

### BOX 3.1 Linkages between formal and informal sectors

*Empirical evidence on the degree of cyclicality of the informal economy with the formal economy is mixed. The cyclicality and sensitivity of informal employment to formal business cycles depends on the sources of shocks driving business cycles, the presence of rigidities in the formal sector, the initial extent of informality, and the availability of informal jobs.*

While there is broad consensus that the informal economy is sizable in emerging market and developing economies (EMDEs), evidence for its behavior over the business cycles remains inconclusive. An informal economy that expands while the formal economy contracts may support household incomes during economic downturns and could serve as a safety net (Loayza and Rigolini 2011). An informal economy that behaves procyclically could function as a “growth engine” by providing more services and intermediate inputs to the formal economy during economic expansions but, conversely, could also amplify the adverse effect of recessions (Dell’Anno 2008; Chen 2005; Meagher 2013).<sup>1</sup> Earlier work suggests that the degree of cyclicality of the informal economy depends on the measure of informality, the types of shocks causing business cycles, and country characteristics.

Against this backdrop, this box reviews the literature and presents results from a set of empirical exercises to address the following questions:

- What conclusions does the literature offer about the cyclical behavior of the informal economy?
- How synchronized have been movements in informal and formal economies?
- What are the policy implications of cyclicality?

#### Literature review

The literature on the cyclical behavior of the informal economy offers mixed conclusions. Studies focusing on the share of the informal economy in total output or employment tend to find countercyclical behavior whereas studies focusing on output or employment levels tend to find procyclical behavior. The theoretical literature suggests that the degree of procyclicality depends on the source of shocks causing business cycle fluctuations and on the presence of labor market rigidities. This section summarizes this literature.<sup>2</sup>

Note: This box was prepared by Sergiy Kasyanenko and Shu Yu.

<sup>1</sup> See Meagher (2013) for a literature review on studies concerning the linkage between formal and informal economy.

<sup>2</sup> Several recent studies also argue that pervasive informality may influence the measured cyclicality of the formal economy. For example, Restrepo-Echavarría (2014) and Horvath (2018) show that models with a large and poorly measured informal sector can generate excess volatility of formal consumption relative to formal output – a common feature of business cycles in many EMDEs.

#### *Informal economy as a countercyclical safety net*

The informal sector can serve as buffers and safety nets for the poor if it absorbs labor during recessions.<sup>3</sup> This can facilitate an economic recovery provided that re-entry into the formal sector is possible when the formal economy returns to expansion (Colombo, Onnis, and Tirelli 2016; IMF 2017; Loayza and Rigolini 2011).

**Macroeconomic evidence.** Macroeconomic studies suggest that the informal economy can behave “countercyclically” in the sense that the share of informal employment indeed rises during business cycle downturns.<sup>4</sup> Using data from 54 countries for 1984-2008, Loayza and Rigolini (2011) show that, on average, a one standard deviation slowdown in GDP per capita growth (i.e., 3 percentage points) is linked with a short-run increase in the share of self-employment in the total labor force by 1.2 percentage points. However, they also find considerable heterogeneity across countries—the counter-cyclicality of informal employment is much weaker in economies with more pervasive informality.<sup>5</sup>

Using quarterly data for Mexico, Fernández and Meza (2015) find that the correlation between informal employment and official GDP is modest (about -0.3), whereas the correlation between formal employment and formal output is strongly positive. The authors argue that this lowers cyclicality of total employment. Colombo, Onnis, and Tirelli (2016) use electricity consumption as a proxy for total economic activity to study cyclical properties of informality in 48 countries over the period

<sup>3</sup> Due to its flexibility, the informal sector is able to adjust in wages rather than employment during recessions, which explains the informal employment’s lack of responses to economic downturns (Maloney 2004; Guriev, Speciale and Tuccio 2016).

<sup>4</sup> Remittances, as a buffer against shocks to formal economy, may also influence the cyclicality of the informal sector. Remittances appear to be largely absorbed by the informal sector as Ilevs (2016) finds that high level of remittances tends to be associated with more informality. Shapiro and Mandelman (2016) and Chatterjee and Turnovsky (2018) show that countercyclical remittances are associated with higher informal employment during recessions as formal employment declines.

