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Increasing Access to Finance by Collateral Reform: Evidence from the West Bank and Gaza (Proceedings Version)

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Abstract

This paper examines the impact of an important financial reform in the Palestinian territories of West Bank and Gaza (WBG) of the Middle East and North Africa, a region in which bank credit and financial markets have been very heavily constrained. The reform was to allow firms to use their own equipment and other forms of moveable capital instead of only land as collateral for loans so as to make it easier for private firms to get access to credit. We first do so at both the country and firm levels, in the former case measuring its effect on growth of credit using synthetic control techniques in comparing WBG before and after the reform with comparable other countries which did not go through the reform. In the latter case, we use firm level panel data to trace the impacts of the reform on various outcomes at the firm level between 3 years before the reform and 3 years after the reform. In both cases, despite other difficulties that WBG has been going through, we find considerable evidence that this reform has been very effective.

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Section 1. Introduction

Although capital has long been believed to be an engine of economic growth, making widespread access to credit a crucial ingredient to success in stimulating development, all too frequently firms in developing countries face serious obstacles in getting access to credit, their most important source of finance. Many studies have shown that access to finance is an especially strong obstacle to the development of small- and medium-sized enterprises (or "SMEs"), which contribute greatly to private sector employment and growth across the world (Ayyagari, Beck, and Demirgüç-Kunt, 2007 and Ayyagari, Demirgüç-Kunt, and Maksimovic, 2011). As a result, it is important for researchers be on the lookout for any reforms with some promise for reducing these barriers to credit and financial growth of SMEs, and thereby also for stimulating greater investment, employment, efficiency and economic development.

This paper analyzes one such reform in one of the most financially constrained regions of the world, the Middle East and North Africa (MENA) region. Almost 75% of firms in MENA do not have access to credit, compared to around 50% of firms across the developing world in general (World Bank 2019). The reform under study here is one made in the West Bank and Gaza (WBG) aimed at improving access to credit for SMEs by creating an on-line movable asset collateral registry containing information on these assets and their security interests in collaboration with the Palestinian Authority's "Secured Transactions Law" of 2016 permitting the use of movable assets (such as machinery, equipment and accounts receivable) as collateral (for use in gaining access to credit). Prior to the law, as in most other developing countries, banks in the WBG tended to accept as collateral only large, immovable assets like real estate

which are not often possessed by SMEs. By expanding the assets deemed eligible for use as collateral to include movable assets, more available to SMEs, the policy aimed to broaden access to bank lending by SMEs.

Our analysis is divided into two parts, first to estimate the significance of the treatment effect of the reform on growth of credit at the country level as a percentage of GDP, and then to explore the impact of the reform on financial structure, investment, and credit and employment growth at the firm level between three years prior to the reform (2013) and three years after the reform (2019) based on panel data on the same firms for these two years taken from the Enterprise Surveys of the World Bank.

To analyze the intervention's impact on access to credit at the country level in the first part of the study, we use the synthetic control method pioneered by Abadie et al. (2010) and make use of data from other fairly comparable developing countries that did *not* implement a similar reform, to estimate the economic outcome that the WBG would have experienced in the absence of the reform. The estimated treatment effects show quite clearly that implementation of the collateral registry broadly expanded credit. Indeed, by 2018, just two years after the reform, the volume of outstanding loans as a percentage of GDP in the WBG was 19.16 percentage points higher than it would have been in the absence of the reform. Then, in the second part of the study we provide evidence of the effects of the reform at the firm level showing these effects on different firms to be quite diverse but to have increased machinery investments, access to bank finance, and employment growth among small firms in the West Bank even if not in Gaza.

If further supported in future studies, these findings at both the macro and micro levels would seem to point to the possible usefulness of this type of reform in other countries of the

MENA region. Since lack of financing for SMEs has stunted employment and inhibited the development of a competitive private sector in many MENA countries, especially leaving many youths unemployed and disaffected, this seemingly doable reform could have the potential to reverse the trends that triggered the instability creating events of the "Arab Spring" that have extended to the present date in much of the region. In the absence of such reforms, much of the existing political economy literature on the region has characterized the business environment of the MENA region as reflecting poor access to credit in the private sector leaving that sector dominated by crony elites, inefficiencies, high youth and other unemployment rates, political challenges and instability (Awadallah and Malik 2013).

This paper also hopes to contribute to the broader field of finance and economics since the reform under study is one in which legal institutions play in financial development by focusing on a form of legal institutions, regulations on collateral, which has seldom been explored. Two important exceptions to the neglect of institutions of this type, however, are Love, Peria, and Singh (2016) who use a difference-in-differences approach to compare firms in several reforming countries with those in non-reforming countries, and Xu (2019) which applies firm-level difference-in-differences analysis to a one such legal reform, namely in China's Property Law and its accompanying collateral registry. While there is some largely descriptive literature on collateral regimes in the MENA region[1], to the best of our knowledge, this is the first paper to study the effects of collateral reform in this region.

Although limited to countries outside the MENA region, the aforementioned paper of Love et al (2016) has the advantage of its results being more general since it examines the effects

[1] See, e.g,. Rocha et al. (2011), Baduel, Geginat, and Pierre (2019) and for a more prescriptive analysis, de la Campa (2011)

in several treatment countries as opposed to only the WBG in this study. Yet, as stressed in the comprehensive survey by World Bank (2018), the strength of the treatment effects of the moveable collateral law and registry reform can also vary significantly from one country to another depending on whether or not they are accompanied with Credit Reporting and or Insolvency Practices which varied across the Love et al (2016) sample. Since neither of these facilitating institutions was at all present in WBG, for the WBG the effects are more clearly attributable exclusively to the moveable collateral reform.

The remainder of the paper is organized as follows. Section 2 provides both the economic basis for the hypothesized positive effects of the reform and background on the MENA region and the WBG in particular, including access to finance and details of the reform. Section 3 discusses the data and the synthetic control method used. Section 4 presents the empirical results. Section 5 provides complementary, micro-level analysis of firm surveys from WBG, and Section 6 concludes.

