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FIRMS' LIFECYCLE UNDER CONFLICT-RELATED MOBILITY RESTRICTIONS IN PALESTINE: EVIDENCE FROM ESTABLISHMENT CENSUSES[1]

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Abstract

The Israeli occupation of Palestine has been accompanied by a repressive security and regulatory regime affecting the mobility of labor and capital. We explore how these policies have impacted Palestinian business establishments during 1997–2012, particularly between regions facing the most versus least restrictive regimes. We construct an index of mobility restrictions in individual governorates and years using principal component analysis of multiple indicators painstakingly collected from OCHA-oPt, B'Tselem, World Bank databases, and other sources. Implications for establishments' operating and legal status, economic activity, and female and total employment are assessed during years when the occupation regime in individual governorates was at varying degrees of intensity. Our data – of up to 500,000 establishment-year observations – come from four waves of the Palestinian Establishment Census.

Regression analysis using data from all four Census waves shows that establishments facing tighter security regimes in their governorates are more likely to suspend their operations through temporary or permanent closure, or engage in restructuring of their operations through preparatory or ancillary activities, rather than be in active operation. Restrictions are also associated with a reduction in establishments' scale in terms of total employment, female employment, and female share of employment. Mobility restrictions are thus damaging to employment in Palestine for several reasons. Some firms do not survive, or enter hibernation engaging in peripheral activities. Surviving firms respond to restrictions by retaining fewer workers. Female workers appear to be the first to be fired, and last to be rehired. We find no evidence that establishments try to escape mobility restrictions in one governorate for another governorate, which validates our governorate-level analysis of the creation, expansion and disappearance of firms.

Keywords: Israeli security regime, mobility restrictions, Palestine, firms' lifecycle.

JEL Classifications: N45, N65, N95, O24.

ملخص

رافق الاحتلال الإسرائيلي لفلسطين نظام أمني وتنظيمي قمعي يؤثر على حركة القوى العاملة ورأس المال. نستكشف في بحثنا كيف أثرت هذه السياسات على مؤسسات الأعمال الفلسطينية خلال الفترة 1977-2012 ، لا سيما أثرها على المناطق التي تواجه أكثر الأنظمة تضييقاً في مقابل المناطق الأقل تقييداً. فنضع مؤشراً للقيود على التنقل في كل محافظة على حدة وعدد سنوات التقييد باستخدام التحليل الأساسي لمكونات مؤشرات متعددة جُمعت بمشقة من مكتب تنسيق الشؤون الإنسانية في الأرض الفلسطينية المحتلة ، ومنظمة بيتسليم ، وقواعد بيانات البنك الدولي ، ومصادر أخرى. يتم تقييم آثار ذلك على تشغيل المؤسسات ووضعها القانوني ، والنشاط الاقتصادي ، وعمالة المرأة وإجمالي العمالة خلال السنوات التي كان فيها نظام الاحتلال في المحافظات المختلفة متفاوت في شدته. تأتي بياناتنا ـ التي تصل إلى 500 ألف رصد سنوي ـ من أربع موجات من تعداد المؤسسات الفلسطينية.

تبين انعكاسات الاختلاف في داخل هذا الاختلاف أن المؤسسات التي تواجه أنظمة أمنية أكثر تشدداً في محافظاتها، هى أكثر عرضة لتعليق عملها بإغلاق مؤقت أو دائم ، أو بالانخراط في إعادة هيكلة أعمالها من خلال أنشطة تحضيرية أو مساعدة ، بدلاً من أن تكون في حالة عملية نشطة. كما ترتبط القيود أيضا بانخفاض في نطاق إجمالي العمالة التي تشغلها المؤسسات وخاصة العمالة النسائية ، وحصة الإناث من العمل. ومن ثم ، فإن قيود التنقل تضر بالعمل في فلسطين لعدة أسباب. بعض الشركات لا تتمكن من البقاء ، أو تدخل في حالة سبات وتشترك في أنشطة هامشية. وشركات أخرى تتمكن من البقاء فى ظل القيود من خلال الإبقاء على عدد أقل من العمال. يبدو أن العاملات هن أول من يتم الأستغناء عنهن ، وهن آخرمن يُعاد توظيفهن. ولا نجد أي دليل على أن المؤسسات تحاول الهروب من القيود المفروضة على التنقل في إحدى المحافظات بالهروب إلى محافظة أخرى ، الأمر الذي يؤكد صحة تحليلنا لإنشاء الشركات وتوسيعها واختفائها على مستوى المحافظات كافة.

1. Motivation

Occupation of the Gaza Strip and the West Bank including East Jerusalem (jointly: occupied Palestinian territories, oPt) by Israel started in 1967 and has been accompanied by repressive security and economic policies affecting inter-regional and cross-border mobility of labor, materials and capital. Israel, Palestine's closest neighbor, rich trade partner and home to many capital-intensive and technology firms, has held keys to Palestinians' access to materials and capital, and opportunities for trade and high-quality employment. The combined set of domestic and cross-border mobility barriers impose a heavy toll on how Palestinian workers, business establishments and public institutions can conduct their day-to-day operations, and harm their prospects for attaining prosperity.

Economic conditions in Palestine have been poor and volatile since the 1990s, to a large extent due to the mobility and trade restrictions imposed by the Israeli authorities. Domestic output has grown intermittently subject to contractions, most notably during the conflict years of the Second Intifada, and years 2007-2009 and 2013-2014. Unemployment rate has exceeded 20 percent in the West Bank and 30 percent in the Gaza Strip in much of the past two decades. On the eve of the Second Intifada, employment in Israel accounted for as many as one-sixth of jobs in Gaza and one-quarter of jobs in the West Bank. For the span of the following decade, however, as the Israeli authorities tightened the rules on travel and border crossing, these figures plummeted to zero in Gaza and to less than 15 percent in the West Bank. Amid tightened access to private credit and harder access to suppliers and markets, businesses have had hard time opening, remaining in operation, or expanding. 90 percent of operating businesses have four or fewer employees, and fewer than one percent have over 18 employees. Even these numbers deteriorated during the Second Intifada, and have been only partially recovering since then. The Palestinian economy underwent a transformation since pre-Intifada years whereby agriculture and fishery, transportation, services and manufacturing have diminished in importance, while import, information and communication, and public administration have become more prominent.

This study uses census microdata to investigate numerically the economic implications of the Israeli-imposed mobility and trade restrictions for business establishments across all oPt. We evaluate the conditions for opening, operating and expanding of businesses over the years, particularly between regions affected most versus least by the restrictions. Firms' operating and legal status, economic activity, employment and female employment are assessed. The study relies on two sources of highly specialized data: Operations of all Palestinian business establishments are taken from four waves of the Palestinian Establishment Census (PEC 1997, 2004, 2007 and 2012). These surveys span years when the Israeli occupation regime was at its least restrictive recent level (year 1997), at the height of restrictiveness (2004 and 2007), and in years when the security situation stabilized and the regime of checks abated (2012). These surveys add up to 500,000 establishment-year observations, and allow the linking of firms' status in a panel setup.

The restrictiveness of the Israeli security regime in individual governorates and years – as experienced by businesses and civilians alike – was amassed from the United Nations Office for

the Coordination of Humanitarian Affairs (OCHA oPt), B'Tselem, internal World Bank databases, and other sources. The collected indicators are combined using principal component analysis to construct a one-dimensional index of the restrictiveness of the security regime in individual governorates and years. Combining these highly specialized institutional data with the Palestinian census microdata, and exploiting their intertemporal and panel dimension in a difference-in-difference setup to investigate business establishments' operating status, main activity and employment are important contributions of our study.

The study is organized as follows. Section 2 outlines the background of the Israeli occupation of Palestine emphasizing the period since the signing of the Oslo II Accord in 1995. The section also presents existing knowledge regarding the burden of the Israeli occupation on Palestinian business conditions. Section 3 outlines the estimation methods and testable hypotheses regarding the impact of mobility restrictions on firms' status. Section 4 describes the data used to evaluate the hypotheses. Section 5 presents the main results, and Section 6 concludes with major findings and their significance.

2. Historical review of conflict-related restrictions in Palestine

The time period evaluated in our analysis, 1997–2012, spans fifteen tumultuous years following the signing of the Oslo Accords in 1993. The time covers years from before the outbreak of the Second Intifada in 2000, through the Gaza Disengagement Plan in August 2005 leading to Israel's withdrawal from Gaza, the Israeli blockade and military offensives in Gaza during 2007–2008, and the clashes of the Israeli and Hamas forces in Gaza in 2008–2009 and 2012. The analysis also covers the period before and during the construction of a separation barrier in the West Bank and East Jerusalem starting in 2002, and the continued expansion of Israeli settlements and restricted-access areas in West Bank following the Second Intifada.

Through the Israeli-sanctioned settlements, yet-unsanctioned outposts, military areas, and the control of Palestine's inflows and outflows of capital, Israel is in control of large swaths of arable land, fresh water and other resources in Palestine, as well as a significant share of public revenues. Israel uses these mechanisms to apply pressure on Palestinian authorities and citizens, punish any acts of opposition, or simply advance the interests of Israeli citizens. All the Israeli infringements on the Palestinian economy jointly inflict great financial damage.

The Israeli occupation regime has not been applied uniformly, and has varied markedly between the Gaza Strip and the West Bank, as well as across individual West Bank governorates. Under the Oslo Accords of 1993, the Palestinian Authority was granted full control over security and civilian affairs in Palestinian municipalities (Area A, 18% of West Bank's land), and control over civilian affairs in Palestinian rural communities (Area B, 20% of West Bank). Security in Area B was agreed to be under the joint control of the Palestinian and the Israeli forces. Lastly, Israel was granted control over its settlements in the West Bank and Gaza, roads, and the sparsely inhabited vast majority of the Jordan Valley and the Dead Sea area (Area C, over 60% of West Bank). Area C is under the full security and planning control of Israeli authorities, and Palestinians living there – 51 percent of Palestinian population, 260 villages in all – have no autonomy and no right to use natural resources or to build facilities. The cost of restrictions on

Palestinian's access and use of Area C resources has been estimated at $3.4 billion annually, and the total burden on the Palestinian economy at large has been estimated at $9.8 billion.

At the time the Oslo Accords were signed, areas A, B and C were clearly delineated, and their agreed administration and security regimes were fully in effect. Israel agreed that its enforcement of restricted-access zones in Area C would be temporary, and Israel would cede its control as new agreement is negotiated. In the following years, and particularly since the Second Intifada, however, Israel has continuously and systematically intensified its encroachment on the West Bank territories. Area C has become the home of an increasing number of internationally unrecognized Israeli settlements, and illegal new outposts (figure A1). These settlements and outposts gradually receive greater recognition in the Israeli law and, correspondingly, continue proliferating and growing. Under the status quo, all of the West Bank with the sole exception of Ramallah has effectively come under the administrative regime of area C.

Evolution of the security regime over time

Years 1995-2000 were a period of stability when the final resolution was expected to be negotiated under the interim rule of the Palestinian Authority. The period saw a large inflow of donor aid, and the return of many Palestinian entrepreneurs from abroad. In September 2000, however, the Second Intifada erupted, partly on account of a lack of progress in negotiations.

The Second Intifada raged for five years, leading to significant fatalities and destruction of infrastructure and property. Violent confrontations peaked in summer 2002, but economic deprivation of Gaza and West Bank became particularly pronounced in the ensuing years after Israel started building a separation barrier in the West Bank and East Jerusalem in 2002, and after Israel imposed an economic blockade on Gaza in 2007 (Oberholzer 2015). As part of the security measures enacted following the start of the Second Intifada, Israel implemented a system of roadblocks, checkpoints and other obstructions to restrict mobility within the West Bank as well as across its borders. Many welfare and business-climate indicators deteriorated in those years.

The Second Intifada ended and trade restrictions on Palestine were partially lifted in summer 2005. That summer Israel also disengaged from Gaza – it withdrew its military forces and relocated all of its settlers from Gaza, and dismantled all settlements there. However, the relaxation was weak and short-lived. Following Hamas's victory in the Palestinian Authority's legislative elections in January 2006, Israel and the Quartet on the Middle East (UN, EU, Russia and US) imposed economic sanctions on Gaza, including a complete trade blockade and punitive measures against Hamas's struggle against Israel, such as cuts to fuel and electricity supplies, and periodic military offensives in Gaza (B'Tselem 2014).

In both Gaza and the West Bank, construction materials and permits became hard to come by, and the provision of public services and infrastructure, such as roads, hospitals and sanitation deteriorated (Bocco et al. 2002).

The barrier, constructed in the interior of the West Bank, along with numerous road obstacles throughout the West Bank such as roadblocks and checkpoints, impinged on the available road infrastructure. Israeli military zones, and continuously expanding Israeli settlements and outposts further limited Palestinians' mobility and access to resources in their own land, and contributed

to the fragmentation of Palestine into disjointed markets. This has complicated firms' access to their customers, suppliers and workers (World Bank 2014). In Gaza, the strict closure that has been restricting the movement of people, materials and capital in and out of the territory has led to particularly adverse economic conditions there.

Within the West Bank, mobility and trade restrictions have persisted (World Bank 2007a,b). Permanent full-time and part-time (hereafter 'fixed'), and temporary ('flying') road checkpoints expanded over time continuously. The number of full- and part-time checkpoints rose from 64 in January 2004, to 105 in January 2012. The number of full-time checkpoints alone stood at 80 by July 2007, and rose to 96 by April 2015 (B'Tselem 2015; also refer to table 1). Business perception surveys mentioned political instability and the corresponding macroeconomic instability, corruption, interrupted access to electricity, and transportation restrictions as major constraints impinging on firms' operations (World Bank Enterprise Survey 2006-2007, as cited in World Bank 2013).[4]

In 2008 hostilities between Hamas and Israel in Gaza intensified again, leading to a January 2009 Gaza War (Israeli Operation Cast Lead). Humanitarian situation in Gaza deteriorated further, leading to "a massive destruction of livelihoods and a significant deterioration of infrastructure and basic services" for Gazans (Mansour 2009:1). A period of reconstruction followed, fueled in part by a relaxation in the mobility restrictions in 2009 (van der Weide et al. 2015). Year 2011 was the most politically stable year since the 1990s, allowing the economy to regain some of the past losses.

Economic growth slowed down yet again in 2012 and 2013, with isolated violent incidents in Gaza in March and November 2012.[5] To this day, because of the poor state of infrastructure and the multitude of restrictions on Palestinians' day-to-day operations, local firms have difficulties doing business domestically, cannot compete in the export market and have a low prospect for expanding and survival (ITC 2015; van der Weide et al. 2015). This drags down the statewide economy, keeping Palestine in a perpetual deprivation trap in need of donor aid (World Bank 2013).[6]

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[4] AIX Group (2013), Weide et al. (2015), Amodio, Baccini, and Di Maio (2017), Amodio and Di Maio (2017), Cal`ı and S. H. Miaari (2018) are other studies documenting the extent and evolution of mobility restrictions across Palestine and their effect on market outcomes.

[5] In 2013 and 2014, the security situation deteriorated further, which had repercussions for economic activity and trade. Rafah, the only crossing between Gaza and Egypt, was shut down, limiting the ability of workers and businesses to access markets and social and health services across the border. Another destructive war in Gaza then erupted in July 2014. During 2015 alone, 91 road obstacles were constructed, including new checkpoints, roadblocks and earth mounds, on top of the 452 in existence from prior years (OCHA oPt 2016).

[6] The Israeli security regime is not limited to controlling domestic mobility, but importantly affects the movement of Palestinian workers, goods and capital across oPt borders. Appendix 1 discusses these restrictions in relation to international trade and the macroeconomic conditions in the West Bank and Gaza.

Beside the burden of security protocols and mobility restrictions implemented by the Israeli forces, Palestinian firms face ineffective and haphazard governance by local regulatory authorities. Two-thirds of Palestinian businesses perceive that regulations are not interpreted consistently and predictably (Investment Climate Survey). Corruption and incompetence of public officials is a problem. Draft form of competition law has been awaiting implementation for several years, leading to regulatory vacuum and uncertainty in the meantime. In the West Bank, an authoritarian rule by Fatah has eroded people's political freedoms and has facilitated corruption (Jamal, 2012; Kurtzer et al. 2012;

Given the multitude of economic restrictions imposed by the Israeli forces across the West Bank and Gaza, question arises regarding their joint impact on Palestinian firms. The following two sections discuss the problem of measurement of the security regime in effect at firms' locations, and estimation of its effect on firms' observable status and performance. Section 5 then presents our main empirical results, and Section 6 concludes.

3. Methods

This study aims to quantify the effect of mobility restrictions imposed by Israeli forces across the oPt on the performance and lifecycle of Palestinian establishments. Two methodologies are used for this task. First, we must derive a summary indicator quantifying the degree of restrictiveness of the security regime in each Palestinian governorate in the years leading up to the four PECs. Second, we must link the restrictiveness of the security regime to firms' observed status so as to infer a relationship. These steps, and methodologies employed, are described in turn on the following pages.

Identification strategy 1: quantifying mobility restrictions

To distinguish areas affected more versus less heavily by the mobility restrictions, a time-varying summary index is obtained from principal component analysis (PCA) of all observable time-varying indicators of mobility constraints in all available years. To our knowledge, this is the first time PCA is used to gauge the degree of restrictions imposed on civilians' mobility across regions, although political science literature has previously used PCA to measure regulation or governance quality across countries (Jalilian et al. 2007; Langbein and Knack 2010). (Appendix 2 reports on a robustness check using an alternative static index of mobility restrictions.)

The PCA is performed on cross-sectional data in each year, and scores from the retained first principal component are used to construct the mobility-restriction index in that year. Some limitations of the index are that the index scores are ordinal and unitless, have different ranges across years, and may be sensitive to individual values of the source vectors. For ease of interpretation and comparability across years, governorates are classified according to the estimated scores as highest, medium or least affected by Israeli security measures.

This indicator of the intensity of security restrictions is thought to have bearing on Palestinians' ability to open, run and expand businesses. It gives rise to two testable hypotheses:

H1: Tighter mobility restrictions in a governorate affect negatively the operating status and performance of establishments residing there.

Mobility restrictions increase firms' operating costs of doing business, and affect adversely their revenues. Mobility restrictions cause delays in the deliveries – and give rise to the risk of non-delivery – of productive factors or parts. They increase the risk that firms' products will not reach the market place, will get there subject to extensive spoilage, or their customers will not arrive.[7] The risk of personal searches, arrests, or other violence also affects adversely firms'

Abrahams 2018). Finally worth noting, low factor productivity, high indirect costs, and business environment-related losses hold down Palestinian firms' productivity (World Bank 2011).

[7] Restrictions on capital flow and credit, unmeasured here, also affect firms' ability to pay their suppliers and collect from their customers. Even more importantly, Israeli policy governing land ownership and access to Palestinian land creates uncertainty over property rights. Private parties have limited ability to register land and put it to efficient long-term use (World Bank 2017c).

ability to rely on workers, suppliers and customers. These are the various channels through which local mobility restrictions affect firms' performance.

The second, more speculative hypothesis concerns firms' response to the burdens and uncertainty. To the extent that firms can relocate at some finite cost between areas facing different sets of mobility restrictions, we should find evidence of that at least in panel data.

H2: Establishments operating under tighter mobility restrictions attempt to put themselves out of harm's way by relocating to governorates facing looser restrictions.

Identification strategy 1: Difference in difference estimation

To estimate the effect of mobility restrictions on firms' operating status and performance, a difference-in-difference estimator at the level of Palestinian governorates is used to isolate the effect of the security regime on firms' performance. The summary measure of mobility restrictions is linked to the count of various types of establishments, their operating and legal status, location and main economic activity, employment, and female employment. PCA scores for the mobility restriction index for years 2002–2004, 2005–2006 and 2009–2010 are linked to business conditions observed in the 2004, 2007 and 2012 rounds of the PEC, respectively. Because information on mobility restrictions in 1997 is missing, the inventory from years 2002–2004 is used as the best available proxy for the relative tightness of the security regime across governorates in 1997. Because relative rather than absolute mobility restrictions are used, this proxy is deemed acceptable. The following reduced-form regression specification is estimated:

$$y_{it} = \alpha + \beta z_{it} + \gamma x_{it} + \delta t + \rho t z_{it} + (e_i + u_{it}) \qquad (1)$$

where y_{it} is the outcome of interest of establishment i in survey round t, z_{it} is the relative index of mobility restrictions in firm i's governorate in year t (lagged as described above), x_{it} is a set of control variables at the level of firms or governorates, t is a linear trend indicator, e_i is a firm-level unobserved fixed effect, and u_{it} is an idiosyncratic firm-level time-varying shock. z_{it} may be a continuous index or a categorical variable. $\alpha, \beta, \gamma, \delta, \rho$ are estimable parameters, and ρ has the interpretation as the difference-in-difference estimator.