<sup>5</sup> The extent of countercyclicality drops as the share of informal employment in total employment increases and disappears when informal employment accounts for more than 42-43 percent of total employment. Theoretically, Shapiro (2014) suggest that while the share of self-employment tends to decline during economic upturns, the ease of entry into self-employment explains the differences in cyclical behavior across countries.

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1984-2005 and illustrate that the informal economy expands following a banking crisis. Finally, Kaufmann and Kaliberda (1996), Busato and Chiarini (2004) and Elgin (2012) present empirical evidence that the informal economy acts as a buffer, increasing its share of official GDP during economic downturns.<sup>6</sup>

More procyclical fiscal policy in less developed economies with weaker institutions may contribute to counter-cyclicality of informal activity. Fiscal policy tends to be more procyclical in countries with higher informality (Çiçek and Elgin 2011). In particular, procyclical fiscal consolidation during recessions, including through higher taxes, may encourage more informal employment and strengthen the counter-cyclicality of informal activity.

**Microeconomic evidence.** In work flow data for Brazilian metropolitan labor markets between 1983 and 2002, Bosch, Goni, and Maloney (2007) find that the informal sector is able to absorb more labor during economic downturns as jobs became scarce in the formal sectors. Bosch and Esteban-Pretel (2012) use the same data and find that the share of formal employment falls as formal-economy output contracts, in part because the rate at which workers find formal jobs plummets while that at which they find informal jobs remains broadly stable.<sup>7</sup>

#### *Informal economy as an engine of growth*

Since informal firms provide services, as well as final and intermediate goods to the formal sector, one would expect a positive correlation between formal and informal sector activity (Lubell 1991; Arvin-Rad, Basu, and Willumsen 2010; Moreno-Monroy, Pieters, and Erumban 2014). In addition, informal-economy income can support formal-economy demand.<sup>8</sup>

<sup>6</sup>This empirical relationship between informal and formal activities appears to be present in both advanced economies and EMDEs. For example, Kaufmann and Kaliberda (1996) cover a panel of 16 Central and Eastern European countries in 1989-1994; Busato and Chiarini (2004) used data on the share of informal output in total GDP from the United States, Italy, the United Kingdom, and New Zealand over the period 1960-1997; Elgin (2012) utilizes a panel of 152 countries from 1999 to 2007.

<sup>7</sup>Job separation rates are countercyclical (i.e. rise during recessions) for both sectors, with a much higher probability of losing an informal job during recessions.

<sup>8</sup>See Schneider (1998), Gibson (2005), Docquier, Müller, and Naval (2017), Kanbur (2017), Eliat and Zinnes (2002), and World Bank (2014). Although the relationship between formal and informal sectors may be symbiotic in the short run especially when policymakers are concerned about the welfare of low-skilled working poor, argue that in the long-run pervasive informality may create poverty traps and stymie economic development.

**Macroeconomic evidence.** Using informal output levels (as opposed to the share of the informal economy), Bajada (2003), Giles (1997), Tedds and Giles (2000), and Dell'Anno (2008) find that informal-economy output movements correlate positively (i.e., move pro-cyclically) with formal-economy output movements in Australia, New Zealand, Canada, and a group of 19 Latin American countries. In a group of developing countries, Fiess, Fugazza, and Maloney (2010) identify episodes where relative demand or productivity shocks to the non-tradables sector (as opposed to the tradables sector) are associated with higher informal employment (hence, procyclicality). In Brazil and Mexico, higher separation rates from informal jobs and a large drop of the formal job finding rate may induce labor outflows from the informal sector during recessions (Bosch and Maloney 2008). Arvin-Rad, Basu, and Willumsen (2010) develop a theoretical model that establishes procyclical informal-formal sector linkages, particularly when formal firms sub-contract labor-intensive stages of production to the informal sector.

**Microeconomic evidence.** Schneider (1998) reports that in Germany and Austria at least two-thirds of the income earned in the informal economy is immediately spent in the official economy resulting in considerable (positive) stimulating effects on the official economy. In firm-level data for India, Moreno-Monroy, Pieters, and Erumban (2014) find that formal and informal sector employment are positively correlated, in part because subcontracting by formal-sector firms to informal firms contributes to job creation in the informal sector. Data from Indian manufacturing firms show that the gross value added for several predominantly informal industries is positively correlated with that in the formal sector and FDI. This may be indicative of technological spillovers contributing to both formal and informal sectors (Beladi, Dutta, and Kar 2016).

