

# MIRREM

Measuring Irregular Migration

[www.irregularmigration.eu](http://www.irregularmigration.eu)

## Irregular Migrants in the Informal Economy: Conceptual Issues and its Measurement

*MIRreM Working Paper 5/2024*

AUTHORS:

Aslı Salihoğlu

Carlos Vargas-Silva



Co-funded by:



Canada Excellence  
Research Chair in  
Migration & Integration

**Deliverable Information:**

<b>Project Acronym:</b>	Measuring irregular migration and related policies (MIrreM)
<b>Project No.</b>	101061314
<b>WP</b>	WP - Stocks of migrants with an irregular status
<b>Deliverable Type:</b>	Working Paper
<b>Deliverable Name</b>	D4.3 Working Paper: Irregular migration and the economy
<b>Version:</b>	1.0
<b>Date:</b>	25/01/2024
<b>Responsible Partner:</b>	University of Oxford / UOXF
<b>Contributing Partners:</b>	University of Warsaw / UNIWARSAW
<b>Authors</b>	Aslı Salihoğlu (UOXF), Carlos Vargas-Silva (UOXF)
<b>Reviewers:</b>	Pawel Kaczmarczyk (UNIWARSAW), Agnieszka Fihel (UNIWARSAW), Albert Krater (UWK)
<b>Dissemination Level:</b>	Public

**Revision History:**

Revision	Date	Author	Organisation	Description
<b>0.1</b>	04/10/2023	Aslı Salihoğlu Carlos Vargas-Silva	University of Oxford	First draft
<b>0.2</b>	04/10/2023	Pawel Kaczmarczyk	University of Warsaw	Review and suggestions for changes
<b>0.3</b>	27/10/2023	Aslı Salihoğlu Carlos Vargas-Silva	University of Oxford	Second draft
<b>0.4</b>	28/10/2023	Agnieszka Fihel	University of Warsaw	Review and suggestions for changes
<b>0.5</b>	13/11/2023	Aslı Salihoğlu Carlos Vargas-Silva	University of Oxford	Third draft

<b>0.6</b>	09/12/2023	Albert Kraller	University for Continuing Education Krems	Review and suggestions for changes
<b>1.0</b>	25/01/2024	Aslı Salihoğlu Carlos Vargas-Silva	University of Oxford	Final manuscript

## Summary

This paper provides a framework for discussing the participation of irregular migrants in the informal economy. Conceptual ambiguities surrounding both informality and irregularity have undermined academic and public discussions of this topic. We review alternative approaches to informality and pin down working definitions for the informal (formal) economy, unregistered (registered) firms, and the category of irregular (regular) migrant workers. Furthermore, we present a discussion of pathways into economic informality at the micro- and macro-levels for employers and workers alike. In particular, we elaborate on the additional and unique incentives and constraints that both regular and irregular migrants face in the labor market. We end with a survey of methodological approaches to measuring the size of the informal economy, with the goal of informing the construction of novel methodologies that generate standalone estimates of the participation of irregular migrants in the informal economy.

## Table of contents

---

Summary.....	4
Table of contents .....	5
LIST OF TABLES .....	5
LIST OF FIGURES.....	5
THE MIRREM PROJECT .....	6
1. INTRODUCTION .....	7
2. A FRAMEWORK FOR ANALYSIS .....	9
2.1 Informal economy and employment.....	9
2.2 Irregular migrant workers .....	11
3. DRIVERS OF INFORMAL EMPLOYMENT .....	15
3.1 Micro-level .....	15
3.2 Macro-level .....	19
4. ESTIMATES OF THE PARTICIPATION OF IRREGULAR MIGRANTS IN THE INFORMAL ECONOMY .....	21
4.1 Microeconomic approaches .....	22
4.2 Macroeconomic approaches .....	24
5. CONCLUSION.....	31
6. REFERENCES .....	32

### LIST OF TABLES

---

Table 1: Key socio-demographic factors .....	17
Table 2: Common indicators of informality.....	23
Table 3: Macroeconomic approaches and methods to measuring informality .....	24
Table 4: Macroeconomic estimates of the size of the informal economy in Italy, averages for 1981-1985 .....	26
Table 5: Macroeconomic estimates of the size of various definitions of the informal economy in select European countries, 2013 .....	28

### LIST OF FIGURES

---

Figure 1: Framework for analysis .....	13
Figure 2: The intersection of migrant ir/regularity and the in/formal economy .....	22

## THE MIRREM PROJECT

MIRREM examines estimates and statistical indicators on the irregular migrant population in Europe as well as related policies, including the regularisation of migrants in irregular situations.

---

MIRREM analyses policies defining migrant irregularity, stakeholders' data needs and usage, and assesses existing estimates and statistical indicators on irregular migration in the countries under study and at the EU level. Using several coordinated pilots, the project develops new and innovative methods for measuring irregular migration and explores if and how these instruments can be applied in other socio-economic or institutional contexts. Based on a broad mapping of regularisation practices in the EU as well as detailed case studies, MIRREM will develop 'regularisation scenarios' to better understand conditions under which regularisation should be considered as a policy option. Together with expert groups that will be set up on irregular migration data and regularisation, respectively, the project will synthesise findings into a Handbook on data on irregular migration and a Handbook on pathways out of irregularity. The project's research covers 20 countries, including 12 EU countries and the United Kingdom.

### **TO CITE:**

Salihoğlu, A. and Vargas-Silva, C.. 2024. Irregular Migrants in the Informal Economy: Conceptual Issues and its Measurement. MIRREM Working Paper No.5. Krems: University for Continuing Education Krems (Danube University Krems). DOI: 10.5281/zenodo.10569403.

### **KEYWORDS**

Informal Economy; Unregistered firms; Irregular Migration

### **ACKNOWLEDGEMENTS**

#### **FUNDING ACKNOWLEDGEMENT**

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the Research Executive Agency. Neither the European Union nor the granting authority can be held responsible for them.

In addition, MIRREM benefit from funding provided by UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee. The Canadian research component of this project is undertaken, in part, thanks to funding from the Canada Excellence Research Chairs Program of the Government of Canada.

# 1. INTRODUCTION

The media has placed a lot of attention on the role irregular migrants in the informal economy. Headlines suggest that “*Migrants scrape by in underground economy*”, “*Migrants will keep coming as long as we offer illegal jobs*” and “*We don’t need French lessons on the black economy and illegal workers*”. Yet, there is a lack of general understanding of how concepts such as the “underground”, “black” or “shadow” economy relate to migration.

The systematic study of irregular migrants in the informal economy is beset by conceptual ambiguities and methodological challenges. Definitions of economic informality and migrant irregularity remain indefinite as scholars and policy professionals continue to reformulate them iteratively. Any synthesis and cohesive knowledge accumulation are hampered by the competing definitions used in this large body of research. Furthermore, data unavailability and unreliability hinder efforts to estimate the size of the informal economy and irregular migrant stocks across different contexts and time periods in a consistent fashion. Since both phenomena are hard to capture statistically, the accurate assessment of their intersection is doubly challenging. Overall, confusion regarding the concepts themselves and obstacles to measurement impede research and policymaking regarding the participation of irregular migrants in the informal economy.

In this paper, we address the conceptual ambiguities and methodological challenges in question as a part of the EU-funded project “Measuring irregular migration and related policies” (MIrreM). We adopt a non-technical tone in an effort to appeal to all those interested in the topic, including but not limited to academic and policy circles. This paper has two objectives. First, we build on the taxonomy of migrant irregularity developed by Kraler and Ahrens (2023) to present a conceptual guide that explains the differences and interactions between the informal (formal) economy, unregistered (registered) firms, and irregular (regular) migration. Second, complementing Rodriguez-Sanchez and Tjaden’s (2023) survey of methods to estimate irregular migration, we review methodological approaches to measuring the size of the informal economy, with the goal of informing the construction of novel methodologies that generate standalone estimates of the participation of irregular migrants in the informal economy. These estimations of the participation of irregular migrants in the informal economy will take place as a separate output of the MIrreM project.

The structure of the paper is as follows: Section 2 begins with an overview of scholarly debates on how to define the informal economy and employment. It introduces a working definition for irregular migrant workers at the intersection of three key features: residence status, workplace registration, and conditions of stay. It then presents the framework that we propose to relate the informal economy to irregular migrant workers. Section 3 discusses

pathways into informal employment at the micro- and macro-levels for employers and workers, whether they be nationals or foreign nationals. Section 4 discusses measurement methodologies that estimate the size of the informal economy with both microeconomic and macroeconomic data sources. Section 5 concludes.

## 2. A FRAMEWORK FOR ANALYSIS

We start the discussion in this section by providing the key definitions that are necessary to understand the framework that we propose to relate the informal economy to irregular migrant workers. In particular, we define the informal economy, irregular migrant workers and, ultimately, the relationship between the two.

### 2.1 Informal economy and employment

Scholars and organizations working on the informal economy highlight that there is no single, universally applicable and accepted definition describing what it is (Dell’Anno, 2021; Ulyssea, 2020). For the purposes of this paper, we develop the discussion using the legalistic, activity-based understanding of the informal economy (International Labour Conference, 2015; Chen, 2012; Perry et al., 2007). The informal economy comprises “all economic activities by workers and economic units that are – in law or in practice – not covered or insufficiently covered by formal arrangements,” excluding illicit activities<sup>1</sup> (International Labour Conference, 2015: 4). Within this framework, informal employment is defined as “working arrangements that are *de facto* or *de jure* not subject to national labor legislation, income taxation or entitlement to social protection or certain other employment benefits,” (OECD and ILO, 2019).

This definition comes from analysis of different schools of thought that have postulated alternative definitions based on what they diagnose to be the main causes and consequences of economic informality. The well-established approaches include:

1. **The dualist view**, exemplified by the writings of Lewis (1953), Rostow (1960), Harris and Todaro (1970), casts the informal economy as the traditional, under-developed, marginal and agrarian portion of the economy that is bound to disappear through industrialization and economic growth. In this formulation, the informal economy is defined through its spatial separation from the formal economy across the urban-rural divide and informal employment is equivalent to rural employment.

---

<sup>1</sup> The informal economy covers the extralegal production, provision and distribution of *otherwise legal* final products and services. Economic products and services which are illicit (e.g., human and drugs trafficking), constitute the criminal sector of the economy and are not considered to be a part of the informal economy (Fernández-Kelly and Shefner, 2006).

2. **The revisionist view**, including contributions by Hart (1973) who coined the term ‘informal’, highlights and celebrates the prevalence of informal economic activities in urban landscapes in the form of petty trading. This approach, while challenging the urban-rural spatial separation proposed by the dualists, nonetheless maintains the functional separation of formal and informal spheres of economic activity (Bromley and Gerry, 1979; Moser, 1978). In largely mutually exclusive fashion, the informal economy is associated with urban micro-entrepreneurship while the formal economy hosts wage employment opportunities.
3. **The structuralist view**, promulgated by Portes, Castells and Benton (1989) and Sassen (1988) offers the hitherto most inclusive definition of the informal economy and concludes that it encompasses all income-generating activities which are “unregulated by the institutions of society, in a *legal and social environment* in which similar activities are regulated”, (Castells and Portes, 1989: 12) [emphasis added]. In the structuralist view, the informal economy is characterized by exploitative working conditions.
4. **The neoliberal view**, represented most notably by de Soto (1989, 2001), promotes a narrower definition of economic informality compared to that espoused by the structuralists by focusing exclusively on the *legal environment* as the key factor differentiating the informal economy from its formal counterpart. De Soto emphasizes lack of proper documentation and a lack of property rights related to self-employment in micro-enterprises as the distinguishing features of the informal economy.
5. **The holistic view** brings together insights from all preceding periods of research and debate on the informal economy by recognizing the heterogeneity of causes, consequences, motivations and narratives of informality (Dell’Anno, 2022; Ulyssea, 2018; La Porta and Shleifer, 2014; Williams and Lansky, 2013; Chen, 2012; Perry et al., 2007; Fernández-Kelly and Shefner, 2006). While nuances in focus persist in the literature (e.g., urban versus rural, self-employment versus wage employment, voluntarism versus exploitation), most approaches have recognized the saliency of the legalistic definition of informality based on *de jure* or *de facto* regulatory coverage (or lack thereof) as the greatest common denominator in all lines of research on the subject.

We use the term “firm” in reference to any business that employs workers, including self-employment. Some firms are “unregistered”, meaning that the business does not have a formal license to operate, and it instead conducts its activities outside of the legal regulatory framework of the country. As such, the firm is not registered with tax and social security authorities, among others. Unlike statistical approaches that put a primacy on firm size and/or firm registration status in both defining and measuring the informal economy (e.g., United Nations, 1993: 135), the legalistic approach accounts for informal employment by both registered and unregistered firms.