In this study, equation 1 is estimated using ordinary least squares regressions for various outcome indicators y_{it}.[8] To find the effect of mobility restrictions on firms' status and performance, firms' observable characteristics and conditions in governorates x_{it} are controlled for. Governorate-industry fixed effects are also used. These models are expected to yield consistent and efficient estimates of the effects of mobility restrictions on establishments' performance as long as the mobility-restrictions index is measured without a substantial error, any measurement error is uncorrelated with the measured index, and the index is exogenous and uncorrelated with the composite error term $(e_i + u_{it})$. It is plausible that these assumptions hold approximately. In waves where it is possible (2007-2012), longitudinal analysis of the intertemporal changes in firms' status and operations as a function of changes in mobility restrictions is performed. Establishment-level fixed effects are used in these models.

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[8] Alternatively, better tailored estimators were considered for specific dependent variables, such as probit or logit for binary dependent variables such as operating status, tobit for employment size, or ordered probit for categorical outcomes such as legal status or type of organizational unit.

4. Data

Our study investigates the distribution of various types of establishments, and their operational status and performance at different points in time, as functions of time-varying mobility restriction regimes. To this end, measures of the security regime and mobility restrictions across governorates and years, obtained from several public sources, are linked to the status and performance indicators of all Palestinian establishments in the 1997–2012 PECs.

Mobility restriction index

For the PCA index of time-varying mobility restrictions, the following vectors of security measures were incorporated in all years when they were available: house demolitions; adults and minors made homeless; curfew hours and curfew incidents (during the Intifada); full-time, part-time, and flying checkpoints; searches and arrests; adult and child fatalities and injuries; population exposed to violence; Israeli and Yesha Council settlements; and settler density. These factors are thought to have bearing on Palestinians' ability to operate businesses, because they reflect the red-tape, transportation and transaction costs, and risks of doing business and working in each governorate. These vectors have an adequate degree of availability and variation over time, suggesting that this index could provide a better measure of the security regime faced by firms than a static measure. Counts of housing units, curfew incidents, checkpoints and settlements are standardized by governorate area. Counts of persons and searches are standardized by governorate population as of 2014.[9]

Firms' status and performance

Information on individual establishments is taken from four waves of the PEC. The PEC, administered by the Palestinian Central Bureau of Statistics (PCBS), covers all economic establishments operating across Palestine without restriction on their size, incorporation or purpose. The sole exception omitted from the survey universe in year 2012 is agricultural establishments. All Palestinian territories with the exception of East Jerusalem are covered. Because survey design did not entail sampling or stratification, establishment-year observations are used self-weighted.

The 1997, 2004, 2007 and 2012 waves of the Census, with 99,000-170,000 establishment records each, are used, adding up to nearly 500,000 establishment-year records (441,000 in operation). Between the 2007 and 2012 waves, establishment identifiers are linked, allowing the usage of establishment-level fixed effects, or an advanced longitudinal analysis of firms' coming into existence, attrition, expansion and changes in operations. Out of 117,153 establishments in year 2007, and 132,874 establishments in year 2012, 78,080 are present in both years (156,160 or 62.5% of observations). The 2012 Census is also the latest wave, and is thus our most recent source of insight on the status and operating conditions of firms in Palestine.[10]

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[9] Appendix 2 provides more information on the alternatives considered. Table A7 reviews the variables used in the PCA and their contribution in the index of mobility restrictions. Table A8 and figures A2-A18 illustrate the variables used.

[10] The 2017 wave will become available to authors in December 2018. The PCBS has not prepared a public-access version of the 1994-round microdata. These additional waves would be useful for testing whether economic conditions were stationary before the onset of the Second Intifada, and in the more recent years under a relatively stable political climate.

The public-access version of PEC microdata includes information on establishments' operating status, economic organization and legal status, main economic activity, and male and female employment.[11] We find that the share of sole proprietorships and single-unit firms among establishments rose significantly during 2004-2012 relative to the pre-Intifada period. The share of manufacturing firms diminished, while that of trade-sector firms increased (AIX Group 2013). These statistics suggest that the conditions during and after the Intifada favored firms with simple ownership and structure relatively to more incorporated firms, and the conditions for manufacturing deteriorated while those for importing improved.

Historical backdrop of the Palestinian Establishment Censuses

The 1997 PEC was conducted in September 1997 amid sporadic armed clashes on the ground and high-level efforts to enforce the Oslo II Accord of 1995. Three years later, in September 2000, the Second Intifada broke out. The second PEC was originally planned for 2002, but had to be postponed until the security situation allowed it and Israeli restrictions on people's mobility were softened (PCBS 2004). The Census was conducted during the 2004-2005 winter, after the worst fighting of the Second Intifada had passed. The Intifada ended and trade restrictions were partially lifted in summer 2005, but in the West Bank, restrictions on movement and trade remained. The number of road checkpoints within the West Bank kept rising. The 2007 PEC survey was conducted during a period of relative political stability but of unrelenting restrictions on the ground, effectively fragmenting Palestinian markets, increasing firms' costs of operation and dashing their prospect of attaining prosperity. Fieldwork for the Census was conducted at the originally scheduled time, during October and November of 2007, and thus only three years after the prior Census.

In 2008 hostilities between Hamas and Israel in Gaza intensified again, leading up to the January 2009 Gaza War (a.k.a., Israeli Operation Cast Lead). Humanitarian situation in Gaza deteriorated, leading to "a massive destruction of livelihoods and a significant deterioration of infrastructure and basic services" for Palestinians (UN-OCHA 2009). A period of reconstruction followed interrupted only in March and November 2012 by outbreaks of violence. The 2012 PEC was administered in between of these outbreaks, from September 3 to October 24 (reference date August 31), in a period of relative stability but uncertainty.

This overview suggests that the intensity of mobility restrictions varied significantly across Palestinian territories and across years, and that various firms surveyed in the four PECs were likely affected differently depending on their location.[12]

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[11] Refer to table A1 in the appendix. Information on establishments' age, and current capital is surveyed but not made available, and other monetary indicators are not surveyed. Table A2 reports summary statistics of the available variables, and tables A3-A5b compares the composition of the survey samples across the PES rounds along the most relevant criteria. Table A6 shows the comparable statistics for the 1994 round (PCBS 1995).

[12] However, nothing in the available documentation suggests that survey fieldwork and processing were affected by security concerns. The differences we uncover in firms' status and performance can be attributed to the circumstances in which firms operate, not to survey design or implementation.

5. Results

Section 3 introduced two methods for identifying the effect of mobility restrictions on firms' status and performance – quantifying the mobility restrictions and isolating their effects on firms – using data described in Section 4. This section reports the main results of the two analyses, evaluates the corresponding hypotheses *H1* and *H2*, and reports other trends in the composition of the Palestinian economy and business establishments' characteristics across governorates and over time. The concluding paragraphs will discuss robustness of the analysis, and economic implications of the main findings.

Gaza and West Bank are analyzed separately.

Index of mobility restrictions

Table 2 shows the classification of the security regime in each Palestinian governorate: the estimated restriction scores and the classification of governorates as the highest, medium or least affected by the restrictions.[13] In the following analysis, this PCA-based index of mobility restrictions is used as a benchmark specification, subject to several robustness tests.[14] We find that Tubas and Jericho consistently rank as having the lowest densities of flying and permanent checkpoints, as well as lowest values of other measures of mobility restrictions during 2004-2012, while Bethlehem, Hebron, Qalqiliya and Tulkarem score as having the highest densities. Salfit ranks among the least affected governorates in 2015, but among the medium group in 2010 and 2014, and among the most affected group in 2004 and 2006. Hebron, on the other hand, ranked among the least-affected areas in 2004-2006, but started ranking high in 2010. Tulkarem, similarly, ranked as least affected in 2004, 2010 and 2014, but as most affected in 2006 and 2015.

The fact that the classification of a number of governorates changes over time, and at different times in different governorates, facilitates the identification of the effects of security measures on economic outcomes, since the outcomes cannot be due to unobserved time-constant effects of selected governorates.

The effect of mobility restrictions on establishments' outcomes: longitudinal analysis (2007-2012)

For a balanced panel of 78,080 firms, we observe firms' status and operations across two years, 2007 and 2012.[15] For these firms we can measure the effects of security conditions, or the firms' responses to those security conditions, untainted by the changing composition of the sample of establishments in the two years. We can also explicitly control out the effects of firms' unobserved heterogeneity by including firm fixed effects.

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[13] Appendix 3 presents selected additional statistics on the performance of the PCA.

[14] Refer to appendix 3. Results for the time-constant (year 2015) index are available on request. These results agree qualitatively with the main correlation and regression results in the text, but they appear more noisy and less significant, because the time-constant index does not take into account differential time trends in mobility restrictions across governorates, and effectively simply correlates the time-average of firms' outcomes and the time-constant mobility restriction index.

[15] By contrast, 54,794 establishments were newly added in 2012, and 39,073 were surveyed in 2007 but not in 2012. For these firms it is unclear whether they became newly established or defunct, or whether they slipped out of the survey universe or simply failed to respond to the survey in one year.

Table 3 presents selected regressions of firms' employment, female employment, and female share among firms' workforce using panel data for 2007 and 2012. Because of the large sample sizes, many coefficients are highly significant even though their magnitudes are small. Across all models estimated, we consistently find that a higher degree of mobility restrictions is associated with a reduction in firms' scale in terms of workforce. This is the case for total employment, female employment, as well as the ratio of women among establishments' workforce. This finding remains valid and highly significant even when firm-level effects are taken out, a highly intrusive approach in a dataset with such a high cross-sectional dimension and only two time periods. The result thus appears highly robust.

The coefficients in regressions of log employment have the interpretation as the percent effects on employment of a 0.01 change in the corresponding explanatory variables. Intensifying of the security regime in a governorate from the lowest level to the highest level, a change of 2 units, is thus predicted to reduce firms' employment by 1.4–1.6 percent (-0.007×2×100%; -0.008×2×100%), and reduce female employment by 0.4 – 1.8 percent (-0.002×2×100%; -0.009×2×100%). The female share is predicted to fall by 0.4 percentage points. These are small but highly significant results.

The analogous analysis performed on 3–4 census rounds pooled together (without the ability to match firms across rounds, or control out latent time-constant firm heterogeneity) confirms the qualitative and even quantitative results. Moreover, establishments facing tighter security regimes in their location are found to be systematically less likely to be in active operation, suggesting that they temporarily or permanently close, or they work on restructuring their operations by engaging in preparatory or ancillary activities.[16]

Results across all columns of table 3 (supplemented by results in tables A9 and A10) suggest that mobility restrictions are damaging to employment in Palestine for several reasons. One, firms that survive respond to economic challenges by holding on to fewer workers. Two, some firms do not survive, or they enter a hibernating period in which they engage in peripheral activities, hoping to weather the worst crisis and to reemerge in a brighter future. These firms are not properly included in the Census, and their omission is likely to underestimate the gravity of the effect of mobility restrictions on economic activity. Finally, vulnerable workers such as women are likely to be affected more seriously than other workers confirming the findings by Oberholzer (2015). Like many prior worldwide studies have documented, female workers appear to be the first to be fired, and the last to be rehired. Our findings in table 3 (and table A9 and A10) support this narrative.

Could firms that disappeared from the Census at one point or another have simply changed industry or location, and become more successful there? For firms that we observe at multiple

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[16] Table A9 in the appendix confirms these results using census rounds 2004–2012 for which high-quality information on security regime in governorates is available. Table A10 shows estimates using all available census rounds, 1997–2012, under the assumption that in 1997 Palestinian governorates had a similar ranking in regard to the security regime in place as in 2004. Across all these estimations, and across establishments that appear only in a subset of rounds, there is evidence that mobility restrictions are detrimental to firms' size and employment. Moreover, table A10 also reports on regressions of the operating status of establishments. Because the dependent variable is binary, linear probability model as well as a probit model are estimated.

points in time, in the 2007-2012 panel, we find that 16.8% changed their main economic activity, but only a handful changed governorates. All but 30 remain in the same governorate across the two years, and 48,878 (or 62.6%) operate in the same governorate and engage in the same main economic activity between the two years. There is no evidence that establishments try to escape mobility restrictions in one governorate for another governorate – or more technically that they would succeed at escaping. Firms that change industry or government do not appear to expand in size compared to firms that stay behind. Hence, firms that disappear from the Census at some point, as well as workers whom they used to hire, are likely to be victims of economic hardships that may be attributable to the restrictive Israel-imposed security regime.

6. Conclusions

This study has aimed to estimate the impact of Israeli-imposed trade and mobility restrictions on the operating status and size of Palestinian business establishments. The study has proposed a one-dimensional index of restrictiveness of the security regime in each governorate and year, and linked it to firms' legal and operating status, main economic activity, employment and female share in employment. Our main results indicate that the employment at Palestinian establishments is sensitive to the imposition of the multitude of domestic and cross-border mobility restrictions. This result holds even for female employment alone, or for female share of firms' employment. This corroborates evidence that most Palestinian economic sectors have been weakened by restrictions on the movement of Palestinian workers and resources within the occupied territory as well as across its borders, particularly in the initial years of the Second Intifada (years leading up to 2004), at the onset of the blockade of Gaza, and following the Israeli military operations in Gaza in 2008 and 2012. Entrepreneurs responded to the red-tape and transaction costs and risks by postponing opening/expansion of their businesses, or by early closures, to the detriment of themselves, of Palestinian workers and of the economy at large.

Private sector development in Palestine has been weak, and development programs have not achieved their potential, but this is not entirely due to mobility restrictions (IEG 2010). The Palestinian authorities failed to implement reforms necessary to level the competitive field, assuage uncertainty, and attract private investments. Property rights are unclear, and private parties have limited ability to register land. The existing body of regulation is piecemeal, subject to capture by vested interests (World Bank 2017c). Nevertheless, mobility restrictions play a vital role, particularly in tandem with regulatory failures on the part of the Palestinian Authority, and other structural weakness in the Palestinian economy. The ongoing construction of the separation barrier within the West Bank territory and the systematic demolition and confiscation of Palestinians' property exacerbate the degree of Israel's encroachment on Palestinian livelihoods, and adversely affect the prospect of economic rebirth. Taken together with a political impasse, with the decision of the current American administration to side with Israel in its appropriation of land, and historical and cultural landmarks, and with violence on both sides of the Israeli-Palestinian border, prospects of a peaceful resolution are low for years to come.

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Table 1. Flying checkpoints, and full-time and part-time checkpoints by governorate in West Bank, selected years 2004–2012 (count)

	Flying checkpoints				Full-time & part-time checkpoints								
	2005	2006	2007	2008	Jan-04	Jan-05	Jan-06	Jan-07	Jan-08	Jan-09	Jan-10	Jan-11	Jan-12
Jenin	54	878	1,068	328	2	1	2	2	2	3	3	3	3
Tubas	109	286	108	143	1	1	2	1	1	1	1	1	1
Tulkarem	389	365	430	252	2	3	2	3	4	5	5	5	5
Nablus	220	653	259	171	7	7	7	8	8	8	8	10	10
Qalqiliya	371	1,375	1,593	637	--	--	2	2	6	7	9	7	6
Salfit	76	336	280	256	2	2	2	2	2	2	3	3	3
Ramallah & Al Bir	83	269	97	56	6	6	6	6	6	6	8	12	12
Jericho, Ariha, Al Aghwar	34	35	59	11	1	2	3	3	3	4	4	3	3
Bethlehem	283	1,180	737	404	8	7	10	11	11	11	12	10	8
Hebron / Al Khalil	564	1,485	894	759	31	32	35	36	37	37	41	39	39
Jerusalem / Al Quds	82	228	333	61	--	--	--	--	--	--	--	1	1
East Jerusalem (J1, when excluded from Jerusalem stats)					--	1	1	1	1	2	2	2	2
J2 (when excluded from Al Quds & J1)					4	3	8	10	10	13	15	12	12
Total	2,265	7,090	5,858	3,078	64	65	80	85	91	99	111	108	105

Source: Flying checkpoints from OCHA oPt; full-time and part-time checkpoints from Roy van der Weide, World Bank. '--' unavailable. 'Total' treats unavailable as 0.

Table 2. Principal component analysis scores, and governorates facing the lowest vs. highest restrictiveness of mobility (L/H)

Governorate	2002-04[a]	2005-06[b]	2009-10[c]
Tubas	0.084 L	0.369	0.000 L
Jericho & Al Aghwar	0.295	0.083 L	0.438
Jenin	0.021 L	0.485	0.359 L
Hebron & Al Khalil	0.040 L	0.339 L	0.619 H
Tulkarem	0.000 L	1.000 H	0.401 L
Nablus	0.084	0.727 H	0.515
Bethlehem	0.276	0.521	0.568
Ramallah & Al-Bireh	0.363	0.428	1.000 H
Salfit	0.845 H	0.609 H	0.583
Qalqiliya	0.551 H	0.896 H	0.658 H
East Jerusalem	1.000 H	0.000 L	0.760 H
Average	0.324	0.496	0.536

Source: Author's analysis of B'Tselem, OCHA oPt, PCBS and Roy van der Weide (World Bank) data. Scores normalized to be in unit interval. Governorates ordered by the sum of the four scores. Governorates classified as facing the Least or Most restrictions in view of clusters and natural breaks in scores, in view of score ranges in other years, and to have 3-4 governorates in each group.

[a] Observed variables include: Israeli and Yesha Council settlements, and settler density 2002; and full-time and part-time checkpoints 2004.

[b] Observed variables include: house demolitions, adults and minors made homeless 2006; curfew hours and curfew incidents 2005-2006; flying checkpoints 2005-2006; searches and arrests 2005-2006; adult & child fatalities & injuries 2005-2006; and full-time and part-time checkpoints 2005-2006.

[c] Observed variables include: house demolitions, adults and minors made homeless 2009-2010; Israeli and Yesha Council settlements, and settler density 2010; population exposed to violence 2010; adult & child fatalities & injuries 2009-2010; and full-time and part-time checkpoints 2009-2010.

Table 3. Regressions of firms' employment: panel data of matched firms in 2007 and 2012 rounds

	Log(employment)		Log(female employment+1)		Female share of employment	
	OLS	FE	OLS	FE	OLS	FE
Time-varying mobility restrictions	-0.007***	-0.008***	-0.009***	-0.002*	-0.002**	-0.002**
	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Year (2012=1)	0.020***	0.027***	-0.040***	0.004***	-0.021***	0.001
	(0.003)	(0.003)	(0.002)	(0.001)	(0.001)	(0.001)
Privately owned	0.119	0.021	-0.149	-0.185	0.088	0.025
	(0.151)	(0.292)	(0.152)	(0.142)	(0.135)	(0.055)
Publicly owned	0.419***	-0.103	0.470***	-0.166	0.309**	0.057
	(0.152)	(0.293)	(0.152)	(0.145)	(0.135)	(0.056)
Single unit	0.779***	0.862***	0.289*	0.346**	-0.043	0.001
	(0.147)	(0.278)	(0.151)	(0.135)	(0.135)	(0.052)
Head office	1.426***	1.009***	0.550***	0.414***	-0.030	0.007
	(0.148)	(0.279)	(0.152)	(0.135)	(0.135)	(0.052)
Company branch	0.940***	0.823***	0.376**	0.346**	-0.025	0.003
	(0.147)	(0.279)	(0.152)	(0.135)	(0.135)	(0.052)
Sole proprietorship	-0.446***	-0.148***	0.006	-0.016***	0.040***	-0.001
	(0.010)	(0.009)	(0.006)	(0.004)	(0.003)	(0.002)
Partnership	0.049***	0.010	0.014*	-0.005	0.012***	-0.002
	(0.013)	(0.012)	(0.008)	(0.006)	(0.004)	(0.003)
Shareholding firm	0.675***	0.057***	0.278***	0.042***	0.032***	0.007
	(0.024)	(0.020)	(0.017)	(0.012)	(0.004)	(0.004)
Limited/unlimited liability	0.457***	0.068	0.031	-0.002	0.023**	0.002
	(0.054)	(0.055)	(0.027)	(0.028)	(0.009)	(0.009)
12 ind. indicators	Y***	Y***	Y***	Y***	Y***	Y***
15 gov. indicators	Y***	Y***	Y***	Y***	Y***	Y***
Establish. fixed effects		Y		Y		Y
Constant	0.853***	-0.720*	-0.155***	-0.388	-0.036	0.042
	(0.056)	(0.405)	(0.028)	(0.283)	(0.024)	(0.108)
Observations [estabs.]	139,823 [78,080]		139,823 [78,080]		139,823 [78,080]	
Within R-squared	0.270	0.020	0.256	0.006	0.147	0.001

Notes: Sample restricted to non-agricultural firms surveyed in both 2007 and 2012.
Standard errors in parentheses are corrected for arbitrary heteroskedasticity and autocorrelation at the firm level.
Significant at * 10%, ** 5%, *** 1% using two-sided tests.