Section 2. Economic Rationale for the Reform and Background on MENA and WBG

As stressed in the literature on microfinance (e.g., Armendariz de Aghion and Morduch (2005)), the central economic problem lying behind the provision of credit to small firms is the information problem. Asymmetries in information lead to adverse selection and moral hazard on the part of potential borrowers, greatly constraining the provision of credit and inducing the lenders to ration the amount of credit when they do provide it (Stiglitz and Weiss 1981). One common mechanism to align the incentives of the borrower with the lender is collateral. By pledging their assets, borrowers can better assure lenders that they intend to pay back their loans.

Collateral is often the primary way that lenders evaluate borrowers in economies that lack strong credit rating and reporting institutions. Rigid collateral requirements are common in developing countries and can have the effect of largely excluding private firms from credit markets. Indeed, firm surveys in such countries often identify unacceptable collateral as one of the most common reasons for rejection of loan applications (World Bank 2019), and banks often accept only immovable assets such as real estate as collateral, which most SMEs are unlikely to possess or, even if they do, may be unable to produce proof of ownership due to poorly developed and weakly enforced property rights.

Yet, these same small firms may have assets in the form of equipment, inventory, livestock, or accounts receivable which, although seldom accepted as collateral by financial institutions in developing countries at present, with appropriate reforms they could be (World Bank 2019).[2] This contrasts sharply with the situation in developed economies, where such assets are frequently used to secure lending.[3] One practical reason for why banks do not accept these movable assets is that they are difficult to monitor in that borrowers can conveniently misplace them or escape with them without paying back on their loans. This is where a collateral registry system can come into play. This is an online, third-party, system through which borrowers can demonstrate ownership of their movable assets, and lenders can confirm and track their security interests in such assets, allowing them to better enforce loans in the case of a default. In the absence of such a registry system, even with a law allowing moveable collateral to

[2] Movable assets are thought to make up 78% of firm's movable assets across the developing world. This figure originally comes from Fleisig, Safavian, and Steinbuks (2006), who use World Bank Enterprise Survey Data from 2001-2005. The survey no longer contains questions explicitly regarding the proportion of fixed to movable assets.
[3] E.g., in the United States, movable assets make up some 60% of firms' assets and facilitate about 70% of small business lending (World Bank 2019).

serve as collateral on loans, banks often do not allow it unless they can hold onto the collateral themselves which could be extremely damaging to the borrowing firms. As such, this policy intervention has the potential to reduce information asymmetries in credit markets, especially for SMEs, thereby hinderng their access to credit and overall economic growth.

Encouraged by important international agencies, such as the World Bank, the International Finance Corporation and the Asian Development Bank, progress in this direction is slowly being made. Indeed, according to the World Bank (2018), by that date some 32 countries had established moveable collateral registries. Ten of these were in East Asia and the Pacific[4] and another ten in Latin America and Sub-Sahara Africa. Although Jordan, Egypt, Tunisia and the United Arab Emirates were reported to have made at least some progress in this respect, no MENA other than WBG has completed the process.

As a result and as noted above, compared to other developing economies, the MENA region still lags behind in terms of access to finance. As shown in **Figure 1**, data from the World Bank Enterprise Surveys shows that 73% of firms in the Middle East and North Africa do not have access to either a loan or a line of credit, compared to about 50% of firms in Eastern Europe & Central Asia, South Asia, and Latin America & Caribbean (World Bank 2019). Similarly, only 9.8% of MENA firms use bank loans to finance their investments. This is less than half the figure for OECD countries and is lower than other regions of developing countries. It is also important to note that this data on such access only applies to formal firms. Informal firms, which are so numerous especially in the MENA region[5], virtually never have access to bank

[4] See also Asian Development Bank (2014).
[5] Indeed, according to some of the best estimates of the importance of informal firms from Schneider (2012) informal firms were estimated to account for over 25% of overall economic activity in the MENA region.

loans (Elbadawi and Loayza 2008), implying therefore that the credit shortfall to firms in the MENA region is considerably greater than the above statistics would indicate.

An even more recent survey of MENA banks in 2010 shows that these institutional constraints are especially limiting in lending to SMEs. The average share of SME lending to total lending in MENA was then only 8% (Rocha et al. 2011), compared to the 18% in middle income countries and 22% in high income countries as a whole (Saleem 2017). When asked which factors prove to be obstacles to their working with SMEs, more than 80% of banks identified "SME transparency", "reliable collateral by SMEs", and "credit information systems" as important (Rocha et al. 2011). Additionally, more than half of the banks indicated that collateral requirements were higher for SMEs than for larger, corporate clients. They also reported facing significant problems with movable collateral at some point in the lending process. As a result, bank lending to SMEs in the MENA region remains severely restricted, and many firms have no access to credit at all.

These lower levels of access to finance are associated with less-developed legal and institutional environments. According to the Strength of Legal Rights index from the World Bank's Doing Business Database, and as shown in Figure 2, the MENA region appears to have the least effective collateral and bankruptcy laws. The region also lags behind others in terms of the percentage of adults covered by private credit bureaus (Love and Mylenko 2003 and Peria and Singh 2014), further inhibiting lending to all firms in the economy. The lack of such credit stunts the private sector, and its ability to provide employment, especially to its youth, leaving so much of the economy to be dominated by crony elites and insufficient competition, often triggering economic, social and political instability (Awadallah and Malik 2013).

The Palestinian economy, made up of two rather unconnected regions West Bank and Gaza, stands out in the MENA region in both positive and incredibly negative ways. On the one hand, the government has been proactive in reforming the business environment, launching the first notable collateral registry in the region. On the other hand, the economy is burdened by a complex political situation which makes cooperation between its two regions very difficult and leaves the WBG occupied by the state of Israel which has imposed tight restrictions on the movement of people and goods into and out of the territories. Gaza is isolated, not only from the West Bank, but also to a large extent from other countries and Israel. The West Bank is less constrained, but even within it, there are over 500 roadblocks and checkpoints which greatly impede commerce (International Finance Corporation 2017). These restrictions have induced large transaction costs for firms, severely impeding their economic outlook (US Department of State 2019). Moreover, even aside from the constraints imposed by Israeli occupation, the Palestinian Authority has, through its creation of some huge holding companies made up of large public and private companies with monopolistic control of the sectors in which they operate and chaired by top leaders of the Palestinian Authority, made it very difficult for small private firms to prosper, earning the WBG the label of "crony capitalism" (Dana, 2019). Additionally, the political takeover of the Gaza Strip from the Palestinian Authority (which presides over the West Bank) by Hamas and the subsequent blockade of it by Israel have limited WBG contact with the global economy. Despite having high rates of literacy and technology penetration, the economy is characterized by high unemployment and limited opportunities for credit.

