

Remittances, the Dutch Disease, and Premature Deindustrialization in the Philippines

Tuan Khai VU[†]

Abstract

In this paper we ask the question of whether remittance inflows may have played some role in the premature deindustrialization observed in many developing countries over the past few decades. We analyze the question using data for the Philippines, a country that has experienced both large inflows of remittances and deindustrialization. We also document a number of important facts about remittances and deindustrialization in the Philippines. We find evidence of the Dutch disease and deindustrialization associated with remittance inflows. Specifically, an increase in remittance inflows raises the price level, appreciates the home currency in real terms, and reduces the share of value added of industry in GDP of the home country in the medium run. In the short run, however, the effects of the remittance shock are somewhat more favorable: output increases and industrialization is promoted.

Keywords: Remittances, Dutch disease, premature deindustrialization, the Philippine economy, vector auto-regression with block exogeneity.

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[†] Faculty of Economics, Hosei University. E-mail: vu.tuankhai hosei.ac.jp.

1. Introduction

Remittance inflows and deindustrialization are two economic phenomena characterizing many developing economies over the past several decades. Remittance flows to low- and middle-income countries (LMICs) have grown steadily from less than 50 billion U.S. dollars in 1990 to over 600 billion U.S. dollars in 2021 (World Bank, 2022). They have been an important source of external finance for LMICs, recently being very close to FDI, the largest source, and about three times of official development aid (ODA). On the other hand, deindustrialization, which refers to the process in which the relative size of manufacturing is shrinking, has been observed in many countries, especially those in Latin America and sub-Saharan Africa (Rodrik, 2016).

Remittance inflows and deindustrialization have been studied in separated strands of the literature. In the literature on remittances, the effects of remittances at both microeconomic and macroeconomic levels are studied extensively (see, e.g., Lartey, 2019 and other papers in the same volume). One negative effect of remittances is the Dutch disease in which remittance inflows cause the home currency to appreciate in real terms, reducing the competitiveness of the home country's tradable sectors such as manufacturing (Daway-Ducanes, 2019; Lartey and Nigatu, 2021). The industrialization literature addresses the problem of premature deindustrialization, in which many developing countries began to deindustrialize at much earlier stages of development and at much lower levels of income per capita compared to what developed countries experienced in the past.

Given this background, the present paper asks the question: Have remittance inflows played any role in the premature deindustrialization

observed in developing countries? Our conjecture at the outset of the research was that since remittances may bring about the Dutch disease, they may potentially have an effect on deindustrialization (Rodrik, 2016).

To answer the question raised above, we choose as a case study the Philippines, a country that has experienced both large inflows of remittances and deindustrialization over past few decades. Given the fact that we need to analyze the effects of remittances on the economy of the Philippines, we use a time series econometric method called vector autoregression with block exogeneity that is able to capture the dynamic and interdependent relations between remittances and other economic variables of the Philippines. We also explicitly take into account and isolate the effects of cofounding factors potentially affecting both remittances and other economic variables, an important point to which little attention is paid in the literature.

The remainder of the paper is organized as follows. Section 2 documents some important facts on remittance inflows and deindustrialization in the Philippines. Section 3, the main part of the paper, provides an analysis of the question raised above. The last section concludes the paper.

2. Some facts about remittances and deindustrialization in the Philippines

One fact that stands out about remittances of the Philippines is that it is a large remittance recipient. According to data of the World Bank, the Philippines is the second largest country in the world in terms of remittances received in the period 2000-2020 (Table 1), ranking lower than India but higher than other large remittance recipient countries such as Mexico, China, Nigeria, Egypt, and Pakistan. The amount of remittance

inflows to the Philippines is about 29 billion U.S. dollars per year, which is equivalent to 9.7 percent of annual GDP of the country (again these data are annual averages of 2000-2020). In 2020 amount of remittance per capita was 318 U.S. dollars, compared to nominal GDP per capita of 3301 U.S. dollars.

Over the past few decades remittances of the Philippines have grown steadily. The annual growth rate of remittances per capita in the period 1980-2020 is 9.5 percent, which is considerably higher than the growth rate of 4.3 percent of nominal GDP per capita (Figure 1). Remittances grew faster than GDP especially in the 1980s and the 1990s, which can be seen by the steady rise of remittances as ratio to GDP from 1.1 percent in 1980 to 9.9 percent in 1998 (Figure 2). Since 2000 the ratio has been fluctuating between seven and ten percent.