Appendix 1

Border crossings, foreign trade and macroeconomic conditions in Palestine

Palestinian industry and trade have traditionally been oriented strongly toward Israel. In 2014, Israel accounted for 69.6 percent of Palestinian imports and 83.9 percent of exports. Egypt is only Palestine's 9th largest trade partner by volume, with nearly all trade consisting of imports to Gaza. Trade flows between Gaza and the West Bank remain negligible. Exports from Gaza are undermined by the Israeli blockade of Gaza, including the obstruction of exports to the West Bank. This has led to the decline of Gaza's exports to around 3 percent of their 2005 levels (Judis 2014).

Security protocols and restrictions on mobility within Palestine and across borders – including closures of roads and border crossings – have eroded Palestinian capacity to export (ESCWA 2015; ITC 2015). Palestinian firms compete with unconstrained foreign firms and are at a cost disadvantage. Companies' costs of exporting were higher by a factor of 2.3, and those of importing by a factor of 3.8 compared to Israeli firms.

All goods entering or exiting Palestine via Israel are required to use Israeli transport firms, and are subject to similar screening procedures as at internal checkpoints. Under a *back-to-back* security system, trucks in Palestine are restricted from entering urban areas, so all goods must be reloaded from trucks at special border facilities onto other trucks waiting on the other side. This increases costs and causes delays, spoilage and damage to goods (Akkaya et al. 2008). With the shrinking of agricultural and manufacturing shares of the Palestinian GDP, Palestinian exports of goods and services together accounted for only 20 percent of GDP in 2014, a low value compared to other small open economies.

Conditions differ dramatically between Gaza and the West Bank. Gaza Strip has been under full blockade since 2007, which has inhibited its ability to engage in trade and virtually eliminated exports. As the Palestinian economy recovered from the devastation of 2000–2002, exports from the West Bank increased continuously starting in 2003, yet exports from Gaza stalled, and fell to near zero by 2010 after the imposition of a blockade of Gaza. Agricultural produce, susceptible to spoilage if held up at checkpoints, is now sold much closer to its place of origin. This has given rise to internal price differentials across Palestine, for example 50 percent between Nablus and Ramallah, two cities 40 kilometers apart but separated by numerous checkpoints.

Macroeconomic performance of Gaza was worse than the West Bank's for all years 1994–2014. From 1994 to 1999, both economies moved on a positive growth trajectory. Real GDP per capita in the West Bank and Gaza rose from $1,494 and $1,347 in 1994, to $1,948 and $1,372 in 1999, respectively. In 1998, real GDP per capita in the West Bank and Gaza exhibited high growth rates of 11.5 and 8.9 percent, respectively. However, from 2000 to 2003, the start of the Intifada led to a sharp contraction in economic growth in both territories.

Disparity between the West Bank and Gaza grew in years following 2005 – a turning point that saw complete Israeli disengagement from Gaza including military withdrawal and settlement dismantlement. At the same time as the withdrawal offered Palestinians greater mobility within Gaza, Israel imposed a stricter regime for the movement of residents in and out of Gaza. In 2006 Israel launched a military operation and tightened its blockade of Gaza. The Rafah Crossing,

previously facilitating the movement to and from Egypt, closed seven months after the disengagement. All these factors, and most notably the blockade of Gaza distorted the daily operations of Gazan residents and businesses, and caused a contraction of the Gazan economy.

The triumph of Hamas in the Palestinian legislative elections in 2006 pushed Israel to intensify its restrictions on trade, and capital and labor mobility in Palestine, and to withhold cargo-clearance revenues. These restrictions slowed down investment and increased net exports gap, leading to a reduction of the Palestinian real GDP by 3.9 percent and per capita GDP by 6.8 percent in 2006. GDP in Gaza contracted by 17.5 percent in 2006, while GDP in West Bank expanded by 4.2 percent. IMF has estimated that investment fell by over 15 percent, "resulting in a hollowing out of the productive sectors" and ceasing of public investment (cited in World Bank 2008:3). In spite of the crisis in Gaza and fall in the Palestinian investment and net exports, consumption in Palestine at large dropped by a mere 3 percent in 2006 owing to a combination of recovery in West Bank, and flows of aid, remittances and borrowing from abroad.

In June 2007, Israel declared Gaza a hostile entity, and imposed a blockade on it. In part due to the blockade and a 22-day Israeli military operation in December 2008–January 2009, Gaza's GDP contracted by 6.5 percent in 2007 and 8.6 percent in 2008. Exports of goods were nearly eliminated in 2008.

At the same time, the situation in West Bank was improving. Israel removed financial sanctions on West Bank in June 2007 (IMF 2013). This led to a rebound in economic activity in West Bank and growth reached 12.8 percent in 2007 and 11.8 percent in 2008. Thus, the 2007 and 2008 growth rates of 6.6 and 6.1 percent for Palestine at large came from positive growth in West Bank.

In December 2007 the Paris Donors Conference led to a pledge of $7.4 billion in aid to Palestine. The impact was evident in the following year. Growth was driven by a large flow of aid, followed by the lowering of restrictions by Israel. In 2009, GDP in West Bank and Gaza grew by 9.1 and 7.4 percent, respectively. Growth in Gaza was largely due to a rebound from low growth levels of 2006–2008 and the expansion of tunnel trade from Egypt. Although the war and the imposed blockade hampered reconstruction efforts in Gaza, the economy rebounded largely due to the proliferation of informal "tunnel economy" trade.

Economic recovery continued in 2010 with household consumption in Palestine growing by nearly 3.8 percent, net exports by 9.7 percent and GDP by an estimated 8.1 percent. Gaza saw growth of 11.4 and 17.7 percent in 2010 and 2011, showing recovery from very low levels following the tightening of Israeli blockade in 2006. Most of the growth in Gaza can be attributed to increased cross-border tunnel trade with Egypt, leading to growth in the construction sector of 192.2 percent in 2010 and 132.4 percent in 2011. Gaza's deprivation under the 2006–2009 Israeli blockade and the 2008–2009 winter Gaza War also played a significant role in the following recovery. In West Bank, mobility restrictions were marginally reduced, and West Bank continued seeing positive growth.

In 2013 the economies of Gaza and West Bank slowed down. Palestinian GDP rose by 6.3 percent in 2012, but only by 2.2 percent in 2013. The slowdown resulted from the continuation of restrictions imposed by Israel, decline of agricultural production, elevated imports without

corresponding increases in exports or output (World Bank 2013). Moreover, private investment and production in Palestine declined during 2013. Until July 2013 tunnel economy was alleviating the impact of the blockade imposed on Gaza in 2007. Over 150 tunnels operated, bringing in mainly construction materials at much lower cost than those brought from Israel. When Egyptian security forces began demolishing known trade routes, construction activities in Palestine contracted by 28.3 percent between the second and third quarter of 2013, and by 63.9 percent year-on-year in the first quarter of 2014 (B'Tselem 2014).

July–August 2014 saw the eruption of another war in Gaza. This war led to the largest destruction of infrastructure and property and the largest loss of life since the onset of the Israeli occupation. The military conflict and the halt of tunnel economy cost Gaza's economy some $460 million in lost output and infrastructure damages worth $400 million (World Bank 2015). At the same time, West Bank's GDP rose in 2014 by 5.1 percent on bank-loan fueled growth in private consumption and exports. In the first two quarters of 2015, Israeli blockade of Gaza remained largely in place, and reconstruction efforts produced only slow economic recovery (IMF 2015a). During the first quarter of that year, Gaza's GDP rose by 6.7 percent owing to reconstruction efforts, while West Bank's contracted by 2.9 percent owing to a four-month suspension of transfers of cargo-clearance revenues (IMF 2015b).

Appendix 2

Data description

Security regime restrictions on Palestinians' mobility

The density of flying checkpoints during 2005–2008 (source: OCHA oPt), and the density of full-time and part-time checkpoints during 2004–2012 (Roy van der Weide, World Bank) are used. As table 2 indicates, there was substantial variation in the security presence in West Bank over time, and the trends differed systematically across governorates. Data for Gaza are unavailable, but recognizing the desperate living situation in Gaza due to Israeli blockade and military attacks, we classify all Gaza governorates as facing a harsh security regime and mobility restrictions (M). For 2005–2014, we also account for Palestinian adults and children killed and injured in direct conflict, excluding in the three Gaza wars. For 2005–2008, we also use curfew hours, curfew incidents, searches and arrests (OCHA oPt). For 2006–2014, we have information on demolished housing units, and adults and minors made homeless. For 2002 and 2010–2014, we also account for the number of Israeli and Yesha Council settlements, and the count of settlers in each (PCBS Settlements Survey 2014, Settlements reports). Finally, for 2010 we use information on the share of population exposed to violence (PCBS Violence Survey 2011).

Establishment Censuses

The survey unit of the PEC is the economic establishment. The 2013 System of National Accounts defines the establishment as an enterprise or part of an enterprise in which one group of goods and services is produced, even if secondary activities are conducted in that establishment (PCBS 1997). Data are self-weighted.

Establishments of all sizes, incorporation and purpose are included. For-profit as well as non-profit organizations, organizations with a business address as well as those operating from homes, and organizations operated by private parties, government or international institutions are all included. Even self-employed individuals are included. The sole exception omitted from the survey universe in year 2012 is agricultural, forestry, fishing and animal husbandry establishments, while establishments involved in the preservation of meat, seafood and produce are included even in that year.

The PECs report each entity's place of registration (governorate or locality), status as for-profit or non-profit, operating status (operating, temporarily or permanently closed, under preparation or ancillary activity), legal status (sole proprietorship, partnership, shareholding firm, limited liability firm, etc.), organizational arrangement (single unit, head office or branch), main economic activity (13 industry groups; or 4 digit ISIC) and employment (male and female, paid and unpaid). Firms' current capitalization, and owners' demographics – unavailable at the level of individual firms in the publicly available files – can additionally be investigated at the governorate level. Variables in the PEC are not top-coded.

The public versions of the four rounds are not entirely harmonized. For one, different variables are made publicly available from the different survey rounds (table A1). Two, values that variables take are common between two or three rounds, but not always across all four waves. It is thus impossible to use all variables in cross-round comparisons. Three, samples that are made available to the public are not exactly comparable across the four rounds. The 2007 round is

restricted to presently operating firms, while other rounds contain non-operating units (temporarily or permanently closed, engaged in ancillary activities, or under preparation), or even units that did not complete survey interviews.

The operational status takes five possible values: operation, permanently closed, temporarily closed, under preparation, or auxiliary activity unit. Ownership can be private national, private foreign, national government corporation, foreign government corporation, central government, local government, foreign government, UNRWA, or international body. Economic organization is either a single establishment, head office or branch. For the legal status of establishments, the 1964 Jordanian law is used in the West Bank, while the 1929 Palestinian law is used in Gaza. The possible responses are: sole proprietorship, de facto company, partnership company, shareholding company, limited or not limited company, and others. Principal economic activity is the activity generating the majority of value added for the establishment according to the International Industrial Classification of all Economic Activities, first revision (ISIC-1), coded at the four digit level. Employment encompasses all permanent and temporary staff aged 10 years and older, including both paid employees and unpaid owners and family members.

Appendix 3

Principal component analysis of mobility restrictions

Mobility restrictions take many forms, and have various implications for businesses, their suppliers and workers, and their clients. As an alternative to using single or multiple indicators for the multiple forms of restrictions on mobility and business operations under the Israeli occupation, we compute a one-dimensional index of the burden of mobility restrictions on residents of each governorate and year. The mobility-restriction index is obtained from the first component in the principal component analysis of all observable measures of the restrictions. This first component can be expressed as the weighted sum of the individual forms of restrictions (numbering p forms of restriction), where restriction indicators are standardized by the mean and standard deviation across governorates, and where the weights (a_p) are selected to maximize sample variance of the index subject to $\Sigma_p a_p{}^2 = 1$:

$$w = \Sigma_p\, a_p \left.\frac{(x_p - \overline{x_p})}{stdev(x_p)}\right. \quad s.t. \ \Sigma_p\, a_p^2 = 1 \tag{1}$$

The principal component method assigns the highest weights to mobility restrictions that vary most across governorates in a year, thus informing on maximum discrimination in business operating conditions between governorates. The available data have several notable limitations that affect the usability and interpretation of the obtained mobility-restriction index. The set of observable restrictions varies across census rounds. As a result, we must use relative scores of the restrictions index rather than the absolute scores of the index in cross-year analysis. Several dimensions of mobility restrictions are notably missing for lack of consistent data, including the presence of Israeli armed personnel on the ground, or the typical time delay caused by various checkpoints and truck-reloading border facilities. These additional burdens – in relative terms across Palestinian governorates – are assumed to be sufficiently subsumed by the set of observable burdens, and the mobility-restriction index can still inform consistently of the true degree of relative burden across governorates. Ubiquitous forms of restrictions should not discriminate across governorates well, and should be assigned a low weight.

Tables 2 and A4, and figures A1-A2 present detailed results of the PCA. Scores in table 3 were computed using PCA of the contributing vectors of mobility restrictions in each year. presents selected additional statistics on the performance of the PCA: relative performance of the first versus the second principal components (figure A1), loadings of individual vectors of mobility restrictions (figure A2), and governorate scores under the first versus the second principal component.

PCA was performed with alternative combinations of variables to select the set attaining the most desirable properties including the share of variance explained by the first component, its eigenvalue, the Kaiser-Meyer-Olkin score of sampling adequacy, and the Bartlett test of sphericity. Only components with eigenvalues greater than unity are retained in agreement with the Guttman-Kaiser criterion (e.g., Yeomans and Golder 1982). To evaluate internal consistency and reliability of the index of mobility restrictions, Cronbach's α coefficient is used, evaluating to what extent the observable variables measure the same underlying content.

Scores on the first component are transformed to take only three values: least restricted, medium restricted and highest restricted regime. This categorical form makes the resulting index robust to differences in units and distributions across variables used in the analysis.

An alternative static index

As a robustness check, an alternative static index of restrictiveness of the security regime is inferred from the density of fixed road checkpoints per square kilometer in individual West Bank governorates as of November 2015. This indicator aims to gauge the constraints faced by businesses and workers in the decade since the end of the Intifada. One justification for using the static delineation is empirical: The count of mobility restrictions is not available consistently for all years, and some checkpoints are built (or dis-assembled) mid-year, leaving uncertainty how they should be treated in the analysis, particularly when business owners are not aware of the up-to-date security status. The static measure is robust to year-to-year measurement errors particularly during the Intifada or in the early post-Intifada years. It may also account for unmeasured obstacles in earlier years, such as temporary checkpoints, that led to the setting up of fixed check points in following years. Finally, the majority of checkpoints were erected during or in the aftermath of the Second Intifada, and have remained in place since.

The static indicator classifies governorates as most affected (+1: Hebron, Tulkarm, Qalqiliya, East Jerusalem), medium affected (0: Ramallah and Al-Bireh, Nablus, Bethlehem) or least affected (-1: Jenin, Jericho and Al Aghwar, Salfit, Tubas). The three groups of governorates were chosen in view of natural breaks in the data – 0 to 1, 1 to 1.5, and 2.8 to 3.5 checkpoints per $100km^2$ – and because each group represents approximately one third of the Palestinian territory (refer to Table 1). Using only internal fixed checkpoints rather than all checkpoints including part-time (or even flying) checkpoints and border crossings, one would get very similar groupings of governorates.

Alternative specifications were considered: total checkpoints (not density) in each governorate and year; density itself rather than the -1/0/1 values; and an index of full-time, part-time and flying checkpoints. These alternative specifications were thought to be more sensitive to issues such as different geography and topography of different governorates, and measurement errors related to the exact count of checkpoints and the temporariness of part-time and flying checkpoints.

Table A1. Basic descriptive statistics for the included surveys

Census round	Sample size (completed interview)	In operation	Workers covered by presently operating firms[i]	Fieldwork [ref. date for employees]	Variables available to researchers
1994[ii]	66,063	60,333 (56,820 in private sector)	147,218 in private sector	Dec 1994	Governorate, operational status, legal status, principal econ. activity (44 groups), male & female employment
1997	98,900	82,165	190,542 (192,205 including non-operating firms)	Dec 10-24, 1997 [Sep 30, 1997]	Governorate, operational status, ownership, profit/nonprofit, economic organization – unit, legal status, principal econ. activity (13 groups), male & female employment
2004	117,153	103,846	257,588	Nov 28, 2004 -Jan 25, 2005 [Nov 28, 2004]	Interview result, governorate, locality, operational status, ownership, economic organization – unit, legal status, principal econ. activity (4-digit), male & female wage/non-wage employment
2007	132,874	109,686[iii]	297,056	Oct 20-Nov 10, 2007 [Sep 30, 2007]	Governorate, ownership, economic organization – unit, legal status, principal econ. activity (13 groups, 2- & 4-digit), male & female employment
2012	169,531	144,969	385,264	Sep 3-Oct 24, 2012 [Aug 31, '12]	Governorate, ownership, economic organization – unit, legal status, principal econ. activity (4-digit), male & female employment
2017	166,486	158,590	444,060	Dec 2017-Jan. 2018	

Source: Authors' analysis of PCBS (1995, 2018a), and microdata for 1997-2012 censuses.

[i] This is likely to double-count workers with multiple jobs (particularly non-wage workers).

[ii] PES 1994 excludes East Jerusalem. Microdata unavailable to researchers.

[iii] The available sample is restricted to interviewed and presently operating firms. Information on other firms is only available from PCBS (2008).

Table A2. Descriptive statistics for main variables in the included surveys

Types of establishments	1994	1997	2004	2007	2012[i]	2017
Establishments with active operations (%)	91.33	81.97	88.21	87.91[ii]	85.51	95.26
Establishments temp/perm closed (%)	8.52	9.86	5.09	6.61	13.72	3.72
Establishments under preparation (%)		8.17	0.99	0.48	0.77	1.02
Private firms, not NGOs or public (%)	94.18	76.60	90.53	96.30	91.07	91.23
Sole proprietorships (%)	72.55	66.96	82.45	85.61	85.47	88.13
Shareholding companies (%)	1.11	1.99	1.41	1.89	2.02	3.61
Single unit firm, not main office or branch (%)		71.63	93.55	94.85	90.59	92.13
Main office, not single unit or branch (%)		1.50	2.34	1.88	2.22	0.46
Manufacturing (%)	19.26	16.36	13.47	14.94	12.36	13.08
Wholesale, retail & repair (%)	57.48	42.75	56.22	57.69	51.10	51.24
Establishments with up to 9 employees (%)	96.83	97.41	97.07	96.84	96.58	95.96
Establishment employment (mean #)		1.97	2.68	2.75	2.91	2.80
Establishment employment, private estab. (mean #)	2.59	2.57	2.50	2.52	2.71	
Female share of employment (%)		9.8	9.9	12.8	13.1	18.5
Female employment share, private establishments (%)	12.4	9.8	9.0	11.7	12.2	
Employment concentr. (mean 0-1 HHI index by ISIC-4 sector)		0.006[i]	0.20	0.14	0.25	
Non-agricultural establishments	66,063	92,821	112,820	102,710	169,531	158,573

Source: Authors' analysis of PCBS (1995, 2018), and microdata for 1997-2012 censuses.

Year 1994-2007 samples restricted to non-agricultural establishments, for comparability with the 2012 survey wave, which excludes agricultural establishments. (Agricultural establishments account for 6.15, 5.66 and 6.36% of all establishments in waves 1997-2007.) PES 1994 excludes East Jerusalem.

[i] Evaluated across 12 industry groups (excluding agriculture), since more detailed industry classification is unavailable.

[ii] In 2007, share of establishments under operation/closure/preparation was evaluated in full sample, including agricultural establishments, as per PCBS (2014), since microdata is available only for operating establishments.