## 2.2 Irregular migrant workers

---

One important step for the purpose of the paper is to define an irregular migrant worker. This is a difficult task and it is always possible to think about nuances and additional aspects that are not covered by any single definition. The definition developed below is one that allows for the introduction of a framework that facilitates a conceptual understanding of the role of irregular migrants in the informal economy and follows other material produced as part of the MIRreM project.

Three key features inform the definition of an irregular migrant worker:

- residence status;
- registration status of the firm in which a worker is employed, and;
- conditions attached to residence status, including in relation to the labor market.

### Residence status

Firstly, we define three main groups according to their legal status of residence in a country:

1. Nationals and denizens,
2. Foreign nationals with terminable right of residence,
3. Foreign nationals with no right of residence.

Nationals refer to all individuals who hold the citizenship of the country in question and as such are afforded rights and protections by their state, including employment rights. Denizens (Hammer, 1990) refer to foreign nationals who hold a secure, long-term legal status in between terminable residency and full citizenship. Similar to nationals, denizens enjoy effectively unrestricted access to employment in a given economy.

Foreign nationals with terminable right of residence refer to legal temporary or permanent residence status holders within a country's territory whose status can be revoked in connection to a breach of employment conditions. It pertains to the legality associated with the right to stay, independent of one's entry circumstances into a country. For the purposes of this paper, we also include here foreign residents with a provisional right to residence (Kraler and Ahrens, 2023), for example asylum seekers or persons whose removal has been formally suspended.

Foreign nationals with no right of residence include individuals in all residency arrangements *not* covered by citizenship and legal temporary or permanent residence. This final category covers foreign nationals without any legal residence status (including overstayers), with false documentation and those issued with a removal decision with immediate effect.

### Workplace registration

In our framework, unregistered firms can only employ workers 'off-the-books' as these firms are outside the legal regulatory framework of the country. In contrast, registered firms can choose between employing workers formally or informally (Ulyssea, 2020).

The informal economy consists of all types of undeclared work and activities that produce licit goods and services regardless of the registration status of the site of production. The

concept covers a) all self- and wage employment and production in unregistered firms and b) informal self- and wage employment and production practices in registered firms.

For example, a foreign national with or without a residence permit employed in an unregistered firm is a part of the informal economy. A foreign national without a residence permit employed in a registered firm is also a part of the informal economy. While this latter worker is employed in a firm that operates with an official license and is registered with the relevant authorities, their particular employment is undeclared to the authorities.

In our framework, we use the registration status of the firm to indicate worker placement more precisely and name the constituent sub-groups of foreign nationals that cumulatively make up the overall group of irregular migrants in the informal economy.

### Conditions of stay

Conditions of stay refer to the rights, obligations and limitations designated by the residence status of a foreign national. These may relate to the right to access the formal labor market and public funds, mobility rights within the national territory and employment restrictions (e.g., on sectors and hours worked).

We follow the classification scheme suggested by Kraler and Ahrens (2023) wherein a breach of the conditions of one's stay leads to a loss of status for foreign nationals with terminable right of residence and renders them *irregular* migrants. All employment in an unregistered firm is considered to be such a breach. Employment in a registered firm, if it does *not* meet the conditions stipulated by a foreign national's residence status, can also be a pathway into irregularity. Examples of this configuration include holders of student visas working more hours per week than is allowed by their permit, individuals on tourist visas engaging in any type of remunerative employment and labor migrants on employer-specific work visas who start a job with a new employer without amending their visa status. Lastly, foreign nationals with no right of residence who are employed in a registered firm, for instance migrants with false documentation securing formal job contracts, are also classified as irregular migrants.

The distinction between denizens (i.e., foreign nationals with secure long-term residence status) versus foreign nationals with terminable right of residence hinges on how each status implicates a different set of conditions of stay (see Kraler, 2006). Legal employment in a registered firm does not constitute a relevant condition of stay for them as the detection of their engagement in the informal economy does not deprive them of their right of residence and employment. As such, their presence in the informal economy alone does not render them irregular migrants; they occupy a legal space that is closer to citizens than to other foreign nationals in a given country. Nevertheless, unlike citizens, denizens' right of residence and connectedly their employment rights can be terminated in case of severe criminal offenses or a risk to public order. This caveat notwithstanding, for the purposes of this analysis, we focus on foreign nationals without right of residence or whose right of residence is terminable on employment-related grounds.

Overall, irregular migrants can be, and often are, employed by registered firms. Yet, this employment is counted as part of the informal economy. This creates a distinction between the place of work (which could be officially registered) and the type of economic activity (formal or informal) that is taking place. The same firm can have activities that are classified as part of the formal economy (e.g. foreign nationals with right of residence following all rules

of visa conditions) and the informal economy (e.g. foreign nationals with right of residence violating visa conditions).

Many countries tolerate and do not actively monitor breaches of visa conditions. Authorities also often ignore informal economic activities and do not penalize unregistered firms. While we acknowledge these practices, they do not have substantial implications for the following analysis in which we delineate economic activity in the informal versus formal economy regardless of whether a country monitors and penalizes informal economic activity.

On a final note, conditions of stay as defined above do not constitute an applicable categorization scheme for nationals. Instead, for this subcategory of residence status, we focus on conditions that refer to relevant commercial law, labor codes and employment rights. We assume that whether a national abides by these conditions does not have a bearing on their citizenship status, but it does determine whether they are counted as a participant in the formal or informal economy.

Framework for analysis

*Figure 1: Framework for analysis*

	Registered firms		Unregistered firms
	Conditions met	Conditions not met	
Nationals and denizens	National and denizen workers in the formal economy	National and denizen workers in the informal economy	
Foreign nationals with terminable right of residence	Regular migrant workers in the formal economy	Foreign nationals with terminable right of residence working in registered firms, but violating their conditions of stay otherwise	Foreign nationals with terminable right of residence working in unregistered firms
Foreign nationals without right of residence	Not applicable	Foreign nationals without right of residence working in registered firms	Foreign nationals without right of residence working in unregistered firms

 Irregular migrant workers in the informal economy

Figure 1 summarizes the framework that we propose based on the discussion above. There are two types of firms, registered and unregistered, where foreign nationals (with and without right of residence), denizens and nationals of the country can take up employment. The informal economy is composed of both wage employees and the self-employed a) working in unregistered firms, and b) working in registered firms, but not abiding by all regulations (e.g., getting paid “off the books”, not having a residence permit, etc.).

In the rest of this paper, we focus on irregular migrant workers in the informal economy, shaded in red in Figure 1. This group is composed of four sub-groups: (1) Foreign nationals without right of residence working in registered firms; (2) Foreign nationals without right of residence working in unregistered firms; (3) Foreign nationals with terminable right of residence working in registered firms but violating their conditions of stay otherwise; (4) Foreign nationals with terminable right of residence working in unregistered firms. All subgroups engage in informal employment.

## 3. DRIVERS OF INFORMAL EMPLOYMENT

In this section, we discuss the reasons for which workers and firms enter into informal employment arrangements. We combine conceptual ideas with empirical evidence on the subject, including micro-level drivers (i.e., individual- and firm-level), socio-demographic factors (e.g., age, gender, legal status), and broader macro-level forces (i.e., country- and global-level).

### 3.1 Micro-level

---

At the micro-level, the presence of nationals and foreign nationals in the informal economy can be examined from the vantage points of both employers and workers using a cost-benefit framework.

#### Employers

There are two key stages to employers' decision-making regarding their participation in the informal economy: 1) whether to register their firm with the authorities and 2) if registered, whether to employ workers formally or informally. We focus on the latter dimension concerning hiring decisions and will discuss firm registration status solely in terms of its implications for employment.

Informality can configure into other margins of decision-making that make up a spectrum going from full formality to full informality. For instance, a registered firm that employs formal workers may pay them "envelope wages" greater than the pay rate indicated in their job contracts (Di Nola, Kocharkov and Vasilev, 2019). It can also underreport its earnings to evade paying taxes on a proportion of their income (Perry et al., 2007). Nevertheless, the two critical thresholds for conceptually and empirically assessing participation in the informal economy pertain to firm registration and formal contractual employment.

Among registered firms, the choice to hire workers with a formal job contract versus "off the books" has been modeled out as a profit maximization decision that weighs the benefits of informal hiring against its costs (Ulyseas, 2018). The benefits of employing informal labor concern all the cost-savings and productivity gains associated with not abiding by labor codes and tax laws, including not paying workers' social security contributions, instituting longer working hours than the legal maximum, avoiding investments in workplace conditions and safety measures, and paying wages to workers below the legal minimum (OECD and ILO, 2019; Dibben and Williams, 2012).

The costs of informal employment are co-determined by the risk of detection by authorities and the penalties levied in case of detection. Penalty rates differ by context and jurisdiction. Conversely, detection probabilities can be effectively proxied by firm size for most settings, for both registered and unregistered firms. The visibility of firms to tax authorities increases as they hire more workers, thereby increasing their chances of getting caught employing workers informally (Ulyssea, 2018; Perry et al., 2007).

Informal employment is the only available form of labor for unregistered firms. While the benefits of labor informality remain largely similar for registered and unregistered firms, the associated costs may defer. For instance, the detection of informal employment at an unregistered firm may incur a wider set of penalties that not only stem from transgressions of the labor code but also commercial law violations.

### Workers

Workers consider both the benefits and costs associated with undeclared work in their decision to enter either informal or formal employment (Eide, von Simson and Strøm, 2011; Amaral and Quintin, 2006; Slemrod, 2001).<sup>2</sup> The main benefit of informal employment, whether it is dependent or self-employment, is greater immediate income retention through tax evasion. The rewards can be expanded to include factors such as flexibility and convenience (McKay, Markova and Paraskevopoulou, 2011).

The costs of labor informality include forgone social security contributions and fines levied to the worker if they are detected by tax authorities, a factor which is attenuated by enforcement intensity. There is also a wage penalty associated with informal employment, although the size of this penalty depends on the geographical and industrial context (Narayanan, 2015; Bargain and Kwenda, 2011; El Badaoui, Strobl and Walsh, 2008). Whether a worker is informally employed in a registered or unregistered firm has implications on their likelihood of detection as firms across this divide face differing probabilities and frequencies of inspections on account of the median firm size (de Paula and Scheinkman, 2011). Costs can also cover non-pecuniary elements such as the psychological burden of and physiological damage from exploitative and unsavory workplace practices and conditions (Tansel, 1999; Pradhan and van Soest, 1997).

Several studies conceptualize both unemployment and informal employment as pitstops for workers in search of formal employment opportunities (e.g., Rogers and Swinnerton, 2004; Fortin, Marceau and Savard, 1997; Fields, 1989, 1975; Mincer, 1976). These approaches assume that formal jobs are inherently preferable to and better paid than informal ones. In contrast, other studies propose the existence of upper tier informal employment opportunities which are preferable to lower tier formal ones (Günther and Launov, 2012; Maloney, 2004; Yamada, 1996; Fields, 1990). In particular, self-employed workers who operate microenterprises may choose to do so informally owing to lower costs or higher earnings (Gutierrez et al., 2019; Bargain and Kwenda, 2011; Rauch, 1991).

---

<sup>2</sup> We won't explore individuals' labor force participation decisions. We limit our conceptual and empirical discussion to workers only.

The mediating role of socio-demographic factors, including nationality and legal status

In addition to the considerations provided by the cost-benefit framework explained above, the benefits, costs and risks associated with formality and informality are shaped by socio-demographic factors at the level of the individual. These factors determine the opportunity portfolios available to workers in the economy. Table 1 lists some of the key socio-demographic factors to take into account in this regard.

*Table 1: Key socio-demographic factors*

Factor	Explanation
Age	Globally, middle-aged individuals are likelier than other demographics to be formally employed (OECD and ILO, 2019). Child labor is by definition informal. In the case of older workers (aged 64+), labor informality may allow the combination of pension payments with informal wages to maximize earnings. However, this U-shaped trend does not apply to Europe wherein age and informal employment rates are negatively correlated (Williams and Horodnic, 2017; 2015a; 2015b).
Human capital	Workers with relatively lower levels of education and work experience may find it more challenging to obtain formal jobs (International Labour Office, 2018; Tansel and Acar, 2017; Hazans, 2011). Since younger workers (ages <24) tend to have lower levels of education and/or work experience on account of their age, they are also more likely to find employment in the informal economy. Thus, for these two demographics, the labor supply decision may be structurally constrained to informal employment. As for the self-employed, both the least and the most entrepreneurially competent individuals select into the informal sector (Sinclair-Desgagné, 2012).
Gender	Women tend to participate in the labor market at lower rates than men (ILO, 2018; Gong and van Soest, 2002). If they are workers, the impact of their gender vis-à-vis the formal/informal divide varies by geography and industry. More women are in informal employment than men in Africa and Southeast Asia whereas the gender proportions are reversed for the Middle East, East Asia and Europe (International Labour Office, 2018; Williams and Horodnic, 2017; 2015a; 2015b). Certain industries, such as domestic and care work are predominantly informal and feminized in most economies (Suleman and Figueiredo, 2018; Delaney and MacDonald, 2018; Meyer, 2015; Bastia, 2007; Fan, 2004).
Race and ethnicity	Discrimination by employers and hiring queues may obstruct workers’ free self-selection into formal employment. Racial and ethnic minorities, whether they be nationals or foreign nationals, suffer from employer bias and stereotyping, which in turn produces labor markets that are segmented and hierarchized along racial and ethnic lines (Scott and Rye, 2021; Vuolo, Uggen and Lageson, 2017; Zschirnt and Ruedin, 2016; Hersch, 2011; Bohon, 2005). These segments frequently map onto the formal/informal labor dichotomy (Steiler, 2021; Srivasta, 2019; Tuominen, 1994).