As indicated above, in April 2016, the Palestinian Authority passed the Law on Secured Transactions intended to boost bank lending to SMEs and other firms and as a complement to

this, the Ministry of National Economy launched an online collateral registry with the support of the World Bank Group.[6] Prior to this, the law only allowed for fixed assets such as land to be pledged as collateral, thereby effectively excluding most SMEs from access to credit since they generally lacked such assets. The reform explicitly expanded the definition of collateral to include movable assets such as machinery, accounts receivable, and consumer goods — all assets more commonly available to SMEs.

In view of the attention paid to WBG after the initiation of the Oslo Accords initiated in 1993 to establish a peace agreement between the WBG and Israel and the extremely distorted state of financial management in WBG both before and after that, one might think that there might well have been initiated some other reforms in public financial management that might have contributed directly or indirectly to at this impressive increase in SME access to credit. Yet, on the basis of our literature survey, including the up-to-date one by Beschel, Jr. and Ahern (2021), we do not find anything relevant.[7] While in the early part of this period the leadership of the Palestinian Liberation Organization attempted to please the public by loosening the budget to increase public sector employment, it actually tightened other regulations with its greater authoritarianism. Only after the fiscal deficit exploded to crisis proportions and the enormous death toll resulting from the "Second Intifada" with Israel did the PLO leadership begin to undertake some meaningful reforms. These were largely fiscal, consisting consolidating the expenditures and revenue sides of the government under the Ministry of Finance and publicizing the budget. Yet after the victory of Hamas (Gaza-based) over the West Bank-based PLO in 2006,

[6] The International Finance Corporation, the UK Department for International Development and the European Commission all played a part in the reform (DAI 2017).
[7] Some other useful sources include Brown (2002), Amandsen et al eds, (2004), and World Bank (2007)

the economic reform movement came to a halt, although there was a significant reduction in the fiscal deficit between 2013 and 2015.

In the remainder of this paper, we attempt to make use of both national and firm level data to see if there is any evidence that the objective of the collateral reform has been fulfilled.

Section 3. Data and Methodology for the Country-Level Analysis

For the country-level analysis we make use of annual time series data from the sample of 21 control countries listed in Table 1 to estimate the volume of lending that would have existed in the WBG, had the government not implemented its collateral registry. First, to arrive at our chosen set of control countries, we reviewed the major credit reforms of countries across the globe, identifying which countries did not implement a similar reform, drawing heavily upon the World Bank Doing Business database.[8] Then we collected annual time series data for the years 2008-2018 on relevant variables for each of these "control countries" from a variety of databases. This list of control countries includes countries not only from MENA but also from Sub-Sahara Africa and South Asia that did not enact similar reforms. The main outcome variable to be analyzed is the volume of bank lending, measured as outstanding loans from commercial banks as a percentage of GDP (*pctLoans*) from the IMF Financial Access Survey.

For predictor covariates, we use (1) the depth of credit information index (*creditInfo*) from the World Bank Doing Business Database as a measure of the quality of information available in credit reporting institutions, (2) the logged average number of days it takes to enforce a contract as a proxy for the effectiveness of legal institutions (*enforcement*), (3) the

[8] In addition to this database, we also look to the literature on business environment reforms in the MENA region (namely, OECD, The European Commission, and European Training Foundation 2018), as well as government websites and news publications to confirm the existence and timing of such reforms.

Political Stability and Absence of Violence/Terrorism index (*polStab*) from the Worldwide Governance Indicators as a measure of conflict, (4) a measure of the strength of the rule of law (*ruleOfLaw* from the Varieties of Democracy Data) so as to capture the transparency and predictability of institutions,[9] and (5) log GDP per capita (*GDPLag*) from the World Bank Development Indicators to control for the level of development, but lagged two years so as to mitigate the potential for endogeneity bias. Overall, the selection of predictors is intended to capture both the main features of economies associated with more developed lending systems, and conflict which has become an all-too-common hindrance to growth in the region and developing countries in general.

As indicated above, our primary specific means of analyzing the effect of the reform is the synthetic control method laid out by Abadie et al. (2010) to estimate the counterfactual for the WBG using a weighted combination of the 21 countries listed in Table 1 that were similar to WBG prior to the WBG reform but which did not implement a similar reform. Given the unique and complex situation in WBG, we find that such a linear combination serves as a better control group than any individual country would. The control weights are chosen to minimize the distance (mean squared prediction error or "MSPE") between the observed unit and the synthetic control unit based on a series of preintervention characteristics, including both outcomes and the aforementioned predictor variables. Put more formally, we estimate the counterfactual outcome for the treated unit y_1 in time *t* with

$$\hat{y}_{1t}^{*} = \sum_{i=2}^{N} w_i y_{it} \qquad (1)$$

[9] Since the *ruleOfLaw* index is reported separately for Gaza and for the West Bank, we use an average of the two values, weighted by each territory's contribution to GDP based on data from the Palestinian Central Bureau of Statistics (2019).

where the index $i = 2, \dots, N$ refers to the N-1 units in the control pool and the weights $\mathbf{W} = (w_2, \dots, w_N)'$ are obtained by minimizing the distance

$$\|\mathbf{X_1} - \mathbf{X_0}\mathbf{W}\| = \sqrt{(\mathbf{X_1} - \mathbf{X_0}\mathbf{W})'\mathbf{V}(\mathbf{X_1} - \mathbf{X_0}\mathbf{W})} \qquad (2)$$

where $\mathbf{X_1}$ is a vector of pre-intervention outcomes and predictors for the treated unit, $\mathbf{X_0}$ is a matrix containing the respective values for the units in the control pool, and $\mathbf{V}$ is some positive, semidefinite matrix. The predictors used in applying this method to measure the treatment effect are listed in **Table 2**.[10]

Two central assumptions of this model are (1) the independence of the treatment from the covariate predictors and (2) the independence of outcomes in the treated unit from those of the untreated units. As a result of the considerable care that went into selecting the potential control countries, we are confident both that lending outcomes in the non-reforming control countries were indeed independent from lending outcomes in the reformed WBG, and that the effects of the collateral reform in WBG were wholly domestic and thus did not affect the credit restraints on firms in the control countries, thereby triggering spillover effects on lending in such countries.