Table A3. Descriptive statistics for main Census variables, by governorate (%, '97 '04 / '07 '12)

Governorate	Active operations	Sole proprietor.	Single unit firms	Manufact.	Trade	Up to 9 employees	Avg. employees	Female share	Employ. concentr.[i]
Jenin	82.8 | 82.7	62.7 | 86.5	71.1 | 95.8	12.4 | 13.3	48.1 | 59.4	98.3 | 98.3	1.6 | 2.1	10.7 | 11.4	.04 | .33
	85.8[i] | 78.0	91.6 | 89.8	97.8 | 93.2	13.7 | 11.3	61.1 | 54.4	97.9 | 98.1	2.1 | 2.3	15.0 | 16.7	.38 | .33
Tubas	91.4 | 71.8	76.1 | 90.0	79.9 | 96.9	10.7 | 11.3	53.2 | 62.4	99.5 | 99.3	1.3 | 1.7	8.2 | 10.8	.14 | .37
	85.4 | 71.6	91.7 | 89.1	97.1 | 95.2	12.1 | 10.0	64.3 | 54.3	99.1 | 98.3	1.8 | 2.1	15.8 | 19.3	.45 | .40
Talkarm	81.1 | 87.8	67.8 | 79.1	72.2 | 96.2	13.5 | 12.9	45.4 | 58.0	97.7 | 97.8	1.7 | 2.2	11.6 | 13.9	.05 | .40
	85.9 | 79.4	82.6 | 87.5	96.4 | 91.9	14.7 | 12.0	58.8 | 52.9	97.5 | 97.2	2.4 | 2.4	16.2 | 17.0	.43 | .38
Nablus	94.3 | 81.3	80.8 | 77.3	83.8 | 90.7	20.9 | 16.0	47.3 | 56.4	98.9 | 97.2	1.5 | 2.7	15.6 | 11.1	.25 | .35
	84.8 | 81.9	82.1 | 81.7	93.7 | 88.9	18.0 | 16.0	56.4 | 50.6	97.1 | 96.4	2.7 | 2.9	13.7 | 14.2	.34 | .32
Qalqilya	78.4 | 85.7	61.8 | 82.7	68.1 | 95.7	19.3 | 13.7	39.3 | 56.5	97.2 | 97.7	2.1 | 2.2	9.7 | 11.1	.08 | .36
	86.9 | 78.7	87.8 | 87.5	97.1 | 94.1	17.7 | 14.2	59.1 | 50.0	97.3 | 97.8	2.4 | 2.3	14.4 | 16.5	.41 | .38
Salfit	87.5 | 93.1	69.4 | 87.6	75.7 | 96.9	14.4 | 14.3	47.1 | 55.9	98.0 | 98.3	1.7 | 1.9	11.7 | 18.1	.08 | .35
	91.0 | 75.6	90.7 | 93.1	96.9 | 92.8	17.6 | 15.7	57.1 | 46.7	97.9 | 97.4	2.1 | 2.3	19.0 | 22.6	.47 | .33
Ramallah & Al-Bireh	85.1 | 88.7	64.1 | 70.8	72.1 | 90.6	15.7 | 12.8	39.5 | 50.2	96.5 | 95.6	2.6 | 3.5	13.7 | 15.4	.11 | .36
	89.2 | 90.0	78.1 | 80.3	91.9 | 88.8	14.7 | 11.0	50.3 | 44.7	94.8 | 94.0	3.8 | 4.3	17.6 | 17.8	.37 | .36
Jericho & Al Aghwar	86.4 | 85.6	75.1 | 78.5	78.0 | 90.1	22.6 | 9.4	45.1 | 51.4	96.9 | 96.5	2.3 | 2.6	11.8 | 10.9	.13 | .41
	89.8 | 82.4	84.9 | 79.6	92.9 | 87.7	10.6 | 7.4	55.5 | 46.8	95.7 | 95.4	3.1 | 3.4	15.6 | 19.1	.47 | .41
Jerusalem	75.6 | 90.9	57.2 | 86.1	57.4 | 93.4	8.4 | 12.2	33.3 | 58.0	97.1 | 95.6	1.7 | 3.3	15.8 | 7.5	.18 | .43
	92.6 | 94.7	90.1 | 94.0	95.9 | 91.5	19.8 | 10.6	54.9 | 52.2	96.6 | 95.8	2.7 | 3.3	12.2 | 12.8	.48 | .37
Bethlehem	85.7 | 89.9	69.3 | 80.2	75.1 | 95.8	21.5 | 17.3	39.4 | 52.2	95.5 | 96.0	2.6 | 2.9	16.0 | 14.9	.11 | .44
	90.4 | 81.4	85.2 | 82.8	96.6 | 92.0	20.0 | 15.6	52.4 | 46.4	95.1 | 95.1	3.2 | 3.3	17.7 | 19.2	.39 | .38
Hebron	83.1 | 93.0	69.8 | 80.8	72.3 | 93.7	20.2 | 15.1	43.3 | 57.5	97.7 | 97.4	1.9 | 2.5	7.4 | 8.8	.05 | .37
	90.4 | 84.0	84.7 | 85.0	95.1 | 91.9	16.9 | 14.8	59.2 | 52.1	96.9 | 97.1	2.7 | 2.6	11.4 | 12.2	.31 | .31
North Gaza	80.3 | 90.7	68.7 | 86.8	71.6 | 93.6	14.0 | 13.1	45.6 | 58.1	97.3 | 96.8	1.8 | 2.8	9.8 | 8.6	.08 | .35
	88.0 | 83.1	87.9 | 86.9	94.2 | 91.7	11.0 | 11.1	63.0 | 54.3	97.5 | 96.9	2.5 | 2.7	10.4 | 9.3	.43 | .33
Gaza	87.5 | 91.7	73.2 | 84.7	77.1 | 92.6	16.8 | 13.1	45.9 | 56.3	96.5 | 96.4	2.3 | 3.1	6.1 | 5.9	.03 | .29
	86.7 | 91.4	84.4 | 85.4	92.6 | 87.5	12.7 | 11.6	59.0 | 52.5	96.0 | 95.8	3.2 | 3.4	8.0 | 7.7	.27 | .27
Deir Al-Balah	74.9 | 84.5	64.2 | 89.4	66.5 | 94.4	11.7 | 10.5	39.8 | 55.7	98.7 | 97.9	1.3 | 2.4	6.4 | 6.9	.06 | .36
	86.0 | 92.4	91.4 | 83.5	95.6 | 90.5	10.2 | 9.95	60.2 | 49.8	98.0 | 97.7	2.4 | 2.6	10.1 | 8.6	.36 | .32
Khan Younis	69.3 | 93.3	58.9 | 90.7	61.6 | 94.5	10.3 | 10.8	36.9 | 54.4	98.6 | 98.4	1.4 | 2.2	7.7 | 6.5	.06 | .34
	90.0 | 94.3	90.7 | 88.7	95.1 | 89.1	11.4 | 9.5	57.9 | 51.6	98.2 | 98.1	2.4 | 2.4	8.4 | 7.8	.37 | .32
Rafah	73.3 | 88.3	64.5 | 87.2	66.3 | 95.4	9.3 | 8.4	41.0 | 57.1	98.9 | 97.8	1.3 | 2.4	6.7 | 5.9	.09 | .37
	90.1 | 90.5	90.0 | 86.0	97.1 | 91.1	8.3 | 8.2	60.5 | 54.3	98.0 | 98.1	2.3 | 2.3	8.0 | 8.1	.43 | .29
Total Palestine	83.1 | 88.8	67.0 | 82.4	71.6 | 93.6	16.4 | 13.5	42.8 | 56.2	97.4 | 97.1	2.0 | 2.7	9.8 | 9.9	.10 | .37
	88.3 | 85.5	85.6 | 85.5	94.8 | 90.6	14.9 | 12.4	57.7 | 51.1	96.8 | 96.6	2.8 | 2.9	12.8 | 13.1	.39 | .34

Source: Authors' analysis of 1997-2012 census microdata.

Year 1997-2007 samples restricted to non-agricultural establishments, for comparability with the 2012 survey wave, which excludes agricultural establishments.

-- not available.

[i] Evaluated across 12 industry groups (excluding agriculture), since more detailed industry classification is unavailable.

[ii] In 2007, share of establishments under operation was evaluated in full sample, including agricultural establishments, as per PCBS (2014), since microdata is available only for operating establishments.

Table A4. Main economic-activity of private-sector establishments and workforce (%,
'94 '97 '04
'07 '12 '17)

Main economic activity	Share of establishments		Share of workforce	
	West Bank	Gaza	West Bank	Gaza
Mining & quarrying	0.8 | 0.0 | 0.4 0.5 | 0.3 | 0.3	0.0 | 0.0 | 0.01 0.0 | 0.05 | 0.05	2.1 | 0.0 | 1.1 1.1 | 0.7 | 0.7	0.0 | 0.0 | 0.01 0.0 | 0.12 | 0.0
Manufacturing	20.1 | 22.7 | 15.7 18.2 | 14.6 | 13.9	17.7 | 18.2 | 13.0 12.8 | 11.3 | 9.4	34.5 | 36.2 | 25.9 29.7 | 23.5 | 20.7	33.9 | 30.7 | 25.0 19.2 | 17.2 | 13.2
Electricity & water	0.7 | 0.5 | 0.3 0.3 | 0.3 | 0.3	9.0 | 3.0 | 1.2 0.9 | 0.6 | 0.7	0.7 | 0.4 | 1.0 0.6 | 1.0 | 0.9	0.8 | 1.5 | 1.6 2.4 | 1.7 | 1.4
Construction	0.6 | 0.6 | 0.5 0.6 | 0.5 | 0.5	0.8 | 0.9 | 1.3 0.9 | 0.5 | 0.6	1.5 | 1.9 | 1.5 1.8 | 1.3 | 1.8	2.7 | 3.1 | 3.8 2.2 | 2.2 | 1.6
Trade & repairs	58.2 | 55.6 | 62.2 63.0 | 63.5 | 50.3	56.1 | 57.3 | 61.9 67.2 | 66.7 | 53.2	38.3 | 35.3 | 45.0 45.5 | 45.5 | 35.7	43.5 | 38.7 | 45.9 53.0 | 54.9 | 40.0
Hotels & restaurants	3.9 | 3.9 | 5.0 5.1 | 5.4 | 5.4	2.7 | 3.3 | 4.2 4.8 | 4.4 | 4.8	3.1 | 3.3 | 4.7 4.4 | 5.9 | 6.1	2.3 | 2.7 | 4.0 5.4 | 5.7 | 5.8
Transport & communication	0.7 | 0.7 | 1.0 1.1 | 2.0 | 1.1	0.8 | 1.4 | 0.9 1.8 | 4.7 | 1.0	1.2 | 1.7 | 4.1 3.7 | 2.2 | 1.8	1.4 | 2.4 | 2.1 3.3 | 1.5 | 2.0
Finance	0.8 | 0.9 | 0.7 0.8 | 0.7 | 0.9	0.6 | 0.8 | 0.7 0.8 | 0.7 | 0.8	1.7 | 2.5 | 1.8 1.8 | 2.1 | 3.2	1.5 | 1.8 | 1.3 1.6 | 1.2 | 1.6
Real estate & business serv.	3.7 | 3.9 | 3.7 4.4 | 5.6 | 5.5	3.9 | 3.7 | 5.5 5.0 | 5.1 | 4.9	3.1 | 3.6 | 3.8 4.3 | 7.9 | 7.1	3.6 | 3.8 | 5.2 4.8 | 6.6 | 6.4
Education	2.0 | 2.0 | 1.6 -- | 1.8 | 4.1	1.3 | 2.2 | 1.7 -- | 2.0 | 4.7	5.4 | 6.0 | 4.1 -- | 4.9 | 7.8	3.1 | 4.4 | 3.8 -- | 5.2 | 10.4
Health & social work	4.5 | 4.5 | 3.5 1.8 | 3.9 | 4.7	2.7 | 3.7 | 3.3 2.2 | 2.8 | 3.5	5.7 | 5.6 | 3.3 4.0 | 3.4 | 6.0	4.2 | 6.0 | 2.6 5.4 | 2.1 | 6.4
Community & personal serv.	4.2 | 4.8 | 5.4 4.2 | 1.5 | 9.5	4.4 | 5.5 | 6.1 3.7 | 1.3 | 13.6	2.8 | 3.6 | 3.9 3.1 | 1.8 | 5.7	3.0 | 5.0 | 4.8 2.9 | 1.6 | 8.9

Source: Authors' analysis of PCBS (1995, 2018a,b), and microdata for 1997-2012 censuses.
Notes: PES 1994 excludes East Jerusalem. Numbers are the shares of non-agricultural private-sector operating establishments (or shares of non-agricultural private-sector workforce) in the territory that engage in the various economic activities. Numbers add up to 100% in each column.

Table A5a. Size distribution of private-sector establishments by main economic activity, West Bank (%,

	'94	'97	'04
	'07	'12	'17

)

Main economic activity	1–4 workers	5–9 workers	10–19 workers	20–49 workers	50–99 workers	100+ workers
Mining & quarrying	52.2 | -- | 36.5 46.5 | 38.7 | 34.7	34.7 | -- | 43.8 40.7 | 48.2 | 46.8	9.1 | -- | 14.9 9.4 | 11.2 | 14.1	3.0 | -- | 4.3 2.7 | 1.2 | 3.4	.7 | -- | .5 .7 | .8 | 1.0	.3 | -- | .0 .0 | .0 | .0
Manufacturing	72.3 | 76.7 | 78.6 78.0 | 77.0 | 77.3	17.5 | 15.1 | 14.2 14.0 | 14.8 | 14.3	7.5 | 5.8 | 5.1 5.5 | 5.5 | 5.5	2.2 | 1.9 | 1.7 2.1 | 2.2 | 2.2	.3 | .3 | .4 .3 | .4 | .5	.2 | .2 | .1 .2 | .2 | .2
Electricity & water	89.8 | 94.4 | 88.3 89.7 | 85.0 | 76.5	7.1 | 3.5 | 4.6 4.4 | 8.1 | 8.2	2.4 | 1.3 | 1.3 2.5 | 2.6 | 6.1	0.4 | 0.4 | 2.6 1.5 | 2.1 | 4.6	.0 | .4 | .7 .5 | .4 | 2.0	.4 | .0 | 2.6 1.5 | 1.7 | 2.6
Construction	64.7 | 60.1 | 66.6 58.3 | 54.3 | 58.2	18.4 | 19.8 | 19.2 21.1 | 25.1 | 20.0	9.7 | 12.4 | 7.3 14.3 | 14.3 | 12.0	4.8 | 5.7 | 5.4 3.7 | 4.7 | 7.6	1.4 | 1.1 | 1.0 1.9 | 1.5 | 1.0	1.0 | 1.1 | .6 .8 | .3 | 1.2
Trade & repairs	95.9 | 96.9 | 96.7 95.9 | 95.6 | 94.7	3.6 | 2.5 | 2.7 3.4 | 3.5 | 4.0	0.5 | 0.5 | 0.5 0.6 | 0.7 | 0.9	0.1 | 0.1 | 0.1 0.1 | 0.2 | 0.3	.0 | .0 | .0 .0 | .0 | .0	.0 | .0 | .0 .0 | .0 | .0
Hotels & restaurants	93.0 | 92.5 | 92.4 92.9 | 89.0 | 86.6	5.6 | 5.5 | 5.8 5.5 | 7.6 | 8.1	1.0 | 1.2 | 1.2 1.3 | 2.2 | 3.5	0.3 | 0.8 | 0.5 0.3 | 1.0 | 1.4	.1 | .1 | .1 .0 | .2 | .3	.0 | .0 | .0 .0 | .1 | .1
Transport & communication	73.4 | 68.9 | 58.1 52.7 | 51.3 | 57.4	14.9 | 18.3 | 25.9 27.1 | 31.6 | 24.6	6.9 | 6.7 | 10.0 12.8 | 10.3 | 11.8	4.4 | 4.2 | 4.2 5.6 | 5.4 | 5.6	.4 | 1.7 | .9 1.0 | 1.1 | .6	.0 | .3 | .9 .9 | .3 | .0
Finance	81.1 | 76.6 | 76.7 73.8 | 70.6 | 57.3	10.2 | 6.8 | 11.5 13.1 | 12.5 | 18.2	2.1 | 6.1 | 6.5 7.6 | 11.3 | 15.5	4.2 | 8.2 | 3.0 3.5 | 3.2 | 5.9	2.1 | 1.6 | 1.4 1.6 | 1.2 | 1.0	.4 | .7 | .9 .4 | 1.1 | 2.0
Real estate & business serv.	90.6 | 90.7 | 90.2 89.8 | 85.7 | 85.2	7.8 | 6.5 | 7.8 8.0 | 10.0 | 7.9	1.3 | 2.2 | 1.5 1.6 | 2.7 | 3.8	0.3 | 0.6 | 0.4 0.4 | 1.0 | 2.7	.0 | .1 | .0 .2 | .3 | .3	.0 | .0 | .0 .0 | .3 | .0
Education	64.8 | 61.9 | 65.6 68.0 | 58.1 | 52.3	19.0 | 22.1 | 21.3 20.8 | 26.9 | 25.0	9.2 | 8.6 | 8.0 7.0 | 8.8 | 13.5	5.9 | 6.2 | 4.1 3.2 | 4.9 | 7.0	.7 | .9 | .9 .8 | .9 | 1.4	.4 | .3 | .2 .3 | .4 | .7
Health & social work	88.8 | 89.7 | 94.3 95.3 | 94.5 | 88.8	6.6 | 5.2 | 3.0 2.9 | 3.6 | 5.7	2.7 | 2.7 | 1.75 1.4 | 1.2 | 3.5	1.2 | 1.7 | 0.7 0.3 | 0.4 | 1.3	.5 | .4 | .2 .1 | .2 | .2	.4 | .3 | .1 .0 | .1 | .5
Community & personal serv.	94.6 | 92.3 | 95.4 90.5 | 82.4 | 93.8	4.0 | 5.2 | 3.7 6.5 | 12.7 | 4.1	1.1 | 2.1 | 0.7 2.0 | 3.7 | 1.2	0.1 | 0.3 | 0.2 0.7 | 1.0 | 0.8	.1 | .0 | .0 .1 | .2 | .1	.1 | .0 | .0 .1 | .0 | .0

Source: Authors' analysis of PCBS (1995, 2018a,b), and microdata for 1997-2012 censuses.

Notes: PES 1994 excludes East Jerusalem. Numbers are the shares of private-sector operating establishments in each economic activity with various sizes. Numbers add up to 100% in each row.

Table A5b. Size distribution of private-sector establishments by main economic activity, Gaza (%, '94 '97 '04 / '07 '12 '17)

Main economic activity	1–4 workers	5–9 workers	10–19 workers	20–49 workers	50–99 workers	100+ workers
Mining & quarrying	-- | -- | 100.0 100.0 | 47.6 | 52.2	-- | -- | 0.0 0.0 | 33.3 | 34.8	-- | -- | 0.0 0.0 | 19.1 | 13.0	-- | -- | 0.0 0.0 | 0.0 | 0.0	-- | -- | .0 .0 | .0 | .0	-- | -- | .0 .0 | .0 | .0
Manufacturing	72.0 | 75.3 | 74.3 81.8 | 76.9 | 78.4	19.0 | 15.9 | 16.8 12.5 | 16.9 | 13.9	6.5 | 6.2 | 5.9 4.4 | 4.7 | 5.0	2.1 | 2.3 | 2.3 0.9 | 1.3 | 2.4	.3 | .2 | .4 .1 | .1 | .3	.1 | .0 | .2 .1 | .1 | .1
Electricity & water	99.8 | 98.9 | 94.7 92.1 | 89.0 | 79.2	0.1 | 0.9 | 3.2 4.7 | 8.0 | 14.1	0.1 | 0.0 | 0.3 0.4 | 0.4 | 1.6	0.0 | 0.2 | 0.3 0.0 | 0.4 | 1.6	.0 | .0 | .9 1.2 | .8 | .0	.0 | .0 | .6 1.6 | 1.3 | 3.6
Construction	62.9 | 55.5 | 53.8 57.7 | 47.3 | 51.5	19.2 | 21.3 | 28.0 24.7 | 22.4 | 25.2	7.3 | 13.4 | 11.6 13.4 | 16.9 | 14.4	7.3 | 7.9 | 5.4 3.8 | 10.0 | 6.7	2.6 | 1.5 | .8 .4 | .5 | 1.9	.7 | .5 | .5 .0 | 3.0 | .4
Trade & repairs	95.6 | 97.0 | 96.5 95.4 | 95.0 | 95.0	3.7 | 2.5 | 3.0 3.9 | 4.3 | 3.9	0.6 | 0.5 | 0.5 0.6 | 0.6 | 0.8	0.1 | 0.1 | 0.1 0.1 | 0.2 | 0.2	.0 | .0 | .0 .0 | .0 | .0	.0 | .0 | .0 .0 | .0 | .0
Hotels & restaurants	95.6 | 95.3 | 92.4 89.1 | 85.1 | 85.1	3.2 | 3.1 | 6.1 8.6 | 11.9 | 10.6	0.9 | 1.0 | 1.3 1.6 | 1.7 | 2.9	0.2 | 0.6 | 0.2 0.6 | 1.1 | 1.1	.0 | .0 | .0 .1 | .1 | .3	.0 | .0 | .0 .0 | .1 | .0
Transport & communication	76.8 | 86.6 | 72.1 80.8 | 62.7 | 50.1	14.6 | 7.7 | 16.0 11.6 | 18.3 | 22.0	6.6 | 3.4 | 8.6 5.4 | 14.4 | 20.1	1.3 | 0.7 | 2.2 1.2 | 4.6 | 7.2	.7 | 1.3 | .7 .6 | .0 | .5	.0 | .3 | .4 .4 | .0 | .0
Finance	80.5 | 78.3 | 82.4 79.6 | 82.9 | 73.6	7.1 | 4.6 | 7.8 8.9 | 8.0 | 12.1	7.1 | 10.3 | 5.9 8.0 | 5.7 | 9.4	4.4 | 5.7 | 2.9 2.7 | 2.7 | 4.4	.0 | 1.1 | .5 .4 | .3 | .2	.9 | .0 | .5 .4 | .3 | .2
Real estate & business serv.	93.6 | 91.3 | 94.4 91.3 | 84.8 | 86.3	5.2 | 6.1 | 4.3 6.6 | 11.1 | 8.5	0.7 | 2.3 | 0.9 1.8 | 2.6 | 3.4	0.4 | 0.3 | 0.2 0.4 | 1.3 | 1.7	.1 | .0 | .1 .0 | .1 | .0	.0 | .1 | .1 .0 | .1 | .0
Education	66.4 | 61.9 | 57.3 -- | 46.8 | 53.2	25.0 | 28.8 | 34.4 -- | 39.4 | 33.0	5.7 | 7.4 | 5.7 -- | 10.0 | 8.8	1.2 | 1.7 | 2.3 -- | 3.1 | 4.0	1.6 | .2 | .2 -- | .6 | .6	.0 | .0 | .2 -- | .1 | .4
Health & social work	88.1 | 84.6 | 95.9 53.2 | 95.9 | 80.2	5.5 | 7.7 | 2.9 35.0 | 2.9 | 9.5	4.0 | 4.7 | 0.8 7.9 | 1.0 | 5.2	1.9 | 2.0 | 0.3 3.0 | 0.3 | 3.6	.2 | .5 | .0 .7 | .0 | .9	.4 | .5 | .0 .2 | .0 | .6
Community & personal serv.	95.9 | 91.2 | 95.0 95.3 | 83.6 | 93.1	2.9 | 5.7 | 4.1 3.0 | 11.4 | 4.1	1.1 | 2.5 | 0.6 1.5 | 3.5 | 2.0	0.1 | 0.5 | 0.1 0.2 | 1.3 | .8	.0 | .2 | .1 .0 | .2 | .1	.0 | .0 | .0 .0 | .0 | .0

Source: Authors' analysis of PCBS (1995, 2018a,b), and microdata for 1997-2012 censuses.
Notes: Numbers are the shares of private-sector operating establishments in each economic activity with various sizes. Numbers add up to 100% in each row.

