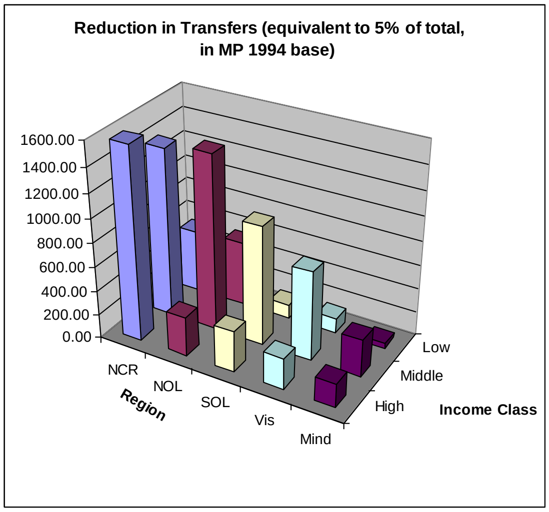


Figure 2

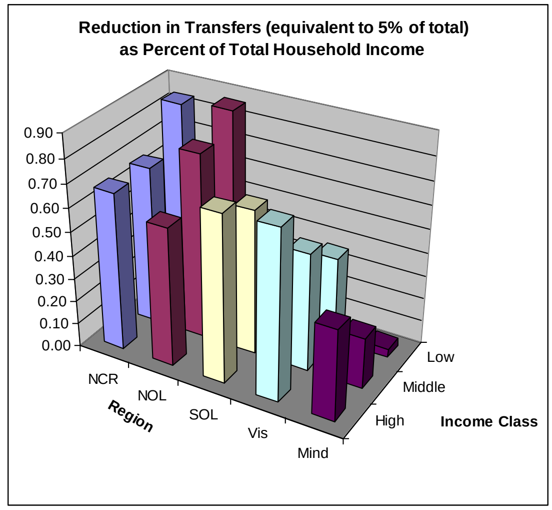


Figure 3

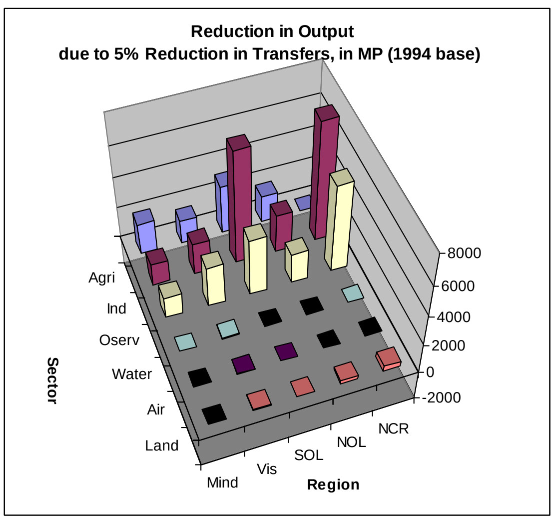


Fig 4

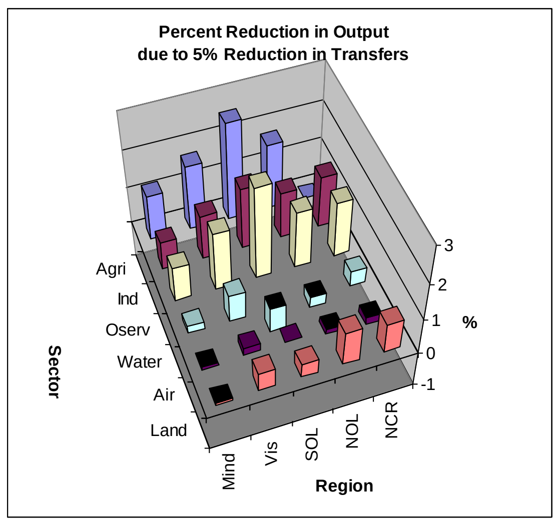


Fig 5

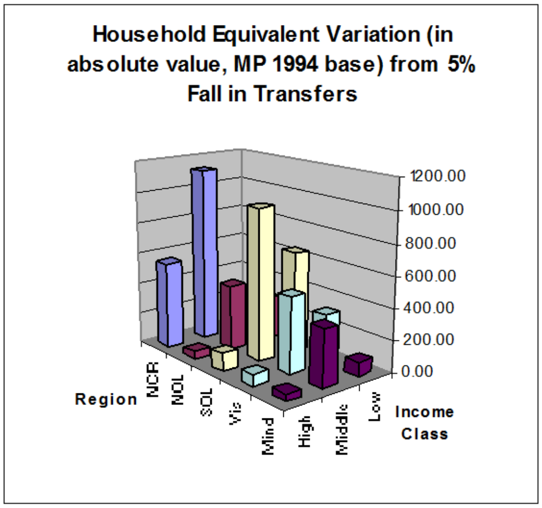

Household Equivalent Variation (in absolute value, MP 1994 base) from 5% Fall in Transfers
1200.00
1000.00
800.00
600.00
400.00
200.00
0.00
Region
NCR
NOL
SOL
Vis
Mind
High
Middle
Low
Income Class