By creating a synthetic WBG that matches closely to the observed WBG in the pre-period, both in outcomes and predictors, we expect it to be good estimator of how the WBG would have behaved in the post-treatment period in the absence of the collateral reform. As a result, the treatment effect of the reform can be estimated simply by taking the difference between the observed WBG unit and the counterfactual control unit.[11]

[10] Note that some predictor variables commonly appearing in the literature on determinants of private credit such as GDP growth and Inflation in Djankov, McLiesh, and Schleifer (2006) and Hainz and Nabokin (2013) are deliberately excluded since they would seem to violate the assumption of independence from the treatment.
[11] For more detail on the derivation and computation involved in this synthetic control method see Abadie et al (2010).

Section 4 Results and Discussion of the Country Level Analysis

The primary specification results in a synthetic West Bank and Gaza with the weights for each of the 21 control countries in **Table 3**.[12] As in the cases presented by Abadie et al. (2010, 2015), most of the synthetic control estimate is attributable to only a few of the units in the 21 country pool. In this case, the counterfactual estimate is weighted about 69% for Iraq, 20% for Lebanon, and 12% for Iran.

In **Table 4**, we compare the means of the pre-intervention characteristics of the observed unit and the synthetic control unit to assess how well they match. A close match in the pre-intervention period suggests that the synthetic unit should be a good estimator of the counterfactual in the post-intervention period. From the top row of the table it can be seen that the synthetic control based on these weights does a better job of matching lending volume than the simple average of the general sample. The same is true to some extent with respect to the various predictors in subsequent rows of the table. There is however some discrepancy between the synthetic and observed unit in the depth of the information provided by credit reporting institutions. While the synthetic control provides a poor match for some of these covariates, like rule of law and GDP, the overall mean squared prediction error (or MSPE) across the pre-intervention outcomes is only 2.063, leading us to believe that the synthetic control does a very decent job of estimating the counterfactual.

Figure 3 traces the comparison between the observed lending volumes and that of the synthetic outcomes over time. As can be seen, the synthetic unit very well matches the observed unit prior to the reform in 2016. Following the reform, however, we observe a significant upward

[12] Tables 3-5 and Figure 3 were developed using the *Synth* R Package developed by Abadie and his coauthors.

trend in the observed unit for WBG compared to the counterfactual, suggesting that the reform did lead to a credit expansion that would not have occurred in the absence of the treatment. As can be determined from Figure 3 by 2018, just two years after the reform, we observe over a 19.16-point increase in outstanding loans from commercial banks as a percentage of GDP.

While this effect seems large, it is important to evaluate its inferential power. To do so, we follow the inferential techniques proposed by Abadie et al. (2010), in particular conducting a series of falsification tests by assigning placebo reforms. To this end, we calculate synthetic control estimates for each of the countries in the sample, even though none of them received the treatment. The idea for this is akin to a permutation test, in which we randomly assign the estimator to the units in the sample, allowing us to assess the likelihood of getting an estimate this large.

To this end, for each country in the sample, we calculate a synthetic control estimator and take the ratio of the corresponding post-intervention MSPE to its pre-intervention MSPE. In this way, we evaluate the size of the estimated treatment effect in the post-period, relative to the closeness of fit in the pre-period. From Table 5 and Figure 4, we can see that the WBG generates a post-MSPE that is 97 times its pre-MSPE. This ratio is the largest in the sample. Thus, the probability of getting a post/pre- MSPE ratio this large is 0.045 (one out of our sample of 22 countries). Thinking of this value as akin to a *p*-value, we find the results to be significant at the 95% level of confidence.

As noted above, to assess the robustness of the synthetic control results, we do two things. First, we change the number of predictor variables included (alternatively adding some even if this reduces the sample size due to missing observations or reducing some with the

lowest explanatory power) and compare the results. Second, as an alternative to the Abadie et al (2010) method for synthetic control, we use the Panel Data Approach of Hsiao et al (2012) and the stepwise regression method laid out in Hsiao and Zhou (2019) for implementing the LASSO method for model selection as suggested by Li and Bell (2017). In both cases, however, the alternative methods yield results that are very similar and showing the effect of the WBG collateral reform to be large and highly significant.

Before turning to the micro-level analysis of the individual firms in WBG, we deem it relevant to provide a slightly broader background on the economic, financial and other changes in the WBG over the period 2008-2019-20. We should first mention why we omit data on years before 2008. This is for two main reasons: (1) lesser availability of the data and (2) because, prior to this the WBG had gone through some extremely important shocks which greatly affected economic performance during that period, including the "Second Intifada" which rocked the nation, and after which Israel pulled out some of its forces and the Palestinian National Authority, weakened by the recent conflict, struggled to control widespread violence and crime in the territory (Uppsala Conflict Data Program 2020) but which was prior to the control of the Gaza Strip in 2007 by the militant religious group Hamas took control of the Gaza Strip in 2007 and Israel's strict blockade of Gaza which severely limited the movement of people and goods into and out of the Gaza Strip and massively reducing the economic welfare of its inhabitants (Zimring 2013).