Type of economic unit	Globally, self-employed workers are more likely to be in informal employment than wage employees regardless of economic development levels (International Labour Office, 2018; Slack et al., 2017). Relatedly, certain groups of foreign nationals may take up entrepreneurship more frequently than nationals (OECD, 2010; Kloosterman, Van der Leun and Rath, 1999).
-----------------------	--

While all these socio-demographic factors play a key role, the preceding discussion focused on workers in the informal economy without emphasizing dissimilarities between nationals and foreign nationals. We now move onto an analysis of what distinguishes foreign nationals' labor market choices and circumstances. In particular, we focus on four key differences between nationals and foreign nationals: the prospect of deportability, unequal treatment, occupational penalties, and networks.

A key difference between nationals and foreign nationals is the prospect of deportability (De Genova, 2002). Detection of the latter's participation in the informal economy is simply more consequential and life-altering. In addition to the potential loss of their livelihood and receiving fines, they face a threat of forced removal and/or detention by the authorities (van Meeteren, 2014; Willen, 2007). A foreign national's deportability increases the risk that they take on while in informal employment (Anderson, 2010), which in turn increases their 'exploitability' by employers (Rottmann and Kaya, 2020; Urzi and Williams, 2017; Bevelander and Pendakur, 2014). The prospect of deportability varies widely across countries; it is de facto null in some countries, while being very high in others.

Rather than avoiding the risk of detection by exiting informal employment altogether, foreign nationals often deploy mitigation measures to lower their risk profile while staying informal, including bribery (Reeves, 2015) and 'false' self-employment (Vershina et al., 2018). Here, fraudulent formal employment can help migrants build a paper trail of civic deservingness and presence in hopes of eventual legalization (Chauvin and Garcés-Masareñas, 2014). Other strategies for legalization include marrying a national (Sinityna et al., 2021) or participation in ad hoc migrants' amnesties (Chauvin, Garcés-Masareñas and Kraler, 2013). Once legalization is achieved, studies find that, contingent on the specific policy context and migrants' socio-demographic characteristics, foreign nationals with previously irregular status may improve their wages, obtain greater occupational mobility and/or formalize their employment circumstances (Bahar, Ibáñez and Roza, 2021; Monras, Vázquez-Grenno and Elias, 2020; Devillanova, Fasani and Frattini, 2018; Amuedo-Dorantes and Antman, 2017; Pan, 2012; Amuedo-Dorantes and Bansak, 2011; Finotelli and Arango, 2011; Kossoudji and Cobb-Clark 2002). On the net, the benefits of informal employment, including a chance to increase their earnings (Tawodzera and Chikanda, 2016; Oka, 2011) and the prospects of obtaining a more permanent legal status and access to better jobs in due course (Vianello, Finotelli and Brey, 2021), may outweigh deportation risk.

Furthermore, foreign nationals might suffer from more acute forms of unequal treatment in the labor market on account of their legal status and perception as societal 'others' (Zetter and Ruadel, 2016; Bloch, 2014; Rivera-Batiz, 1999). One's circumstances for residency and work authorization premeditate the relative abundance of certain labor market opportunities and modulate risk profiles. For instance, undocumented migrants are often at the bottom of hiring queues for desirable jobs, typically excluded from formal jobs and the preferred choice

for low wage, informal work (Scott and Rye, 2021; Khosravi, 2010). Overall, legal status shapes occupational mobility trajectories, limiting access to formal wage and self-employment for some while allowing rapid advancement for others (Bisignano and El-Anis, 2019; Goldring and Landolt, 2011).

Additionally, foreign nationals incur occupational penalties after migrating. For many reasons, which include the lack of formal skills recognition, they cannot transfer the entirety of their skillset and experience to their destination labor market (Chiswick and Lee, 2005). Partially owing to this penalty, immigration encourages both nationals and foreign nationals to engage in task specialization; nationals take up communicative and managerial tasks requiring host country language skills while foreign nationals are hired for manual or math-analytical tasks (Akgündüz and Torun, 2019; Ottoviano and Peri, 2012; Fullin and Reyneri, 2010; Peri and Sparber, 2009).

Lastly, network effects mediate a foreign national's propensity to enter informal employment over other forms of work. Existing migrant networks within the host country and established transnational networks may reduce job search costs all the while funneling foreign nationals towards a limited set of jobs (Cheung and Phillimore, 2014; Jones, Monder and Edwards, 2007; Portes and Stepick, 1985). These networks encompass personal contacts, communal connections, and professional labor market intermediaries such as worker recruitment agencies. Contingent upon the network in question, information on job availability and support for direct job placement might lower barriers of entry into low-skilled, precarious, informal employment positions (Deshingkar et al., 2019; Bellamy et al., 2017; Maroukis, 2013; Sporton, 2013; Ahmad, 2008) or may encourage entry into formal and technical roles (Hanna and Batalova, 2020; Finnan, 1982). Moreover, residents of ethnic enclaves which are located close to certain industries geographically tend to take up jobs in these very establishments (Ellis, Wright and Parks, 2007). Recently arrived immigrants may receive a wage premium for sorting into the same industries as previous cohorts, deepening occupational segregation patterns (Patel and Vella, 2013). Depending on the business dynamics inherent to these 'migrant' and/or 'ethnic' industries, the jobs available might be predominantly informal. Overall, while network effects and personal contacts also shape nationals' job prospects, the insularity and bifurcated quality (low-skill informal employment versus high-skill formal employment) of networks immediately available to foreign nationals stand out.

## 3.2 Macro-level

---

Macro-level factors influence individual decision-making in the formal and informal economy. These factors include the size of the informal economy, institutional indicators and migration policies.

To begin with, the sheer size of the informal economy governs differences in labor market trajectories for both nationals and foreign nationals. Compared to the post-industrial, formalized economies of the Global North, it is likelier to find both national and foreign national workers employed in the larger informal economies of the Global South (OECD and ILO, 2019; ILO, 2018). As countries improve their GDP per capita, their informal economies ultimately shrink in size (Salinas et al., 2023; La Porta and Shleifer, 2014). Furthermore,

beyond indicators of growth, the industrial mix of a given economy affects the prevalence of informal employment (Nguyen, 2022). Certain labor-intensive industries wherein foreign nationals are overrepresented, such as construction, ready-made garment manufacturing and home-based care work, are more susceptible to informality than others such as financial services and the public sector (Sinitsyna et al., 2021; Teipen and Mehl, 2021; Triandafyllidou and Bartolini, 2020; Chen, 2013; Fullin and Reyneri, 2010; Bastia, 2007).

Related to a country's level of economic development, various socio-legal institutional indicators, including but not limited to state capacity, tax morale, levels of corruption, bureaucratic red tape, enforcement intensity and business culture, modulate perceived detection risk and costs for informal firms and workers alike. Higher public institutional quality – wherein tax systems are efficient, rule of law is consistently applied, contracts are enforceable and public officials are not corrupt – is associated with smaller informal economies (Schneider, 2010; Dabla-Norris, Gradstein and Inchauste, 2008). More frequent inspections of workplaces ensure that minimum wages hold in the labor market and may render lower-tier formal employment more attractive to informal workers (Almeida and Carneiro, 2012). They can also increase firm registration rates (De Giorgi, Ploenzke and Rahman, 2018). However, higher regulatory and administrative burdens – independent from enforcement intensity – are generally correlated with larger informal economies (Prado, 2011; Bacchetta, Ernst and Bustamente, 2009). Moreover, institutional quality shapes public perceptions and expectations; a lack of trust in institutions is correlated with the social acceptance of informal practices in business culture (Cvetičanin, Popovikj and Jovanović, 2019).

In terms of the influence of specific policies on the informal labor market, various areas of law- and policy-making are implicated: labor regulations, the tax code and social contributions, property law, commercial law, and migration policies, etc. In general, higher taxes and social contributions encourage informalization in the economy (Dell'Anno, Gomez-Antonio and Alanon Pardo, 2007). Even though the literature has demonstrated that raising the minimum wage ostensibly makes the formal sector more attractive for workers, the evidence for employment effects and the impact on informal sector wages is mixed (Hohberg and Lay, 2015; Gindling and Terrell, 2007). Additionally, non-contributory social programs conditional on remaining (formally) unemployed discourage labor formalization (Revel, 2020; Garganta and Gasparini, 2015).

Migration policies not only govern foreign nationals' economic incorporation, but they also shape labor market opportunities for nationals as well. Regularizations even out the playing field between foreign national and national workers in the labor market by providing secure and often permanent legal access to formal employment to the former (Clemens, Huang and Graham, 2018; Amuedo-Dorantes and Bansak, 2011). Stricter border enforcement changes the educational and demographic composition of irregular migrant flows (Massey, Durand and Pren, 2016; Orrenius and Zavodny, 2005), which in turn may change the competitive landscape for jobs for all labor market participants, segmented by skill and experience levels.

On the whole, an examination of all relevant determinants and contextual variables – ranging from global trends to national indicators, from tax law to migration policies – is necessary to assess how macro-level factors regulate the labor market for all participants, irrespective of citizenship and residency rights.

## 4. ESTIMATES OF THE PARTICIPATION OF IRREGULAR MIGRANTS IN THE INFORMAL ECONOMY

Our goal in this section is to inform the construction of estimation methodologies that measure the participation of irregular migrants in informal employment. These estimations will take place in a separate output of the MIRreM project. While the MirreM project is focused on numbers of irregular migrants, the measurement of irregular migrants in informal employment could take different forms. For instance, these estimates can take the form of a number (i.e., how many irregular migrants are employed in the informal economy?) or a share of output figure (i.e., what share of informal economic activity is attributable to irregular migrants?), among other possibilities.

To measure the participation of irregular migrants in informal employment, the intersection of two estimates, namely that of irregular migrants and the informal economy, should be isolated. This intersection is presented as cell F in Figure 2, along with other possible combinations between migrant status and participation in the economy. There are long-standing methodological literatures on the estimation of both irregular migrant stocks (cells E + F) and the size of the informal economy (cells F + G + H). However, we are not aware of any generalizable quantitative estimation methodology that generates estimates for the specific intersection in question.<sup>3</sup>