On the other hand, industrialization in the Philippines followed an inverted U-shaped path: it proceeded during the 1950s through the 1970s and peaked out around 1980.¹ After that deindustrialization began and has been continuing to the present. This can be seen in the downward trend of the share of value added of industry in GDP: from close to 40 percent at the beginning of the 1980s to below 30 percent in 2020. The same trend is observed for manufacturing since 2000 when data is available. Given that the Philippines is still a developing country with an average income remaining low (currently it is classified by the World Bank as a lower-middle-income country and it has been so for decades), we may say that the country has been experiencing premature deindustrialization.

1 The U-shaped plot here is a bit different from that in the literature (e.g., Herrendorf, Rogerson and Valentinyi, 2014; and Rodrik, 2016) in which the output share of industry (more precisely manufacturing) is plotted against natural logs of real income per capita using cross country data. But the fact that the output share of industry of the Philippines peaked out when income per capita was still at a low level remains the same.

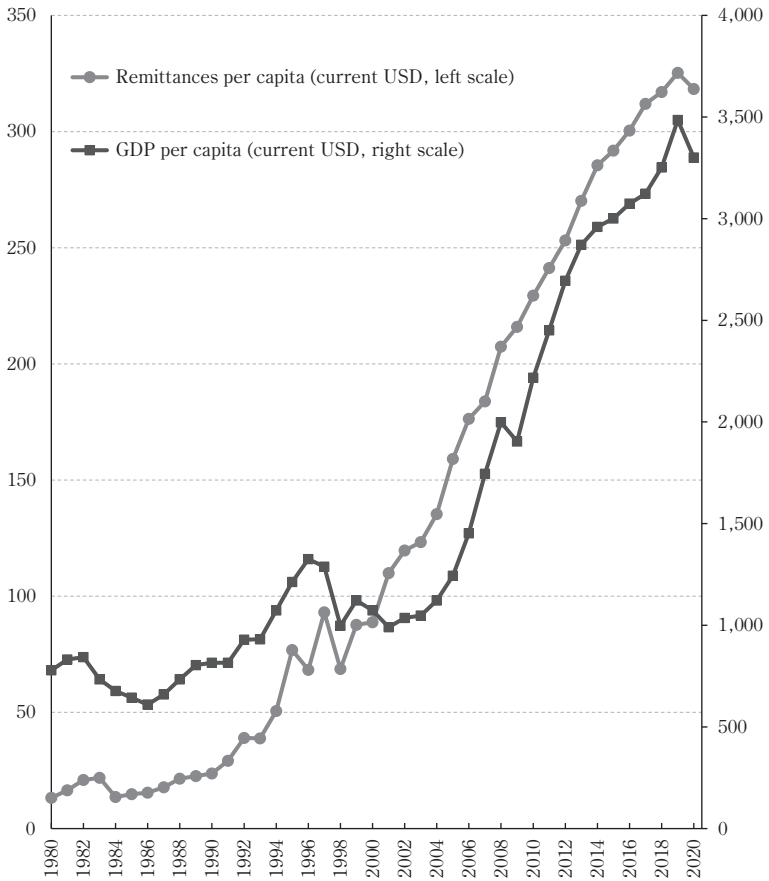
The facts described above about remittances suggest that they have been an increasingly important factor influencing the economy of the Philippines. And they may have related to the deindustrialization trend in the country. The next section will investigate this issue.

