

Annex 1

Annex Table 1.1: Regressions for Active Population as a Share of Working Age Population

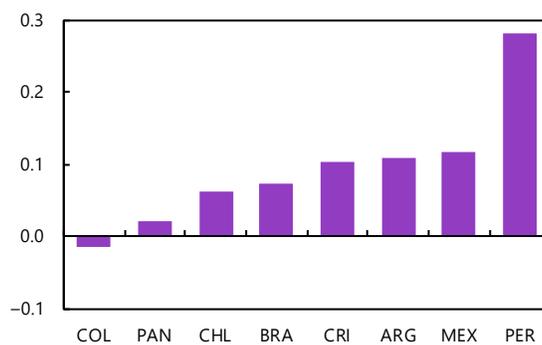
	(1) Δ Participation	(2) Δ Participation
Δ GDP _t	0.0610** (0.0272)	0.0698*** (0.0269)
Δ GDP _{t-1}		-0.0324 (0.0448)
Constant	0.142 (0.264)	-0.0423 (0.319)
Observations	439	439
Countries	18	18

Source: IMF staff calculations.

Note: Standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Annex Figure 1.1. Share of Active Population Responsiveness to GDP Changes



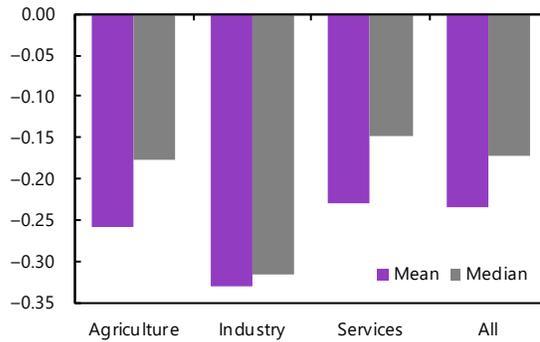
Source: IMF staff calculations.

Annex 2

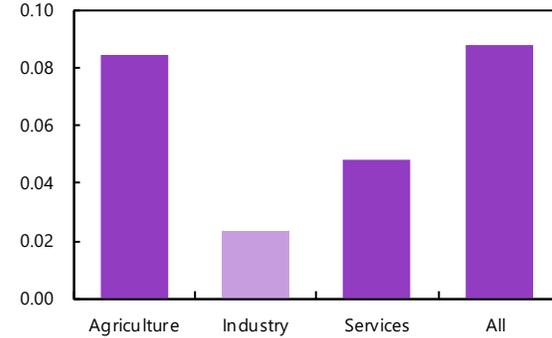
This section documents the results of the estimation of a Common Correlated Effect Error-Correction Model described in equation 3 for three broad sectors (agriculture, industry and services). The results, presented in Annex Figure 2.1, panel 1, show that there are large differences in the speed of adjustment across sectors. Industry has the highest average estimated coefficient of the speed of adjustment parameter and services has the lowest average estimated coefficient. Interestingly, there are also noticeable differences in the correlation between informality at the country level and the estimated sectoral speed of adjustment parameters. Informality appears to reduce the speed of adjustment parameter for services and agriculture but not for industry.

Annex Figure 2.1. Common Correlated Effect Error-Correction Model by Sector

1. Speed of Adjustment Coefficients



2. Elasticity of Speed of Adjustment Coefficient with Respect to (Log) Informality



Source: IMF staff calculations based on David, Pienknagura, and Roldos (2019).

Note: Solid bars are significant at the 95 percent confidence level. Light purple bars are not significant.

Annex 3

Caballero, Cowan, Engel, and Micco (2013) Methodology

Assume a sector's representative firm faces the following isoelastic demand and has access to a Cobb-Douglas production function in labor and hours per worker:

$$y = a + \alpha e + \beta h$$

$$p = d - \frac{1}{\eta} y$$

where variables (in lower case) are expressed in logs. Firms are competitive in the labor market but pay wages that increase with hours worked according to a wage schedule $w(h)$, with w' and w'' strictly positive. This simple framework implies that the following equilibrium equation holds:

$$\bar{e} - e = \frac{\phi}{1 - \alpha\gamma} (v - \bar{w})$$

with $\phi = \frac{\mu - \beta\gamma}{\mu}$, $\mu = 1 + \frac{w''(\bar{h})\bar{h}}{w'(\bar{h})}$, $\gamma = \frac{\eta - 1}{\eta}$, and $v = y - e$.