Table A6. Establishment Census 1994: Surveyed establishments and workers by governorate

Governorate	Employees	All workers	Establishments	Localities
Jenin	3,888	11,340	5,348	78
Talkarm	4,429	10,020	4,384	71
Nablus	13,163	24,723	8,556	59
Qalqilya	1,694	3,622	1,635	23
Ramallah	10,796	17,410	5,205	96
Jerusalem[i]	--	--	--	15
Jericho	797	1,460	533	16
Bethlehem	6,618	11,472	3,099	70
Hebron	9,310	22,251	8,648	128
Gaza	19,838	44,920	19,412	28

Source: Authors' analysis of PCBS (1995).

[i] Statistics for Jerusalem excluded from the PCBS (1995) report.

Table A7. Factor loadings of all variables

			Factor loadings		
Variable	Description	Avg. (Min–Max)	2002–2004	2005–2006	2009–2010
Fixed checkpoints	Density of fulltime & part-time chkpts in Jan 2004 used for 2004 PCA; in 2005-2006 used for 2007 PCA; in 2009-2010 used for 2012 PCA (chkpts/km^2)	0.016 (0.002–0.054)	-0.060	0.089 0.046	0.090 0.103
Flying checkpoints	Density of chkpts in Jan 2005 & 2006 used for 2007 PCA (chkpts/km^2)	1.152 (0.057–8.283)		0.321 0.244	
Israeli settlements	Settlements in 2002 used for 2004 PCA; 2010 used for 2012 PCA (count/km^2)	0.005 (0.000–0.046)	0.462		0.140
Yesha Council settlements	Settlements in 2002 used for 2004 PCA; 2010 used for 2012 PCA (count/km^2)	0.025 (0.009–0.059)	0.549		0.123
Israeli settlers	Settlers in 2002 used for 2004 PCA; 2010 used for 2012 PCA (count/km^2)	21.4 (0.8–68.1)	0.693		0.227
House demolitions	Demolitions in 2006 used for 2007 PCA; 2009-2010 used for 2012 PCA (count/km^2)	0.040 (0.001–0.145)		-0.152	-0.052 -0.244
Adults made homeless	2006 figures used for 2007 PCA; 2009-2010 used for 2012 PCA (count/pop)	0.001 (0.000–0.003)		-0.098	-0.358 -0.316
Minors made homeless	2006 figures used for 2007 PCA; 2009-2010 used for 2012 PCA (count/pop)	0.000 (0.000–0.001)		-0.055	-0.329 -0.266
Curfew hours	2005-2006 figures used for 2007 PCA (hours)	90.7 (0–473)		0.283 0.122	
Curfew incidents	2005-2006 figures used for 2007 PCA (count/km^2)	0.017 (0–0.085)		0.352 0.229	
Searches	2005-2006 figures used for 2007 PCA (count/pop)	0.001 (0.000–0.006)		0.144 0.202	
Arrests	2005-2006 figures used for 2007 PCA (count/pop)	0.002 (0.001–0.003)		0.322 0.340	
Adult fatalities	2005-2006 figures used for 2007 PCA; 2009-2010 used for 2012 PCA (count/pop)	4×10^{-6} ($0–14\times10^{-6}$)		0.296 0.037	0.133 0.062
Child fatalities	2005-2006 figures used for 2007 PCA; 2009-2010 used for 2012 PCA (count/pop)	1×10^{-6} ($0–9\times10^{-6}$)		0.313 0.020	0.231 0.152
Adult injuries	2005-2006 figures used for 2007 PCA; 2009-2010 used for 2012 PCA (count/pop)	3×10^{-4} ($0–11\times10^{-4}$)		0.196 -0.042	0.309 0.257
Child injuries	2005-2006 figures used for 2007 PCA; 2009-2010 used for 2012 PCA (count/pop)	70×10^{-6} ($0–332\times10^{-6}$)		0.034 0.105	0.318 0.243
Pop. exposed to violence	2010 figures used for 2012 PCA (count/pop)	46.4 (23.3–60.0)			-0.078

Source: Authors' analysis of data from OCHA oPt, B'Tselem, Roy van der Weide, PCBS.

Table A8. Fixed checkpoints by West Bank governorate, November 2015 (count)

Governorate	Area (km^2)	Internal checkpoints	Last checkpoint before Israel	Other border checkpoints	Total fixed checkpoints	Density of fixed checkpts./100km^2
Tubas (H)	402	1	0	0	1	0.2
Jericho & Al Aghwar (H)	593	3	1	1	5	0.8
Salfit (H)	204	2	0	0	2	1.0
Jenin (H)	583	1	5	0	6	1.0
Ramallah & Al-Bireh	855	6	5	0	11	1.3
Nablus	605	9	0	0	9	1.5
Bethlehem	659	5	5	0	10	1.5
Hebron (L)	997	7	4	17[a]	28	2.8
Tulkarem (L)	246	1	6	0	7	2.8
Qalqiliya (L)	166	2	3	0	5	3.0
East Jerusalem (L)	345	2	10	0	12	3.5
Total	5,655	39	39	18	96	1.7

Source: Authors' analysis of B'Tselem data. For a static index of mobility restrictions, governorates ordered by density of fixed checkpoints, and grouped into highest (H), medium, and least (L) affected by mobility restrictions.
[a] Border checkpoints near Israeli settlement enclaves. 2 additional border crossing checkpoints exist between the Gaza Strip and Israel: Erez pedestrian crossing and Kerem Shalom crossing for transporting of goods & fuel. Temporary flying checkpoints are also prevalent in Palestine, but their numbers have not been kept track of week by week or even, averaged, annually.

Table A9. OLS regressions of firms' employment: pooled cross-sections of 2004–2012 surveys

	Log(employment)	Log(female employment+1)	Female share of employ.
Time-varying mobility restrictions	-0.001	-0.008***	-0.011***
	(0.002)	(0.001)	(0.001)
Year (1997=0, 2012=3)	0.034***	0.017***	0.012***
	(0.001)	(0.001)	(0.001)
Privately owned	0.124	-0.048	0.101
	(0.098)	(0.091)	(0.082)
Publicly owned	0.366***	0.443***	0.295***
	(0.098)	(0.092)	(0.082)
Single unit	0.847***	0.226**	-0.036
	(0.097)	(0.091)	(0.082)
Head office	1.443***	0.456***	-0.023
	(0.098)	(0.091)	(0.082)
Company branch	0.982***	0.299***	-0.019
	(0.097)	(0.091)	(0.082)
Sole proprietorship	-0.504***	-0.031***	0.025***
	(0.007)	(0.005)	(0.002)
Partnership	-0.075***	-0.045***	-0.012***
	(0.008)	(0.005)	(0.002)
Shareholding firm	0.527***	0.216***	0.018***
	(0.015)	(0.010)	(0.003)
Limited/unlimited liability	0.548***	0.071***	0.027***
	(0.028)	(0.017)	(0.005)
12 industry indicators	Y***	Y***	Y***
15 gov. indicators	Y***	Y***	Y***
Constant	0.804***	-0.171***	-0.085***
	(0.032)	(0.017)	(0.014)
Observations	320,609	321,193	320,608
R-squared	0.268	0.237	0.141

Notes: 2004-2012 establishment-level data are used because they can be matched to government-level security regime (which is unavailable for year 1997). Sample restricted to non-agricultural firms.

Standard errors in parentheses are corrected for arbitrary heteroskedasticity and autocorrelation at the firm level.
Significant at * 10%, ** 5%, *** 1% using two-sided tests.

Table A10. OLS regressions of firms' employment: pooled cross-sections of 1997–2012 Census rounds

	Log(employment)	Log(female employment+1)	Female share of employment	Operating status (OLS)	Operating status (Probit)
Time-varying mobility restrictions	-0.004**	-0.006***	-0.009***	-0.001***	-0.174***
	(0.002)	(0.001)	(0.001)	(0.000)	(0.023)
Year (1997=0, 2012=3)	0.039***	0.015***	0.010***	0.001***	--
	(0.001)	(0.001)	(0.000)	(0.000)	
Privately owned	0.118	-0.033	0.106	0.195***	0.988*
	(0.098)	(0.082)	(0.082)	(0.040)	(0.590)
Publicly owned	0.363***	0.431***	0.287***	0.199***	--
	(0.098)	(0.082)	(0.082)	(0.040)	
Single unit	0.850***	0.219***	-0.031	0.056	0.956
	(0.097)	(0.081)	(0.081)	(0.037)	(0.618)
Head office	1.453***	0.450***	-0.016	0.056	1.149*
	(0.098)	(0.081)	(0.081)	(0.037)	(0.629)
Company branch	1.004***	0.305***	-0.011	0.057	2.260***
	(0.097)	(0.081)	(0.081)	(0.037)	(0.674)
Sole proprietorship	-0.503***	-0.059***	0.013***	0.004***	0.619***
	(0.006)	(0.004)	(0.002)	(0.001)	(0.052)
Partnership	-0.062***	-0.069***	-0.022***	0.004***	0.543***
	(0.008)	(0.005)	(0.002)	(0.001)	(0.154)
Shareholding firm	0.530***	0.183***	0.009***	0.003***	0.622***
	(0.013)	(0.009)	(0.003)	(0.001)	(0.138)
Limited/unlimited liability	0.557***	0.041**	0.010**	0.008***	--
	(0.027)	(0.017)	(0.005)	(0.001)	
Operating	-0.115**	-0.009***	-0.017	--	--
	(0.055)	(0.003)	(0.015)		
12 ind. indicators	Y***	Y***	Y***	Y***	Y***
15 gov. indicators	Y***	Y***	Y***	Y***	Y***
Constant	0.130	-0.006***	-0.034	0.253***	-0.743***
	(0.080)	(0.002)	(0.023)	(0.003)	(0.024)
Observations	391,584	414,012	391,583	414,013	92,819
R-squared	0.274	0.238	0.141	0.723	0.683

Notes: Sample restricted to non-agricultural firms.
Standard errors in parentheses are corrected for arbitrary heteroskedasticity and autocorrelation at the firm level.
Significant at * 10%, ** 5%, *** 1% using two-sided tests.

Figure A1. Employment-size distribution of Palestinian operating, private-sector, non-agricultural establishments
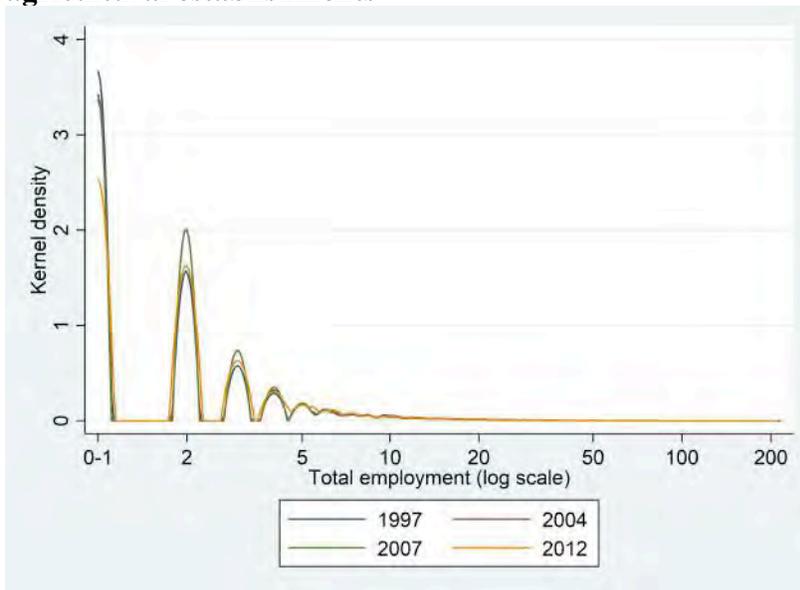
Source: Authors' analysis of 1997-2012 census microdata.
Note: The figure is truncated at 220 employees even though 49 out of 378,814 operating private-sector establishments have 220–1523 workers.

Figure A2. Full-time and part-time fixed checkpoints, West Bank
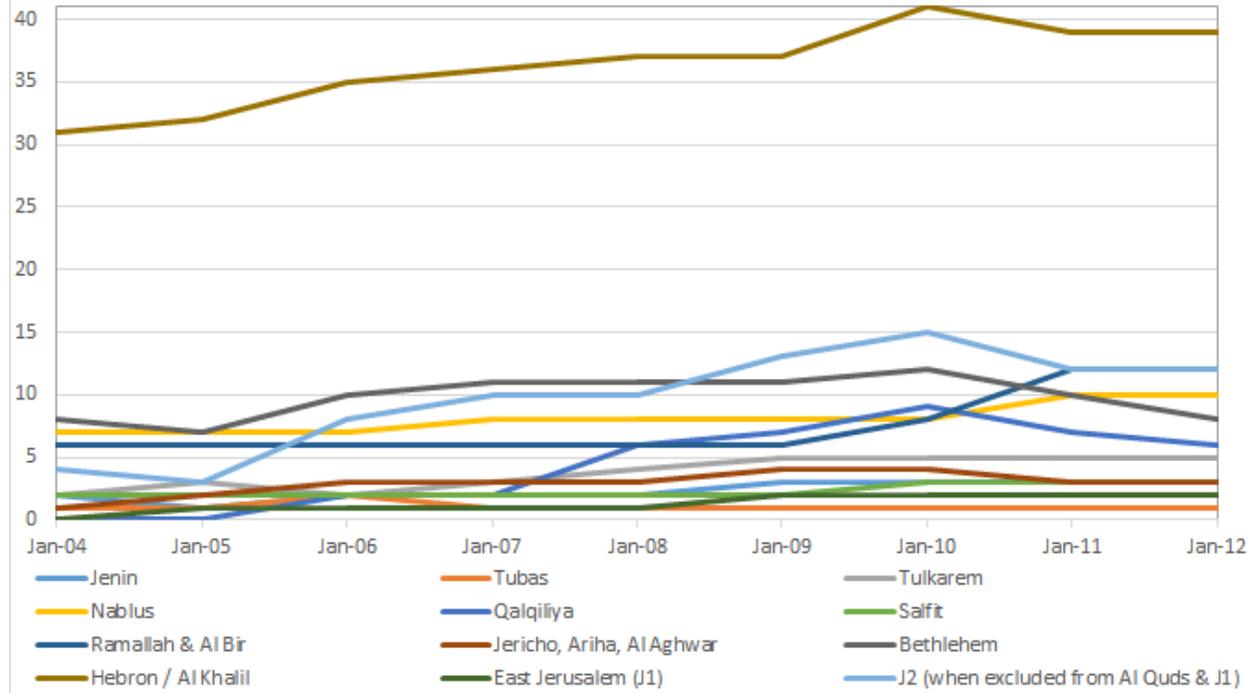
Source: Roy van der Weide.

Figure A3. Flying checkpoints, West Bank (count)
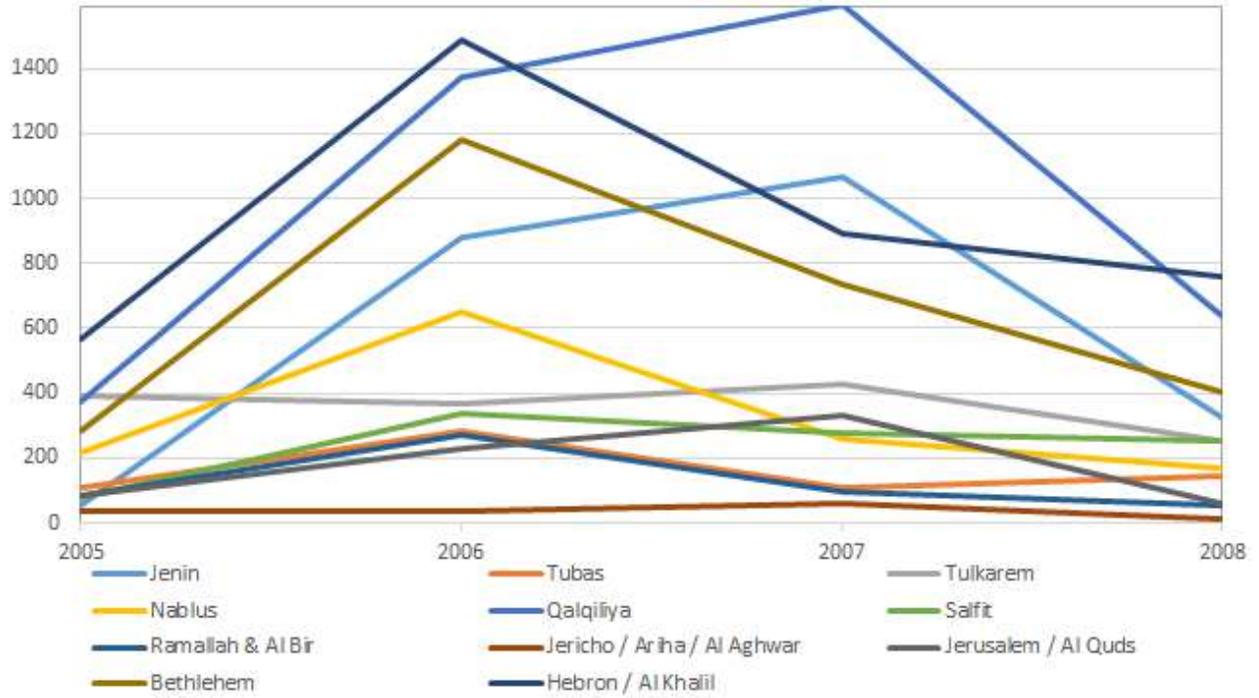
Source: OCHA oPt, Protection of Civilians Report.