Table 1: Top 50 countries in the world with highest remittances received

Ranking	Country	Remittances (mil. USD)	Ranking	Country	Remittances (mil. USD)
1	India	70,096	26	Uzbekistan	6,236
2	Philippines	29,294	27	Dominican Republic	5,558
3	Mexico	29,235	28	Colombia	5,227
4	France	24,165	29	Romania	4,781
5	China	22,283	30	United Kingdom	4,589
6	Nigeria	20,944	31	El Salvador	4,543
7	Egypt, Arab Rep.	20,634	32	Jordan	4,526
8	Pakistan	17,850	33	Honduras	3,858
9	Germany	16,335	34	Serbia	3,824
10	Bangladesh	14,904	35	Hungary	3,737
11	Vietnam	12,915	36	Sweden	3,688
12	Belgium	11,614	37	Japan	3,427
13	Ukraine	10,509	38	Croatia	3,136
14	Italy	9,490	39	Austria	3,042
15	Indonesia	8,846	40	Brazil	2,954
16	Russian Federation	7,557	41	Ghana	2,878
17	Poland	7,249	42	Yemen, Rep.	2,871
18	Guatemala	7,138	43	Peru	2,865
19	Lebanon	7,126	44	Ecuador	2,742
20	Morocco	6,933	45	Czech Republic	2,706
21	Korea, Rep.	6,667	46	Spain	2,675
22	United States	6,483	47	Tajikistan	2,555
23	Thailand	6,475	48	Switzerland	2,550
24	Sri Lanka	6,465	49	Jamaica	2,375
25	Nepal	6,260	50	Haiti	2,274

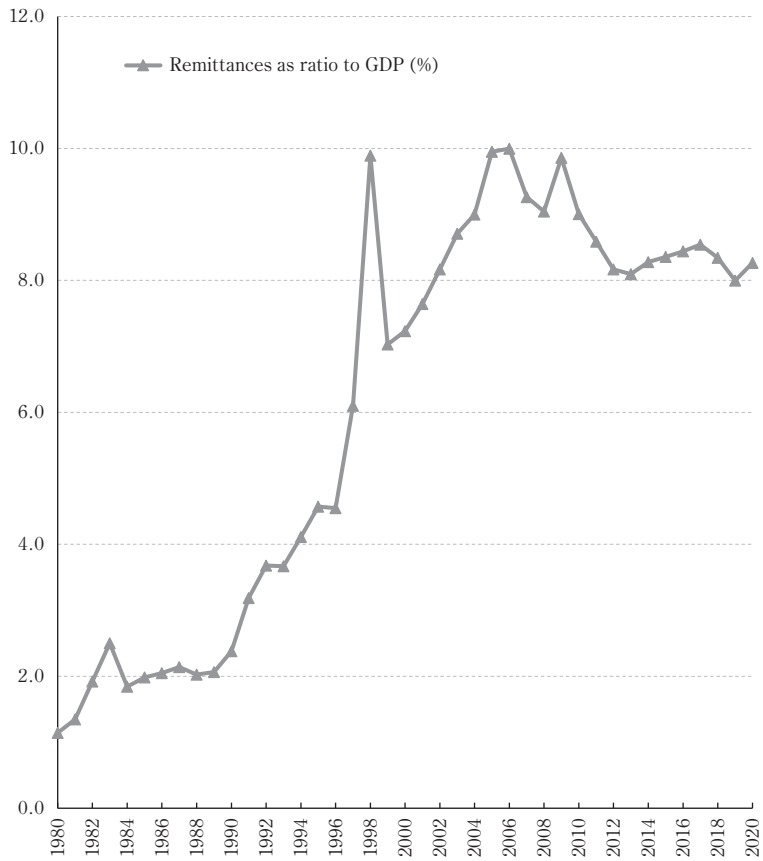
Note: Data are annual average of 2010-2020. Source: Author's calculation based on data from the World Development Indicators database of the World Bank.

Figure 1: Remittances per capita and GDP per capita of the Philippines, 1980-2020



