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ESTIMATION OF LABOR MIGRATION IMPACT ON THE ECONOMY OF SENDING COUNTRY

Abstract. This paper provides a theoretical framework for estimating the labor migration impact on the economy of sending country. The overall emigration impact includes two effects, which can be calculated separately, i.e., a departure effect and a remittances effect. The departure effect causes a negative impact on the economy by decreasing autonomous consumption. The remittances effect causes a positive impact by increasing disposable income and thus internal consumption and savings and imports. Calculations include the multiplier effect. The labor emigration impact on GDP is calculated as a difference between a positive remittances effect and a negative departure effect. The analysis is conducted for countries that are not at full employment.

Key words: international migration, labor emigration, impact estimation, GDP, consumption, savings.

1. Introduction

International migration, especially labor migration, and its outcomes are still under discussion after decades of active research. While most studies, developed until and during the 00s, argue on the positive impact of labor migration on economies of sending countries, lately developed studies, usually based on different types of regression analysis, report quite contradictory results.

Although remittances are not the only effect of labor migration, their studies best represent the ambiguous academic opinion. Cazachevici, Havranek, and Hovrath (2020) provided a meta-analysis of 538 estimates from 95 studies, which "typically estimate an extended variant of … basic regression" mainly using panel data for evaluating the impact of remittances on receiving countries. Authors revealed that approximately 40 % of studies reported a positive impact, 40 % reported no impact, and 20 % reported a negative.

At this point, we want to admit that remittances influence the GDP indirectly and are only one of the numerous variables that affect development (Appleyard, 1989). Moreover, the GDP, its growth rates, and other derivative indicators are the basis for evaluating the Push factors (Rosas & Gay, 2015), which stimulate emigration and thus reverse remittances inflow, so the question of endogeneity arises. Therefore, more

accurate results might be obtained if analysed studies focus on the relationship of remittances and consumption together or separately from saving and then calculate its weight in the GDP.

Therefore, this study aims to provide a theoretical framework for estimating the impact of labor migration on the economy of sending country. We split up the overall impact for two effects, which can be calculated separately, i.e., a departure effect and remittances effect. The departure effect causes a negative impact on the economy by decreasing in autonomous consumption of emigrants. The remittances effect causes a positive impact by increasing disposable income and thus in internal consumption and savings. Calculations include the multiplier effect.

2. Literature overview

A significant number of studies conducted until and during the ’00s describe the positive and sometimes crucial role of labor migration for migrant-sending countries. Many authors focused primarily on remittances effects admitting its positive impact on consumption, savings, and investments. Many authors also admit that positive remittances impact is usually undermined by the poor financial sector and low developed economy, limiting investment possibilities.

Stahl & Arnold (1986) point out that although remittances are mostly spent on daily consumption and a little for investing, this creates a stimulus to local industries as it increases the aggregate demand. Authors also provide data, based on surveys and estimation, on the distribution of remittances on internal consumption, imports, and savings in Asia countries. Panda (2009) distinguishes micro and macro remittances effects as increasing in households' expenditures at micro-level cause the multiplier effect for the whole economy. The author also admits that remittances highly contribute to households' stability during a crisis. Turnell, Vicary & Bradford (2008), analyzing remittances' impact on Burma, concludes that mostly it is spent on basic daily needs. Kannan & Hari (2002) estimated that remittances resulted in approximately 20 % of the income of the Karela state in India during 1972–2000, also adding that low development of financial system economic systems limited the efficiency to invest the remittances or just put into the banking system. Lika (2014), analyzing remittances' impact on Albanian's economy, concludes that approximately 90 % of remittances were spent on consumption and only 10 % for investing. The author also admits that proper financial institutions and policies can increase the rate at which remittances are converted into investment. This hypothesis was proved by Kim (2021), who applied an unobserved dynamic factor model to the data set of 46 countries during 1996–2016 and concluded that developed financial institutions increase the efficiency of remittances distribution. Woodruff & Zenteno (2007) found out that access to remittances enhances investing in micro-enterprises in Mexico.