#### *Factors determining the degree of procyclicality of the informal economy*

**Cross-country heterogeneity.** There is considerable cross-country heterogeneity in the degree of pro-cyclicality of informal employment. It tends to be higher when informality is greater (Loayza and Rigolini 2011), when informal employment is more common (Shapiro 2014), when there are stronger informal-formal sector linkages such as through subcontracting (e.g., Moreno-Monroy, Pieters, and Erumban 2014; Mbaye, Benjamin, and Gueye 2017).

**Source of shocks causing business cycles.** The informal economy can move procyclically or countercyclically,

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depending on the sectoral origin of the shocks that generate business cycles in the presence of wage rigidities, especially in the formal sector (Fiess, Fugazza, and Maloney 2010). Positive relative demand or productivity shocks to the non-tradable (largely informal) sector could increase informal employment, i.e. generate procyclicality in informal employment, especially when combined with wage rigidities in the formal sector. For instance, in Colombia, capital account liberalization in the context of broader reforms during 1991-1996 raised permanent income and constituted a positive demand shock to the non-tradeable sector. This upturn resulted in an expanding non-tradeable informal sector. Conversely, in the presence of wage rigidities, a negative shock to the tradables sector would expand informal (nontradables) employment and thus appear as countercyclicality.

#### Synchronization in formal and informal-economy movements

As in other studies that examine levels of employment and output, the data set used in this chapter suggests that, at the macroeconomic level, *formal employment* levels and *informal output* levels comove with formal output levels but *informal employment* levels do not. Several methodologies point to this finding, including analyses of volatility, business cycle turning points, correlations and factor models.

- **Macroeconomic volatility.** Since formal and informal employment move marginally (but statistically significantly) in opposite directions, the volatility of total (formal and informal) employment is somewhat lower than the volatility of each type of employment in isolation (Figure 3.1.1, Elgin et al. forthcoming a; Loayza and Rigolini 2011; Fernández and Meza 2015).<sup>9</sup> Self-employment (as a proxy for informal employment) is somewhat less volatile than formal employment. In contrast, informal output is somewhat less volatile than formal output, possibly reflecting flexible adjustments in hours worked in the informal economy (Meghir, Narita, and Robin 2015; Guriev, Speciale, and Tuccio 2016).
- **Business cycle turning points.** About three fourths of business cycle troughs in formal output coincide with a trough in the informal output; seven out of ten formal output peaks coincide with informal output

peaks (Elgin et al. forthcoming b). In contrast, turning points in self-employment, as a proxy for informal employment, rarely coincide with turning points in formal employment or formal output.

- **Correlations.** Lead, lag, and contemporaneous correlations of formal-economy output with informal-economy output are highly and statistically significant whereas those between formal output and informal employment are statistically insignificant (Figure 3.1.1; Elgin et al. forthcoming b). This is consistent with studies that find countercyclicality in the share of the informal economy and those show that informal firms are flexible enough to adjust in wages rather than employment during economic downturns (Maloney 2004; Loayza and Rigolini 2011; Guriev, Speciale and Tuccio 2016).<sup>10</sup>
- **Common factors.** A dynamic factor model applied to formal and informal output and employment finds that a single common factor accounts for 38 and 40 percent of the output variance of the informal and formal economies, respectively (Kose, Prasad, and Terrones 2003; Elgin et al. forthcoming b). This common factor explains only a negligible share of the variance in informal employment.