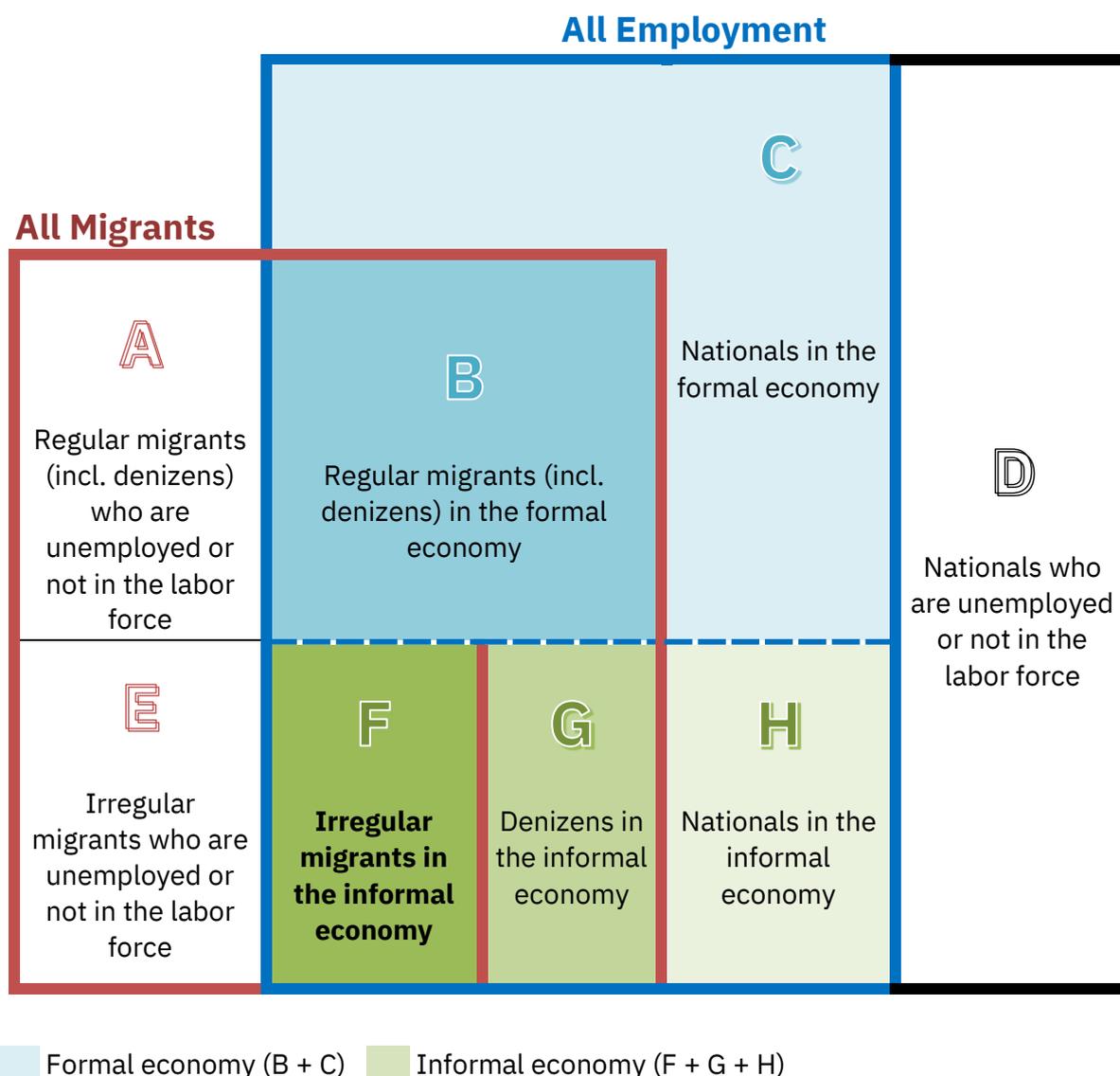
A review of methodological approaches to measuring irregular migration is undertaken elsewhere in the MIRreM project (Rodriguez-Sanchez and Tjaden, 2023). To complement their survey, we undertake a review of approaches to estimating the size of the informal economy, with a view to informing the development of methods to measure the participation of irregular migrants in the informal economy. In other words, we discuss the composite measurement of cells F + G + H in Figure 2, in order to inform future methodologies that home in on standalone estimates of cell F.

There are both micro- and macroeconomic approaches that measure and/or estimate the size of the informal economy. Microeconomic approaches rely on individual- or household-level data collected from surveys, tax audits and labor inspections. Macroeconomic approaches broadly encompass monetary methods, accounting and survey discrepancy computations, econometric modelling, and physical input methods.

---

<sup>3</sup> Schneider (2007; 2002, as cited in Kraller, Reichel and Hollomey, 2008) provides estimates on the number of foreigners working in the informal economy in Austria in the 2000s based on hours worked/full-time equivalents (FTEs). He does not, however, offer details on the specifics of his methodology so that it may be replicated.

Figure 2: The intersection of migrant ir/regularity and the in/formal economy



### 4.1 Micro-level approaches

Measuring informality in the economy, with a particular focus on labor informality, involves various microeconomic approaches, each with its own strengths and weaknesses. One common procedure involves the use of surveys, which can be conducted at the household or firm level. In-home direct surveys are the most widely utilized approach to measuring the informal economy (Williams and Schneider, 2016). Conventional labor force surveys are particularly good at obtaining detailed information on the characteristics of labor informality

at the household level (Elgin and Ertürk, 2019; Schneider and Buehn, 2018).<sup>4</sup> Furthermore, firm surveys, which rely on responses from firm representatives as opposed to workers, are valuable for estimating the level of economic informality within specific sectors (Cantekin and Elgin, 2015). Table 2 lists common indicators covered in survey questionnaires to identify labor and firm informality.

Table 2: Common indicators of informality

Labor Informality	Firm Informality
<ul style="list-style-type: none"> <li>→ Registration with the social security institution</li> <li>→ Access to paid, sick, and/or maternity leave</li> <li>→ Whether the respondent holds a written employment contract</li> <li>→ Access to compensation in case of dismissal</li> <li>→ Receipt of a portion of one’s wages as undeclared to authorities</li> </ul>	<ul style="list-style-type: none"> <li>→ Tax identification number</li> <li>→ Municipal licensing</li> <li>→ Formal registration status when the firm first began operating</li> <li>→ Issuance of receipts</li> <li>→ Workers’ social security registration</li> </ul>

Sources: European Commission, 2020; The World Bank, 2019; Medvedev and Oviedo, 2016; Hussmans, 2004

A survey might rely on a single indicator or a combination of indicators and follow up questions to estimate and characterize informality. For instance, the quarterly Turkish Household Labor Force Survey (HLFS) solely asks employed respondents whether they are registered with *Sosyal Güvenlik Kurumu*, the national social security institution. Hence, the Turkish HLFS only provides a direct estimation of labor informality. On the other hand, the Ecuador Micro-Enterprise Survey conducted in 2011 covered multiple indicators of both firm and labor informality, ranging from tax identification numbers to worker affiliation with social security (Medvedev and Oviedo, 2016). However, unlike the HLFS, this sample doesn’t yield generalizable estimations for the entire Ecuadorian economy insofar as firms with more than 50 employees are purposefully excluded from the survey. Meanwhile, the special Eurobarometer survey conducted in 2019 in 28 EU member states was able to scrutinize the demand for and supply of undeclared work, covering both consumers’ motivations to purchase undeclared goods and services and workers’ motivations to supply informal labor. In 26 questions in total, it provides generalizable estimates for the European Union as a whole (European Commission, 2020). In the absence of direct indicators, combinatory approaches that integrate survey and administrative sources by linking the records of individuals across the independently gathered datasets are able to infer informality at the micro-level (De Gregorio and Giordano, 2016).

---

<sup>4</sup> Labor force surveys rarely contain information on the legal residence status of respondents, which belies their descriptive exhaustiveness otherwise. Most sampling approaches use official population registers that by design do not target foreign nationals who are *irregularly* present in the country (see Pinedo-Caro (2020) and De Gregorio and Giordano (2016)). If the residency status of respondents were recorded in these surveys, the combination of irregular residence status and active employment would automatically implicate labor informality. In contrast, more targeted thematic surveys on immigration and/or migrant integration may directly ask for respondents’ legal residence status (see Blangiardo and Cesareo (2013) for an example on Italy).

Nevertheless, all surveys suffer from data blind spots and inaccuracies owing to procedural and design constraints. For instance, firm surveys which draw their samples from official business registers may underreport the prevalence of firm informality (Alexander and Ribarsky, 2021). In a similar vein, labor force surveys often have participation limitations related to age, which may lead to underreporting of child labor and informality in secondary employment (Ibid.; Hussmans, 2004). They also often under sample migrants. Moreover, the reliability of survey methods is heavily dependent on respondents' willingness to share personal information, whether it be socially desirable or undesirable to do so (Schneider and Buehn, 2018). Given the fact that engaging in undeclared work constitutes extralegal behavior, there is a risk of underreporting in any survey designed to measure economic informality. Nevertheless, comparative research in various survey formats has found that the face-to-face format largely alleviates these concerns and is likelier to compel survey participants to reveal undeclared work (Williams and Schneider, 2016). In comparison to less personable formats such as phone interviews and online surveying, a face-to-face approach allows trust and rapport to build gradually between the respondent and the interviewer, which in turn lowers non-response bias.

Another micro-level method of measuring economic informality is based on disaggregated data collected from tax returns, audits, workplace and labor inspections. Audits and inspections may be conducted either at random or upon receipt of complaints to authorities. For example, based on a random sample of 13,000 individual tax returns, the Internal Revenue Service of the United States regularly estimates the federal tax gap due to income underreporting (Guenther, 2023). As for workplace and labor inspections, while these sources of data provide detailed information, their generalizability is undermined by the fact that even the random selection of workplaces for audits and inspections often rely on official business registers that do not list informal businesses (Schneider and Buehn, 2018). Thus, they may at best systematically capture informal employment within registered firms and only partially detect informal employment in unregistered firms through ad hoc inspections.

## 4.2 Macro-level approaches

Macro-level methods of measuring the informal economy can be grouped into four sets of approaches: monetary, statistical discrepancy, structural modeling, and physical input/output (Table 3). These approaches tend to measure economic activity (e.g. share of output) rather than number of workers engaged in informal economic activity.

*Table 3: Macro approaches and methods to measuring informality*

Macro-approaches	Notable Methods	Early Adopters
Monetary	Currency-deposit ratio method	Cagan (1958); Gutmann (1977)
	Transactions method	Feige (1979)
	Cash demand method	Tanzi (1983)

Accounting and Survey Discrepancies	National expenditure versus income	Macafee (1980); Dilnot and Morris (1981)
	Labor input method	U.S. Congress Joint Economic Committee (1983)
	Labor force participation method	Contini (1981)
Econometric Modeling	MIMIC procedure	Frey and Weck (1983)
	DGE modeling	Roca, Moreno and Sanchez (2001); Ihrig and Moe (2004)
Physical Input/Output	Electricity consumption method	Kaufmann and Kaliberda (1996)
	Nightlight luminosity method	Ghosh et al. (2009)

Monetary Approaches

Monetary approaches, which were more prevalently deployed in the 1980s and 1990s, make use of estimates for currency demand and/or total transactions in the economy and relate this value to official figures for gross national/domestic product (GNP/GDP). Any unexplained discrepancy from the official figures is then attributed to the informal economy.

Firstly, an initial iteration of this approach is the currency-deposit ratio method, which was proposed by Cagan (1958) and later revisited by Gutmann (1977). The method operates on the assumption that the formal economy relies on a specific and constant ratio of cash and current account deposits, while the informal economy operates entirely in cash. Any deviation from this fixed ratio is indicative of changes in the size of the informal economy since its contraction (expansion) would decrease (increase) the ratio.

An alternative to the currency-deposit ratio method is the transactions method proposed by Feige (1979). He calculates total money transactions in a given year and divides this value by observed income recorded in official GNP figures. An increase in the resultant ratio despite a macro-economic climate which was expected to lower it is subsequently attributed to an expansion of the informal economy.

Finally, a more sophisticated monetary approach is the cash-demand method developed by Tanzi (1980, 1983), who relates demand for currency (proxied by the ratio of cash holdings to current accounts) to a host of explanatory variables such as per capita income, interest rates, and income taxes. The method assumes that a) all transactions in the informal economy take place in cash, and b) high taxes induce economic informality. Hence, the relationship between money demand and income taxes is used as a proxy for the evolution of the size of the informal economy over a period.

All three monetary approaches discussed thus far calibrate their estimations by setting a benchmark year wherein an initial size for the informal economy is externally assigned. Furthermore, all methods make the simplifying assumptions that a) the frequency of transactions in the formal and informal economy are equivalent, and b) informal transactions are wholly or dominantly undertaken in cash. Both the *a priori* assignment of a benchmark

size and the unitary frequency of transactions assumption underpinning the estimations are liable to criticism on account of arbitrariness and uncertainty (Williams and Schneider, 2016). Likewise, with the expansion of electronic payment systems in all spheres of economic life, the cash hypothesis may no longer be appropriate for emerging and developed economies with sophisticated financial systems. The increasing popularity of crypto currency in the last decade is likely to add to this dynamic.

Moreover, the application of monetary approaches to international currencies such as the US dollar and the Euro is problematic (Schneider and Breuhn, 2013; Blades, 1982). These currencies are accepted as legal tender in various other countries besides their country of issuance. They are also kept as savings or reserves by both individuals and central banks around the world. Demand for them is a composite of national and international dynamics, the separation of which is necessary in order to estimate the size of *national* informal economies based on data on aggregate currency demand. Likewise, a similar issue of disaggregation arises for all currencies owing to the fact that currency demand generated by the criminal economy is difficult to disentangle from that of the informal economy.

Although monetary methods rely on similar data sources and assumptions, they can nonetheless produce a wide range of estimations for the same context and period. For instance, Table 4 lists average estimates for the size of the informal economy in Italy between 1981 and 1985. The cash-deposit ratio method and the transactions method yield estimates of 29 percent of the Italian official GDP figures for the period in question. On the other hand, the cash demand method estimates the same figure to be around 17.5%, at almost half the previous two estimates. Overall, the use of monetary approaches in isolation from other methodologies is less reliable.

*Table 4: Macroeconomic estimates of the size of the informal economy in Italy, averages for 1981-1985*

Method	Estimate (% of GDP)
Cash-deposit ratio	29.3
Transactions	34.3
Cash demand	17.5

Source: Extract from Schneider and Enste (2000: 107)

#### Accounting and Survey Discrepancies

Discrepancy estimations of the informal economy compare two separate measurements of the same underlying income or production variable in national accounting and microeconomic surveys. Any mismatch found therein is attributed to the informal economy.