Figure A4. Israeli settlements, West Bank (count)
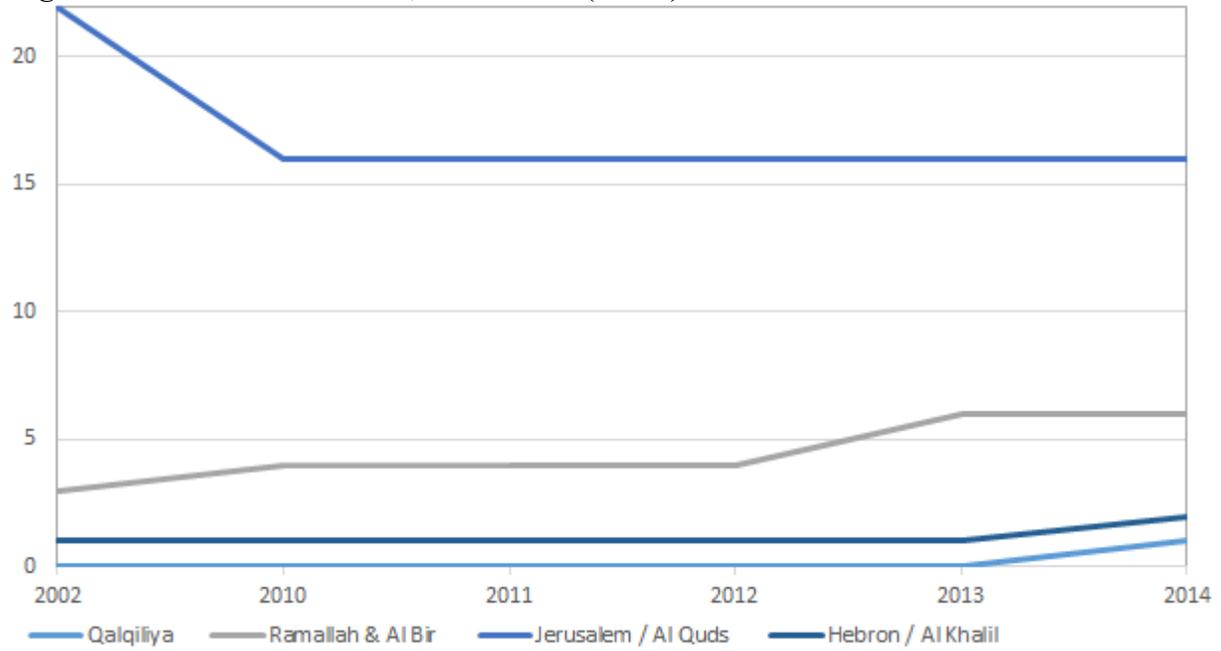
Figure A5. Yesha Council settlements, West Bank (count)

Legend:
- Jenin
- Tubas
- Tulkarem
- Nablus
- Qalqiliya
- Salfit
- Ramallah & Al Bir
- Jericho / Ariha / Al Aghwar
- Jerusalem / Al Quds
- Bethlehem
- Hebron / Al Khalil
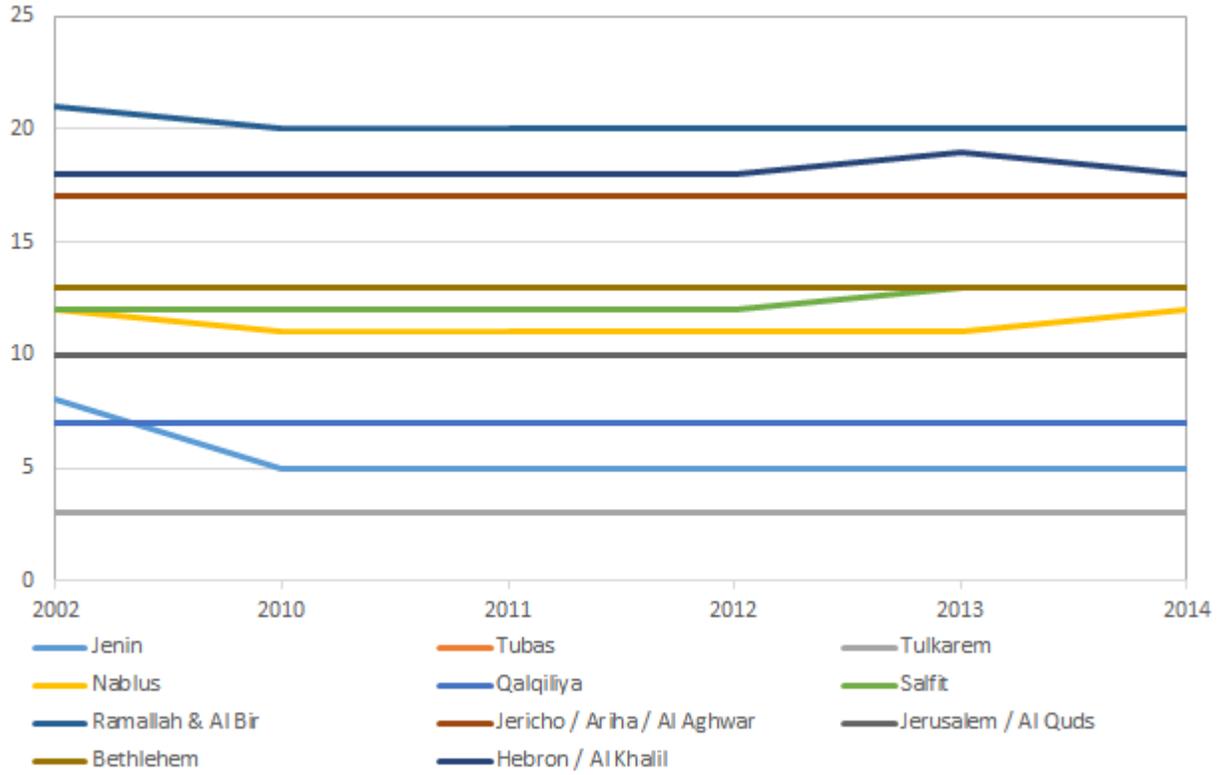
Figure A6. Yesha Council settlers, West Bank (count)
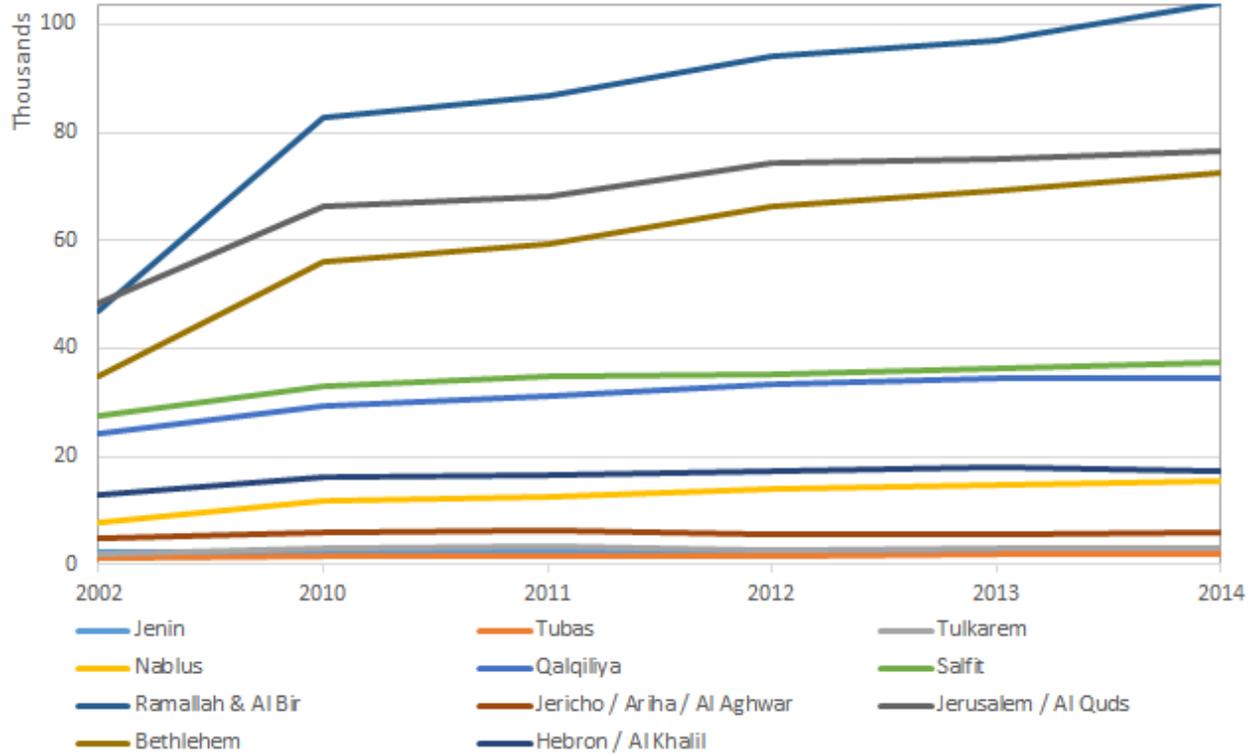
Figure A7. Net increases in the number of all Israeli settlers, and settlement housing-unit construction starts, West Bank (count of individuals or housing units in 1,000s)
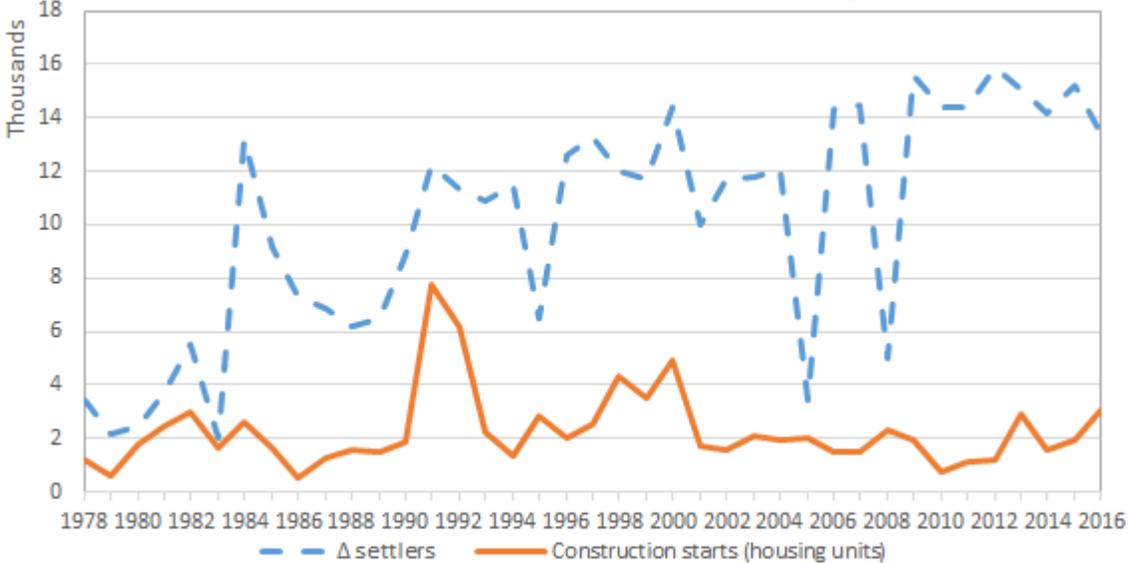
Source: Israeli Central bureau of Statistics (ICBS)

Figure A8. Demolitions of housing units without permits, West Bank (count)
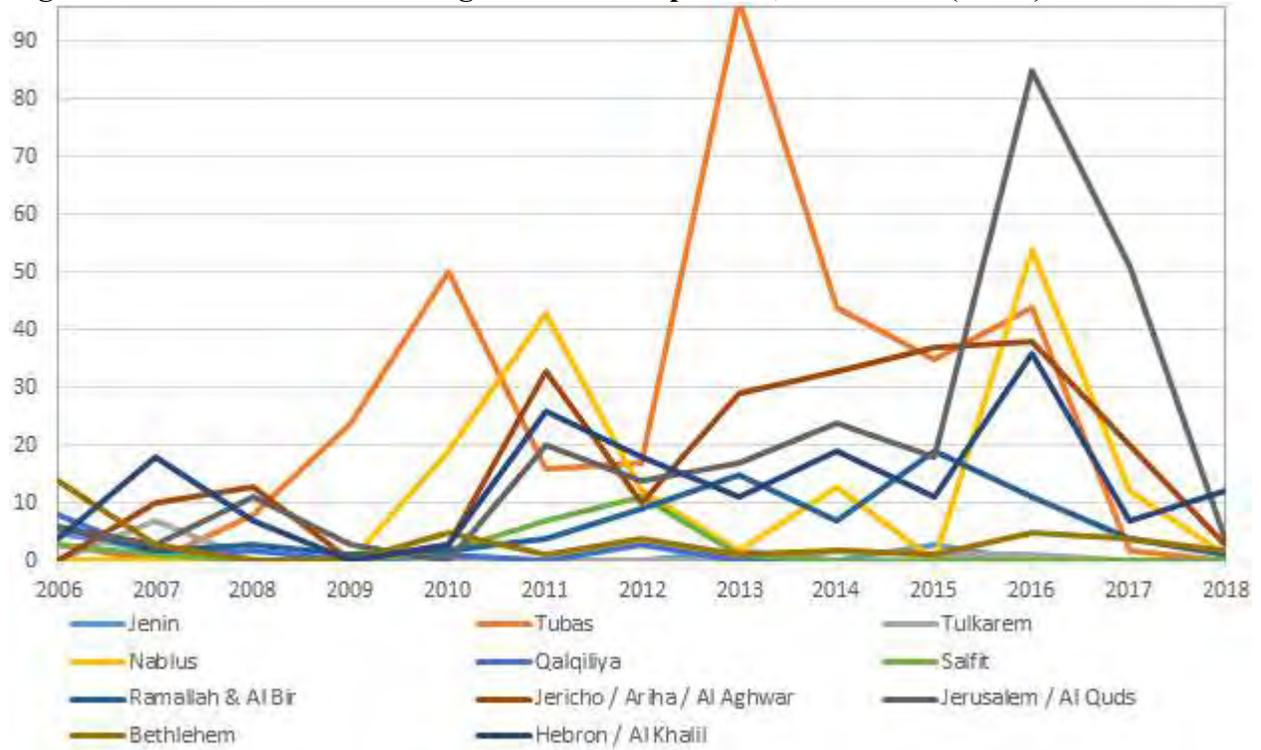
Source: B'Tselem. https://www.btselem.org/planning_and_building/statistics , as of 30 June 2018.

Figure A9. Adults made homeless, West Bank (count)
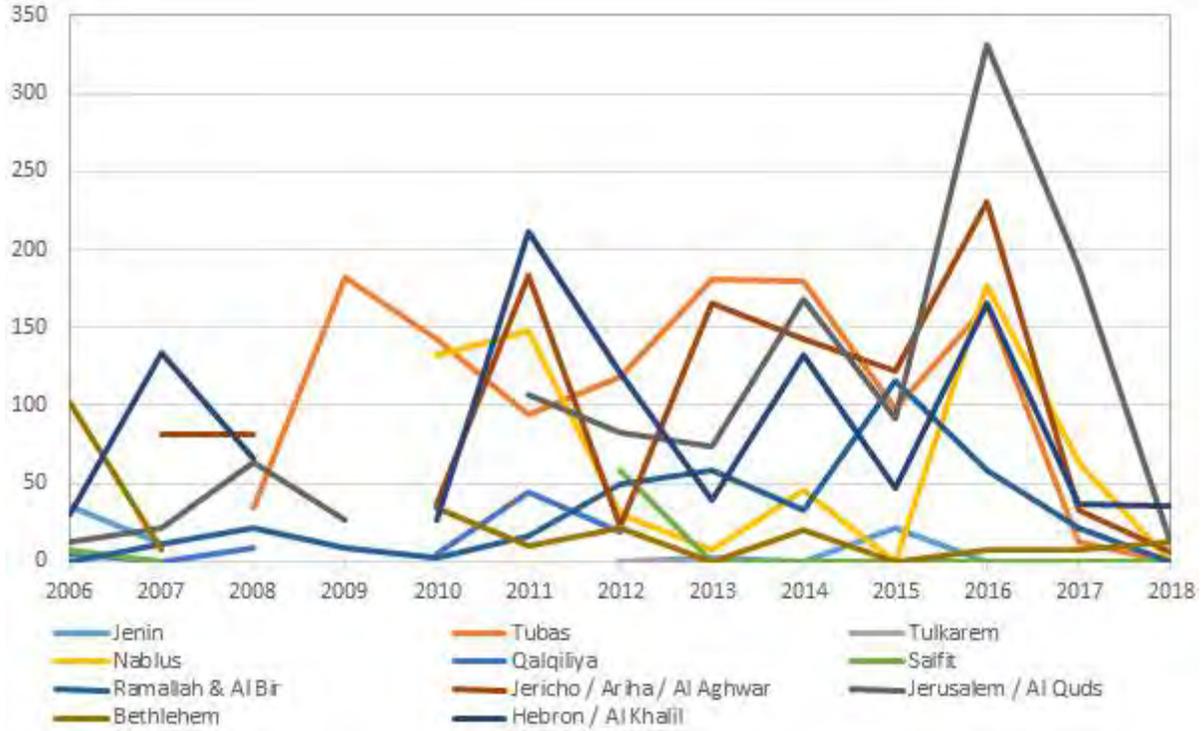
Source: B'Tselem. https://www.btselem.org/planning_and_building/statistics , as of 30 June 2018.

Figure A10. Minors made homeless, West Bank (count)
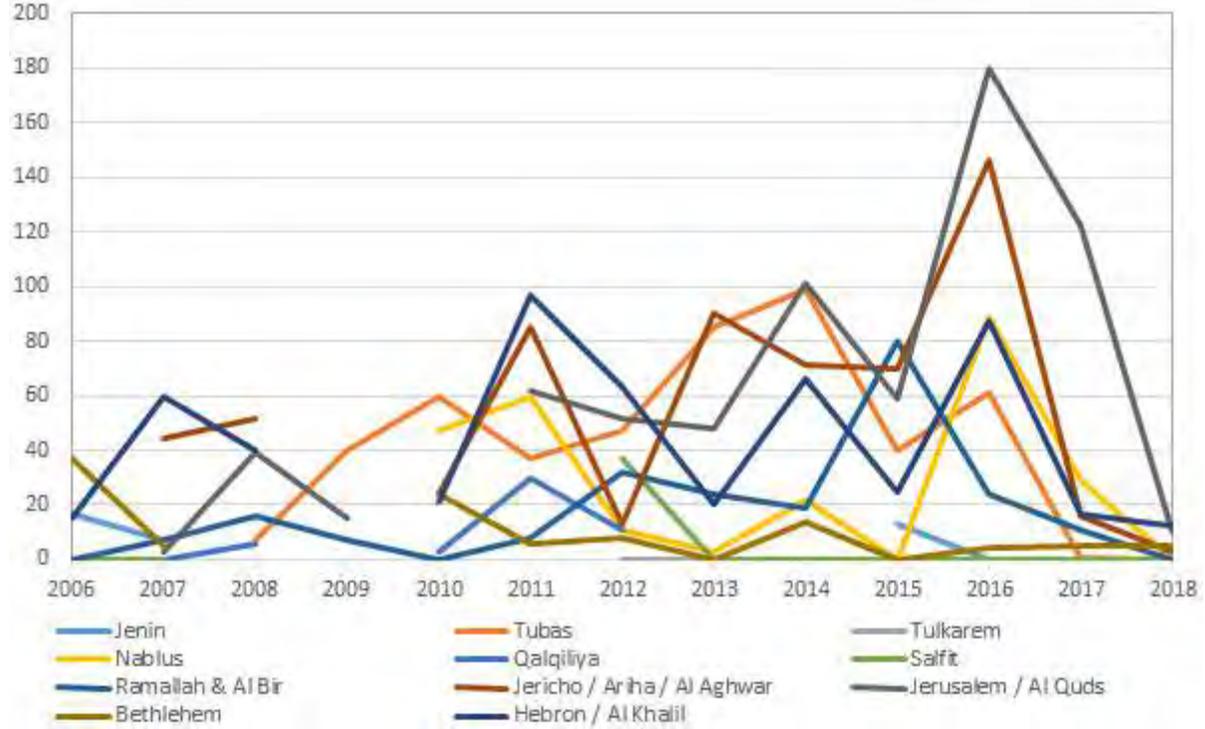
Source: B'Tselem. https://www.btselem.org/planning_and_building/statistics , as of 30 June 2018.