#### Policy implications

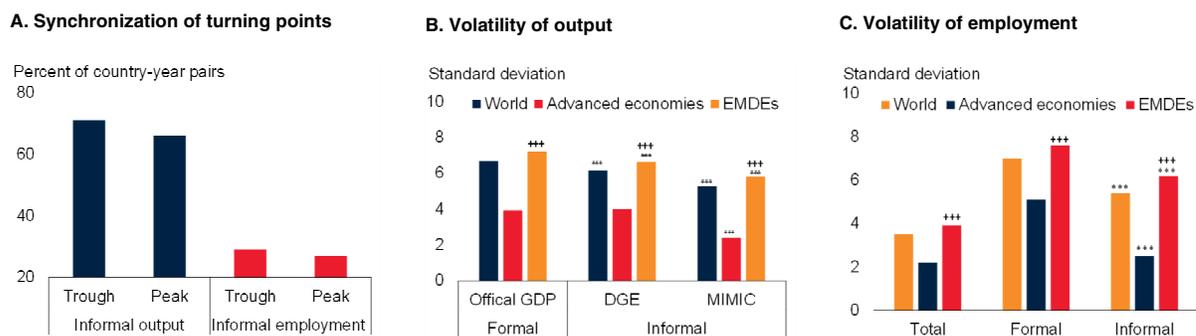
A large degree of comovement of informal employment and formal output in and of itself may not warrant policy action for two reasons. First, the direction of comovement can change over time if business cycle fluctuations are caused by changing sources of sectoral shocks. Second, the appropriate policy response would depend on the source of the shock that generates comovement. If a procyclical expansion in informal employment is largely the reflection of shocks in the nontradable sector, such as in construction, no policy response specifically related to informality may be needed. In contrast, if a countercyclical expansion in informal employment reflects a downturn in the tradable sector, such as in manufacturing, in the presence of labor market rigidities, measures to ease labor market rigidities may be the appropriate response (Fiess, Fugazza, and Maloney 2010).

<sup>9</sup>The correlation between formal and informal employment growth rates is above 0.2 and significant at 1 percent level.

<sup>10</sup>This lack of comovement between formal output and informal employment is particularly pronounced in EMDEs, possibly reflecting data challenges in EMDEs, genuinely lesser synchronicity between formal economic output and formal employment in advanced economies, or higher labor market rigidities in EMDEs (Neumeier and Perri 2005; Botero et al. 2004; Campos and Nugent 2012).

**BOX 3.1 Linkages between formal and informal sectors (continued)****FIGURE 3.1.1 Interaction between formal and informal economies**

Formal employment and informal output levels tend to comove with formal output levels, whereas informal employment levels do not. Since formal and informal employment are marginally negatively correlated, total (formal and informal employment) is less volatile than each in isolation.



Source: Elgin et al. (forthcoming a, forthcoming b).

Note: Data are from 1990 to 2016. DGE-based estimates are used for informal output in A-B, while data on self-employment are used for informal employment.

A. Troughs and peaks are identified as in Harding and Pagan (2002). The bars show the share of formal peaks (or troughs) that coincide with informal peaks (or troughs).

B-C. Standard deviations in annual growth rates are shown in bars. "\*\*\*\*" indicates statistically significant differences at least at 10 percent level between informal and informal output (employment). "+++" indicates statistically significant differences at least at 10 percent level between advanced economies and EMDEs.

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In addition to measures taken explicitly to address informality, many measures undertaken for other reasons, such as tax measures, may have implications for informality. The discussion in this box highlights that these implications warrant a carefully calibrated policy mix.

The resilience of informal employment to business cycle swings, juxtaposed with the weaker development outcomes associated with informality (discussed in the main text), suggests a trade-off. In the short run, informal activity can provide a safety net during business cycle swings and labor dislocations caused by major structural changes such as trade liberalizations; in the long term, however, the informal sector can be a source of poverty and stymie development (Docquier, Müller, and Naval 2017; Dix-

Carniero, Goldberg and Meghir 2018). Policy measures that—deliberately or inadvertently—reduce informality can therefore protect vulnerable population groups better if they are accompanied by strengthened social safety nets that can fulfill some of the roles of the informal sector.

Similarly, if comovement between formal and informal output reflects synergies, such as through subcontracting, policy measures aimed at curtailing informal activity can disrupt formal activity.

These effects could be mitigated if measures that reduce informality were accompanied by greater labor and product market flexibility in the formal sector that facilitates a reallocation of informal workers and firms.

for informality highlights the need for a comprehensive policy package that takes into account country-specific features that lead to informality and determine its consequences. First, strategies to reduce informality outright may hurt vulnerable groups and disrupt formal activity that relies on informal-economy inputs. These effects can be mitigated by stronger safety nets, greater labor

and product market flexibility, and better access to resources for informal firms. Second, policies to spur development, as a collateral benefit, can help reduce informality. Specific measures discussed in this chapter include simplification of tax codes and enhanced enforcement of revenue collection, which can reduce the incentive to operate informally depending on country-specific circumstances;