A common application frequently utilized by tax authorities examines discrepancies between independently measured national/household expenditure and income figures, which should theoretically be equal one another (Dimova, Gang and Landan-Lane, 2011; McAfee, 1980; US Internal Revenue Service, 1979). Here, it is assumed that data on expenditure is more complete than that on income; the former is harder to hide whereas the underreporting of the latter is more widespread (Medina and Schneider, 2019). The measurements for both sides of the accounting equation need to be undertaken independently.

Another method that relies on survey discrepancies is the labor input method (Alexander and Ribarsky, 2021; Williams et al., 2017; US Congress Joint Economic Committee, 1983). Labor input refers to the amount of labor used in the production of goods and services, which can be measured in terms of labor hours, job units or the total value-added generated by all workers in an economy. The method compares labor input reported by workers in labor force surveys (supply-side) and output estimates reported by employers in enterprise surveys (demand-side). It assumes that workers are less likely to underreport labor input than enterprises (Williams et al., 2017). Hence, any residual labor input from supply-side estimations is taken as an estimate of the size of the informal economy, estimated based on workforce levels.

Lastly, the labor force participation (LFP) method, which was more popular in the 1980s, provides a proxy measure of the size of the informal economy (Contini, 1981). The method assumes that there is a constant LFP rate in an economy. When individuals cannot find work in the formal economy, they seek it in its informal counterpart. The real LFP rate remains constant in this scenario. However, because the informally employed conceal their actual employment status in traditional surveying, official labor statistics register a fall in the LFP rate. This negative deviation from the norm is then associated with an increase in size of the informal economy. Ultimately, this method is described as crude and weak by commentators (Williams and Schneider, 2016). It has been criticized for overlooking a) factors which influence the LFP rate other than informality, and b) individuals who simultaneously hold two jobs, one in the formal and the other in the informal economy.

Overall, accounting and survey discrepancy approaches suffer from the same methodological weaknesses as microeconomic approaches. To name a few, these include measurement errors, omissions, reliance on respondents' willingness to be forthcoming about socially undesirable subject matter, and definitional inconsistencies. Additionally, discrepancy correction procedures employed by statisticians in charge of national accounts and surveys may undercut efforts to derive estimates of the informal economy from these very discrepancies (Schneider and Enste, 2013).

### Econometric Modeling

Econometric modeling approaches specify a series of mathematical equations that describe the functioning of an economy. The equations make assumptions about the interaction of the different components of the economy. Their application to the measurement of the size of the informal economy comes in two varieties: the multiple indicators, multiple causes (MIMIC) procedure and dynamic general equilibrium (DGE) modeling.

Firstly, the MIMIC procedure treats the size of the informal economy as an *unobservable* variable which nevertheless has *observable* causes and indicators. The causal parameters can range from the tax burden to institutional quality while indicators can span variables such as real GDP and the currency/money supply ratio (Schneider, Buehn and Montenegro, 2010; Dell'Anno and Schneider, 2003). The choice of causes and indicators is flexible and changes from one application to the next. The procedure estimates an index that describes whether and by what relative magnitude the informal economy expands or contracts across different time periods. However, the index needs to be calibrated with an *a priori* benchmark value to generate exact measurements of the size of the informal economy in a given time period.

Usually, a year for which other reliable estimates of the informal economy exist is chosen for the benchmarking step (Dell’Anno and Schneider, 2003).

Secondly, DGE modeling constructs an economic system complete with firms and households<sup>5</sup> and a two-sector economy divided across the informal and the formal economies (Elgin and Sezgin, 2017, Elgin and Öztunalı, 2012). The choice set available to each agent, their motivations, their endowments, and the constraints they face when they make decisions are all explicitly specified with mathematical equations. Consequently, the model can estimate micro-level decision-making by all agents, including whether and why firms choose to register and how households allocate their labor across registered and unregistered firms. Similar to the MIMIC procedure, DGE modeling requires calibration by exogenous macro-economic parameters to yield exact estimates of the size of the informal economy. Nevertheless, the calibration component is also an asset for any structural modeling exercise insofar as it allows for microeconomic counterfactual analyses and policy simulations.

Both the MIMIC procedure and DGE modeling are highly sensitive to model specifications and rely on strong causal assumptions (Elgin et al., 2021; Williams and Schneider, 2016). The need for calibration with external estimates from a benchmark year for both methods is a common source of criticism. Furthermore, the MIMIC procedure cannot differentiate between the criminal and informal economies, a weakness shared by monetary approaches (Williams and Schneider, 2016). DGE modeling can theoretically circumvent this issue by introducing entry into the criminal sector as an option within the choice set of agents, although data limitations for the calibration phase might hinder this exercise.

*Table 5: Macroeconomic estimates of the size of various definitions of the informal economy in select European countries, 2013*

Country	Labor Input (% of private sector GVA <sup>a</sup> ) <sup>b</sup>	MIMIC (% of official GDP) <sup>c</sup>	DGE (% of official GDP) <sup>c</sup>
Belgium	15.4	22.7	20.7
Germany	7.1	15.6	15.2
Italy	17.2	29.6	26.0
Poland	27.3	25.8	24.3
Sweden	9.7	19.3	17.7
UK	9.5	12.9	12.0

a. Gross value-added

b. Source: Williams et al., 2017

c. Source: Elgin et al., 2021

The MIMIC procedure tends to produce slightly lower estimates of the size of the informal economy than DGE modeling (Elgin et al., 2021). Both econometric modeling approaches

<sup>5</sup> Different iterations of DGE modeling might include or leave out different agents from the model. For instance, Ihrig and Moe (2004) and Elgin and Öztunalı (2012) model out households/individual agents (labor supply) only. Elgin and Sezgin (2017) model out firms (labor demand), households (labor supply) and a government (regulatory agent).

produce much higher estimates than accounting and survey discrepancy approaches, as showcased in Table 5.

### Physical Input/Output Approaches

Physical input/output approaches, consisting of the electricity consumption and nightlight luminosity methods, rely on the direct or indirect measurement of energy usage as an indicator of economic activity levels. The disparity between official production figures versus predicted production values commensurate with total energy usage in a given economy is attributed to informality.

Pioneered by Kaufmann and Kaliberda (1996), the electricity consumption method is foregrounded by the observation that electricity usage and GDP levels tend to move in tandem at a stable rate which averages out to one globally. Predicated on this constant correspondence, they chart the trajectory of electricity consumption in an economy over a set period of time as a stand-in measurement of the growth rate of total GDP. Then, the predicted growth rates are transformed into GDP shares for both the formal and informal economies by the choice of a baseline year wherein the share of informality in the overall economy is predetermined externally. The comparison of these estimated GDP shares with official GDP figures yields empirical estimates of the size of the informal economy.

The nightlight luminosity method is a relative newcomer to the literature (Ghosh et al., 2009). It uses the intensity of light emitted (i.e., luminosity) at nighttime captured through satellite imagery as a proxy for total production. The method calculates the size of the informal economy by subtracting the official GNP / GDP figure from the values predicted by nightlight luminosity levels.

Both the electricity consumption and nighttime luminosity methods are criticized on account of *a priori* assumptions and benchmarking processes, whether it be the assumption of a constant relationship between production and electricity consumption (Lackó, 2000) or the choice of a reasonable reference economy to calibrate coefficients (Tanaka and Keola, 2017). Furthermore, fluctuation in electricity and other energy prices, transition of consumer habits towards renewables, and changes in an economy's output mix may influence electricity consumption and nighttime luminosity patterns in ways that do not alter production levels (Rangel-Gonzalez and Llamosas-Rosas, 2019; Hanousek and Palda, 2006; OECD et al., 2002). In turn, these factors bias estimates that rely on physical input approaches either upwards or downwards. Additionally, the resolution of satellite imagery used to calculate luminosity values modulates the accuracy and precision of estimations of the nighttime luminosity method (Rangel-Gonzalez and Llamosas-Rosas, 2019).

---

Overall, there isn't single methodology, whether it be micro or macroeconomic, which is universally reliable and applicable in all contexts (Alexander and Ribarsky, 2021; Elgin et al., 2021; Williams et al. 2017). In general, micro-level approaches provide lower-bound estimates while macro-level approaches generate upper-bound estimates of the informal economy. Availability of survey data, reliability of national accounting, and other factors

should be taken into account to assess whether a particular estimation method is appropriate to deploy. Even so, the combination and comparison of multiple estimations using a variety of methods for the same context and time period is the general practice. In a separate output from the MIrreM project we use these insights to develop a methodology to measure the role of irregular migrants in the informal economy.

## 5. CONCLUSION

Unsettled academic and policy debates regarding the definition of the informal economy have hindered clearheaded analysis and policymaking vis-à-vis the participation of irregular migrants therein. This paper has pinned down a working definition for the informal economy in order to identify, characterize, and quantitatively measure this phenomenon. We clarified conceptual ambiguities regarding the intersection of economic informality and migrant irregularity, expounded on the theoretical mechanisms behind their interaction, and surveyed methodological approaches to estimating informality.

Our framework suggests that a combination of legal status, worker placement in firms and conditions of stay should be taken into consideration when thinking about the participation of irregular migrants in the informal economy. With this in mind, we suggest that there are four sub-groups of irregular migrants in the informal economy:

- (1) Foreign nationals without right of residence working in registered firms.
- (2) Foreign nationals without right of residence working in unregistered firms.
- (3) Foreign nationals with terminable right of residence working in registered firms, but violating the conditions of their stay.
- (4) Foreign nationals with terminable right of residence working in unregistered firms.

Building on this framework and complementary work produced by colleagues under the M<sub>Irre</sub>M umbrella, our next objective is to develop and test out novel methods to estimate the extent of irregular migrants' participation in the informal economy.

## 6. REFERENCES

- Ahmad, A. N. (2008). Dead men working: Time and space in London's ('illegal') migrant economy. *Work, Employment and Society*, 22(2), 301–318. <https://doi.org/10.1177/0950017008089106>
- Akgündüz, Y. E., & Torun, H. (2020). Two and a half million Syrian refugees, tasks and capital intensity. *Journal of Development Economics*, 145, 102470. <https://doi.org/10.1016/j.jdeveco.2020.102470>
- Alexander, T. F., & Ribarsky, J. (2021). *Measuring the Informal Economy* (IMF Policy Papers). International Monetary Fund.
- Almeida, R., & Carneiro, P. (2023). Enforcement of Labor Regulation and Informality. *American Economic Journal: Applied Economics*, 4(3), 64–89.
- Amaral, P. S., & Quintin, E. (2010). Limited Enforcement, Financial Intermediation, and Economic Development: A Quantitative Assessment. *International Economic Review*, 51(3), 785–811.
- Amuedo-Dorantes, C., & Antman, F. (2017). Schooling and labor market effects of temporary authorization: Evidence from DACA. *Journal of Population Economics*, 30(1), 339–373. <https://doi.org/10.1007/s00148-016-0606-z>
- Amuedo-Dorantes, C., & Bansak, C. (2011). The Impact of Amnesty on Labor Market Outcomes: A Panel Study Using the Legalized Population Survey. *Industrial Relations: A Journal of Economy and Society*, 50(3), 443–471. <https://doi.org/10.1111/j.1468-232X.2011.00642.x>
- Anderson, B. (2010). Migration, immigration controls and the fashioning of precarious workers. *Work, Employment and Society*, 24(2), 300–317. <https://doi.org/10.1177/0950017010362141>
- Bacchetta, M., Ernst, E., & Bustamante, J. P. (2009). *Globalization and informal jobs in developing countries: A Joint Study of the International Labour Office and the Secretariat of the World Trade Organization*. World Trade Organization. <https://doi.org/10.30875/f801556b-en>
- Bahar, D., Ibañez, A. M., & Rozo, S. V. (2021). Give me your tired and your poor: Impact of a large-scale amnesty program for undocumented refugees. *Journal of Development Economics*, 151, 102652. <https://doi.org/10.1016/j.jdeveco.2021.102652>