On the other side, remittances inflows occur as the millions of migrants leave their countries, which influences their countries. In this field, scientists address labor supply questions. Stahl (1982), analyzing costs and benefits of migration, notes that it is advantageous for sending economies, but only to some extent. Extensive emigration can reduce the labor force and thus national output. Hanson & McIntosh (2010) found out that over one-fifth of young working-age Mexican males have migrated to the US, so it caused labor supply shock in Mexico. These findings limit our research, so the provided analysis is suitable for countries which are not at full employment. Rodriguez & Tiongson (2001) revealed that emigration caused decreasing in labor supply in the Philippines as relatives who received remittances were less likely to work or work fewer hours. The decline for men equals 27.7 % and 12.5 % for women. The labor market participation depended on gender and education. Meanwhile, Gonzales-Velosa (2011), estimating the impact of emigration on agricultural production in rural areas in the Philippines, concluded that the local economy did not suffer from emigration due to the elastic labor supply. Moreover, the farming outputs and value-added rose as emigrants provided the source of financing for local production. Also, Lykholat, Mulska, & Rozhko (2020) admit the emigration might balance supply and demand on the domestic labor market, but only in the short run.

At this point, we want to highlight a few findings/conclusions. First, remittances when received are spent on internal consumption, imports and savings. Its effect also includes consumption multiplier. Investments take small part out of remittances, which however depends on the quality of financial institutions and the level of economic development. The second, although intense emigration might cause supply shock on the labor market, it might balance it in a short term due to its elasticity.

3. Methodology

We apply Keynesian economics as a basis. Specifically, the research is based on the general equation of income-expenditures relationship (equation 1), however, without a government and separating net export for imports and exports (equation 2). We also consider that I=S due to Keynes.

$$Y=C+I+G+NX, \quad (1)$$

where Y – income (GDP), C – consumption, I – investments, G – government expenditure, NX – net export.

$$Y=C+I+(Exp-Im). \quad (2)$$

From this standpoint, we try to explain how labor emigration affects each of the components of GDP.

For the theoretical analysis, we take a household of four members where two are economically active, and the other two are economically inactive according to the IOM classification. Economically active members of emigrants household are always employed either abroad and send remittances to the home country or are domestically employed and receive a salary. Migration costs (transport, visa, insurance, etc.) are ignored.

A few more assumptions were made:

(i) a country's economy is not at full employment.

(ii) a consumption function is linear (MPC – constant);

(iii) autonomous consumption is supplied internally.

Theoretical framework

We distinguish the departure effect and remittances effect. These effects are a part of a single process and influence the economy not separately but together. The remittances effect follows the departure effect and complements it causing however greater impact. The departure effect occurs when the emigrant leaves the country, and the remittances effect occurs when the emigrant starts to send remittances home.

It seems obvious that when the emigrant departs, the economy loses his or her consumption and probably savings. And it also seems obvious that when an emigrant sends remittances, it increases the consumption and savings in the home country. Otherwise, emigration seems to cause a change in the amount of GDP by decreasing and increasing its elements (consumption and savings) through departure and remittances effects. It is partially true, however, these effects are a bit more complicated.

Now, remember that we analyze emigrants not individually but as part of households in the economy which is not at full employment (number of unemployed exceeds the number of vacancies).

Let's take two independent households *A* and *B*. An emigrant household *A* consists of two economically active employed members and one of them is going to emigrate. Household *B* also consists of two economically active members who do not want to migrate. One of them is unemployed. Both households have two economically inactive members.