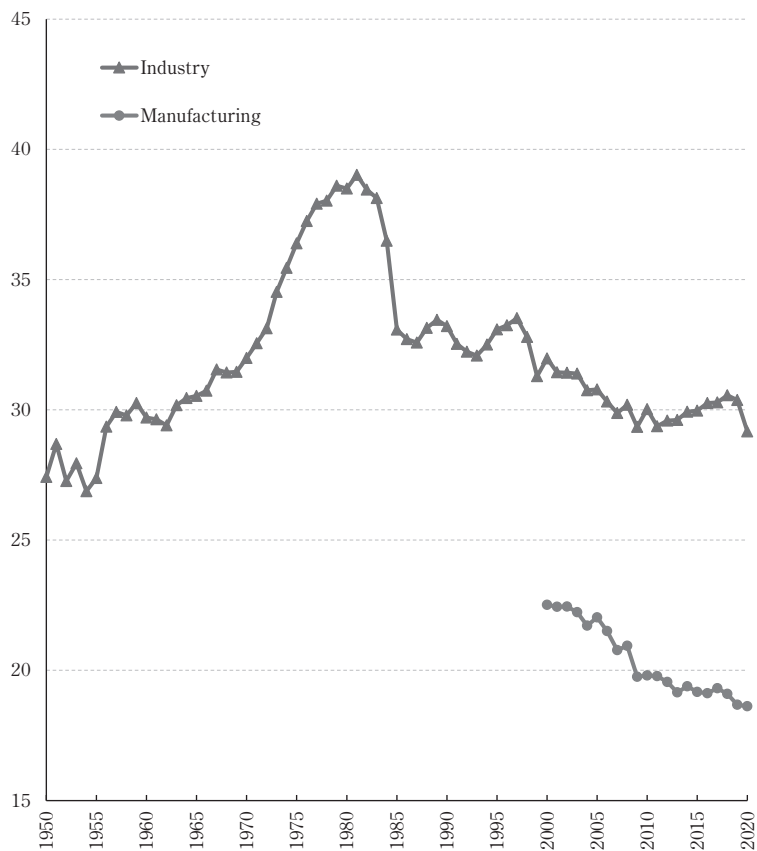
Source: Author's calculation based on data from the World Development Indicators database of the World Bank.

Figure 2: Remittances as ratio to GDP of the Philippines, 1980-2020



Source: Author's calculation based on data from the World Development Indicators database of the World Bank.

Figure 3: Shares in percentages of value added of industry and manufacturing in GDP of the Philippines, 1950-2020



Source: Author's calculation based on data from Bangko Sentral ng Pilipinas Statistics.

3. Relations between remittances and the Dutch disease and deindustrialization in the Philippines

This section lays out an empirical analysis of whether there are any relations between remittances and the Dutch disease and deindustrialization in the Philippines. We begin by describing the methodology and the data and then report the results obtained together with our interpretation and discussion of the issue.

Methodology

For the purpose of our analysis of this paper we need to analyze the effects of remittances on related economic variables of the Philippines. An important point here is that remittances and other variables of the Philippine economy may be interdependent and at the same time may be affected by variables of the world economy, therefore we need to control for such a ‘confounding factor’ that may enter the correlation observed in data between remittances and other variables of interest. In addition, we also need to consider the possibility that the relations between all relevant variables here are dynamic, that is, these variables are related at different points in time (for example, a change in remittances this year may affect output, the price level, and the exchange rate etc. next year or beyond). In short, we need to deal with the dynamic and interdependent relations between variables.

The method that we utilize in this study allows us to do just that; it is a vector auto-regression (VAR), a time series econometric model. More specifically, our method is a VAR with block exogeneity (hereafter VARX) which is used in Vu and Nakata (2019), and which is slightly modified from the framework in Vu and Nakata (2018). As shown in these papers, a VARX

is suitable to analyze a small open economy driven by both internal and external shocks. Below we provide a brief description of it, referring the interested readers to these papers for more details.

Our VARX consists of two blocks, namely, the exogenous block and the endogenous one, which include, respectively, variables of the world economy and variables of a small open economy (SOE) like that of the Philippines. Given the small size of the SOE relatively to the rest of the world, we can assume that variables of the world economy can affect those of the SOE, but not vice versa. In other words, the world economy block is exogenous to the SOE block, thus the name ‘block exogeneity’ of the method.

The structural form of the VARX is

$$\begin{bmatrix} C_{11} & 0 \\ C_{21} & C_{22} \end{bmatrix} \begin{bmatrix} y_{1t} \\ y_{2t} \end{bmatrix} = \begin{bmatrix} B_{11}(L) & 0 \\ B_{21}(L) & B_{22}(L) \end{bmatrix} \begin{bmatrix} y_{1t-1} \\ y_{2t-1} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \end{bmatrix} \quad (1)$$

where t denotes time, y_1 and y_2 respectively are vectors containing variables of the exogenous and the endogenous blocks, C_{ij} are matrices of coefficients, $B_{ij}(L)$ are polynomials made up from coefficient matrices in the lag operator, and ε_1 and ε_2 are vectors of structural shocks in the two blocks. The structural shocks ε_1 and ε_2 are assumed to have zero mean and unit variance, and be orthogonal to one another and to their own leads and lags. Note that in (1), $C_{12}=0$ and $B_{12}(L)=0$ capture the block exogeneity structure of the model.