- Bargain, O., & Kwenda, P. (2011). Earnings Structures, Informal Employment, and Self-Employment: New Evidence from Brazil, Mexico and South Africa. *Review of Income and Wealth*, 57(Special Issue), 100–122.
- Bastia, T. (2007). From Mining to Garment Workshops: Bolivian Migrants in Buenos Aires. *Journal of Ethnic and Migration Studies*, 33(4), 655–669. <https://doi.org/10.1080/13691830701265628>
- Bélanger, D., & Saraçoğlu, C. (2020). The governance of Syrian refugees in Turkey: The state-capital nexus and its discontents. *Mediterranean Politics*, 25(4), 413–432. <https://doi.org/10.1080/13629395.2018.1549785>
- Bellamy, C., Haysom, S., Wake, C., & Barbelet, V. (2017). *The lives and livelihoods of Syrian refugees: A study of refugee perspectives and their institutional environment in Turkey and Jordan*. Overseas Development Institute.
- Bevelander, P., & Pendakur, R. (2014). The labour market integration of refugee and family reunion immigrants: A comparison of outcomes in Canada and Sweden. *Journal of Ethnic and Migration Studies*, 40(5), 689–709. <https://doi.org/10.1080/1369183X.2013.849569>
- Bisignano, A. P., & El-Anis, I. (2019). Making sense of mixed-embeddedness in migrant informal enterprising: The role of community and capital. *International Journal of Entrepreneurial Behavior & Research*, 25(5), 974–995. <https://doi.org/10.1108/IJEBR-03-2018-0114>
- Blades, D. (1982). The Hidden Economy and National Accounts. *The OECD Observer*, 114, 15–17.
- Bloch, A. (2014). Living in Fear: Rejected Asylum Seekers Living as Irregular Migrants in England. *Journal of Ethnic and Migration Studies*, 40(10), 1507–1525. <https://doi.org/10.1080/1369183X.2013.859070>
- Bohon, S. A. (2005). Occupational Attainment of Latino Immigrants in the United States. *Geographical Review*, 95(2), 249–266. <https://doi.org/10.1111/j.1931-0846.2005.tb00365.x>
- Cagan, P. (1958). The Demand for Currency Relative to the Total Money Supply. *Journal of Political Economy*, 66(4), 303–328. <https://doi.org/10.1086/258056>
- Cantekin, K., & Elgin, C. (2017). Extent and Growth Effects of Informality in Turkey: Evidence from a Firm-Level Survey. *The Singapore Economic Review*, 62(5), 1017–1037.
- Chauvin, S., & Garcés-Mascreñas, B. (2014). Becoming Less Illegal: Deservingness Frames and Undocumented Migrant Incorporation: Becoming Less Illegal. *Sociology Compass*, 8(4), 422–432. <https://doi.org/10.1111/soc4.12145>
- Blangiardo, G. C. and Cesareo, V. (2013). Foreign population in Italy: statistical framework and integration. In Cesareo, V. (Ed.), *Migration: A picture from Italy* (pp. 11-38). Fondazione ISMU.
- Chen, M. A. (2012). *The Informal Economy: Definitions, Theories and Policies* (1; WIEGO Working Papers). Women in Informal Employment Globalizing and Organizing.

- Chen, M. A. (2013). Informal Workers in the Developing World: Organizing in the Global Economy. *New Labor Forum*, 22(1), 67–73. <https://doi.org/10.1177/1095796012471310>
- Cheung, S. Y., & Phillimore, J. (2014). Refugees, Social Capital, and Labour Market Integration in the UK. *Sociology*, 48(3), 518–536. <https://doi.org/10.1177/0038038513491467>
- Chiswick, B. R., Lee, Y. L., & Miller, P. W. (2005). A Longitudinal Analysis of Immigrant Occupational Mobility: A Test of the Immigrant Assimilation Hypothesis. *International Migration Review*, 39(2), 332–353. <https://doi.org/10.1111/j.1747-7379.2005.tb00269.x>
- Clemens, M., Huang, C., & Graham, J. (2018). *The Economic and Fiscal Effects of Granting Refugees Formal Labor Market Access* (496; CDG Working Papers). Center for Global Development.
- Connor, P., & Passel, J. S. (2019). *Europe's Unauthorized Immigrant Population Peaks in 2016, Then Levels Off*. Pew Research Center.
- Contini, B. (1981). Labor Market Segmentation and the Development of the Parallel Economy: The Italian Experience. *Oxford Economic Papers*, 33(3), 401–412.
- Cvetičanin, P., Popovikj, M., & Jovanović, M. (2019). Informality in the Western Balkans: A culture, a contextual rational choice, or both? *Southeast European and Black Sea Studies*, 19(4), 585–604. <https://doi.org/10.1080/14683857.2019.1692427>
- Dabla-Norris, E., Gradstein, M., & Inchauste, G. (2008). What causes firms to hide output? The determinants of informality. *Journal of Development Economics*, 85(1–2), 1–27. <https://doi.org/10.1016/j.jdeveco.2006.05.007>
- De Genova, N. P. (2002). Migrant “Illegality” and Deportability in Everyday Life. *Annual Review of Anthropology*, 31(1), 419–447. <https://doi.org/10.1146/annurev.anthro.31.040402.085432>
- De Giorgi, G., Ploenzke, M., & Rahman, A. (2018). Small Firms’ Formalisation: The Stick Treatment. *The Journal of Development Studies*, 54(6), 983–1001. <https://doi.org/10.1080/00220388.2017.1327660>
- Gregorio, C. D., & Giordano, A. (2016). The heterogeneity of undeclared work in Italy: Some results from the statistical integration of survey and administrative sources. *Rivista Di Statistica Ufficiale*, 2, 99–129.
- De Paula, Á., & Scheinkman, J. A. (2011). The Informal Sector: An Equilibrium Model and Some Empirical Evidence from Brazil. *Review of Income and Wealth*, 57(Special Issue), 8–26.
- Delaney, A., & Macdonald, F. (2018). Thinking about informality: Gender (in)equality (in) decent work across geographic and economic boundaries. *Labour & Industry: A Journal of the Social and Economic Relations of Work*, 28(2), 99–114. <https://doi.org/10.1080/10301763.2018.1475024>
- Dell’Anno, R. (2003). *Estimating the Shadow Economy in Italy: A Structural Equation Approach* (2003–07; Working Paper Series). University of Aarhus.

- Dell'Anno, R., Gómez-Antonio, M., & Pardo, A. (2007). The shadow economy in three Mediterranean countries: France, Spain and Greece. A MIMIC approach. *Empirical Economics*, 33(1), 51–84. <https://doi.org/10.1007/s00181-006-0084-3>
- Dell'Anno, R., & Schneider, F. (2003). The Shadow Economy of Italy and other OECD Countries: What Do We Know? *Journal of Public Finance and Public Choice*, 21(2–3), 97–120. <https://doi.org/10.1332/251569203X15668905422009>
- Deshingkar, P., Abrar, C. R., Sultana, M. T., Haque, K. N. H., & Reza, M. S. (2019). Producing ideal Bangladeshi migrants for precarious construction work in Qatar. *Journal of Ethnic and Migration Studies*, 45(14), 2723–2738. <https://doi.org/10.1080/1369183X.2018.1528104>
- Devillanova, C., Fasani, F., & Frattini, T. (2018). Employment of Undocumented Immigrants and the Prospect of Legal Status: Evidence from an Amnesty Program. *ILR Review*, 71(4), 853–881. <https://doi.org/10.1177/0019793917743246>
- Di Nola, A., Kocharkov, G., & Vasilev, A. (2019). Envelope wages, hidden production and labor productivity. *The B.E. Journal of Macroeconomics*, 19(2), 20180252. <https://doi.org/10.1515/bejm-2018-0252>
- Dibben, P., & Williams, C. C. (2012). Varieties of Capitalism and Employment Relations: Informally Dominated Market Economies. *Industrial Relations: A Journal of Economy and Society*, 51(s1), 563–582. <https://doi.org/10.1111/j.1468-232X.2012.00690.x>
- Dilnot, A., & Morris, C. N. (1981). What Do We Know About the Black Economy? *Fiscal Studies*, 2(1), 58–73. <https://doi.org/10.1111/j.1475-5890.1981.tb00457.x>
- Dimova, R. D., Gang, I. N., & Landon-Lane, J. (2011). Revealed Informal Activity. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.1806408>
- Eide, E., Von Simson, K., & Strøm, S. (2011). Rank-Dependent Utility, Tax Evasion, and Labor Supply. *FinanzArchiv*, 67(3), 261. <https://doi.org/10.1628/001522111X600597>
- El Badaoui, E., Strobl, E., & Walsh, F. (2008). Is There an Informal Employment Wage Penalty? Evidence from South Africa. *Economic Development and Cultural Change*, 56(3), 683–710. <https://doi.org/10.1086/533550>
- Elgin, C., & Ertürk, F. (2019). Informal economies around the world: Measures, determinants and consequences. *Eurasian Economic Review*, 9(2), 221–237. <https://doi.org/10.1007/s40822-018-0105-5>
- Elgin, C., Köse, M. A., Ohnsorge, F., & Yu, S. (2021). *Understanding Informality* (109490; MPRA Papers). Munich Personal RePEc Archive.
- Elgin, C., & Öztunalı, O. (2012). *Shadow Economies around the World: Model Based Estimates*. Boğaziçi University.
- Elgin, C., & Sezgin, M. B. (2017). Sectoral Estimates of Informality: A New Method and Application for the Turkish Economy. *The Developing Economies*, 55(4), 261–289. <https://doi.org/10.1111/deve.12151>
- Ellis, M., Wright, R., & Parks, V. (2009). Geography and the Immigrant Division of Labor. *Economic Geography*, 83(3), 255–281. <https://doi.org/10.1111/j.1944-8287.2007.tb00354.x>

- European Commission. (2020). *Undeclared work in the European Union*. European Union.
- Fan, C. C. (2002). The Elite, the Natives, and the Outsiders: Migration and Labor Market Segmentation in Urban China. *Annals of the Association of American Geographers*, 92(1), 103–124. <https://doi.org/10.1111/1467-8306.00282>
- Fan, C. C. (2004). The state, the migrant labor regime, and maiden workers in China. *Political Geography*, 23(3), 283–305. <https://doi.org/10.1016/j.polgeo.2003.12.013>
- Feige, E. L. (1979). How Big Is the Irregular Economy? *Challenge*, 22(5), 5–13. <https://doi.org/10.1080/05775132.1979.11470559>
- Fernández-Kelly, M. P., & Shefner, J. (2006). *Out of the Shadows: Political Action and the Informal Economy in Latin America*. The Pennsylvania State University Press.
- Fields, G. S. (1975). Rural-Urban Migration, Urban Unemployment and Underemployment, and Job-Search Activity in LDCs. *Journal of Development Economics*, 2, 165–187.
- Fields, G. S. (1989). On-the-Job Search in a Labor Market Model: Ex-Ante Choices and Ex-Post Outcomes. *Journal of Development Economics*, 30(1), 159–178.
- Fields, G. S. (1990). Labour Market Modelling and the Urban Informal Sector: Theory and Evidence. In *The Informal Sector Revisited* (pp. 49–69). OECD Publishing.
- Finnan, C. R. (1982). Community Influences on the Occupational Adaptation of Vietnamese Refugees. *Anthropological Quarterly*, 55(3), 161. <https://doi.org/10.2307/3318025>
- Finotelli, C., & Arango, J. (2011). Regularisation of unauthorised immigrants in Italy and Spain: Determinants and effects. *Documents d'Anàlisi Geogràfica*, 57(3), 495. <https://doi.org/10.5565/rev/dag.251>
- Fortin, B., Marceau, N., & Savard, L. (1997). Taxation, wage controls and the informal sector. *Journal of Public Economics*, 66(2), 293–312. [https://doi.org/10.1016/S0047-2727\(97\)00013-3](https://doi.org/10.1016/S0047-2727(97)00013-3)
- Frey, B. S., & Weck-Hanneman, H. (1984). The hidden economy as an ‘unobserved’ variable. *European Economic Review*, 26(1–2), 33–53. [https://doi.org/10.1016/0014-2921\(84\)90020-5](https://doi.org/10.1016/0014-2921(84)90020-5)
- Fullin, G., & Reyneri, E. (2011). Low Unemployment and Bad Jobs for New Immigrants in Italy. *International Migration*, 49(1), 118–147. <https://doi.org/10.1111/j.1468-2435.2009.00594.x>
- Garcés-Mascareñas, B. (2015). Revisiting Bordering Practices: Irregular Migration, Borders, and Citizenship in Malaysia. *International Political Sociology*, 9(2), 128–142. <https://doi.org/10.1111/ips.12087>
- Garganta, S., & Gasparini, L. (2015). The impact of a social program on labor informality: The case of AUH in Argentina. *Journal of Development Economics*, 115, 99–110. <https://doi.org/10.1016/j.jdeveco.2015.02.004>
- Ghosh, S. (2019). “Everything Must Match”: Detection, Deception, and Migrant Illegality in the India-Bangladesh Borderlands. *American Anthropologist*, 121(4), 870–883. <https://doi.org/10.1111/aman.13313>

