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APPENDIX

External Shocks and Labor Market Reforms in Autocracies and Democracies: Evidence from Oil Price Windfalls

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ADB Economics Working Paper No. 752 November 2024 In this appendix, we discuss the estimated effects of oil price windfalls on the additional dependent variables we consider to investigate the transmission channels behind our main result that (i) positive oil price windfalls cause a labor market deregulation reform in autocracies but have no effect in democracies, and (ii) negative windfalls cause a deregulation reform in democracies but have no effect in autocracies.

We start by examining the response of oil rents (Figure A1). As expected, rents increase following positive windfall gains. The estimated effects are similar across democracies and autocracies. Oil rents increase by about 0.7 percentage points of gross domestic product (GDP) at impact following a 1-standard-deviation oil price windfall gain. The effect gradually decreases over the horizon considered, to stabilize at about 0.4 percentage points 4 years after the windfall (still statistically significant). These results confirm that oil price windfall gains generate important rents. Turning to the effect of windfall losses, we estimate a pronounced negative response of oil rents in democracies (peak effect at almost -1 percentage point 1 year after a 1-standard-deviation windfall loss). In autocracies, instead, a decrease in the oil price index leads to a more marginal decrease in the share of oil rents in GDP, which is entirely reabsorbed in the medium term. This more muted negative response of oil rents to negative windfalls in autocracies is partly explained by the reduction in GDP that accompanies the negative windfall, as we will see below, which mechanically pushes the share of oil rents in GDP up.

Next, we turn to the response of the current account balance (Figure A2), GDP (Figure A3) and the employment rate (Figure A4). Positive oil price windfalls tend to increase the current account balance in both autocracies and democracies (by about 0.5 percentage points of GDP on impact after a 1-standard-deviation positive windfall). However, the effects that we estimate for the current account balance are only statistically significant on impact, suggesting that they are an almost mechanical consequence of the terms of trade shock, and in democracies, they are even reversed in the medium term. In autocracies, the response of GDP and the employment rate is muted on impact but gradually increases over the rest of the horizon considered, reaching 1.5% (GDP) and 0.5 percentage points (employment rate) 4 years after a 1-standard-deviation positive windfalls in democracies are instead flat.

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Oil price windfall losses in autocracies have some negative, although relatively mild, effects on GDP (about –0.5% at impact) and no effects on the current account balance nor the employment rate. Windfall losses in democracies do not have effects on GDP but have important negative effects on the current account balance. This decreases by almost 1.5 percentage points of GDP on impact (effect statistically significant at the 99% confidence level) and never recovers over the 5-year horizon that we consider. The response of the employment rate to negative windfalls in both autocracies and democracies is muted.

Tax revenues respond broadly as expected (Figure A6). Their impact response to positive windfall gains is positive (tax revenues increase by about 0.4 percentage points of GDP after 1-standard-deviation shock), while that to negative windfall is negative (decrease of about 0.5 to 0.6 percentage points), in both autocracies and democracies. These responses may be largely mechanical if oil rents were subject to a higher tax rate than the rest of the economy. Looking at the rest of the horizon considered, the response of tax revenues as a share of GDP following positive windfalls is reabsorbed in autocracies, possibly because of a denominator effect, given that GDP increases, while it stabilizes in democracies. The negative response of revenues to negative windfalls instead is just temporary, and even reversed in autocracies while it is more persistent in democracies.

Turning to government expenditures (Figure A7), their impact response to positive windfalls is null, but expenditures increase as a share of GDP over the rest of the horizon considered in democracies, for which we estimate a 1-standard-deviation positive windfall to lead to an increase of about 0.6 percentage points of GDP in government expenditures four years after the windfall (statistically significant at the 99% confidence level). The fact that expenditures react to positive windfalls over the medium term but not on impact is an indication that their responses are not just mechanical but might be due to actual changes in expenditure policies. The response of expenditures to negative windfalls is positive in both autocracies and democracies (about 0.4 percentage points). While in autocracies this positive response might be due to the reduction in economic activity, in democracies it might be driven by an actual change in government policy. Over the medium-term, expenditures as a share of GDP keep increasing in both autocracies and democracies.

We close the analysis by considering the response of the budget balance (Figure A8). This increases following positive windfalls in both autocracies and democracies, but this response is sharper and more persistent in autocracies. The response to negative windfalls is instead negative both in autocracies and democracies, but sharper and more persistent in democracies. There, the budget balance deteriorates by more than 1 percentage point of GDP 4 years after a 1-standard-deviation shock.