Fig. 6

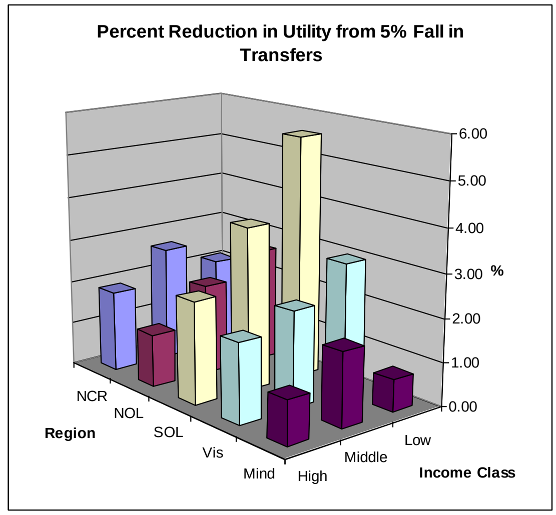
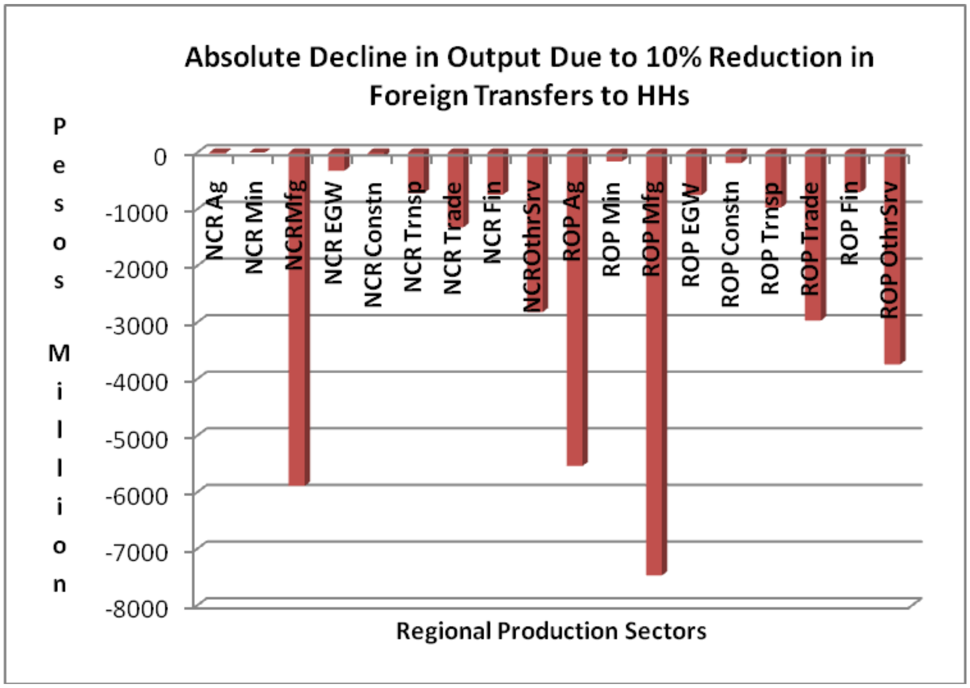

Percent Reduction in Utility from 5% Fall in Transfers
6.00
5.00
4.00
3.00
%
2.00
1.00
0.00
Region
NCR
NOL
SOL
Vis
Mind
High
Middle
Low
Income Class

Fig.7

Table 2 Disaggregation of Two Region Model

Regions	Production Sectors	Households
National Capital Region (NCR) Rest-of-the-Philippines (ROP) (includes Northern Luzon, Southern Luzon, Visayas & Mindanao)	Agriculture (Ag) Mining & Quarrying (Min) Manufacturing (Mfg) Electricity,Gas&Water (EGW) Construction (Constn) Transportation (Trnsp) Trade (Trade) Finance & Insurance (Fin) Other Services (OthrSrv)	Low Income (Low Y) High Income (High Y)



Absolute Decline in Output Due to 10% Reduction in Foreign Transfers to HHs
Pesos Million
0
-1000
-2000
-3000
-4000
-5000
-6000
-7000
-8000
NCR Ag
NCR Min
NCRMfg
NCR EGW
NCR Constn
NCR Trnsp
NCR Trade
NCR Fin
NCROthrSrv
ROP Ag
ROP Min
ROP Mfg
ROP EGW
ROP Constn
ROP Trnsp
ROP Trade
ROP Fin
ROP OthrSrv
Regional Production Sectors