Table 6 provides time series coverage over the whole period from 2008- 2019 on a large number of indicators relevant not only to financial and credit market developments but also to various more general macroeconomic factors and conflict related factors. From the Finance-

Related Indicators, it can be seen that there has indeed been growth in Domestic Credit to the Private Sector as a share of GDP. Although this had been growing steadily even somewhat before 2016, especially since 2016 one can see there was considerable decline in both Real Interest Rates and the Interest Rate Spread between lending and deposit rates, presumably reflecting declining transactions costs and rising efficiency and competitiveness, making commercial banks more anxious to try to attract deposits. One can see quite rapid increases in Outstanding Loans from Commercial Banks as a % of GDP, and Number of Borrowers from Commercial Banks per 1,000 Adults. Notably, however, the sharpest rise of all is in the Outstanding SME Loans from Commercial Banks as % of GDP. This percentage almost quadrupled between 2015 and 2019, presumably reflecting the benefits of the reform for access to credit by SMEs.[13] Additionally, we can see that this uptick in lending to SMEs is not merely due to larger loans being offered to the same few firms, but to a large increase in the number of borrowing firms. The number of SME borrowers increased more than five-fold from 2015 to 2019. This suggests that our main finding, the increase in overall lending, is likely due to the increasing integration of SMEs into the lending system.

Yet, among the General Macroeconomic Indicators at the top of Table 6, quite a few of these have not been favorable, e.g., those showing (1) no growth in the value added at constant prices of Agricultural and other components of the primary sector, (2) no increase in either the Export Share in GDP or Manufacturing Value Added since 2011, and (3) significant declines in

[13] While one could easily conceive of these various financial developments being more attributable to a well-coordinated and timely expansionary monetary policy, the institutional circumstances of the WBG rule this out. In fact, the Palestinian territories do not maintain a sovereign central bank and while the Paris Protocol of 1994 did establish the Palestinian Monetary Authority (PMA), the Israeli occupation has prevented the PMA from issuing a sovereign currency and regulating the money supply (Awartani 2016).

FDI inflows as a % of GDP, and the Growth Rate of Gross Capital Formation, and Net Bilateral Aid Inflows from Donor Countries. Not surprisingly, the end result has been high and until 2019 rising Unemployment Rates (especially among youths aged 15-24). Also, from the Conflict Related Indicators in the middle of the table one can see that there has been relatively continuous Demolition of Structures and Fatalities from Conflict, and the losses of existing land and housing have increased due to the continuing increases in Israeli settlers within WBG.[14] Hence, it is clear that, despite the collateral reform and evidence that the financial sector as a whole has strengthened, many of the other indicators show that economic and social conditions in WBG have been very mixed at best.

Section 5 Some Micro-Level Analysis Comparing Firm Structure and Behavior Before and After the Collateral Reform

To at least partially overcome the shortcoming of using country-level data, in this section we attempt to examine changes in firm structure, borrowing, investment and employment by individual firms based on a panel of firms from WBG in both 2013 (three years before the reform) and 2019 (three years after the reform) based on data from the Enterprise Surveys of the World Bank which happen to have been undertaken in these two years. While it might have been desirable to have such data also from other pre-reform years to control for pre-trends, such data did not exist.

Descriptive statistics on most of the firm responses and characteristics for the panel of 182 WBG firms surveyed in both the 2013 and 2019 Enterprise Surveys are presented in Table 7.

[14] According to reports from the Al Jazeera Center for Public Liberties and Human Rights (2021) and other sources, a large number of additional settlements have been authorized by Israel to take place in 2021.

As can be seen, slightly over half the sample firms are from the relatively more disadvantaged Gaza region. Some surprises in the table are the substantial percentages which changed their legal status between 2013 and 2019. In particular, the percentage of firms that were shareholding companies with shares either not traded or traded privately rose from just over 25% of the total number of firms in 2013 to almost 45% in 2019 while the shares of firms which were sole proprietorships and partnerships declined.[15] The vast majority of firms in the panel were rather small, the mean numbers of full-time workers in the two years being about 25, and with only about 10% of all firms making use of foreign technology. Consistent with the apparent improvements in the financial market of West Bank and Gaza over the period under study, note that the Severity of Access to Finance as a barrier to the firms' business declined moderately and the number of outstanding loans held by the average firm rose from 0.129 to 0.563. While the percentages of firms with Working Capital Financed by a Bank and the expenditures on land and equipment also rose between the two years, these gains were both small. Moreover, the likelihood that firms purchased fixed assets during the preceding year and the expenditures on equipment alone declined slightly between 2013 and 2019. These declines, however, could safely be attributed to the some of the adverse conditions seen to be on the rise in Table 6. Of greatest relevance to our analysis, however, are the small, but not negligible, increases in the percentage of equipment financed by banks and the more than doubling of the still tiny proportion of firms in the panel which made use of equipment as collateral for a loan.

[15] While this surprise raises the question as to whether there were some advantages (perhaps in financing or regulations) at the time in making that change, we have not been able to identify any. In any case, however, we have introduced controls for legal status in some of the subsequent analysis.

Clearly, therefore, as we turn to the firm level investigation of the impacts of the financial reform in West Bank and Gaza, we have to recognize that any estimates of the effects of reforms may well be overshadowed by some of the more exogenous declines in FDI, and Net Bilateral Aid inflows which have contributed to the rising unemployment and poverty rates, especially among youths, Clearly, these factors may have affected some firms in the panel more than others.

In the interest of space and the overall size of the table we do not include the results of Table 8 which are based on regression estimates comparing the results of the panel of firms observed in both 2013 (three years prior to the collateral reform) and 2019 (three years after the reform). Yet, each of the sections of the table show that significant improvements in outcomes occurred for firms in the WBG panel sample between 2013 and 2019. Specifically, the results showed (1) that the percent of equipment funded by bank loans increased, (2) that the severity of access to finance as an obstacle to business decreased, (3), that the increases in purchases of equipment by firms occurred primarily in small firms, (4) that employment increased primarily in firms receiving the collateralized loans and (5) that all these changes except that in employment occurred in the West Bank but not in Gaza (except where the security and other conditions were much more insecure) but where the labor market may have been more similar.