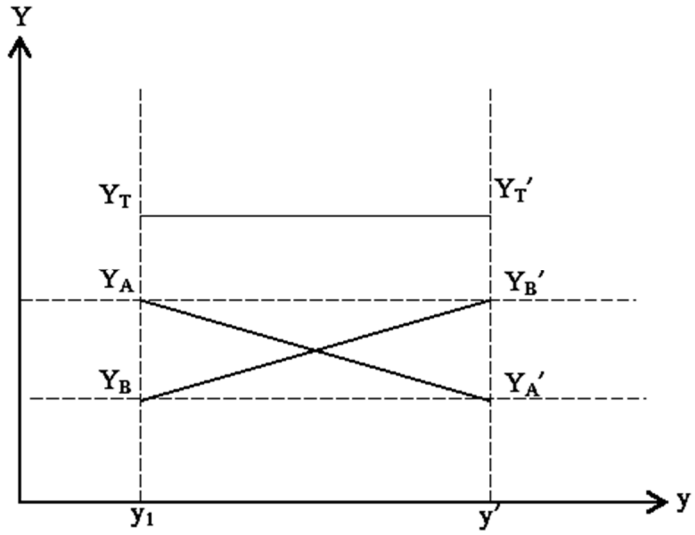
When the emigrant from household *A* leaves a country, his or her household's income (Y_A) and respectively consumption (C_A) and savings (S_A) will decrease. However, as the economy is not at full employment and a newly free workplace will be filled with an unemployed individual from household, *B* which obviously will increase this household's income (Y_B) and respectively consumption (C_B) and savings (S_B).

$$Y_A = C_A + S_A > Y'_A = C'_A + S'_A, \quad (3)$$

$$Y_B = C_B + S_B < Y'_B = C'_B + S'_B, \quad (4)$$

the sing ' is used for indicators after emigrant departure.

Thus, while the income of each household changes, the total income (Y_T) of these two households remains the same before and after departure:



$$Y_A + Y_B = Y_A' + Y_B'$$

$$Y_T = Y_T'$$

Fig.1. Total and households income before and after emigrant departure.

One might oppose that newly employed worker from household *B* will probably not receive the same salary as the worker from household *A* due to probation, so the total income will decrease. This is true for a short run in the scope of a few months, but after the probation, the total income (Y^A) will return to the initial amount.

Similar results are also obtained for households that differ from the one we take for analysis, e.g. (a) a household of two economically active members, one is unemployed and going to emigrate; b) all active members are unemployed, and one or more are going to emigrate; c) some of the active members are unemployed and receives social care, but are going to emigrate, etc.

Therefore, the departure of emigrants does not affect the total households' income but changes the income distribution between households.

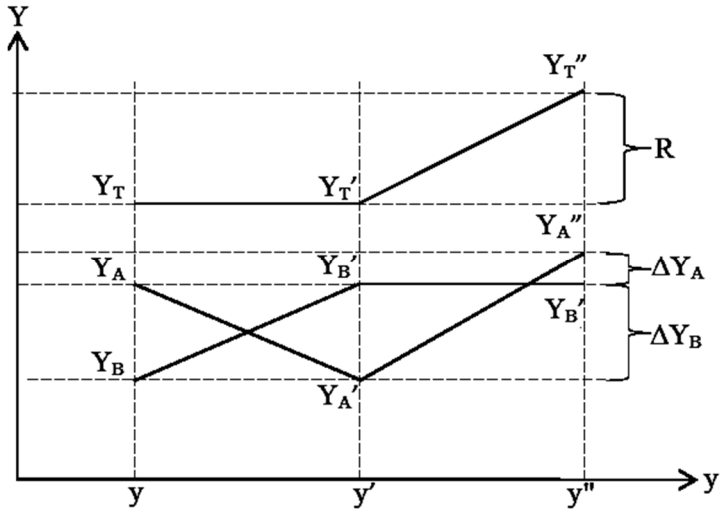
Now we add remittances which emigrant sends to the household *A*, so its income will consist from internal household income after departure (Y_A') and remittances (R):

$$Y_A'' = Y_A' + R, \qquad (5)$$

where Y_A" denotes household's A income after receiving remittances.

We assume that the household's *A* income after emigration (Y_A") always exceeds the household's income before emigration (Y_A) as households, when making a migration decision, are aimed at income maximization.

The total income will also rise for the amount of remittances received by household *A*:



$$Y_T'' = (Y_A' + R) + Y_B'$$

$$\Delta Y_T = Y_T'' - Y_T = R$$

$$R = \Delta Y_A + \Delta Y_B$$

Fig. 2. Total and households' income before and after emigration

Therefore, the total income in the economy rises for the amount of remittances received, despite the household's A income rising only for a difference between remittances and the salary which may be received working domestically.