Fig. 8

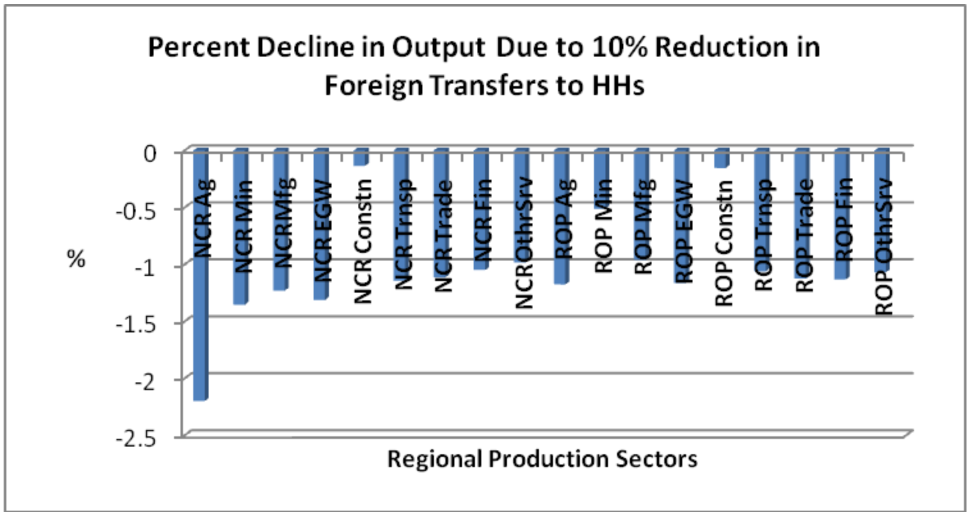

Percent Decline in Output Due to 10% Reduction in Foreign Transfers to HHs
0
-0.5
-1
-1.5
-2
-2.5
%
NCR Ag
NCR Min
NCRMfg
NCR EGW
NCR Constn
NCR Trnsp
NCR Trade
NCR Fin
NCROthrSrv
ROP Ag
ROP Min
ROP Mfg
ROP EGW
ROP Constn
ROP Trnsp
ROP Trade
ROP Fin
ROP OthrSrv
Regional Production Sectors

Fig. 9

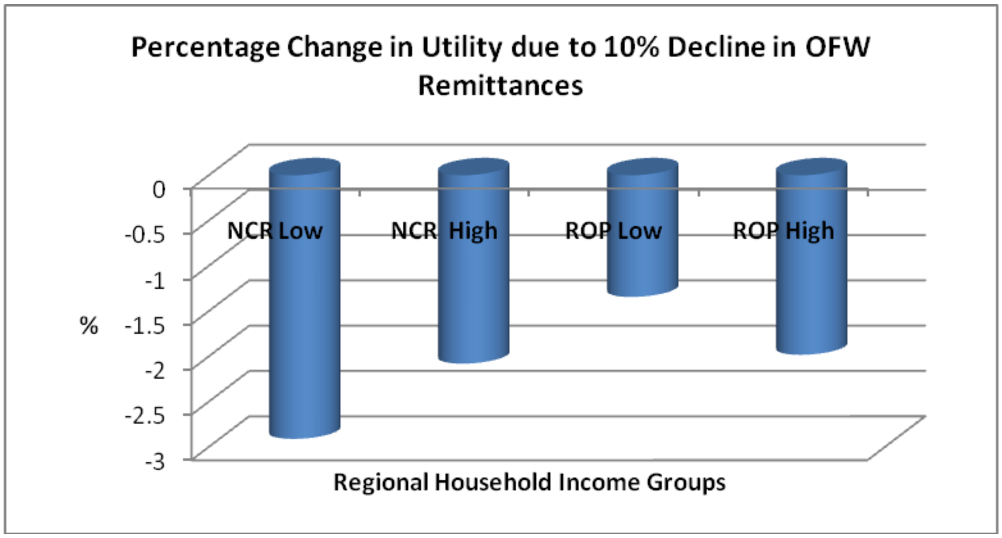

Percentage Change in Utility due to 10% Decline in OFW Remittances
0
-0.5
-1
-1.5
-2
-2.5
-3
%
NCR Low
NCR High
ROP Low
ROP High
Regional Household Income Groups

Fig.10

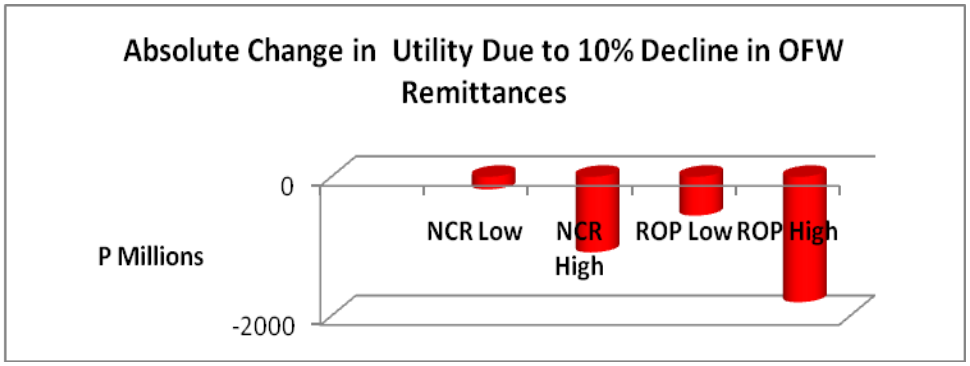

Absolute Change in Utility Due to 10% Decline in OFW Remittances
0
-2000
P Millions
NCR Low
NCR High
ROP Low
ROP High

Fig. 11