Section 6. Conclusion

This paper has attempted to evaluate the introduction of a movable asset collateral registry and its impact on access to credit from banks, investment spending and even employment. It does so in a setting not previously dealt with explicitly in the literature: the West Bank and Gaza (WBG). In the first part of the analysis, i.e., in attempting to measure treatment

effects of the 2016 collateral reform in WBG, two types of synthetic control methods were used, in both cases sowing that the collateral reform and its accompanying online registry led to a nearly 20-point increase in outstanding lending as a percentage of GDP in WBG compared to what the country would have experienced in the absence of the reform. Moreover, the results of both methods are also robust to a variety of specifications in the analysis.

In the second part of the analysis we take advantage of panel data on WBG firms surveyed both 3 years before the reform and three years after it. While at the firm level quite naturally the analysis is clouded by the great diversity of conditions facing firms in different industries, of different sizes, locations, legal types, and experience, in general the results do show the very significant increase in the use of equipment for collateral after the reform, and through this an increase in the share of equipment financed by banks, a decline in the severity of Access to Finance as an obstacle to the firm's business, an increase in Investment in Equipment and Machinery and finally in Fulltime Employment, all at the firm level. Not surprisingly, the connections of these financial reforms to investment in the form of equipment and to increases in full-time employment are somewhat weaker because of the many different risks and other factors affecting these decisions in firms of such different sectors, sizes, ownership types, and locations in such different ways.

Overall, these results demonstrate the usefulness of a reform, namely the reform allowing moveable capital like machinery and equipment to be used as collateral on loans from commercial banks. This reform, that seems to have been at least reasonably successful in WBG, could help a number of other countries across the MENA region greatly increase the supply of

credit to their SMEs. Doing so, moreover, could help these countries reduce widespread unemployment and promote the development of more competitive markets and firms.

Appendix

Figure 1: Access to Credit Across the World

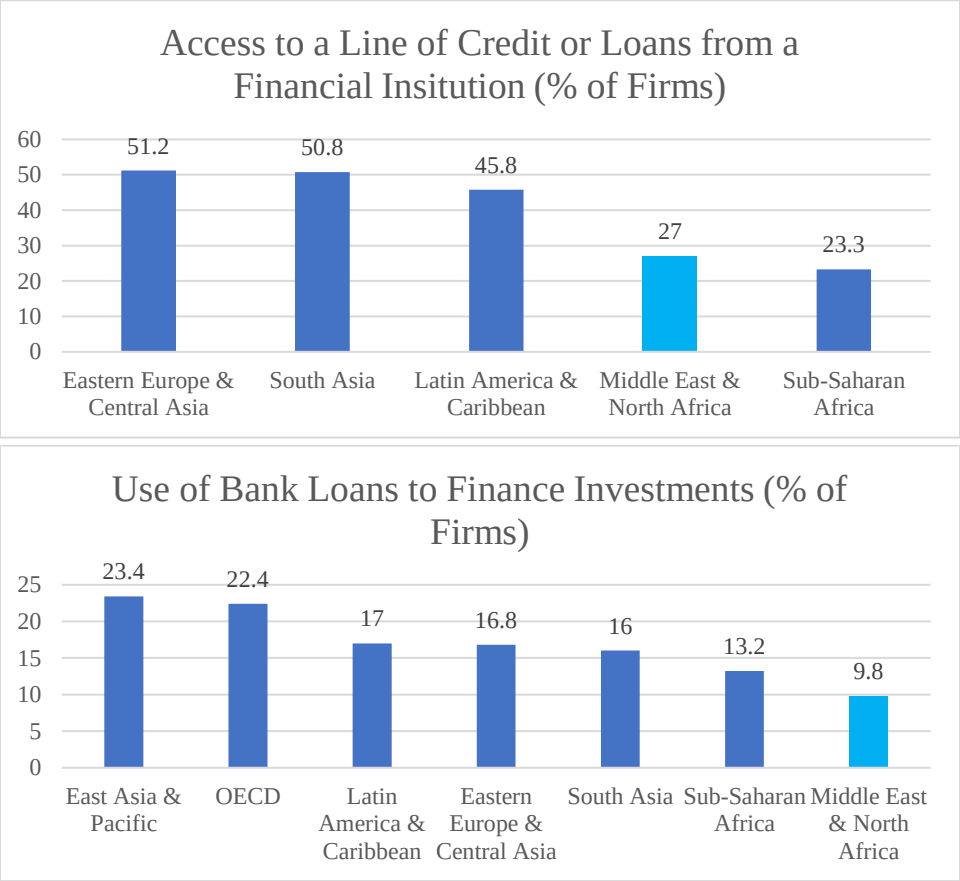
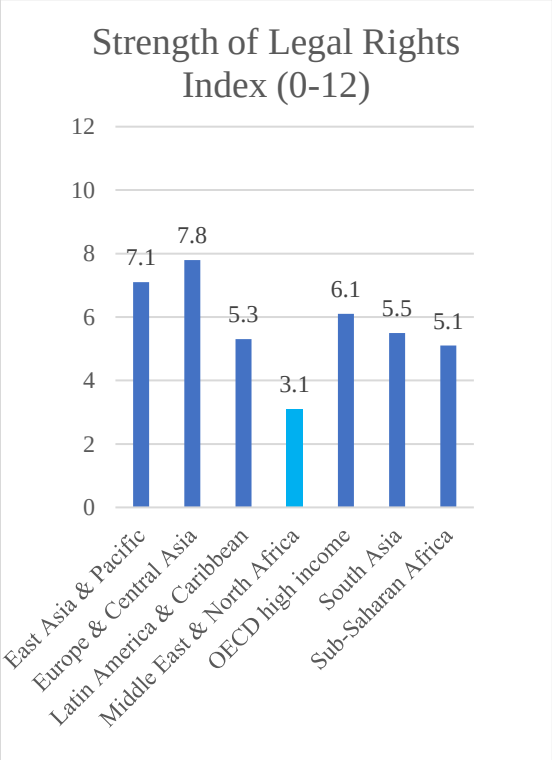