- Ghosh, T., Anderson, S., Powell, R., Sutton, P., & Elvidge, C. (2009). Estimation of Mexico's Informal Economy and Remittances Using Nighttime Imagery. *Remote Sensing*, 1(3), 418–444. <https://doi.org/10.3390/rs1030418>
- Gindling, T. H., & Terrell, K. (2005). The effect of minimum wages on actual wages in formal and informal sectors in Costa Rica. *World Development*, 33(11), 1905–1921. <https://doi.org/10.1016/j.worlddev.2005.04.017>
- Goldring, L., & Landolt, P. (2011). Caught in the Work–Citizenship Matrix: The Lasting Effects of Precarious Legal Status on Work for Toronto Immigrants. *Globalizations*, 8(3), 325–341. <https://doi.org/10.1080/14747731.2011.576850>
- Gong, X., & Van Soest, A. (2002). Wage differentials and mobility in the urban labour market: A panel data analysis for Mexico. *Labour Economics*, 9(4), 513–529. [https://doi.org/10.1016/S0927-5371\(02\)00045-3](https://doi.org/10.1016/S0927-5371(02)00045-3)
- Guenther, G. (2023). *Federal Tax Gap: Size, Contributing Factors, and the Debate over Reducing It*. Congressional Research Service.
- Günther, I., & Launov, A. (2012). Informal employment in developing countries. *Journal of Development Economics*, 97(1), 88–98. <https://doi.org/10.1016/j.jdeveco.2011.01.001>
- Gutierrez, I. A., Kumar, K. B., Mahmud, M., Munshi, F., & Nataraj, S. (2019). Transitions between informal and formal employment: Results from a worker survey in Bangladesh. *IZA Journal of Development and Migration*, 9(1), 3. <https://doi.org/10.1186/s40176-019-0141-2>
- Gutmann, P. M. (1977). The Subterranean Economy. *Financial Analysts Journal*, 33(6), 26–27+34.
- Hammar, T. (1990). *Democracy and the Nation State. Aliens, Denizens and Citizens in a World of International Migration*. Aldershot: Ashgate.
- Hanousek, J., & Palda, F. (2006). Problems measuring the underground economy in transition. *Economics of Transition*, 14(4), 707–718. <https://doi.org/10.1111/j.1468-0351.2006.00268.x>
- Harris, J. R., & Todaro, M. P. (1970). Migration, Unemployment and Development: A Two-Sector Analysis. *The American Economic Review*, 60(1), 126–142.
- Hart, K. (1973). Informal Income Opportunities and Urban Employment in Ghana. *The Journal of Modern African Studies*, 11(1), 61–89. <https://doi.org/10.1017/S0022278X00008089>
- Hazans, M. (2011). *Informal Workers across Europe: Evidence from 30 European Countries*. The World Bank. <https://doi.org/10.1596/1813-9450-5912>
- Hersch, J. (2011). Skin color, physical appearance, and perceived discriminatory treatment. *The Journal of Socio-Economics*, 40(5), 671–678. <https://doi.org/10.1016/j.socec.2011.05.006>
- Hohberg, M., & Lay, J. (2015). The impact of minimum wages on informal and formal labor market outcomes: Evidence from Indonesia. *IZA Journal of Labor & Development*, 4(1), 14. <https://doi.org/10.1186/s40175-015-0036-4>

- Hussmanns, R. (2004). *Measuring the informal economy: From employment in the informal sector to informal employment*. International Labour Organization.
- Ihrig, J., & Moe, K. S. (2004). Lurking in the shadows: The informal sector and government policy. *Journal of Development Economics*, 73(2), 541–557. <https://doi.org/10.1016/j.jdeveco.2003.04.004>
- International Labour Conference. (2015). *Recommendation No. 204 concerning the Transition from the Informal to the Formal Economy*.
- International Labour Office. (2018). *Women and Men in the Informal Economy: A Statistical Picture* (Third Edition). International Labour Organization.
- International Labour Office, Labour Administration and Inspection Programme. (2013). *Labour Inspection and Undeclared Work in the EU*. International Labour Organization.
- International Labour Organization. (2018). *Informality and non-standard forms of employment*. International Labour Organization.
- Jones, T., & Ram, M. (2004). Illegal Immigrants and the Informal Economy: Worker and Employer Experiences in the Asian Underground Economy. *International Journal of Economic Development*, 6(2), 98–119.
- Kaufmann, D., & Kaliberda, A. (1996). *An “Unofficial” Analysis of Economies in Transition: An Empirical Framework and Lessons for Policy*. Harvard Institute for International Development.
- Kaur, A. (2014). Managing Labour Migration in Malaysia: Guest Worker Programs and the Regularisation of Irregular Labour Migrants as a Policy Instrument. *Asian Studies Review*, 38(3), 345–366. <https://doi.org/10.1080/10357823.2014.934659>
- Khosravi, S. (2010). An Ethnography of Migrant ‘Illegality’ in Sweden: Included Yet Excluded? *Journal of International Political Theory*, 6(1), 95–116. <https://doi.org/10.3366/E1755088210000479>
- Kloosterman, R., Van Der Leun, J., & Rath, J. (1999). Mixed Embeddedness: (In)formal Economic Activities and Immigrant Businesses in the Netherlands. *International Journal of Urban and Regional Research*, 23(2), 252–266. <https://doi.org/10.1111/1468-2427.00194>
- Kossoudji, S. A., & Cobb-Clark, D. A. (2002). Coming out of the Shadows: Learning about Legal Status and Wages from the Legalized Population. *Journal of Labor Economics*, 20(3), 598–628.
- Kraler, A. (2006). The legal status of immigrants and their access to nationality. In R. Bauböck (Ed.), *Migration and citizenship: Legal status, rights and political participation* (pp. 33–66). Amsterdam University Press.
- Kraler, A., & Ahrens, J. (2023). *Conceptualising migrant irregularity for measurement purposes*. *MIRreM Working Paper 2/2023*. <https://doi.org/10.5281/ZENODO.7868237>
- Kraler, A., Reichel, D., & Hollomey, C. (2008). *Undocumented Migration: Counting the Uncountable*. *Data and Trends across Europe*. [https://migrant-integration.ec.europa.eu/sites/default/files/2009-07/docl\\_9048\\_930502653.pdf](https://migrant-integration.ec.europa.eu/sites/default/files/2009-07/docl_9048_930502653.pdf)

- La Porta, R., & Shleifer, A. (2014). Informality and Development. *Journal of Economic Perspectives*, 28(3), 109–126. <https://doi.org/10.1257/jep.28.3.109>
- Lackó, M. (2000). Hidden Economy - an Unknown Quantity? Comparative Analysis of Hidden Economies in Transition Countries, 1989-95. *The Economics of Transition*, 8(1), 117–149. <https://doi.org/10.1111/1468-0351.00038>
- Lewis, W. A. (1954). Economic Development with Unlimited Supplies of Labour. *The Manchester School*, 22(2), 139–191. <https://doi.org/10.1111/j.1467-9957.1954.tb00021.x>
- Macafee, K. (1980). A glimpse of the hidden economy in the national accounts. *Economic Trends*, 316, 81–87.
- Maloney, W. F. (2004). Informality Revisited. *World Development*, 32(7), 1159–1178. <https://doi.org/10.1016/j.worlddev.2004.01.008>
- Maroukis, T. (2013). Economic crisis and migrants' employment: A view from Greece in comparative perspective. *Policy Studies*, 34(2), 221–237. <https://doi.org/10.1080/01442872.2013.767589>
- Massey, D. S., Durand, J., & Pren, K. A. (2016). Why Border Enforcement Backfired. *American Journal of Sociology*, 121(5), 1557–1600. <https://doi.org/10.1086/684200>
- McKay, S., Markova, E., & Paraskevopoulou, A. (2011). *Undocumented Workers' Transitions: Legal Status, Migration, and Work in Europe*. Taylor & Francis Group.
- Medina, L., & Schneider, F. G. (2019). *Shedding Light on the Shadow Economy: A Global Database and the Interaction with the Official One* (7981; CESifo Working Papers). Munich Society for the promotion of Economic Research. <https://www.ssrn.com/abstract=3502028>
- Medvedev, D., & Oviedo, A. M. (2013). *Informality and Profitability: Evidence from a New Firm Survey in Ecuador* (6431; Policy Research Working Paper Series). The World Bank.
- Meyer, P. (2015). Eldercare, immigration, and health care in Italy: How the Italian state creates and mitigates inequality. *Economic Anthropology*, 2(2), 343–358. <https://doi.org/10.1002/sea2.12035>
- Mincer, J. (1976). Unemployment Effects of Minimum Wages. *Journal of Political Economy*, 84(4), 87–104.
- Monras, J., Vázquez-Grenno, J., & Elias, F. (2020). *Understanding the Effects of Granting Work Permits to Undocumented Immigrants*.
- Moser, C. O. N. (1978). Informal Sector or Petty Commodity Production: Dualism or Dependence in Urban Development? *World Development*, 6(9/10), 1041–1064.
- Narayanan, A. (2015). Informal employment in India: Voluntary choice or a result of labor market segmentation? *Indian Journal of Labour Economics*, 58(1), 119–167. <https://doi.org/10.1007/s41027-015-0009-9>
- Nguyen, C. P. (2022). Does economic complexity matter for the shadow economy? *Economic Analysis and Policy*, 73, 210–227. <https://doi.org/10.1016/j.eap.2021.12.001>

- OECD. (2010). *Entrepreneurship and Migrants*. OECD.
- OECD & ILO. (2019). *Tackling Vulnerability in the Informal Economy*. OECD Publishing. <https://doi.org/10.1787/939b7bcd-en>
- OECD, ILO, IMF, & International Statistical Committee of the Commonwealth of Independent States. (2002). *Measuring the Non-Observed Economy: A Handbook*. OECD Publishing. <https://doi.org/10.1787/9789264175358-en>
- Oka, R. (2011). Unlikely Cities In The Desert: The Informal Economy As Causal Agent For Permanent “Urban” Sustainability In Kakuma Refugee Camp, Kenya. *Urban Anthropology and Studies of Cultural Systems and World Economic Development*, 40(3/4), 223–262.
- Ordóñez, J. T. (2016). Documents and Shifting Labor Environments Among Undocumented Migrant Workers in Northern California. *Anthropology of Work Review*, 37(1), 24–33. <https://doi.org/10.1111/awr.12082>
- Orrenius, P. M., & Zavodny, M. (2005). Self-selection among undocumented immigrants from Mexico. *Journal of Development Economics*, 78(1), 215–240. <https://doi.org/10.1016/j.jdeveco.2004.07.001>
- Ottaviano, G. I. P., & Peri, G. (2012). Rethinking the Effect of Immigration on Wages. *Journal of the European Economic Association*, 10(1), 152–197.
- Pan, Y. (2012). The Impact of Legal Status on Immigrants’ Earnings and Human Capital: Evidence from the IRCA 1986. *Journal of Labor Research*, 33(2), 119–142. <https://doi.org/10.1007/s12122-012-9134-0>
- Patel, K., & Vella, F. (2013). Immigrant Networks and Their Implications for Occupational Choice and Wages. *The Review of Economics and Statistics*, 95(4), 1249–1277. [https://doi.org/10.1162/REST\\_a\\_00327](https://doi.org/10.1162/REST_a_00327)
- Peri, G., & Sparber, C. (2009). Task Specialization, Immigration, and Wages. *American Economic Journal: Applied Economics*, 1(3), 135–169.
- Perry, G. E., Arias, O., Fajnzylber, P., Maloney, W. F., Mason, A., & Saavedra-Chanduvi, J. (2007). *Informality: Exit and Exclusion*. The World Bank. <https://doi.org/10.1596/978-0-8213-7092-6>
- Pinedo-Caro, L. (2020). Identifying Syrian refugees in Turkish microdata. *IZA Journal of Development and Migration*, 11(1), 20200017. <https://doi.org/10.2478/izajodm-2020-0017>
- Portes, A., & Stepick, A. (1985). Unwelcome Immigrants: The Labor Market Experiences of 1980 (Mariel) Cuban and Haitian Refugees in South Florida. *American Sociological Review*, 50(4), 493. <https://doi.org/10.2307/2095435>
- Pradhan, M., & Soest, A. V. (1997). Household Labor Supply in Urban Areas of Bolivia. *Review of Economics and Statistics*, 79(2), 300–310. <https://doi.org/10.1162/003465397556656>
- Prado, M. (2011). Government policy in the formal and informal sectors. *European Economic Review*, 55(8), 1120–1136. <https://doi.org/10.1016/j.eurocorev.2011.04.010>