The remittances inflow from the other side increases the total disposable income of households (ΔY_A and ΔY_B) which then is spent on consumption (internal and imports) and savings. As the initial distribution of remittances launches a cycle of consumption/savings, the calculation also includes multiplier effects. From this perspective, the remittances effect is calculated as the sum of consumption and savings excluding imports, caused by remittances inflow. The final calculation results in the share of GDP caused by remittances.

$$\Delta GDP_R = \left(\frac{R}{GDP} \cdot 100\%\right) \times \cdot \left(\frac{1 - MPC \cdot MPM}{1 - MPC \cdot (1 - MPM)}\right), \quad (6)$$

where ΔGDP_R denotes the share of GDP caused by remittances effect, MPC denotes marginal propensity to consume, MPM denotes marginal propensity to import.

This equation for estimating the remittances effect and equations for estimating the amounts of consumption, savings, and imports caused by remittances were developed in our previous research (Chernobay, Malibroda, 2020).

As was mentioned remittances effect is the one part of how emigration affects the GDP, so one more adjustment has to be made. The household's disposable income is a difference between a household's total income and its autonomous consumption. As one or more household members leave the country, this household's autonomous consumption will decrease, primarily for food, clothes, transport costs, and probably for rent and some utilities (Turnell, Vicary & Bradford 2008). For simplification of calculation, we assume that household's autonomous consumption (A) is provided internally and equals the average autonomous consumption per person (a) multiplied by a number of household members currently living in a country:

$$A = (k + n - m)a, \quad (7)$$

where k denotes a number of economically inactive members of household, n denotes number of economically active members, m denotes number of labor emigrants in household

So the disposable income for households with labor emigrants equals:

$$DisI = m * r + (n - m) * y - -(n - m + k) * a, \quad (8)$$

n-m denotes a number of domestically employed members, r denotes remittances sent by one emigrant, y denotes a salary of one domestically employed household member.

As the departure of one or more household members decreases autonomous consumption, it eventually increases the disposable income:

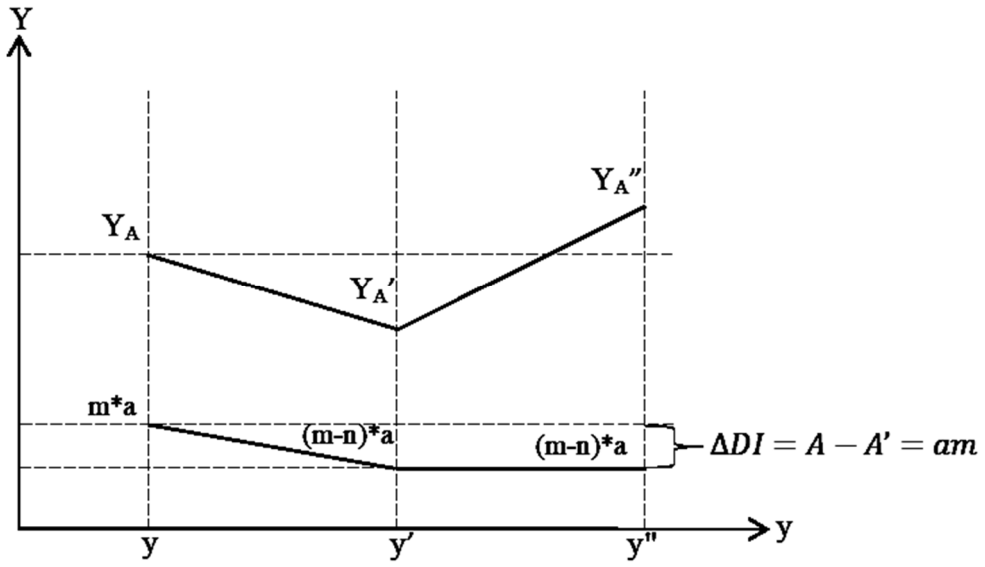


Fig. 3. The change of household's disposable income due to emigration

As we previously assumed that autonomous consumption is supplied internally, its transition into disposable income will cause a decrease in internal consumption for the amount of autonomous consumption and thus in GDP.