In this study, y_2 contains four variables of the Philippine economy, namely, remittances, share of value added of industry in GDP, the consumer price index (CPI), and the real effective exchange rate (REER). These are variables of interest, allowing us to see whether remittances induce the Dutch disease and deindustrialization in the Philippines. As for the exogenous block, y_1 contains one variable: the world industrial production,

which is a proxy for world income, a factor we need to control for because it would affect both remittances and the other three variables of the Philippine economy. It is worth emphasizing that this is an important contribution of this study since many existing papers in the literature, especially those using cross sectional or panel data, fail to recognize the potential existence of so-called confounding factors (such as world income here) which affect both the dependent and independent variables in a regression. Needless to say, failing to control for these factors would result in imprecise estimates of the effects of interest.

The structural form in (1) can be rewritten separately for each of the two blocks, and then, with some matrix manipulation, can be written in the reduced form as follows,

$$y_{1t} = C_{11}^{-1}B_{11}(L)y_{1t-1} + C_{11}^{-1}\varepsilon_{1t} \quad (2)$$

$$y_{2t} = \tilde{B}_{21}(L)y_{1t-1} + \tilde{B}_{22}(L)y_{2t-1} + \tilde{C}_{21}y_{1t} + C_{22}^{-1}\varepsilon_{2t} \quad (3)$$

with $\tilde{B}_{21}(L) \equiv C_{22}^{-1}B_{21}(L)$, $\tilde{B}_{22}(L) \equiv C_{22}^{-1}B_{22}(L)$, and $\tilde{C}_{21}(L) \equiv -C_{22}^{-1}C_{21}$.

We estimate (2) by OLS to get estimates of the coefficients in it and the residuals. Because in this study ε_1 reduces to a scalar (due to the fact that y_1 consists of only one variable), an estimate of its as well as that of C_{11}^{-1} can be obtained using the residuals. As for equation (3), given the exogeneity of y_1 to variables in the endogenous block, we can also use OLS to obtain estimates of its coefficients and the residuals. With an additional assumption that C_{22}^{-1} is a triangular matrix we can identify this matrix and the structural shocks in ε_2 from the residuals. Our main interest is in the shock to remittances, which is the first element in ε_2 .

The recursive structure between variables in the endogenous block resulted from the assumption of triangularity of C_{22}^{-1} implies that

remittances, the first variable in y_2 may respond to changes in the other three economic variables of the home country but only with a lag. This may be justified on the ground that statistics of economic variables such as GDP or CPI are often not available contemporaneously but are revealed to the public with a lag.

Data and estimation

We use an annual dataset for estimation of the VARX described above. The sample period is 1979-2021. The data on remittances is collected from the website of central bank of the Philippines (Bangko Sentral ng Pilipinas Statistics), and the data on the share of value added of industry in GDP,² the consumer price index, and the real effective exchange rate are from the World Development Indicators (WDI) database of the World Bank. For the world industrial production, we use the data of Baumeister and Hamilton (2019), which are updated and made available on the website of the first author.

Before being used in the estimation the variables are transformed as follows. Remittances of the Philippines and the world industrial production are converted to per capita terms by dividing by the corresponding populations whose data are from the WDI database. These two variables and the CPI and the REER of the Philippines are then transformed to one hundred multiplied by the natural logarithms of their original values. This implies that, after these transformations, a change in the value of these variables denotes the rate of change in percentage of them. In addition, the share of value added of industry in GDP is also expressed in percentage.

² In measuring industrialization, it may be more suitable to use the output share of manufacturing. However, the time series data for manufacturing of the Philippines are only available from 2002, which is not long enough to be used for estimation, so we have to use data for industry as a proxy.