The employment gap ($\bar{e} - e$) presented above is the difference between employment and the firm's employment target. To introduce employment dynamics, CCEM (2013) assume that the combination of supply and demand shocks ($d + \gamma a$) follows a random walk. In that case, employment potential in country i , sector j , at time t (e_{ijt}^*) is equal to the static equilibrium (\bar{e}_{ijt}) plus a constant equal to the random walk drift. Allowing for a country-specific stochastic drift and for sector-specific differences in α and γ , leads to:

$$e_{ijt}^* - e_{ijt-1} = \frac{\phi}{1 - \alpha_j\gamma_j} (v_{ijt} - w_{ijt}^0) + \Delta e_{ijt} + \delta_{ct} = gap_{ijt} + \delta_{ct} \quad (A1)$$

To estimate (A1), we proceed in two steps. First, taking first difference we can write the employment equation as:

$$\Delta e_{ijt} = -\frac{\phi}{1 - \alpha_j\gamma_j} (\Delta v_{ijt} - \Delta w_{ijt}^0) + \Delta e_{ijt}^* - \Delta \delta_{ct} = -\phi z_{ijt} + \kappa_{ct} + \varepsilon_{ijt}$$

We estimate the parameter ϕ by constructing the variable $z_{ijt} = \frac{(\Delta v_{ijt} - \Delta w_{ijt}^0)}{1 - \alpha_j\gamma_j}$. To do so, we approximate $\alpha_j\gamma_j$ to be the median labor share for the sector. In the case of manufacturing, this is taken directly from the UNIDO data. For services and construction, we build the median labor share from the OECD STAN dataset. Log labor productivity (v) is constructed as the log of output per worker. We proxy w_{ijt}^0 with the average labor productivity across countries. In estimating ϕ we instrument $\Delta v_{ijt} - \Delta w_{ijt}^0$ with $\Delta w_{ijt-1} - \Delta w_{jt}^0$.

Having estimated ϕ , we construct the employment gap using equation A1. With the proxy for the employment gap we estimate the adjustment parameter from equation 1. Importantly, because we use a two-step procedure, we use the Murphy-Topel standard errors in the second stage, which takes into account the fact that ϕ is estimated with error. When calculating the employment gap, we subtract lagged differences between sectoral labor productivity and average productivity to account for systematic productivity differences across sectors within countries.

Beyond its implications for employment adjustment, the model presented in CCEM can be used to study the link between microeconomic flexibility and growth. More specifically, using a simple AK growth model and the microeconomic structure described above, CCEM show that the difference in long-term growth between two countries that only differ in their speed of adjustment coefficient (λ_i , with $\lambda_2 > \lambda_1$) can be approximated by the following equation:

$$g_2 - g_1 = (g_1 - \delta) \left[\frac{1}{\lambda_1} - \frac{1}{\lambda_2} \right] \varepsilon$$

Where δ is the rate of depreciation of capital and ε is a constant that depends on the labor share, the volatility of productivity, and the demand elasticity. We take the values used by CCEM to compute the values in Table 7.

Data

Sectoral data comes from three sources:

- Data for manufacturing sectors comes from the 3-digit United Nations Industrial Development Organization (UNIDO) Industrial Statistics (INDSTAT) database, Rev. 3. The dataset contains output, employment, wages and capital data for 28 sectors for a large set of countries.
- Employment, output, and wage data for construction and service sectors for European countries comes from the STAN dataset, which contains information for the 2005–17 period.
- Employment and value-added data for construction and service sectors for non-European countries comes from the 10-sector database compiled by Timmer, de Vries and de Vries (2015), which contains information for 40 countries for the period between 2000 and 2010.

Our employment protection and minimum wage variables are constructed from the World Bank’s Doing Business indicators. The labor protection index is the sum of three variables each of which is normalized to take a value between 0 and 1. The variables are: time to notify dismissals, approval of dismissals by a third part, and severance payments. The minimum wage variable is the ratio between the national minimum wage and GDP per worker (labor productivity).

The government effectiveness estimates are taken from the latest Kaufmann, Kraay, and Mastruzzi (2010) governance indicators dataset. The authors construct estimates by using information from a large number of surveys and databases. The variable “High government effectiveness” is a dummy variable taking value one if a country has a government effectiveness estimate in 1996 above the global median in that year.