Autocracies	Democracies		Switchers	
Azerbaijan	Australia	India	Albania	Mozambique
China, People's Republic of	Austria	Ireland	Argentina	Nigeria
Cameroon	Belgium	Israel	Burkina Faso	Nicaragua
Jordan	Bulgaria	Italy	Bangladesh	Nepal
Kazakhstan	Canada	Jamaica	Belarus	Pakistan
Morocco	Switzerland	Japan	Bolivia	Peru
Singapore	Colombia	Sri Lanka	Brazil	Philippines
Tanzania	Costa Rica	Lithuania	Chile	Poland
Uzbekistan	Czech Republic	Latvia	Dominican Republic	Portugal
Viet Nam	Germany	Malaysia	Algeria	Paraguay
	Denmark	Netherlands	Ecuador	Romania
	Estonia	Norway	Spain	Senegal
	Finland	New Zealand	Ethiopia	El Salvador
	France	Sweden	Ghana	Thailand
	United Kingdom	Ukraine	Greece	Tunisia
	Georgia	United States	Guatemala	Türkiye
	Hungary	South Africa	Indonesia	Uganda
			Kenya	Uruguay
			Madagascar	Zimbabwe
			Mexico	
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Table A1: Country Coverage

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Figure A1: Effects of Oil Price Windfalls on Oil Rents

GDP = gross domestic product.

Notes: Effects of a 1-standard-deviation positive and negative oil price windfalls on oil rents over a 5-year horizon on the sample of autocracies and democracies. Estimates are obtained plotting the $\beta_k^{A,P}$ and $\beta_k^{A,N}$ (Panel A) and $\beta_k^{D,P}$ and $\beta_k^{D,N}$ (Panel B) coefficients and their standard errors estimated from an alternative specification of Equation (4) in which the $EPL_{i,t}$ variable is replaced with oil rents as a share of GDP. See notes in Figure 3. Source: Authors' calculations.



Figure A2: Effects of Oil Price Windfalls on the Current Account Balance

GDP = gross domestic product.

Notes: Effects of a 1-standard-deviation positive and negative oil price windfalls on the current account balance over a 5-year horizon on the sample of autocracies and democracies. Estimates are obtained plotting the $\beta_k^{A,P}$ and $\beta_k^{A,N}$ (Panel A) and $\beta_k^{D,P}$ and $\beta_k^{D,N}$ (Panel B) coefficients and their standard errors estimated from an alternative specification of Equation (4) in which the $EPL_{i,t}$ variable is replaced with the current account balance as a share of GDP. See notes in Figure 3.



Figure A3: Effects of Oil Price Windfalls on GDP



GDP = gross domestic product.

Notes: Effects of a 1-standard-deviation positive and negative oil price windfalls on GDP growth over a 5-year horizon on the sample of autocracies and democracies. Estimates are obtained plotting the $\beta_k^{A,P}$ and $\beta_k^{A,N}$ (Panel A) and $\beta_k^{D,P}$ and $\beta_k^{D,N}$ (Panel B) coefficients and their standard errors estimated from an alternative specification of Equation (4) in which the $EPL_{i,t}$ variable is replaced with 100 times the log of real per capita GDP. See notes in Figure 3. Source: Authors' calculations.



Figure A4: Effects of Oil Price Windfalls on the Employment Rate

Notes: Effects of a 1-standard-deviation positive and negative oil price windfalls on the employment rate over a 5year horizon on the sample of autocracies and democracies. Estimates are obtained plotting the $\beta_k^{A,P}$ and $\beta_k^{A,N}$ (Panel A) and $\beta_k^{D,P}$ and $\beta_k^{D,N}$ (Panel B) coefficients and their standard errors estimated from an alternative specification of Equation (4) in which the $EPL_{i,t}$ variable is replaced with the employment to population ratio. See notes in Figure 3.



Figure A5: Effects of Oil Price Windfalls on Tax Revenues

GDP = gross domestic product.

Notes: Effects of a 1-standard-deviation positive and negative oil price windfalls on government tax revenues over a 5-year horizon on the sample of autocracies and democracies. Estimates are obtained plotting the $\beta_k^{A,P}$ and $\beta_k^{A,N}$ (Panel A) and $\beta_k^{D,P}$ and $\beta_k^{D,N}$ (Panel B) coefficients and their standard errors estimated from an alternative specification of Equation (4) in which the $EPL_{i,t}$ variable is replaced with tax revenues as a share of GDP. See notes in Figure 3.



Figure A6: Effects of Oil Price Windfalls on Government Expenditures

GDP = gross domestic product.

Notes: Effects of a 1-standard-deviation positive and negative oil price windfalls on government expenditures over a 5-year horizon on the sample of autocracies and democracies. Estimates are obtained plotting the $\beta_k^{A,P}$ and $\beta_k^{A,N}$ (Panel A) and $\beta_k^{D,P}$ and $\beta_k^{D,N}$ (Panel B) coefficients and their standard errors estimated from an alternative specification of Equation (4) in which the $EPL_{i,t}$ variable is replaced with primary government expenditures as a share of GDP. See notes in Figure 3.



Figure A7: Effects of Oil Price Windfalls on the Primary Balance

GDP = gross domestic product.

Notes: Effects of a 1-standard-deviation positive and negative oil price windfalls on the primary balance over a 5year horizon on the sample of autocracies and democracies. Estimates are obtained plotting the $\beta_k^{A,P}$ and $\beta_k^{A,N}$ (Panel A) and $\beta_k^{D,P}$ and $\beta_k^{D,P}$ and $\beta_k^{D,N}$ (Panel B) coefficients and their standard errors estimated from an alternative specification of Equation (4) in which the $EPL_{i,t}$ variable is replaced with the primary balance as a share of GDP. See notes in Figure 3.