The VARX is estimated with two lags. This lag length is chosen based on the lag order selection criteria: AIC, LR, PFE and HQ.³

Estimation results and analysis

With the VARX estimated we could calculate the impulse response functions (IRFs) to see how variables in the VARX respond to structural shocks. Figures 4 and 5 show the IRFs to two shocks: a world industrial production shock and a remittance shock. Note that each box of these figures, the horizontal axis displays years, with the shock occurring in the first year, and the vertical axis displays percentage changes; solid lines are point estimates, while dashed lines are 16th and 84th quantiles of error bands which are calculated using a bootstrap method.

A shock to world industrial production increases the variable from the first year as seen in Figure 4. This shock raises remittance inflows to the Philippines from the second year, and the effect appears persistent through many years that follow. This result is intuitive since an increase in world industrial production indicates an improvement of the economic condition in the world economy, and under this situation incomes rise in the countries where Filipino diasporas work, and this in turn raises their earnings and thus increasing the money they send to their home country. We observe further that the shock pushes the price level of the Philippines from the second year. We also obtain a result (although not shown in the figure) that GDP of the Philippines increases for the first few years after the shock. Taken together, these results show that a change in the economic condition of the world economy as captured by the world industrial production shock here affects both remittance inflows and other economic variables of the Philippines such as output and the price level. This lends support to what

3 The lag length selection tests are conducted using the software Eviews.

we have argued above about the need to control for these confounding effects (otherwise they will be included spuriously to the effects of remittances we wish to gauge).

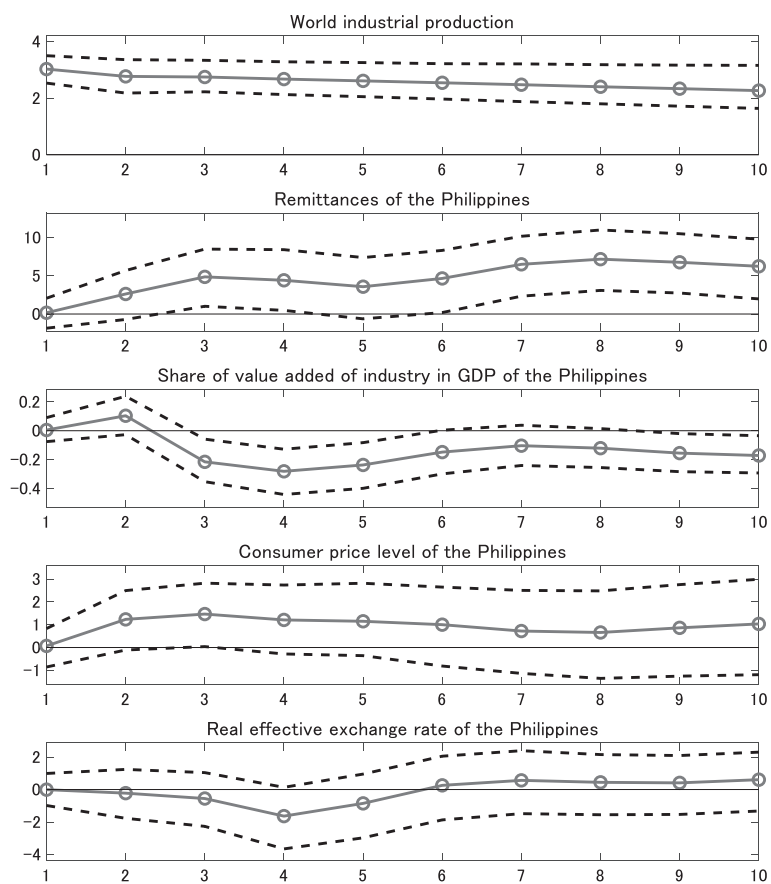
Now we turn to the main results of interest in this study, those on the effects remittances, shown in Figure 5. It is shown that the shock increases remittances by ten percent in the first and second years, and then gradually dies out toward the medium and long run. In response to this shock, the share of value added of industry in GDP increases and the price level goes down in the short run, but these two effects are reversed in the medium and long run. The real effective exchange rate (REER) goes up from the first year and continues so for a while.