Figure 2: Strength of Credit Institutions Across the World



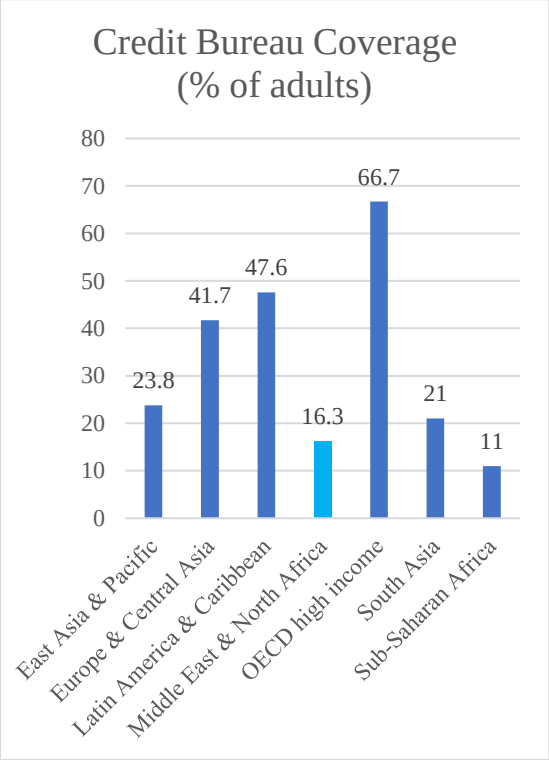


Table 1: Countries included in the Synthetic Control Estimation

Algeria	Iran	Mozambique	Tajikistan
Angola	Iraq	Oman	Tunisia
Bangladesh	Jordan	Qatar	Uganda
Botswana	Kuwait	São Tomé and Príncipe	(West Bank and Gaza)
Cabo Verde	Lebanon	Saudi Arabia	
Eswatini	Morocco	South Africa	

Table 2: Predictors used in Synthetic Control Estimation

Predictor	Variable Name	Pre-Intervention Mean
Dependent Variable	*pctLoans*	Outstanding bank loans (% of GDP)
Information Sharing	*creditInfo*	Depth of credit information index (0-8)
Effectiveness of Legal Institutions	*enforcement*	Log average days to enforce a contract
Political Stability and Absence of Violence	*polStab*	Index ranging from -2.5 (weak governance) to +2.5 (strong governance).
Predictability of Institutions	*ruleOfLaw*	Index ranging from 0 (low) to 1 (high)
Economic Size	*GDPLag*	2-year lag of log GDP per capita
Additional Controls		
Financial Inclusion	*finAccount*	Percentage of population with an account at a financial institution (age 15+)
Business Costs of Terrorism	*costsTerrorism*	Index ranging from 1 (imposes large costs) to 7 (imposes no costs)
Status of Oil Sector	*oilRents*	Crude oil production at world prices minus costs of production (% of GDP)

Table 3: Synthetic Control Weights

Country	Weight	Country	Weight
Algeria	0	Morocco	0
Angola	0	Mozambique	0
Bangladesh	0	Oman	0
Botswana	0	Qatar	0
Cabo Verde	0	São Tomé and Príncipe	0
Eswatini	0	Saudi Arabia	0
Iran	0.117	South Africa	0
Iraq	0.688	Tajikistan	0
Jordan	0	Tunisia	0
Kuwait	0.	Uganda	0
Lebanon	0.195		

Table 4: Observed Unit vs. Synthetic Unit (Pre-Intervention Means)

Characteristic	Treated Unit	Synthetic Unit	Sample Mean
pctLoans	24.626	24.637	44.172
creditInfo	3.500	1.390	2.631
polStab	-1.979	-1.969	-0.384
Enforcement	6.370	6.316	6.508
ruleOfLaw	0.627	0.256	0.462
GDPLag	7.673	8.529	8.353