Figure A11. Curfew hours, West Bank (hours)
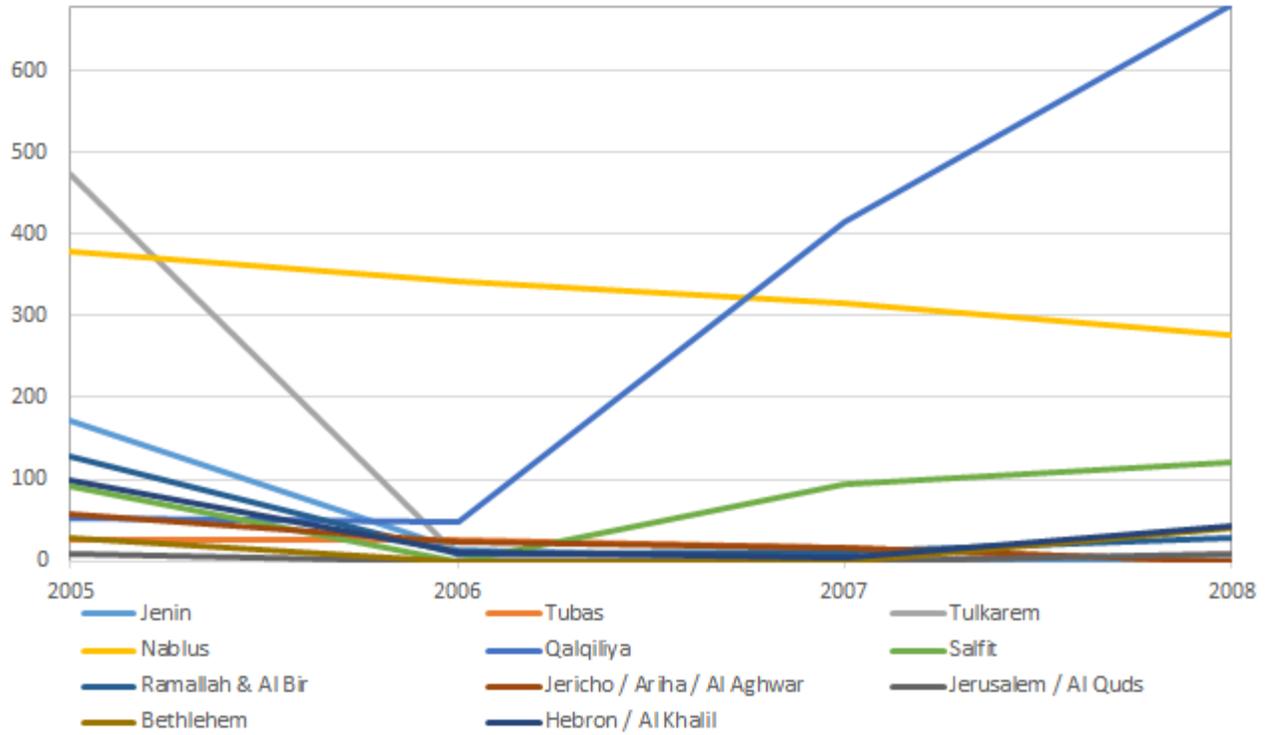
Source: OCHA oPt, Protection of Civilians Report.

Figure A12. Curfew incidents, West Bank (count)
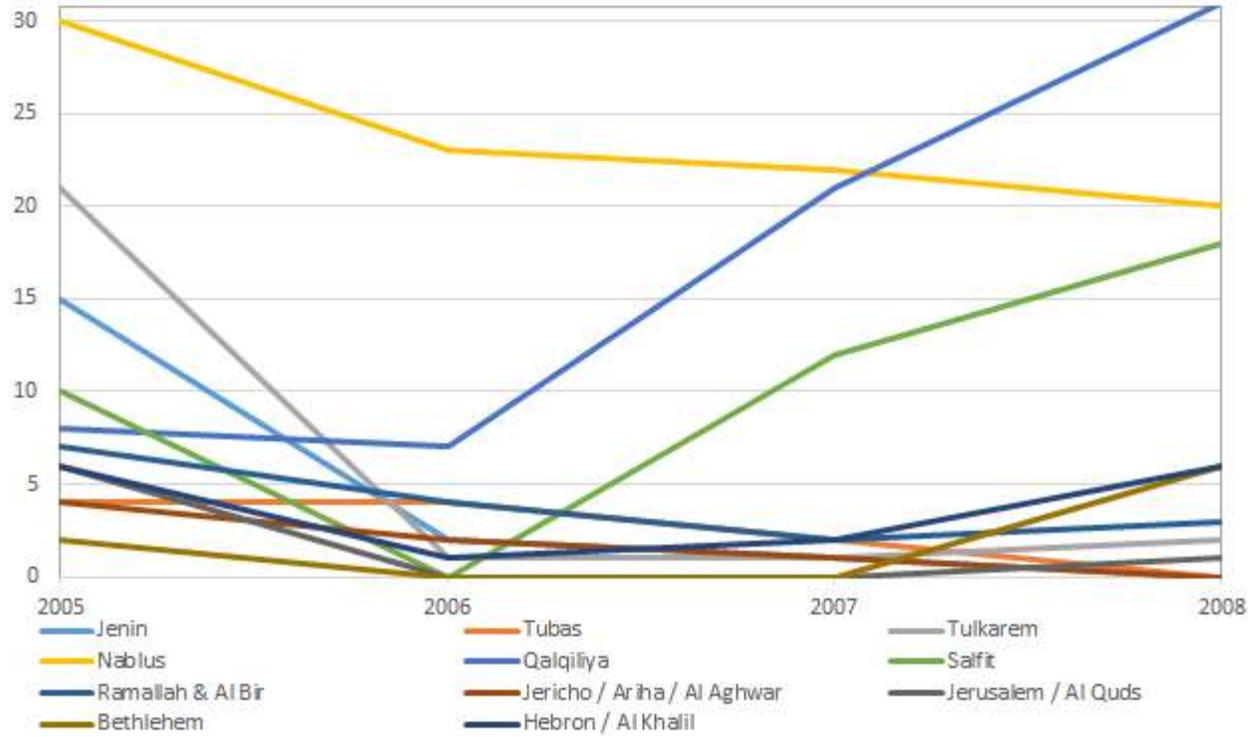
Source: OCHA oPt, Protection of Civilians Report.

Figure A13. Searches, West Bank (count)
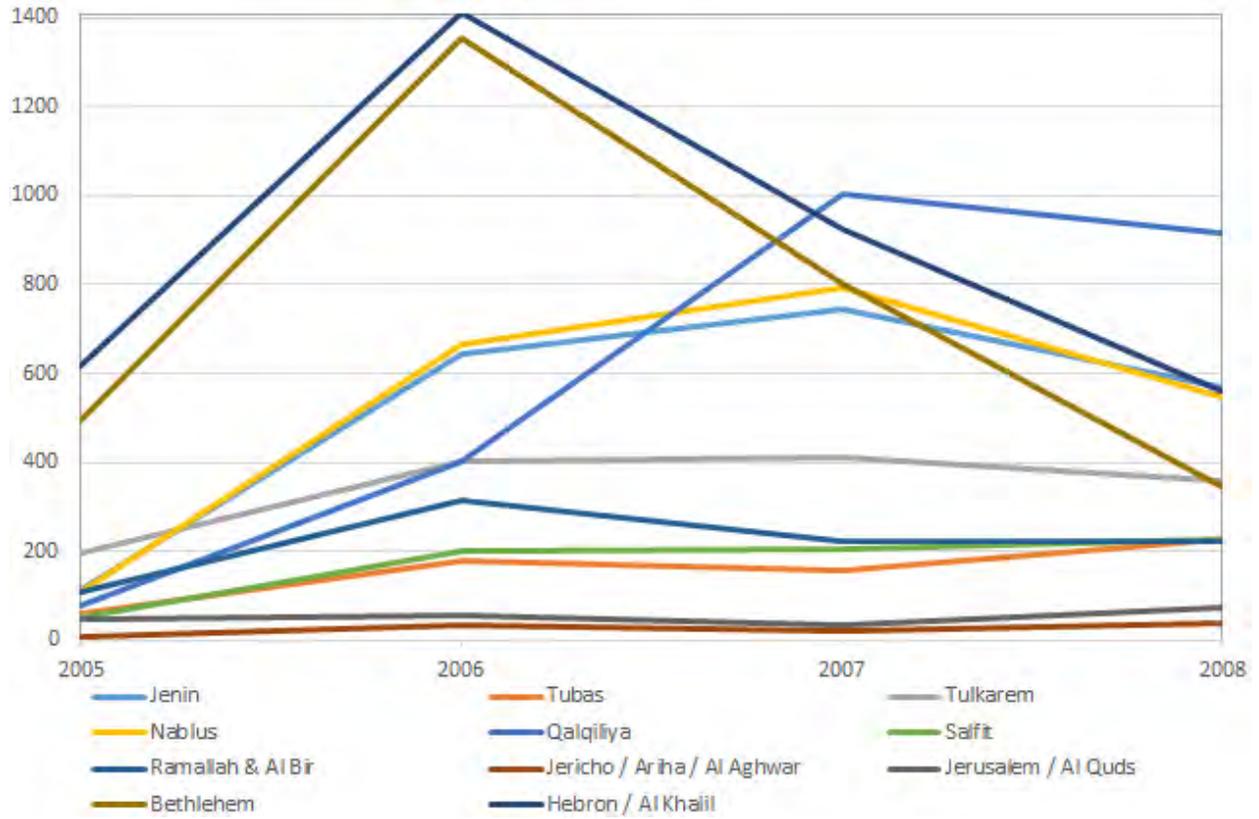
Source: OCHA oPt, Protection of Civilians Report.

Figure A14. Arrests, West Bank (count)
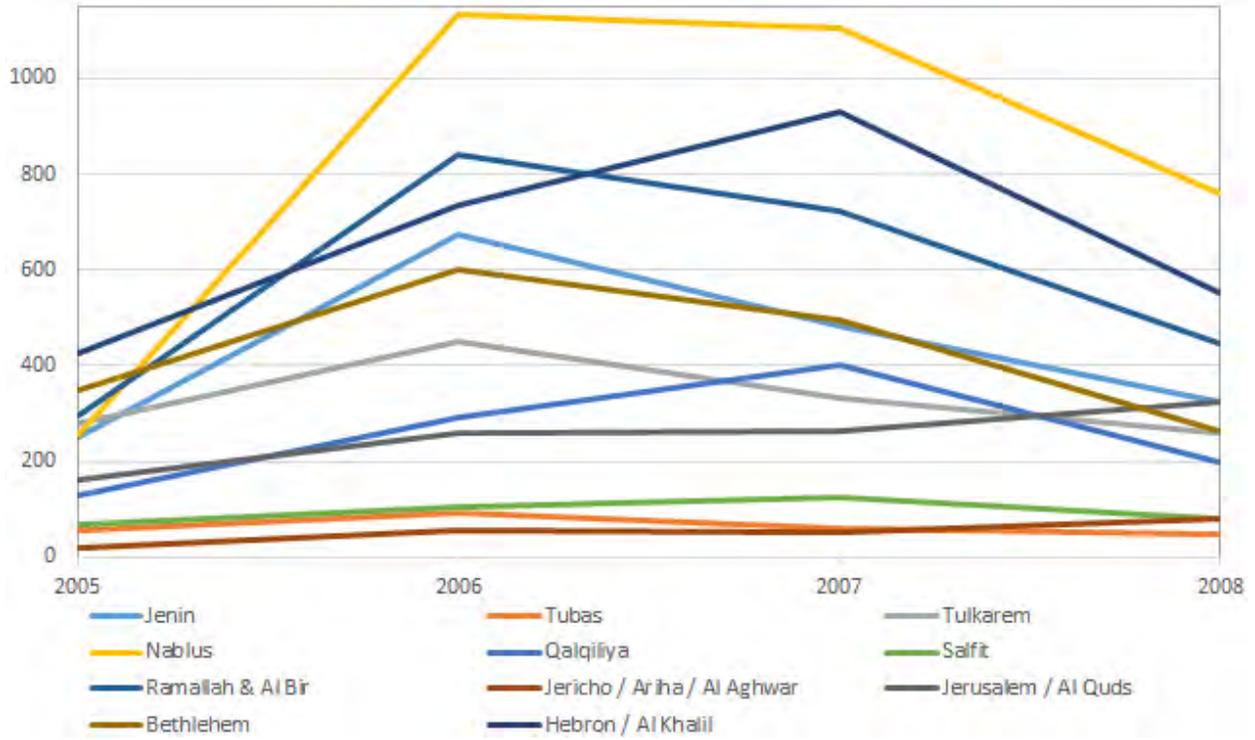
Source: OCHA oPt, Protection of Civilians Report.

Figure A15. Adult fatalities, West Bank and Gaza (excluding 3 Gaza wars)
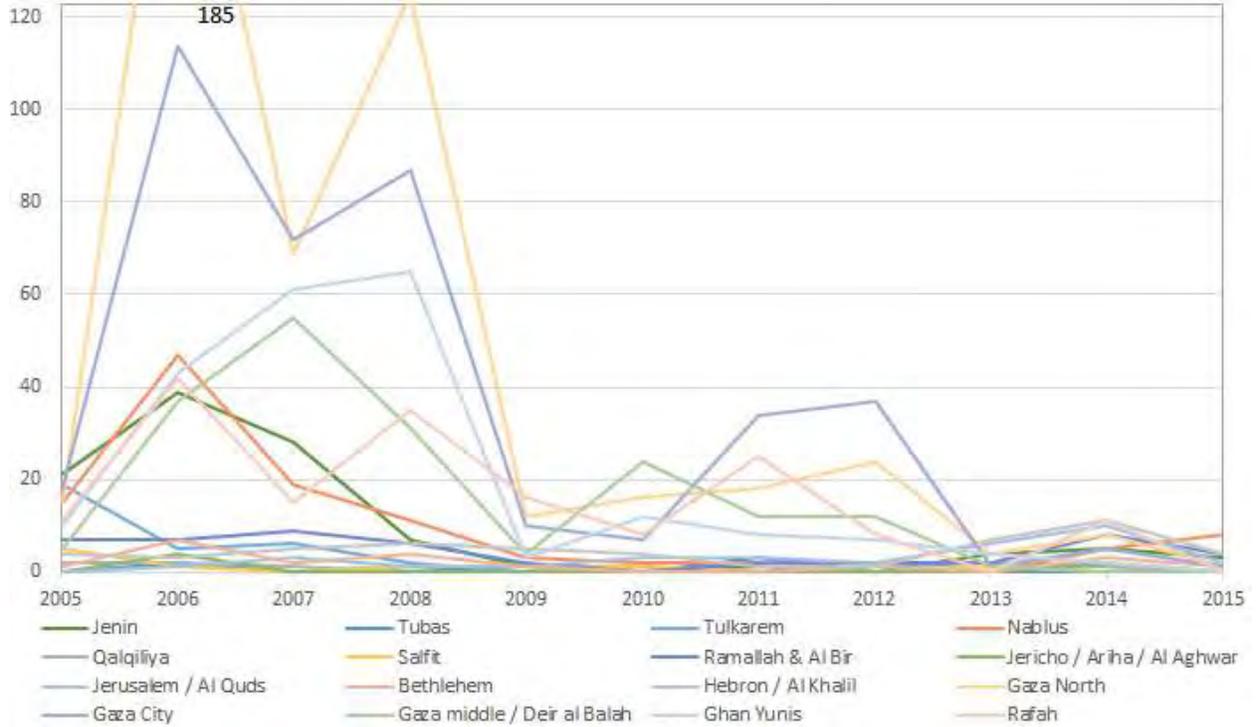
Source: OCHA oPt.

Figure A16. Child fatalities, West Bank and Gaza (excluding 3 Gaza wars)
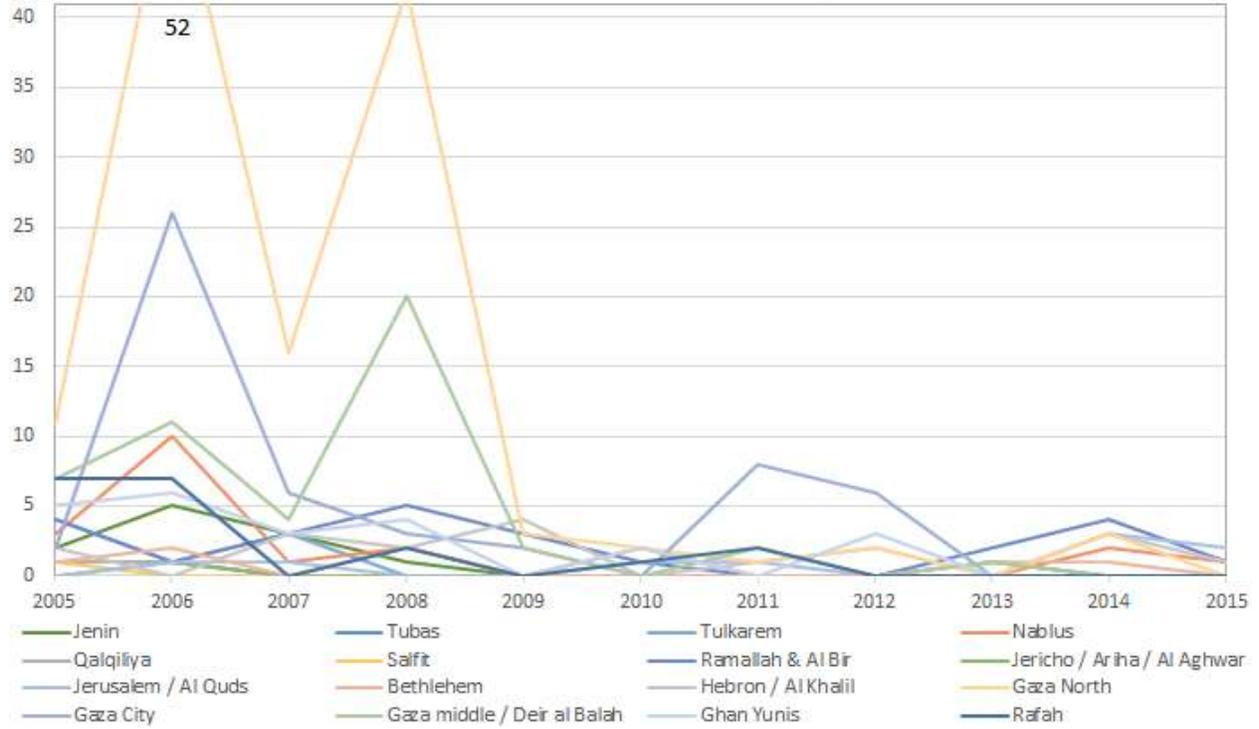
Source: OCHA oPt.

Figure A17. Adult injuries, West Bank and Gaza (excluding 3 Gaza wars)
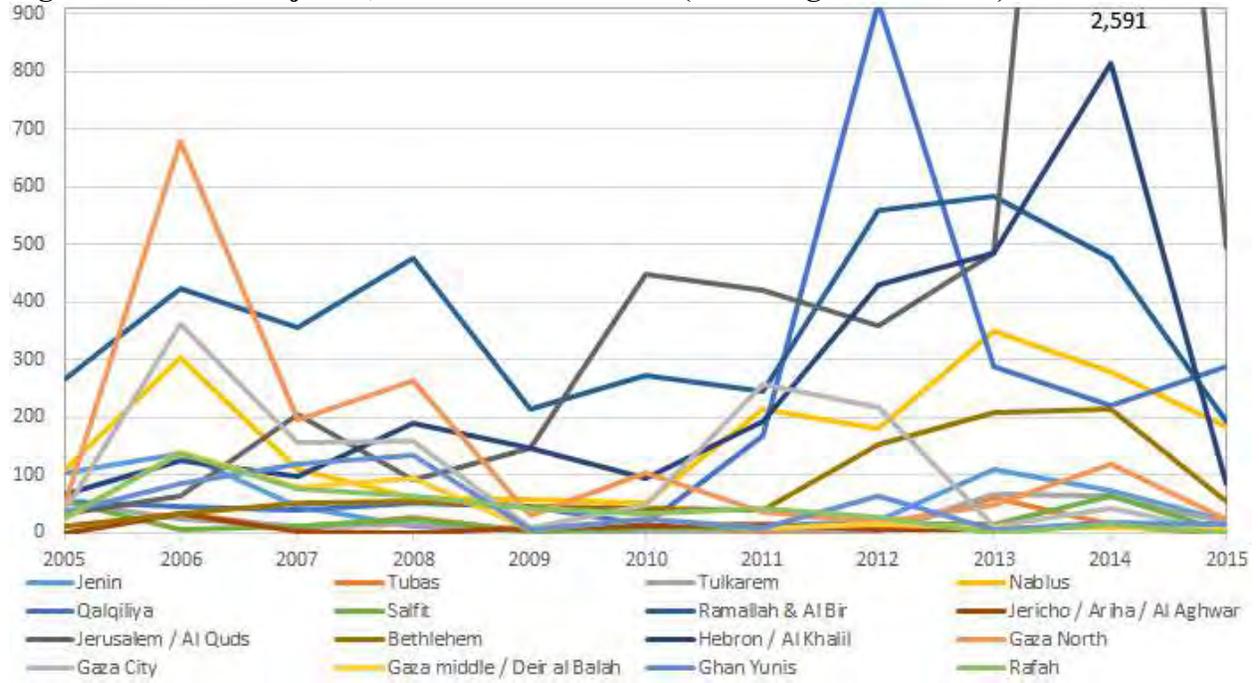
Source: OCHA oPt.