- Rangel-Gonzalez, E., & Llamosas-Rosas, I. (2019). *An alternative method to measure non-registered economic activity in Mexico using satellite nightlights*. Bank of Mexico.
- Rauch, J. E. (1991). Modelling the informal sector formally. *Journal of Development Economics*, 35(1), 33–47. [https://doi.org/10.1016/0304-3878\(91\)90065-4](https://doi.org/10.1016/0304-3878(91)90065-4)
- Reeves, M. (2015). Living from the Nerves. *Social Analysis*, 59(4), 119–136. <https://doi.org/10.3167/sa.2015.590408>
- Revel, B. (2020). *Turkey's Refugee Resilience: Expanding and Improving Solutions for the Economic Inclusion of Syrians in Turkey*. The Atlantic Council.
- Rivera-Batiz, F. L. (1999). Undocumented workers in the labor market: An analysis of the earnings of legal and illegal Mexican immigrants in the United States. *Journal of Population Economics*, 12, 91–116.
- Roca, J. C. C., Moreno, C. D., & Sánchez, J. E. G. (2001). Underground economy and aggregate fluctuations. *Spanish Economic Review*, 3(1), 41–53. <https://doi.org/10.1007/PL00013586>
- Rodriguez-Sanchez, A., & Tjaden, J. (2023). *Estimating irregular migration—A review of traditional and innovative data and methods* (MIRreM). University for Continuing Education (Danube University Krems).
- Rogers, C. A., & Swinnerton, K. A. (2004). *A Model of Informal Sector Labor Markets*.
- Rottmann, S., & Kaya, A. (2021). ‘We can’t integrate in Europe. We will pay a high price if we go there’: Culture, Time and Migration Aspirations for Syrian Refugees in Istanbul. *Journal of Refugee Studies*, 34(1), 474–490. <https://doi.org/10.1093/jrs/feaa018>
- Salinas, A., Ortiz, C., Changoluisa, J., & Muffatto, M. (2023). Testing three views about the determinants of informal economy: New evidence at global level and by country groups using the CS-ARDL approach. *Economic Analysis and Policy*, 78, 438–455. <https://doi.org/10.1016/j.eap.2023.03.016>
- Schneider, F. (2010). The Influence of Public Institutions on the Shadow Economy: An Empirical Investigation for OECD Countries. *Review of Law & Economics*, 6(3), 441–468. <https://doi.org/10.2202/1555-5879.1542>
- Schneider, F., & Buehn, A. (2018). Shadow Economy: Estimation Methods, Problems, Results and Open questions. *Open Economics*, 1(1), 1–29. <https://doi.org/10.1515/openec-2017-0001>
- Schneider, F., Buehn, A., & Montenegro, C. E. (2010). *Shadow Economies All over the World: New Estimates for 162 Countries from 1999 to 2007* (5356; Policy Research Working Paper Series). The World Bank.
- Schneider, F., & Enste, D. H. (2000). Shadow Economies: Size, Causes, and Consequences. *Journal of Economic Literature*, 38(1), 77–114. <https://doi.org/10.1257/jel.38.1.77>
- Schneider, F., & Enste, D. H. (2013). *The Shadow Economy: An International Survey* (Second Edition). Cambridge University Press. <https://doi.org/10.1017/CBO9781139542289>

- Scott, S., & Rye, J. F. (2021). Praised, prized, yet penalised: A critical examination of low-wage hiring queues in the global strawberry industry. *Journal of Rural Studies*, 88, 473–481. <https://doi.org/10.1016/j.jrurstud.2021.04.014>
- Sinclair-Desgagné, B. (2013). Informal versus Formal New Ventures: A Choice Analysis and Some Policy Implications. In M. T. T. Thai & E. Turkina (Eds.), *Entrepreneurship in the Informal Economy: Models, Approaches and Prospects for Economic Development* (pp. 19–33). Taylor & Francis Group. <https://doi.org/10.4324/9780203066775>
- Sinitsyna, A., Torpan, K., Eamets, R., & Tammaru, T. (2021). Overlap Between Industrial Niching and Workplace Segregation: Role of Immigration Policy, Culture and Country of Origin. *Social Inclusion*, 9(2), 179–191. <https://doi.org/10.17645/si.v9i2.3640>
- Slack, T., Cope, M. R., Jensen, L., & Tickamyer, A. R. (2017). Social embeddedness, formal labor supply, and participation in informal work. *International Journal of Sociology and Social Policy*, 37(3/4), 248–264. <https://doi.org/10.1108/IJSSP-02-2016-0022>
- Slemrod, J. (2001). A General Model of the Behavioral Response to Taxation. *International Tax and Public Finance*, 8, 119–128.
- Spencer, S., & Triandafyllidou, A. (Eds.). (2020). *Migrants with Irregular Status in Europe: Evolving Conceptual and Policy Challenges*. Springer International Publishing. [https://doi.org/10.1007/978-3-030-34324-8\\_11](https://doi.org/10.1007/978-3-030-34324-8_11)
- Sporton, D. (2013). ‘They Control My Life’: The Role of Local Recruitment Agencies in East European Migration to the UK. *Population, Space and Place*, 19(5), 443–458. <https://doi.org/10.1002/psp.1732>
- Srivastava, R. (2019). Emerging Dynamics of Labour Market Inequality in India: Migration, Informality, Segmentation and Social Discrimination. *The Indian Journal of Labour Economics*, 62(2), 147–171. <https://doi.org/10.1007/s41027-019-00178-5>
- Steiler, I. (2021). The Intersectionality of Informal Employment: Insights from Street Vending and Domestic Work in Tanzania. *Journal of Labor and Society*, 24(1), 107–132. <https://doi.org/10.1163/24714607-20212004>
- Strauss, K., & McGrath, S. (2017). Temporary migration, precarious employment and unfree labour relations: Exploring the ‘continuum of exploitation’ in Canada’s Temporary Foreign Worker Program. *Geoforum*, 78, 199–208. <https://doi.org/10.1016/j.geoforum.2016.01.008>
- Suleman, F., & Figueiredo, M. D. C. (2018). Wage differentials within a female-dominated occupation: Domestic workers in informal and flexible jobs in Portugal. *International Labour Review*, 157(1), 129–152. <https://doi.org/10.1111/ilr.12065>
- Tanaka, K., & Keola, S. (2017). Shedding Light on the Shadow Economy: A Nighttime Light Approach. *The Journal of Development Studies*, 53(1), 32–48. <https://doi.org/10.1080/00220388.2016.1171845>
- Tansel, A. (1999). *Formal versus Informal Sector Choice of Wage Earners and Their Wages in Turkey*.

- Tansel, A., & Kan, E. O. (2012). *The Formal/Informal Employment Earnings Gap: Evidence from Turkey* (1210; Working Paper Series). Koç University-TÜSİAD Economic Research Forum.
- Tanzi, V. (1983). The Underground Economy in the United States: Annual Estimates, 1930-80. *Staff Papers - International Monetary Fund*, 30(2), 283–305.
- Tawodzera, G., Chikanda, A., Crush, J., & Tengeh, R. (2016). *International Migrants and Refugees in Cape Town's Informal Economy*. Southern African Migration Programme. <https://doi.org/10.2307/j.ctvh8r2zz>
- Teipen, C., & Mehl, F. (2021). Global Value Chains and Industrial Relations in the Global South: Social Upgrading Paths in Different Industries. *Journal of Labor and Society*, 24(1), 214–236. <https://doi.org/10.1163/24714607-20212008>
- The World Bank. (2019). *World Development Report 2019: The Changing Nature of Work*. The World Bank.
- Tuominen, M. (1994). The Hidden Organization of Labor: Gender, Race/Ethnicity and Child-Care Work in the Formal and Informal Economy. *Sociological Perspectives*, 37(2), 229–245. <https://doi.org/10.2307/1389321>
- Ulysea, G. (2018). Firms, Informality, and Development: Theory and Evidence from Brazil. *American Economic Review*, 108(8), 2015–2047. <https://doi.org/10.1257/aer.20141745>
- Ulysea, G. (2020). Informality: Causes and Consequences for Development. *Annual Review of Economics*, 12(1), 525–546. <https://doi.org/10.1146/annurev-economics-082119-121914>
- United Nations. (1993). *System of National Accounts*. United Nations.
- Urzi, D., & Williams, C. (2017). Beyond post-national citizenship: An evaluation of the experiences of Tunisian and Romanian migrants working in the agricultural sector in Sicily. *Citizenship Studies*, 21(1), 136–150. <https://doi.org/10.1080/13621025.2016.1252716>
- U.S. Congress Joint Economic Committee. (1983). *Growth of the Underground Economy, 1950-81: Some Evidence from the Current Population Survey*. U.S. Government Printing Office.
- van Meeteren, M. (2014). *Irregular Migrants in Belgium and the Netherlands: Aspirations and Incorporation*. Amsterdam University Press. <https://doi.org/10.1515/9789048523085>
- van Nierop, P., Schönenberg, L., & Terziev, P. (n.d.). *Counteracting undeclared work and labour exploitation of third- country national workers*.
- Vershinina, N. A., Rodgers, P., Ram, M., Theodorakopoulos, N., & Rodionova, Y. (2018). False self-employment: The case of Ukrainian migrants in London's construction sector. *Industrial Relations Journal*, 49(1), 2–18. <https://doi.org/10.1111/irj.12199>
- Vianello, F. A., Finotelli, C., & Brey, E. (2021). A slow ride towards permanent residency: Legal transitions and the working trajectories of Ukrainian migrants in Italy and Spain. *Journal of Ethnic and Migration Studies*, 47(13), 3172–3189. <https://doi.org/10.1080/1369183X.2019.1590187>

- Vuolo, M., Uggen, C., & Lageson, S. (2017). Race, Recession, and Social Closure in the Low-Wage Labor Market: Experimental and Observational Evidence. *Research in the Sociology of Work*, 30, 141–183. <https://doi.org/10.1108/S0277-283320170000030007>
- Willen, S. S. (2007). Toward a Critical Phenomenology of “Illegality”: State Power, Criminalization, and Abjectivity among Undocumented Migrant Workers in Tel Aviv, Israel. *International Migration*, 45(3), 8–38. <https://doi.org/10.1111/j.1468-2435.2007.00409.x>
- Williams, C. C., Bejakovic, P., Mikulic, D., Franic, J., Kedir, A., & Horodnic, I. A. (2017). *An evaluation of the scale of undeclared work in the European Union and its structural determinants: Estimates using the labour input method*. European Union.
- Williams, C. C., & Horodnic, I. (2015a). Are Marginalised Populations More Likely to Engage in Undeclared Work in the Nordic Countries? *Sociological Research Online*, 20(3), 15–29. <https://doi.org/10.5153/sro.3719>
- Williams, C. C., & Horodnic, I. A. (2015b). Self-employment, the informal economy and the marginalisation thesis: Some evidence from the European Union. *International Journal of Entrepreneurial Behavior & Research*, 21(2), 224–242. <https://doi.org/10.1108/IJEBR-10-2014-0184>
- Williams, C. C., & Horodnic, I. A. (2017). Evaluating the relationship between social exclusion and participation in the informal sector in the European Union. *International Journal of Manpower*, 38(3), 489–503. <https://doi.org/10.1108/IJM-10-2015-0179>
- Williams, C. C., & Lansky, M. A. (2013). Informal employment in developed and developing economies: Perspectives and policy responses. *International Labour Review*, 152(3–4), 355–380. <https://doi.org/10.1111/j.1564-913X.2013.00196.x>
- Yamada, G. (1996). Urban Informal Employment and Self-Employment in Developing Countries, Theory and Evidence. *Economic Development and Cultural Change*, 44(2), 289–314.
- Yu Chen. (2011). Occupational Attainment of Migrants and Local Workers: Findings from a Survey in Shanghai’s Manufacturing Sector. *Urban Studies*, 48(1), 3–21. <https://doi.org/10.1177/0042098009360685>
- Zetter, R., & Ruaudel, H. (2016). *Refugees’ Right to Work and Access to Labor Markets – An Assessment*. KNOMAD.
- Zschirnt, E., & Ruedin, D. (2016). Ethnic discrimination in hiring decisions: A meta-analysis of correspondence tests 1990–2015. *Journal of Ethnic and Migration Studies*, 42(7), 1115–1134. <https://doi.org/10.1080/1369183X.2015.1133279>

## ABOUT THE AUTHORS

Aslı Salihoğlu is a doctoral researcher in Migration Studies at the University of Oxford, based at the Centre on Migration, Policy & Society (COMPAS). Carlos Vargas-Silva is a Professor in Migration Studies at the University of Oxford, based at COMPAS.

## COPYRIGHT CLAUSE



This work is licensed by the MIRreM Consortium under a Creative Commons Attribution-ShareAlike 4.0 International License, 2020. For details, see <http://creativecommons.org/licenses/by-sa/4.0/>

## THE MIRREM CONSORTIUM

University for Continuing Education Krems (Coordinator)

European University Institute

University of Osnabrück

University of Maastricht

University of Turku

Complutense University Madrid

Hellenic Foundation for European and Foreign Policy (ELIAMEP)

University of Milan

University of Potsdam

Platform for International Cooperation on Undocumented Migration (PICUM)

International Centre for Migration Policy Development (ICMPD)

Migration Policy Institute Europe (MPI-E)

University of Warsaw

Vrije Universiteit Brussel

Instituto Universitário de Lisboa

### *Associated Partners:*

Toronto Metropolitan University

University of Leicester

University of Oxford