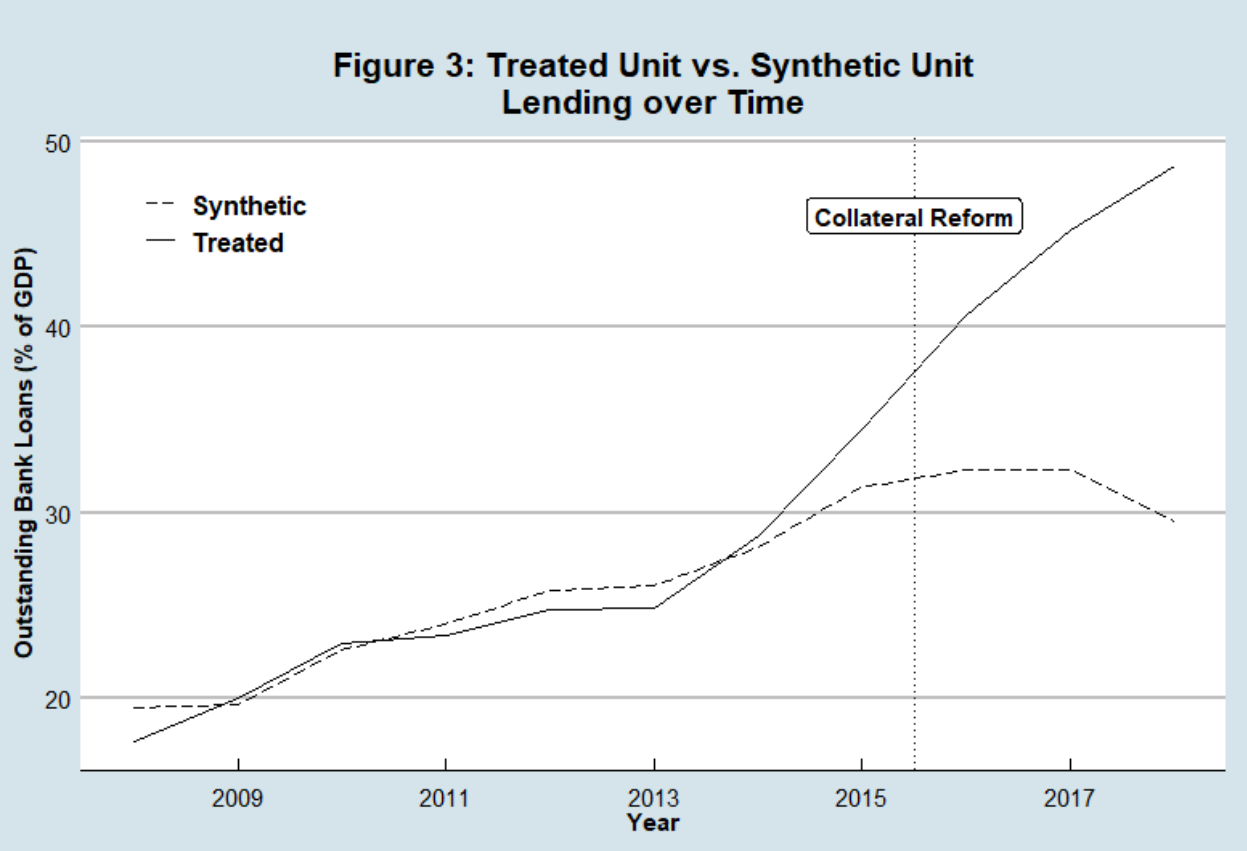


Table 5: Post/Pre-MSPE Ratios

Country	Ratio	Country	Ratio
Algeria	12.38	Morocco	4.25
Angola	3.81	Mozambique	0.44
Bangladesh	7.76	Oman	3.06
Botswana	8.64	Qatar	12.89
Cabo Verde	1.48	São Tomé and Príncipe	0.23
Eswatini	0.50	Saudi Arabia	22.58
Iran	47.39	South Africa	4.40
Iraq	0.22	Tajikistan	22.78
Jordan	1.77	Tunisia	2.58
Kuwait	0.47	Uganda	0.67
Lebanon	4.42	**West Bank and Gaza**	**97.14**

Table 6

Selected Time Series Data for the West Bank and Gaza 2009-2020

General Macroeconomic Indicators	2009	2010	2011	20
Agriculture, forestry, and fishing, value added (constant 2010 US$)	9.64E+08	871600000	9.15E+08	9.6E+
Exports of goods and services (% of GDP)	14.0161	14.1228115	16.08604	15.326
Manufacturing, value added (constant 2010 US$)	9.83E+08	1184000000	1.18E+09	1.33E+
Foreign direct investment, net inflows (% of GDP)	3.716042	1.85860711	2.135156	0.5159
			-	
Gross capital formation (annual % growth)	16.61253	3.66144032	1.758068	27.876
Gross fixed capital formation (constant 2010 US$)	1.95E+09	1824900000	2.22E+09	2.68E+
Inflation, GDP deflator: linked series (annual %)	1.852733	13.1963162	5.419825	2.8677
Net bilateral aid flows from DAC donors, United States (current US$)	8.44E+08	714609985	6.18E+08	2.82E+
Poverty headcount ratio at $3.20 a day (2011 PPP) (% of population)	2.6	3.2	3	..
Unemployment Rate	24.6	23.8	20.9	22
Youth Unemployment Rate (age 15-24)			34	
Conflict Related Indicators				
Structures Demolished Conflict	279	439	681	6
Fatalities from Conflict	1059	87	117	2
Israeli Settlers	510,904	529,319	548,438	565,3
Finance -Related Indicators				
Interest rate spread (lending rate minus deposit rate, %)	5.78	6.04	6.26	6.

Deposit interest rate (%)	0.4	0.29	0.53	0.
Outstanding Loans from Commercial Banks % of GDP	20.1	23	23.4	24
Number of Borrowers from Commercial Banks per 1000 Adults	72.1	82.5	100	108
Outstanding SME Loans from Commercial Banks % of GDP	1.88	2.03	2.01	2
SME Borrowers from Commercial Banks	2328	2031	2993	43
Domestic credit to private sector (% of GDP)	19.53	21.36	22.96	24.
Real interest rate (%)	4.26	-6.06	1.3	3.

Sources: Data from database: World Development Indicators United Nations Office for the Coordination of
Palestinian Central Bureau of Statistics, Israel Central Bureau of Statistics www.ochaopt.org/
IMF Financial Access Survey

Table 7

Descriptive Statistics for Firms in the 2013, 2019 Enterprise Survey Panel

	(1)	(2)	(3)	(4)	(5)	(6
			2013			
VARIABLES	N	mean	Sd	min	max	N
Region (1= West Bank, 2= Gaza)	182	1.516	0.501	1	2	18
limited_legal_status	181	3.077	0.934	1	5	18
Shareholding company with shares traded on the stock market	182	0.0275	0.164	0	1	18
Shareholding company with non-traded share or shares traded privately	182	0.258	0.439	0	1	18
Sole proprietorship	182	0.374	0.485	0	1	18
Partnership	182	0.280	0.450	0	1	18
Limited partnership	182	0.0549	0.229	0	1	18
use_of_foreign_technology	180	0.0944	0.293	0	1	18
collateral_equipment	181	0.0166	0.128	0	1	18
Access_to_finance	181	1.901	1.313	0	4	18
percent_WCretained	174	78.22	34.14	0	100	17
percent_WCnonbank	174	0.172	1.691	0	20	17
purchased_fixed_assets	182	0.363	0.482	0	1	17
percent_equnonbank	61	2.459	14.22	0	100	2(
percent_equcustomer	61	6.066	16.96	0	70	2(
number_fulltime_worker	182	24.86	43.54	5	400	18
manufacturing	182	0.330	0.471	0	1	18
compete_informal	176	0.409	0.493	0	1	17
number_loans	171	0.129	0.515	0	4	17
non_shareholding_company	181	0.713	0.454	0	1	18
percent_WCbank	174	4.167	15.48	0	100	17
ln_expenditure_equipment_land	182	3.643	5.694	0	15.89	18
percent_equbank	177	1.723	9.564	0	85	17
ln_expenditure_equipment	170	3.857	5.735	0	15.61	18
Number of panelid	182	182	182	182	182	18

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