The short run effects on the last three variables can be interpreted as follows. The increase of remittance inflows due to the shock appreciates the home currency in both nominal and real terms, thus a rise in the REER. The increase of remittances raises income and thus demand in the home country. Part of the increased demand is met by domestic production, including industrial production, which raises GDP, but the rest are met by imports, which reduces GDP. The total result is a rise in value added of industry faster than that in GDP, thus a rise of the GDP share of industry. Regarding the price level, there are two effects working in opposite directions: the increase in demand pushes the price level up, while the appreciation of the home currency lowers the prices of imported goods, pushing the price level down. The decrease in the price level in the short run suggests that the second effect is larger.

What about the two issues that we are interested in: the Dutch disease and deindustrialization? Looking at the effects of the remittance shock beyond the short run, our answer is that, in the case of the Philippines, remittance inflows cause the Dutch disease, as seen by the real

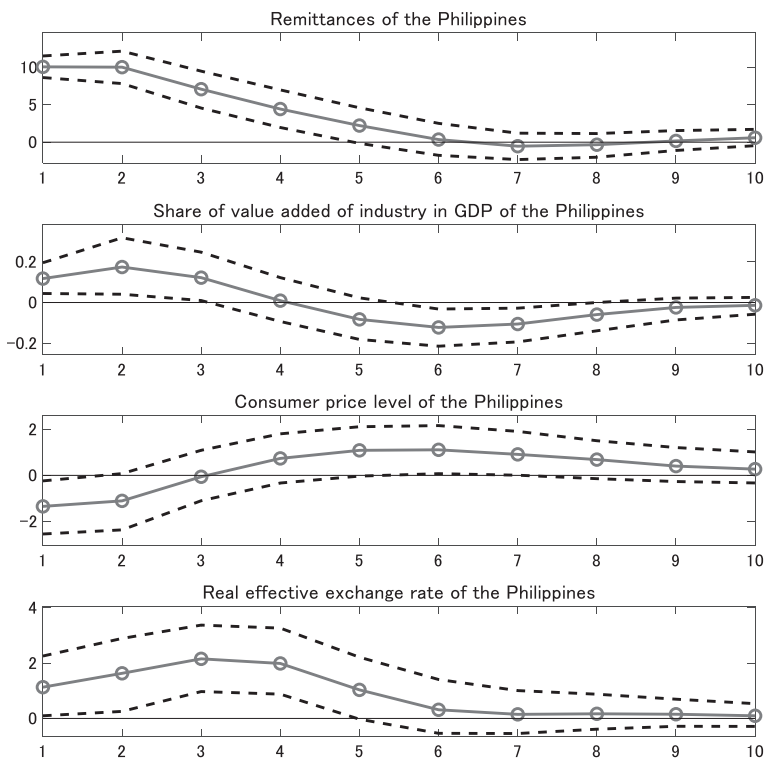
appreciation of the home currency, and contribute to the process of deindustrialization, as seen by the fall of the GDP share of industry. Quantitatively, an increase by ten percent in remittances at impact is associated with a fall by about 0.1 percent of the GDP share of industry in the medium run (about five or six years after the shock)

Figure 4: Responses of economic variables to an increase in world industrial production



Note: See the note in Figure 5.

Figure 5: Responses of economic variables to an increase in remittances of the Philippines



Note: The horizontal axis displays years, with the shock occurring in the first year, and the vertical axis displays percentage changes. Solid lines are point estimates, while dashed lines are 16th and 84th quantiles of error bands which are calculated using a bootstrap method. Source: Author's calculation based on the methodology and data described in Section 3.

4. Concluding remarks

In this paper we ask the question of whether remittance inflows may have played some role in the premature deindustrialization observed in many developing countries over the past decades. We conduct an analysis of the question using data for the Philippines. We also document a number of important facts about remittances and deindustrialization in the Philippines.

We find evidence of the Dutch disease and deindustrialization associated with remittance inflows. Specifically, an increase in remittance inflows raises the price level, appreciates the home currency in real terms, and reduces the share of value added of industry in GDP in the medium run. In the short run, however, the effects of the remittance shock are somewhat more favorable: output increases and industrialization is promoted.

Although the results obtained for the case of the Philippine economy are valuable, more research on other developing countries is needed in order to arrive at a reliable conclusion.

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