The equation for estimating the departure effect is quite simple:

$$\Delta GDP_d = m * a$$

where ΔGDP_d denotes departure effect.

Therefore, an emigration effect on a country's economy consists of remittances' effect, which is positive, and departure effect, which is negative:

$$\Delta GDP = \Delta GDP_R - \Delta GDP_d \quad (9)$$

$$\Delta GDP = R * \left(\frac{1 - MPC * MPM}{1 - MPC * (1 - MPM)}\right) - m * a \quad (10)$$

or

$$\Delta GDP = \frac{R * \left(\frac{1 - MPC * MPM}{1 - MPC * (1 - MPM)}\right) - m * a}{GDP} \times 100\ \%. \quad (11)$$

The first equation provides estimation in absolute numbers and the second in per cents relatively GDP.

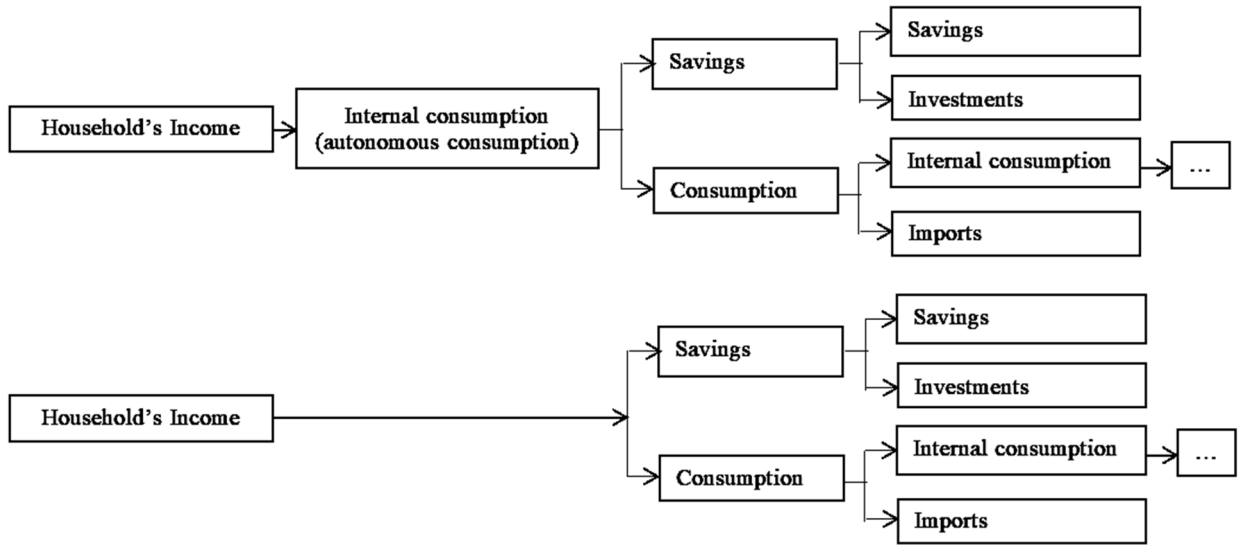


Fig. 4. Household's spending structure with autonomous consumption and without considering multiplier effect

Conclusions

The study provides a theoretical explanation of labor emigration's impact on the economy of sending country. Emigration affects the country's GDP by departure effect and remittances effect.

The departure effect occurs when the migrant leaves the country. Thus autonomous consumption is decreasing, so the disposable income of household rises. This led to the change in household's consumption structure, but GDP loses the amount equivalent autonomous consumption of emigrant.

The remittances effect increases the disposable income for its whole amount in the economy, which is not at full employment. Remittances, when received, are spent on internal consumption, imports, and savings. The increase in internal consumption is accompanied by the multiplier effect. The GDP rises for the amount of internal consumption and savings.

The overall impact of labor emigration on sending country is calculated as a difference between positive remittances effect and negative departure effect.

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