Figure A18. Child injuries, West Bank and Gaza (excluding 3 Gaza wars)
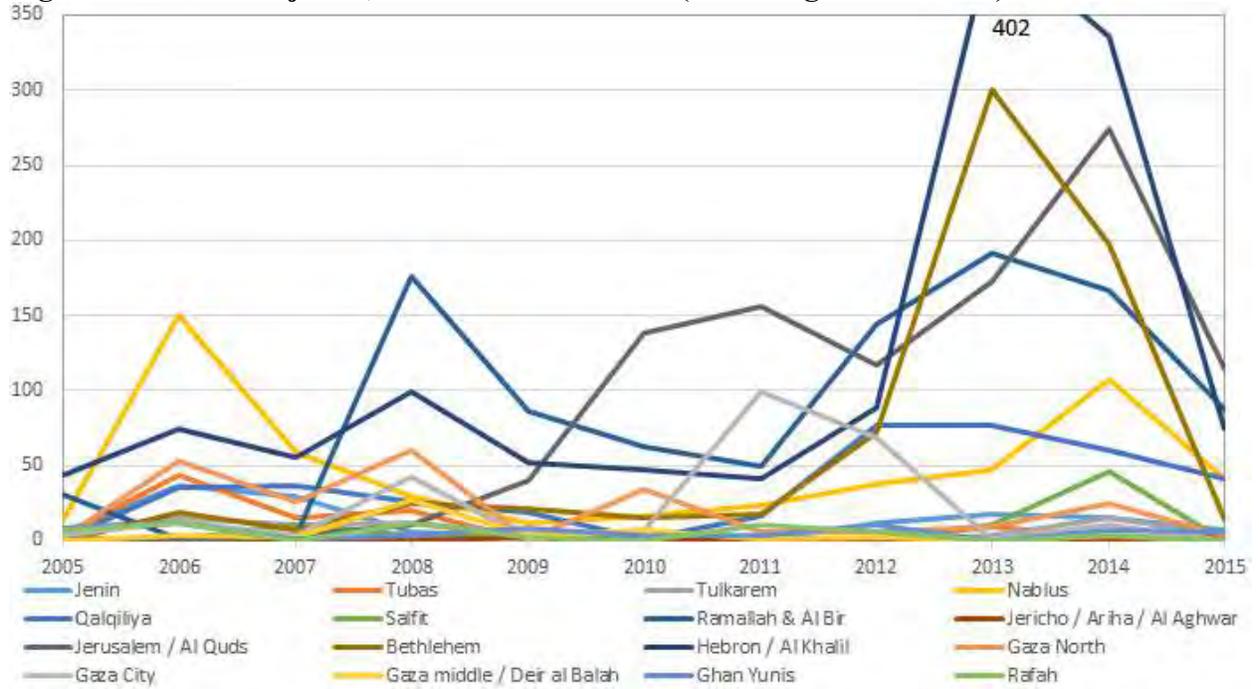
Source: OCHA oPt.

Figure A19. Complete and partial closures of border crossings, Gaza (Work days)
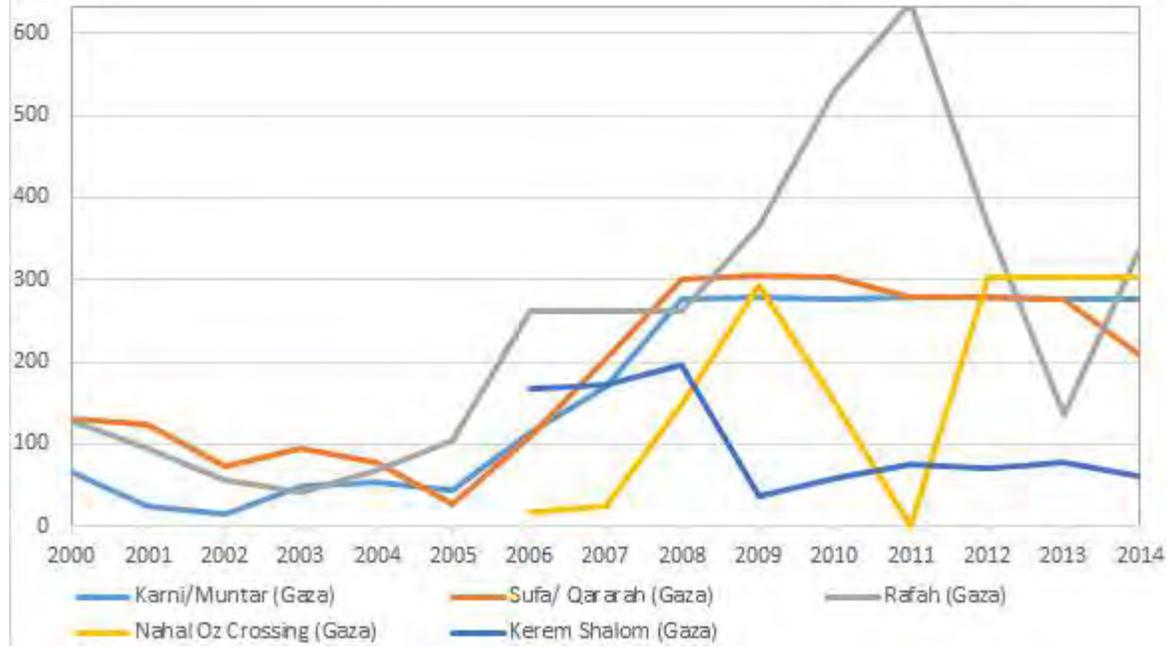
Source: PCBS.

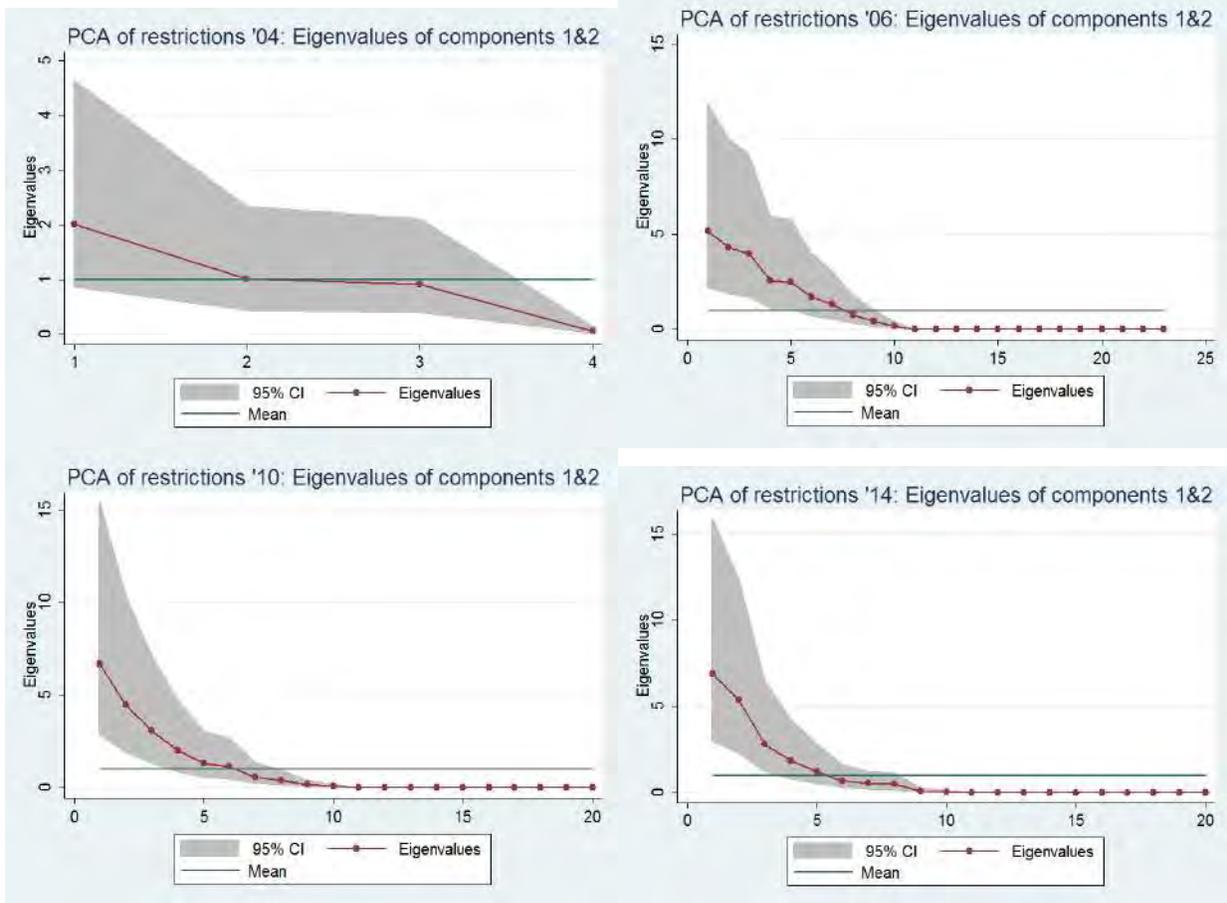**Figure A20. Comprehensive closure days by month, West Bank and Gaza (Days)**
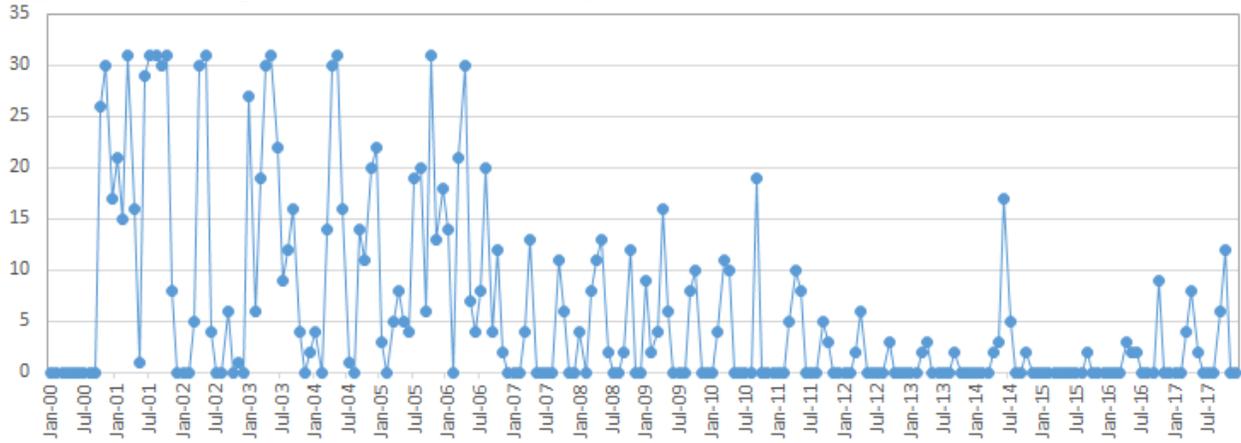
Source: B'Tselem, www.btselem.org/freedom_of_movement/siege_figures.

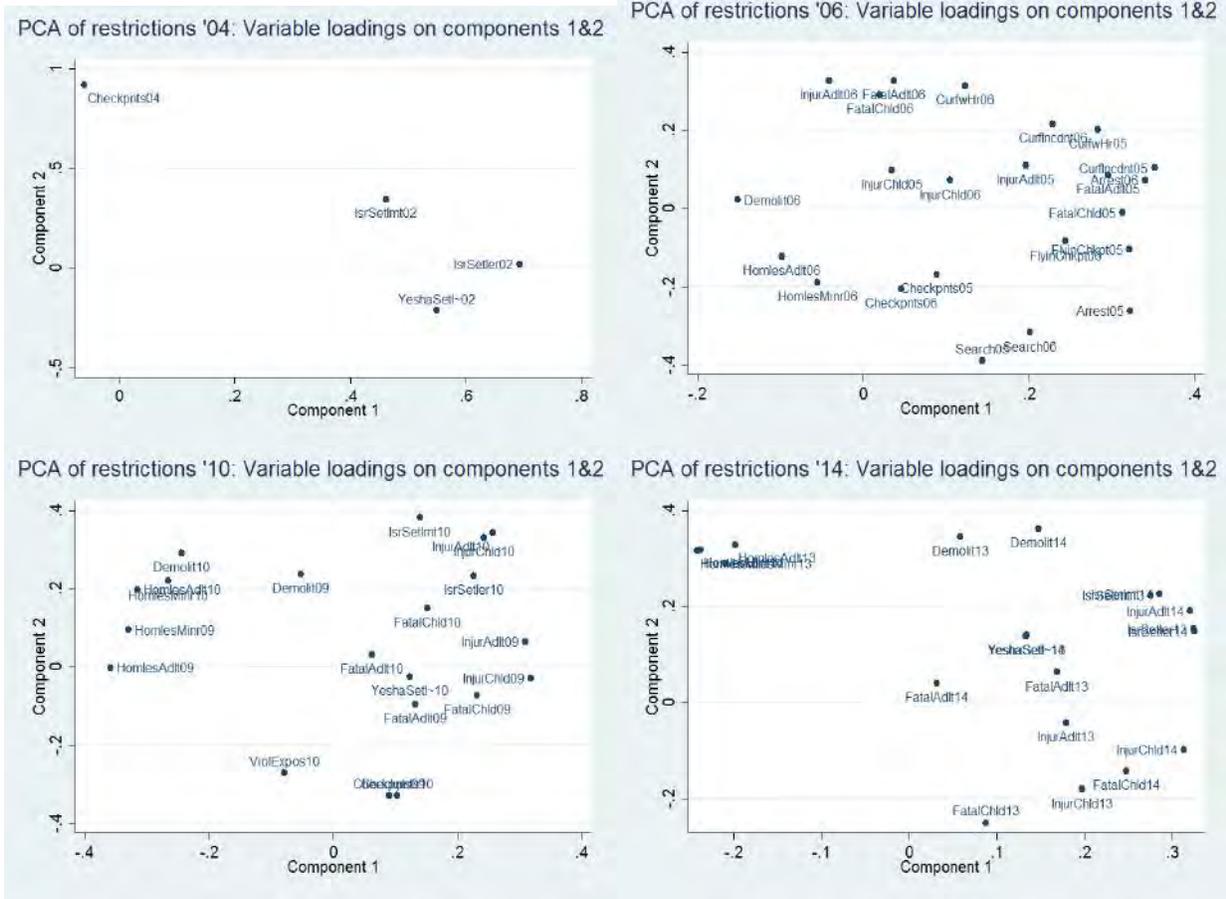**Figure A21. Displaced persons, West Bank (count)**
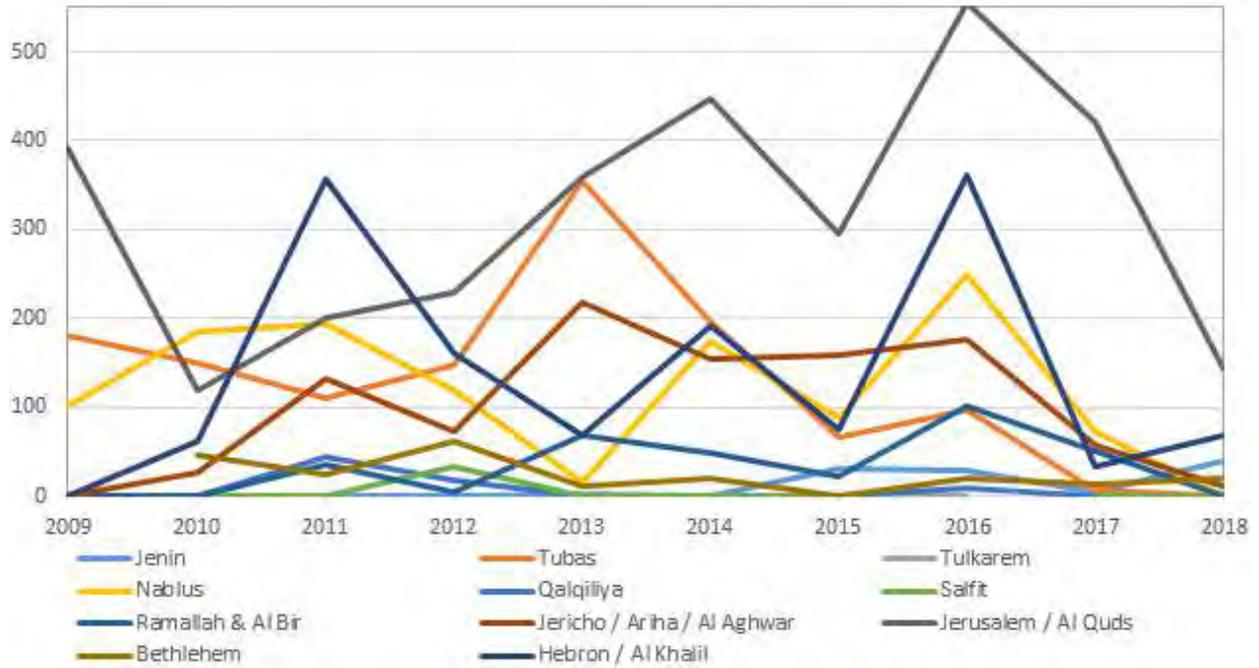
Source: OCHA oPt, https://www.ochaopt.org/page/demolition-system , as of 30 June 2018.

**Figure A22. Eigenvalues of principal components, by year**

Notes: Mean is unity. Confidence interval assumes asymptotic distribution.

Figure A23. Variable loadings to the first two principal components, by year

Notes: Loadings are distributed from –1 to +1, and add up to +1 for each component, interpreted as shares of indicators' variability accounted for by the component (×100%).

Figure A24. Governorate scores under the first two principal components, by year
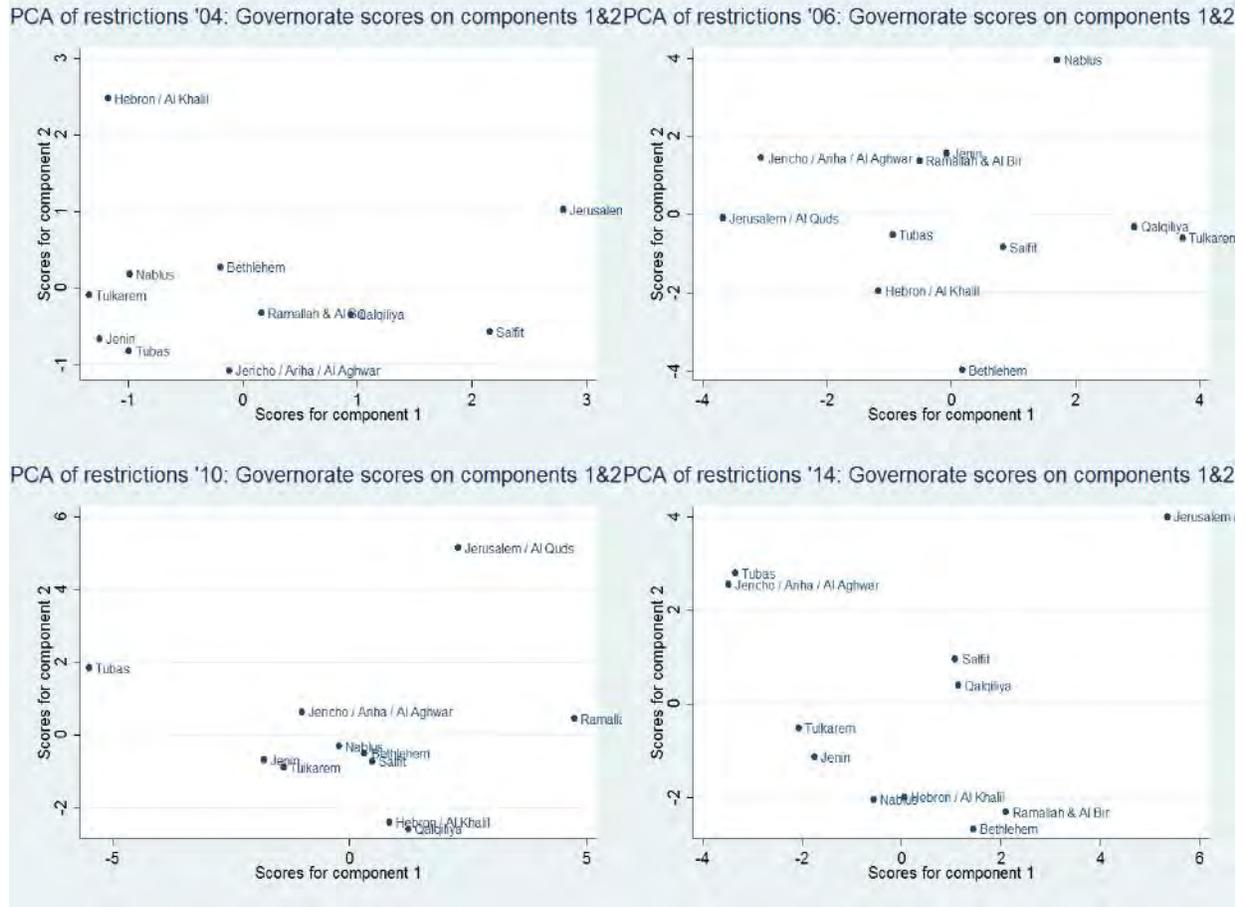
Notes: Scores distributed as normal.

Appendix References

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